



Ridgefield Health Department

Ridgefield, CT 06877

Blastlyme.org

Which tick-borne diseases should we be concerned about?

Several diseases can be acquired from the bite of an infected blacklegged (deer) tick:

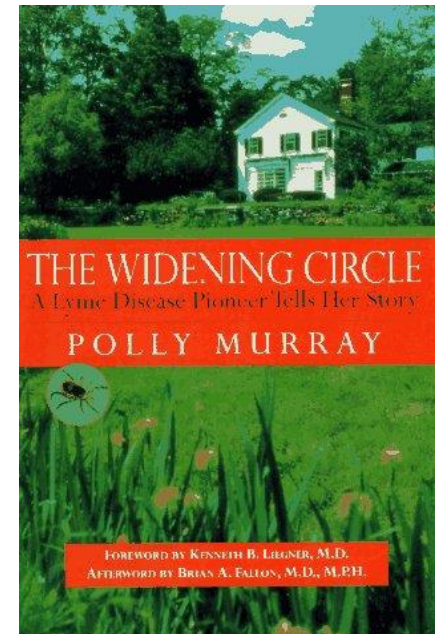
- Lyme Disease
- Babesiosis
- Anaplasmosis
- *Borrelia miyamotoi*
- Powassan Disease



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PHOTOGRAPH BY JIM GATHANY, CDC/PHIL/CORBIS

Named after first cases in Lyme, CT (1975)



Photograph by Michael Patnaude, University of Florida.

Lyme disease in the United States

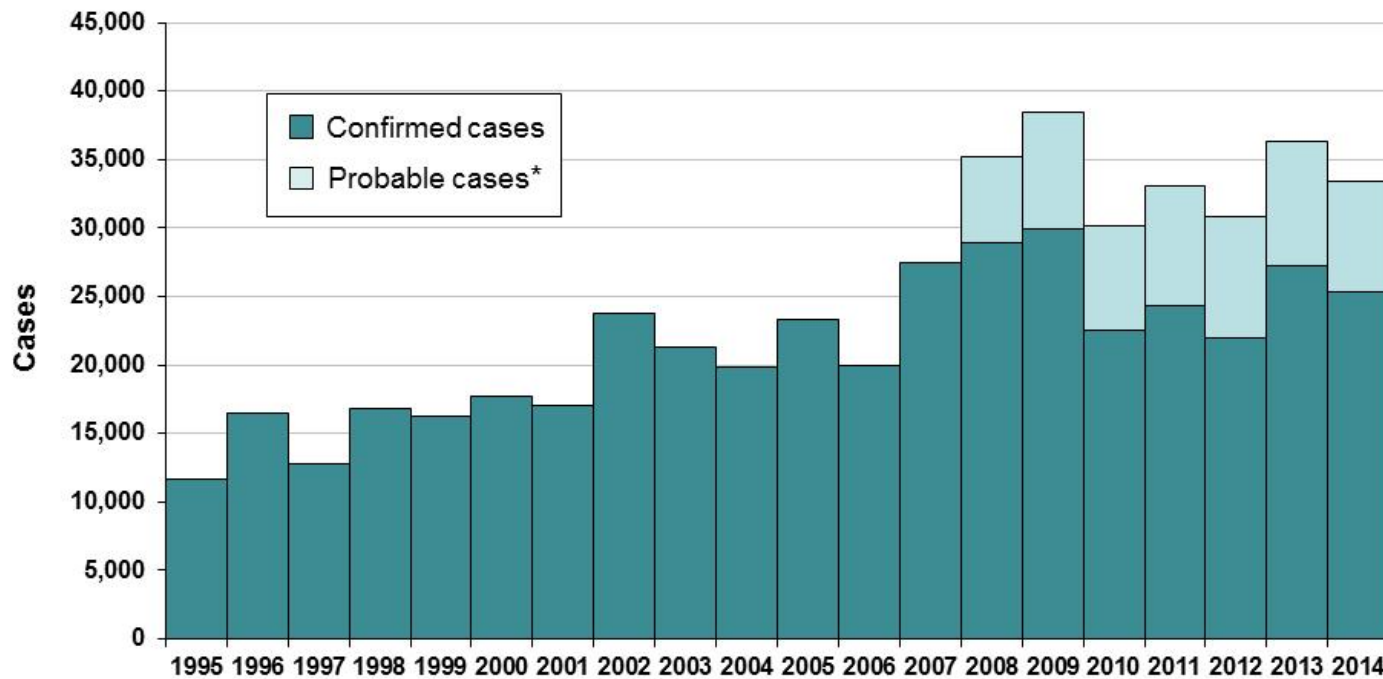
According to the CDC, Lyme disease is the most commonly reported vector-borne illness in the United States with more than 300,000 new cases annually.

In 2014, it was the 5th most common nationally reportable disease with 96% of confirmed cases reported from 14 states:

**Connecticut
New York
Pennsylvania
Rhode Island
Virginia
Wisconsin
Massachusetts**

**Delaware
Maine
Maryland
Vermont
New Jersey
New Hampshire
Minnesota**

Lyme disease is on the rise.



Lyme disease cases 2001

Reported Cases of Lyme Disease -- United States, 2001



1 dot placed randomly within county of residence for each reported case

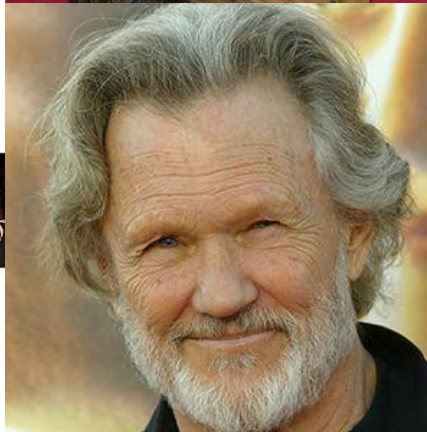
Lyme disease cases 2014

Reported Cases of Lyme Disease -- United States, 2014



1 dot placed randomly within county of residence for each confirmed case

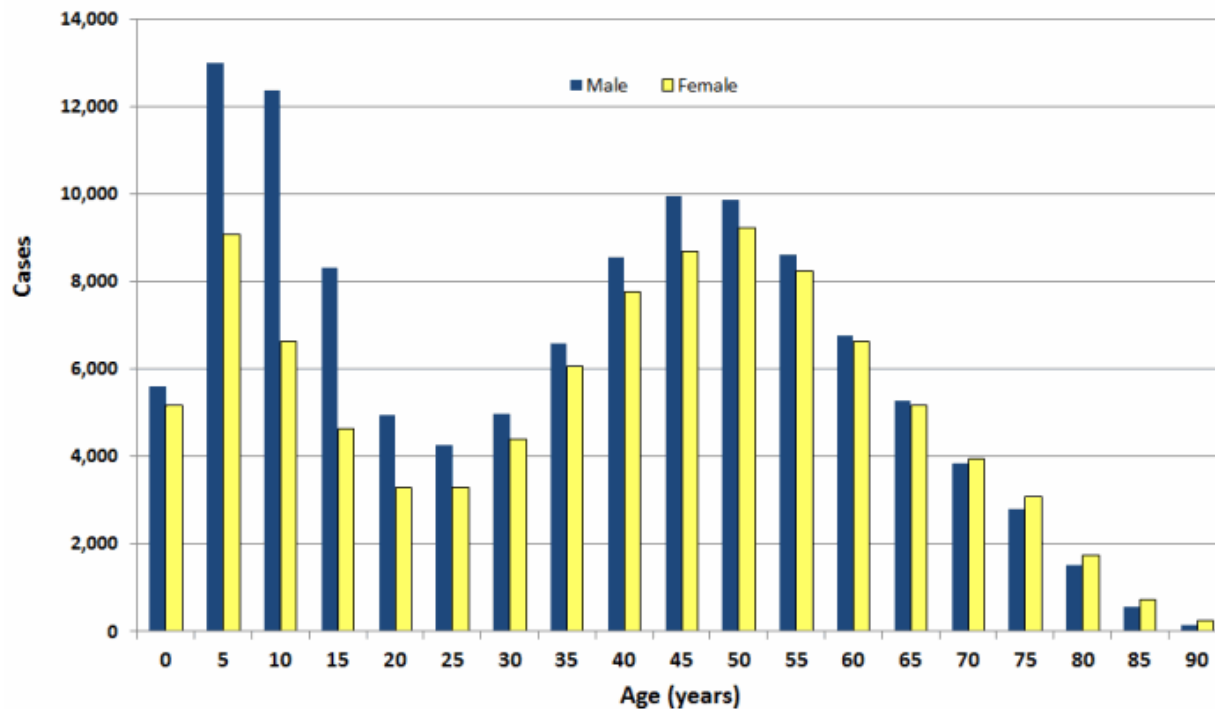
Celebrities with Lyme disease



People magazine

Who gets tick-borne diseases? Everyone.

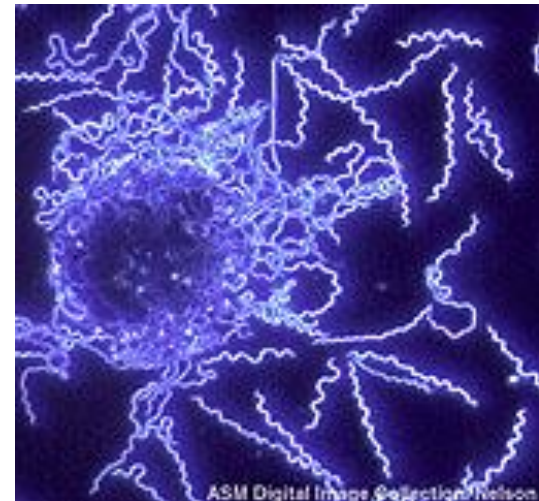
Confirmed Lyme disease cases by age and sex--United States, 2001-2010



What exactly is Lyme disease?

Lyme disease is a bacterial infection caused by the spirochete *Borrelia burgdorferi*.

- This organism attacks various organ systems in the body:
 - Nervous System
 - Activity System
 - Circulatory System

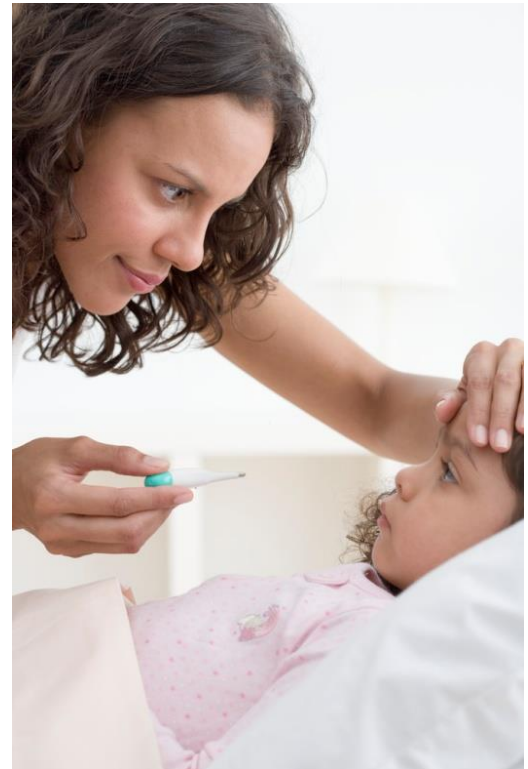


Early Lyme disease symptoms

Symptoms typically appear 2-30 days after the bite of an infected tick.

Early symptoms:

- Expanding "bull's-eye" rash
- Flu-like Symptoms
- Fever
- Malaise
- Fatigue
- Headache
- Muscle aches
- Joint aches



Examples of the "bull's-eye" rash:



*Photos provided by [Pfizer](#)

Later signs and symptoms

- Severe headaches and neck stiffness
- Additional rashes
- Arthritis
- Facial or Bell's palsy
- Intermittent pain
- Heart palpitations or an irregular heart beat (Lyme carditis)
- Episodes of dizziness or shortness of breath
- Inflammation of the brain and spinal cord
- Nerve pain
- Shooting pains, numbness, or tingling
- Problems with short-term memory



Swollen knee of a youth with Lyme arthritis.

Source: National Library of Medicine

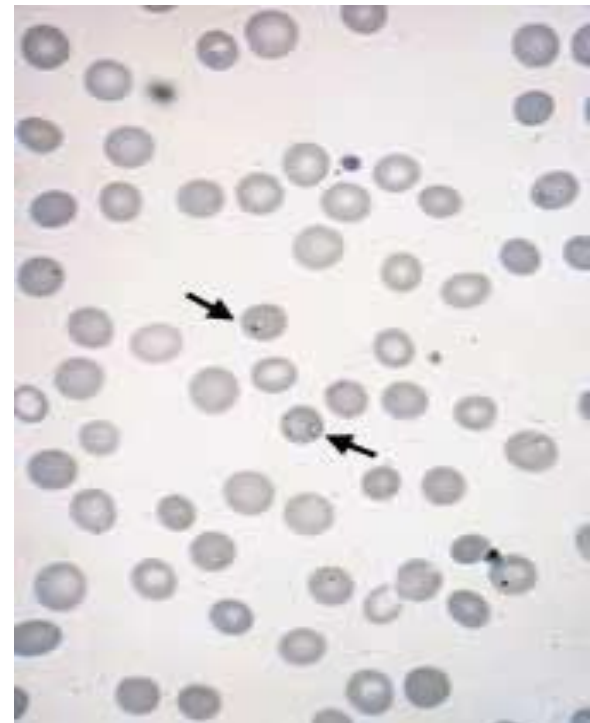
How is Lyme disease diagnosed?

Lyme disease is diagnosed based on symptoms, physical findings (e.g., rash), and the possibility of exposure to infected ticks; laboratory testing is helpful if used correctly.



What is babesiosis?

A malaria-like illness caused by a protozoan called *Babesia microti*. This parasite invades and lives within red blood cells.



<http://www.aafp.org>

Arrows indicate infected RBCs

Symptoms are mostly nonspecific, and the illness can range from very mild to very severe; although most people will not have symptoms.

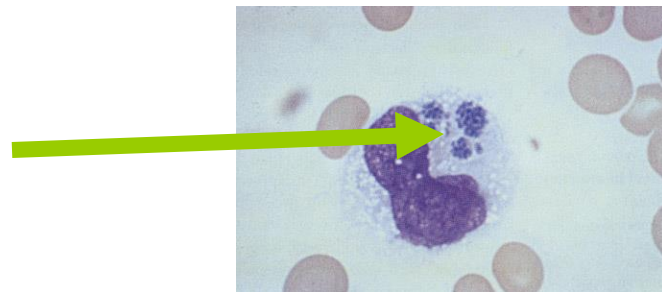
Symptoms may include:

- Fever
- Drenching sweats
- Muscle or joint aches or pains
- A blood test may find a breakdown of the red blood cells called hemolytic anemia

What is anaplasmosis?

Anaplasmosis was formerly known as human granulocytic ehrlichiosis (HGE). These bacteria invade and live in white blood cells called granulocytes.

Note the clumps of Ehrlichia in a white blood cell



Much like babesiosis, symptoms are mostly nonspecific, and the illness can range from very mild to very severe. Most patients will experience:

- Rapid onset of fever
- Shaking
- Chills
- Muscle or joint pain
- Severe headache

Each tick-borne disease has its own test and may have a different treatment protocol.

Are there any vaccines?

- There was a vaccine for Lyme disease several years ago, but it is no longer available
- If you were previously vaccinated for Lyme disease you are NO LONGER protected
- There are no vaccines available for any of the tick-borne diseases, so PREVENTION is key

What do blacklegged ticks look like?



©2005 M. Plonsky

It varies based on their stage...

- Adult Female: Reddish body size comparable to a sesame seed
- Adult Male: Slightly smaller than female, completely dark brown
- Nymph: Size comparable to that of a poppy seed
- Larva: Size smaller than that of a pin head
- Larvae may not transmit Lyme, but do transmit other diseases.



From left to right: Adult female, adult male, nymph, larva

The two year tick life cycle

Year One

Year Two

Spring

Summer

Autumn

Winter

Spring

Summer

Autumn

Winter

eggs

larvae

nymphs

adults

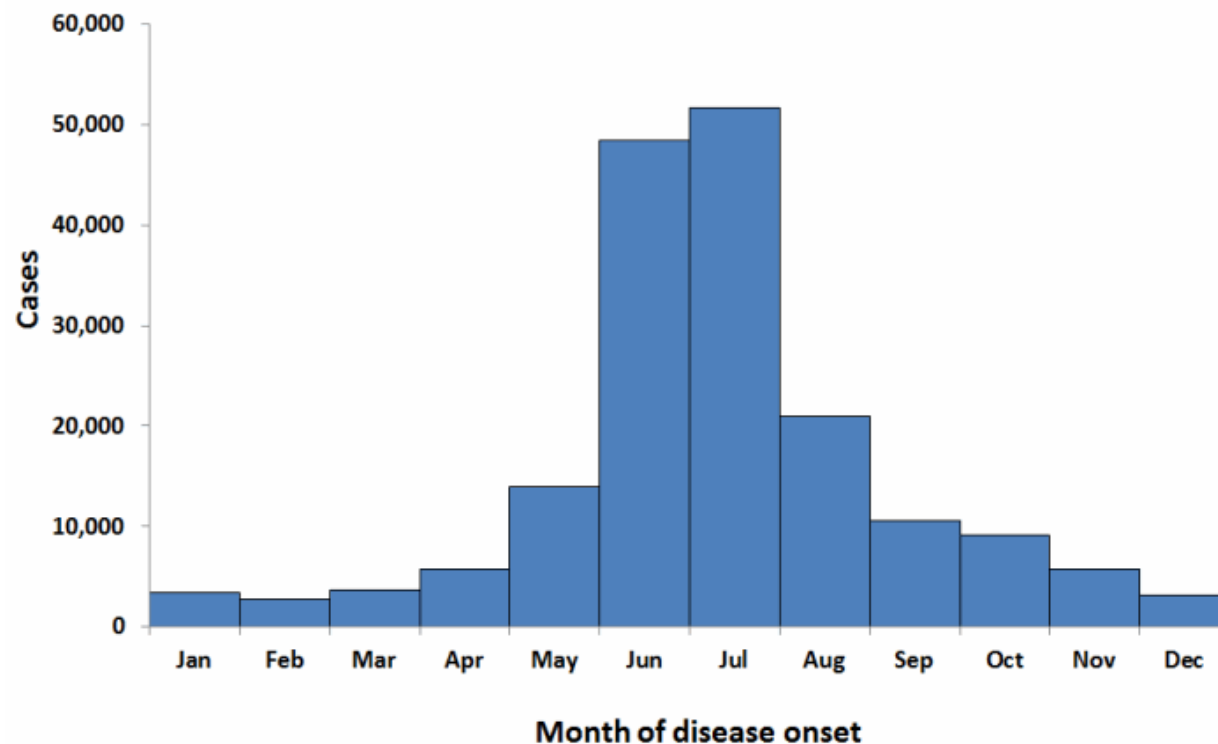


Adults mate,
produce eggs & die

Source: Center for Vector-Borne Disease, University of Rhode Island

When are you most likely to get Lyme disease?

Confirmed Lyme disease cases by month of disease onset--United States, 2001-2010



Where do ticks live?

Ticks thrive in shady, moist areas.



Engorged blacklegged ticks may fool you.

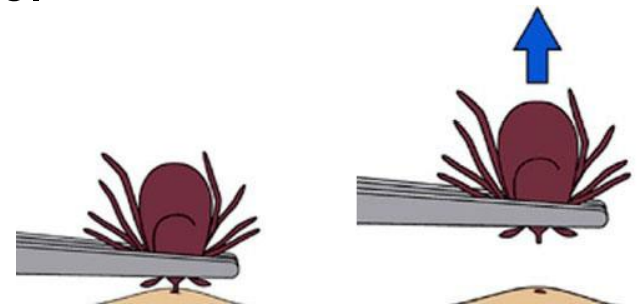


Ticks attach with a unique mouthpart



What's the best way to remove a tick?

- Use fine-tipped tweezers.
- Grasp the tick by the mouthpart close to the skin.
- Pull straight back with a slow, steady force.
- Avoid crushing the tick's body.
- Place tick in a plastic vial or zip-lock bag for testing.
- Wash area and disinfect the bite site.
- Record the date and location of the bite.
- Watch for early symptoms.



Tick Removal DON'Ts

- Don't squeeze or rupture the tick.
- Don't pour kerosene or nail polish remover on the tick.
- Don't rub Vaseline or Petroleum Jelly on the tick.
- Don't do ANYTHING that might otherwise traumatize the tick.

Where do you send a tick for testing?

- Check with your local Health Department to see if they identify and/or test ticks.
- UMass Amherst Laboratory of Medical Zoology and University of Connecticut Veterinary Medical Diagnostic Laboratory identify and test ticks for a fee.
- University of Rhode Island Tick Encounter Resource Center and University of Maine Cooperative Extension Service identify ticks for free.
- Some private labs will test ticks for a fee.

Don't wait for tick-testing results if you suspect that you have contracted a tick-borne disease. See your physician immediately!

How do you avoid getting a tick bite?



BLAST

Bathe or shower soon after coming indoors.

Bathing or showering
within 2 hours of
outdoor activity
helps remove ticks
that haven't
attached.



BLAST



Look for ticks and rashes.

Tick bites are usually painless, therefore most people are unaware when they have a tick attached to them.



- Ticks are very small, and may feed anywhere on the body, so check thoroughly.
- Check under your arms, in your ears, the belly button and behind your knees.
- Do a tick check every night.

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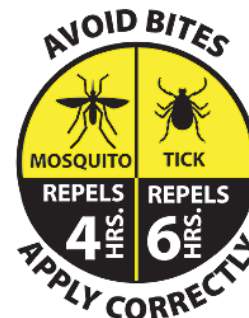
Apply repellents.

SKIN

If you choose to use a tick repellent on your skin, the CDC recommends using a product that contains *DEET* at a concentration of at least 20%.

CLOTHING

A *permethrin* based product is recommended for clothing and gear. It provides great protection against ticks!



Photos CDC

Treat your clothing
with permethrin



Read instructions



Apply in ventilated area



Hang to dry

Testing natural products to repel or kill ticks

- 2-undecanone
- Garlic oil
- Nookatone
- Mixed Essential Oils
rosemary, thyme,
lemongrass, geranio
- Fungus



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Spray the edges of your yard.



- A single *perimeter* spray for tick control once in the Spring can reduce the number of ticks in your yard by up to 80-90%.
- If you decide to spray your yard, it is best to hire a licensed professional who is trained to do this job efficiently and safely.

Create a “Tick-Safe” zone.



Westport/Weston Health District

- Clear tall grasses and brush.
- Add a 3-ft wide barrier of wood chips or gravel between lawns and wooded areas.
- Mow the lawn frequently.
- Keep leaves raked.
- Stack wood neatly in a dry area.
- Keep playground equipment and patio furniture away from yard edges and in a sunny location.
- Choose deer resistant plants.
- Avoid feeding wild animals & birds.

BLAST

Treat your pets.

- Check your pets for ticks after coming indoors.
- Ask your vet about vaccines and products that will help your pet repel ticks.
- Don't sleep with your pet because ticks on your pet may crawl on to you.



Join our team and help tackle tick-borne diseases!



Information provided by:

- Centers for Disease Control and Prevention (CDC)
- CT Agricultural Experiment Station

Tick Management Handbook

- CT Department of Public Health
- Westport/Weston Health District
- Yale School of Public Health

Peridomestic Lyme Disease Prevention:

Results of a Population-Based Case–Control Study

Neeta P. Connally, PhD, Amanda J. Durante, PhD, Kimberly M. Yousey-Hindes, MPH,
James I. Meek, MPH, Randall S. Nelson, DVM, Robert Heimer, PhD