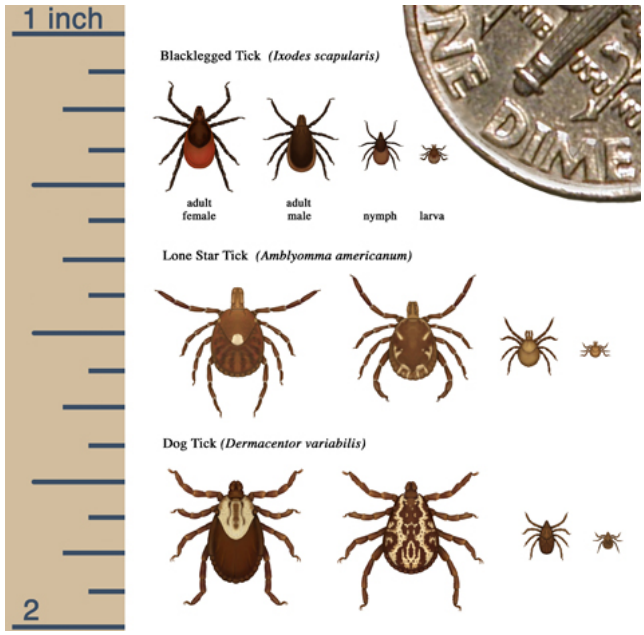
Life cycle of Hard Ticks that Spread Disease

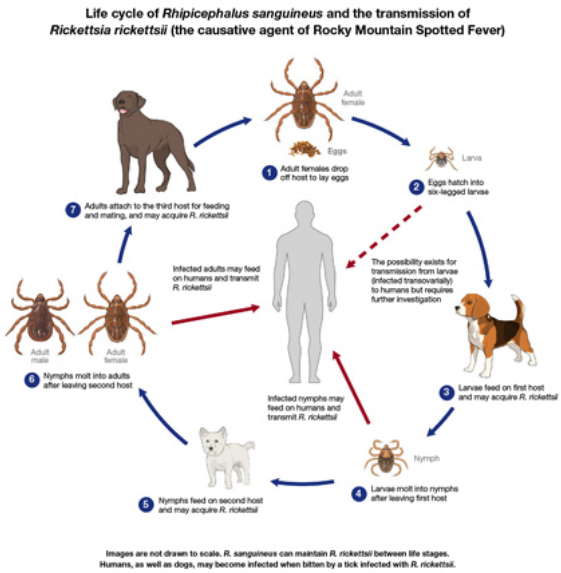
How ticks survive

Most ticks go through four life stages: egg, six-legged larva, eight-legged nymph, and adult. After hatching from the eggs, ticks must eat blood at every stage to survive. Ticks that require this many hosts can take up to 3 years to complete their full life cycle, and most will die because they don't find a host for their next feeding.



Relative sizes of several ticks at different life stages.

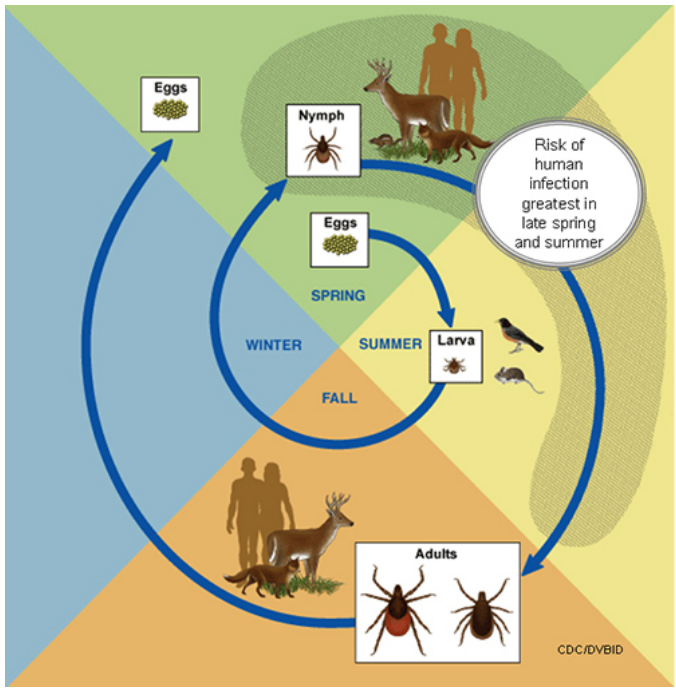
Although some tick species, like the brown dog tick, prefer to feed on the same host during all life stages.



This diagram shows the typical lifecycle of brown dog ticks. Brown dog ticks spread the bacteria that causes Rocky Mountain spotted fever in some parts of the southwestern United States and Mexico.

Click here for printable version [PDF – 180 KB]

Ticks can feed on mammals, birds, reptiles, and amphibians. Most ticks prefer to have a different host animal at each stage of their life, as shown below:



This diagram shows the life cycle of blacklegged ticks that can transmit anaplasmosis, babesiosis, and Lyme disease.

How ticks find their hosts

Ticks find their hosts by detecting animals´ breath and body odors, or by sensing body heat, moisture, and vibrations. Some species can even recognize a shadow. In addition, ticks pick a place to wait by identifying well-used paths. Then they wait for a host, resting on the tips of grasses and shrubs. Ticks can't fly or jump, but many tick species wait in a position known as "questing".

While questing, ticks hold onto leaves and grass by their third and fourth pair of legs. They hold the first pair of legs outstretched, waiting to climb on to the host. When a host brushes the spot where a tick is waiting, it quickly climbs aboard. Some ticks will attach quickly and others will wander, looking for places like the ear, or other areas where the skin is thinner.

How ticks spread disease

Ticks transmit pathogens that cause disease through the process of feeding.

- Depending on the tick species and its stage of life, preparing to feed can take from 10 minutes to 2 hours. When the tick finds a feeding spot, it grasps the skin and cuts into the surface.
- The tick then inserts its feeding tube. Many species also secrete a cement-like substance that keeps them firmly attached during the meal. The feeding tube can have barbs which help keep the tick in place.
- Ticks also can secrete small amounts of saliva with anesthetic properties so that the animal or person can't feel that the tick has attached itself. If the tick is in a sheltered spot, it can go unnoticed.
- A tick will suck the blood slowly for several days. If the host animal has a bloodborne infection, the tick will ingest the pathogens with the blood.
- Small amounts of saliva from the tick may also enter the skin of the host animal during the feeding process. If the tick contains a pathogen, the organism may be transmitted to the host animal in this way.
- After feeding, most ticks will drop off and prepare for the next life stage. At its next feeding, it can then transmit an acquired disease to the new host.

Page last reviewed: June 1, 2015

Page last updated: April 20, 2017

Content source: Centers for Disease Control and Prevention (http://www.cdc.gov/)

National Center for Emerging and Zoonotic Infectious Diseases (NCEZID) (http://www.cdc.gov/ncezid)

Division of Vector-Borne Diseases (DVBD) (http://www.cdc.gov/ncezid/dvbd/index.html)