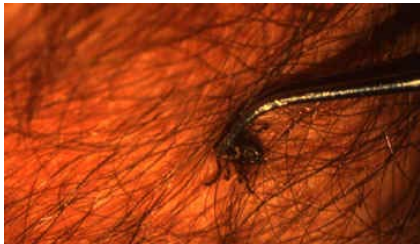


HOW TO REDUCE EXPOSURE TO TICKS AND DISEASE

- When entering a grassy or wooded area wear a long sleeve shirt and light colored pants, with the shirt tucked in and pants tucked into the socks.
- Apply repellents to clothing to help keep ticks away from exposed skin.
- Check clothing and skin for ticks after leaving grassy or wooded areas.
- Remove ticks promptly. An infected tick must be attached for several hours before an infection can be transmitted.
- Remove ticks using tweezers or forceps. Grasp the tick as close to the skin as possible and pull with steady pressure. If tweezers are not available tissue paper or paper towels can be used to prevent transmission of any possible infection.
- Do not squeeze or crush the tick. This may spread infected fluids.
- Contact Environmental Health Services with questions or to learn more about ticks and tick-borne diseases.



References and more information:

www.lymenet.org

www.bsui.edu/csh/phs/phel.html

www.cdc.gov click on health topics A-Z, then on the diseases of interest

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TICKS AND TICK-BORNE DISEASES IN INDIANA



**Environmental Health Services
Elkhart County Health Department**

"Dedicated to a Healthful Life and Environment"

Ticks are arachnids. They have two body parts and eight legs. The life cycle of a tick has four stages: egg, larvae, nymph and adult. Both male and female ticks take blood meals from animals and/or humans. There are about 15 species of ticks found in Indiana. Three species of ticks are of public health importance in Indiana.

Dermacentor variabilis or the American dog tick is the tick most people encounter in Indiana. It is found in all 92 Indiana counties. The dog tick is the largest of the three ticks discussed here. The female has a white shield on the back. The back of the male is mottled gray and dark brown. The adults feed on dogs, cats, and humans and are often seen in late April, May, June, and early July. *Dermacentor variabilis* is the primary vector of Rocky Mountain Spotted Fever (RMSF).



Male



Female

Amblyomma americanum, the lone star tick, is smaller than the American dog tick but has longer mouth parts. The female has a single white spot near the center of the back. Larvae, nymphs and adults will all feed on humans. Lone star ticks have been found in about two-thirds of Indiana counties but are more common in the southern part of the state. Adult ticks appear in late March, numbers peak in May and June and decline in July. Nymphs appear in April, peak in May and June, and can be found throughout the summer. Larvae appear in the spring and again in the fall. *Amblyomma americanum* is a vector of Ehrlichiosis.



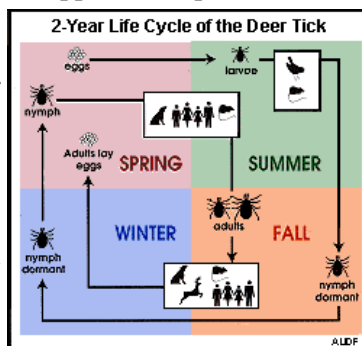
1. male
2. female
3. nymph

Ixodes scapularis, the blacklegged tick (also known as the Lyme Disease tick or deer tick), is the smallest tick discussed here. The female is the largest of the stages and is mahogany in color with long mouth parts. The male has shorter mouth parts and is smaller. The nymph and larva are extremely



- small.
1. Female
 2. Male
 3. Nymph
 4. Larvae

Larvae feed on mice and other small rodents, while adults prefer deer. Nymphs feed on a variety of hosts including humans. The blacklegged tick has been found in about half the counties in Indiana. Established populations can be found in the northwestern part of the state including Lake, Porter, La Porte, Newton, Jasper, Pulaski, and Starke Counties. Adults appear in September, looking for deer. They can be found in October and November and on warm days through the winter. Nymphs are active May-July, and larvae can be found from July-September. *Ixodes scapularis* is the vector of Lyme Disease and Ehrlichiosis. Lyme Disease infected ticks have been found in Newton, Jasper, Pulaski and Porter Counties.



Rocky Mountain Spotted Fever (RMSF) is caused by the bacterium *Rickettsia rickettsii*, which is transmitted by the American dog tick. Symptoms appear approximately 3-14 days after exposure. Symptoms include a moderate-to-high fever, fatigue, muscle aches, severe headache, and chills. A rash develops, usually on the arms, legs, palms of the hands and soles of the feet and spreads to other parts of the body. If RMSF is suspected antibiotic treatment should be started immediately.

Treatment should not be delayed until laboratory confirmation is received. Doxycycline is the primary drug used to treat RMSF. Since 1991 Indiana has had 59 confirmed cases of RMSF.



Late stage RMSF rash

Ehrlichiosis is an infection caused by two different bacteria. Human monocytic ehrlichiosis (HME) is caused by *Ehrlichia chaffeensis* which is transmitted by the lone star tick. Human granulocytic ehrlichiosis (HGE) is caused by *Ehrlichia phagocytophila* which is most likely transmitted by the blacklegged tick. Ehrlichiosis has symptoms similar to RMSF, which appear 7-21 days after exposure; however, the rash rarely appears. Doxycycline is used to treat Ehrlichiosis. Indiana has had 26 confirmed cases of Ehrlichiosis since 1991.

Lyme Disease is an infection caused by the bacterium *Borrelia burgdorferi*, which is transmitted by the blacklegged tick. In most cases a slowly expanding "bullseye" red rash (erythema migrans) that is paler at the center than the edges appears 3-32 days (average 7-10 days) after exposure. Other symptoms include joint pain or swelling (especially in the knees), fatigue, difficulty concentrating, headache, stiff neck or weakness of the facial muscles, dizziness, and an irregular heartbeat. Indiana has had 195 confirmed cases of Lyme Disease since 1991.

