

Lyme Disease

Lyme Disease Overview

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LymeBasics.org

PA Lyme disease Awareness Committee

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What is Lyme Disease?

A bacterial infection

Contracted from the bite of the deer tick



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Other modes of transmission?

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Other ticks (e.g. the dog tick, lone star tick)



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Other modes of transmission?

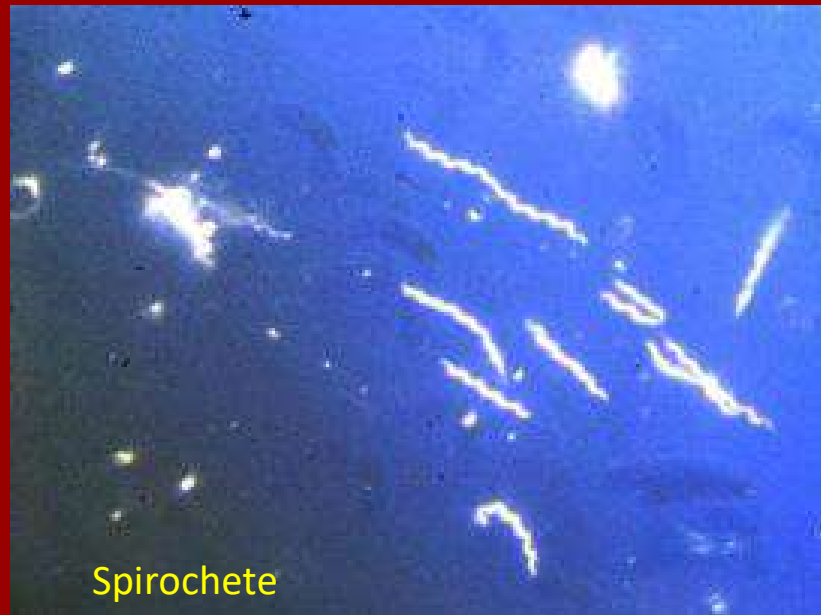
Other ticks (e.g. the dog tick, lone star tick)

Other insects (mosquitoes, fleas, lice, biting flies; not proven)



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Borrelia burgdorferi – the Lyme disease bacteria



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Effects of Lyme Disease

**Can affect any part
or system of the body**

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Effects of Lyme Disease

Neurological

Sensory – Vision, hearing, taste, smell, touch
Can cause hallucinations in some cases



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Motor -- Various movement disorders, similar
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Effects of Lyme Disease

Neurological

Sensory – Vision, hearing, taste, smell, touch
Can cause hallucinations in some cases

Motor -- Various movement disorders, similar
to Parkinson's, ALS

Cognitive – Short or long-term memory problems
“Brain fog”
Word-finding problems
Difficulty in functioning in the world
Lack of concentration



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Effects of Lyme Disease

Neurological

Seizures



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Effects of Lyme Disease

Neurological

Seizures

Psychological – moodiness
Personality change
ADD/ADHD in children and adults



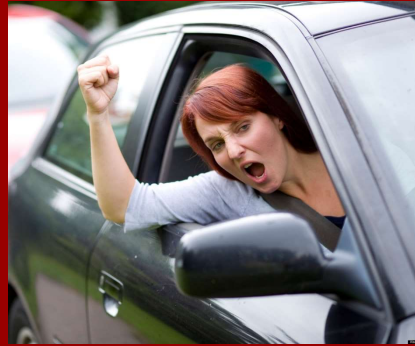
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Effects of Lyme Disease

Neurological

Seizures

Psychological – moodiness
Personality change
ADD/ADHD in children and adults
Rage



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Effects of Lyme Disease

Neurological

Seizures

Psychological – moodiness
Personality change
ADD/ADHD in children and adults
Rage
Depression



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Effects of Lyme Disease

Neurological

Seizures

Psychological – moodiness

Personality change

ADD/ADHD in children and adults

Rage

Depression

Psychosis

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Effects of Lyme Disease

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Psychosis

Panic Attacks

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Psychological – moodiness
Personality change
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Rage
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Psychosis
Panic Attacks

Dementia



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Effects (cont'd)

Arthritic

swollen and/or sore joints anywhere



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Effects (cont'd)

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Cardiac

inflammation of heart or blood vessels
heart arrhythmia, heart block, death

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General Well-being

Extreme fatigue



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Effects (cont'd)

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swollen and/or sore joints anywhere

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inflammation of heart or blood vessels
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General Well-being

Extreme fatigue
Headache

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Effects (cont'd)

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General Well-being

Extreme fatigue
Headache
Swollen glands

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Effects (cont'd)

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General Well-being

Extreme fatigue
Headache
Swollen glands
Unexplained fevers

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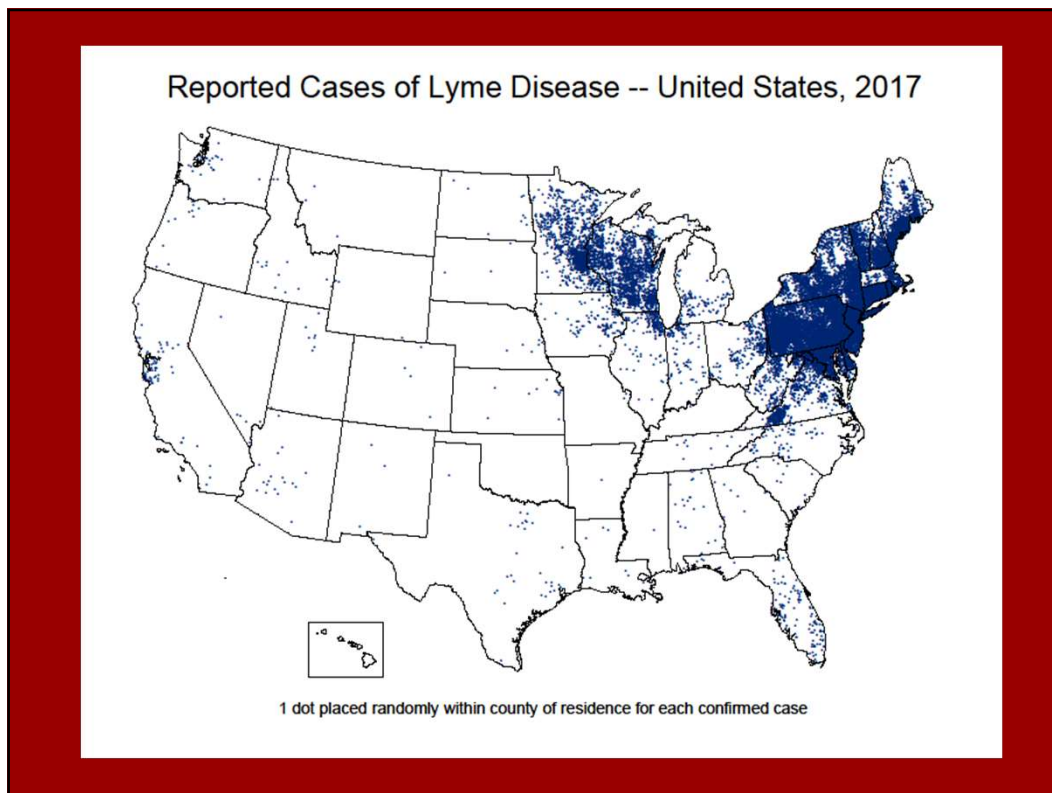
General Well-being

Extreme fatigue
Headache
Swollen glands
Unexplained fevers
Symptoms tend to change quickly

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Lyme Disease Prevalence

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CDC Reported Cases

Cases for 2017

	<u>REPORTED</u>	<u>EQUIVALENT</u>
U.S.	59,439	594,390
PA	11,900 (20%)	119,000
NY	5155.	51,550
NJ	5092.	50,920

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The Actual Numbers are MUCH Higher

- **The CDC's own research indicates actual number is about 600,000 new cases each year**
- *3.4 million tests for Lyme disease are ordered each year*
- **Other estimates say 1 million new cases each year**

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Independent Research:

The estimated cost to treat Lyme patients in the U.S. in 2018 was \$9.6 Billion.

By 2050, 17% of the U.S. population will suffer from Chronic Lyme Disease

Healthcare 2018
www.mdpi.com/journal/healthcare

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Lyme Disease has been around for a Long Time

15 million year old tick in amber

Borrelia very similar to Lyme disease found in the monkey blood inside the tick.



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**Early
Symptoms
of Lyme disease**

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Symptoms of Early Lyme Disease

Symptoms appear 2 to 30 days after infection

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Everybody is different, with varying symptoms

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Mimics many other diseases and conditions

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“summer flu”

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- **Fatigue**

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- **Headache**

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“summer flu”

- Fatigue
- Headache
- **Fever**

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Early symptoms are “flu-like”

“summer flu”

- Fatigue
- Headache
- Fever
- **Stiff neck**

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- Fatigue
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- Stiff neck
- **Swollen glands**

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- Fatigue
- Headache
- Fever
- Stiff neck
- Swollen glands
- **Muscle or bone pain**

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Early symptoms are “flu-like”

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- Fatigue
- Headache
- Fever
- Stiff neck
- Swollen glands
- Muscle or bone pain
- Swollen or sore joints
- *But congestion is unusual*



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- Occurs in fewer than half of infected individuals
- **Diagnostic for Lyme disease**
- Varies considerably in appearance



If you have this rash, you have Lyme disease

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“Bull’s-eye” rash (erythema migrans)



If you have this rash, you have Lyme disease

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***If you have this rash,
you have Lyme disease***



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Most common Lyme rash

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Erythema migrans – Bruise-like on dark skin

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“Anti-viral treatments for Bell’s Palsy are not effective...”

The American Journal of Medicine (2015) 128, 617-628

Bell’s palsy
(Early, disseminated Lyme disease)

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Diagnosis of Lyme Disease

Lyme disease requires a ***clinical diagnosis***

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Diagnosis of Lyme Disease

Lyme disease requires a **clinical diagnosis**, based on:

- signs
- symptoms
- and history of exposure to ticks

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Diagnosis of Lyme Disease

Laboratory tests are not reliable

(CDC and FDA statements)

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Diagnosis of Lyme Disease

**The most common test (ELISA) is
only 30-50% sensitive**

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Diagnosis of Lyme Disease

**The tests will always be
negative during the first few
weeks of infection**

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Common Misdiagnoses

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Common Mis-diagnoses

Fibromyalgia

Chronic Fatigue Syndrome

Parkinson's disease

Carpal Tunnel Syndrome

Crohn's Disease

Lupus

Multiple Sclerosis

ALS

Alzheimer's Disease

ADD or ADHD (Attention Deficit Disorder)

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Common Mis-diagnoses

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Chronic Fatigue Syndrome

Parkinson's disease

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Multiple Sclerosis

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Alzheimer's Disease

ADD or ADHD (Attention Deficit Disorder)

Psychiatric problems

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Immunity

No immunity is developed

You can get Lyme disease over and over
from new tick bites

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Vaccine

There was a Lyme vaccine available from 1999-2002

It caused harm in about a third of patients who got the vaccine

The protect was short-lived

There was no protection from other tick-borne diseases

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Treatment

Antibiotics are used to treat Lyme disease

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Experts recommend 4-8 weeks of treatment is required for a case of Lyme disease that was diagnosed soon after infection

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Early-stage Lyme can be treated with oral antibiotics

Doxycycline or amoxicillin is typically used (90% cure)

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“Persistent” Lyme disease may require months or even years of treatment

Intravenous antibiotics sometimes used, especially if neurological problems are present

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Combinations of antibiotics often used

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A tick bite can give you more than one disease

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A tick bite can give you more than one disease

Babesiosis – Malaria-like blood parasite



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A tick bite can give you more than one disease

Bartonella



Also spread by fleas

Typical Bartonella skin rash (not everyone gets a rash)

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A tick bite can give you more than one disease

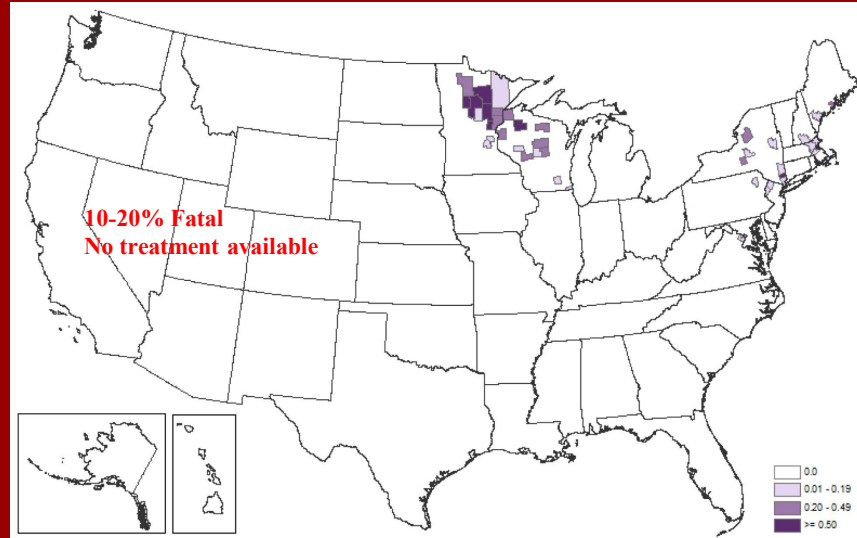
Rocky Mountain Spotted Fever



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A tick bite can give you more than one disease

Powassan Fever



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Powassan Fever (also called Deer Tick Fever)

Carried by deer ticks

Found in all counties of PA

Some areas of PA had up to 93% tick infection rate

10-20% FATAL

No treatment, no vaccine

7-30 day incubation period

Early symptoms: headache, vomiting, weakness, memory loss, encephalitis, loss of coordination, altered mental state, speech difficulties, meningitis

Can be acquired within 15 minutes of tick bite

91% of patients develop severe neuroinvasive disease

50% of surviving patients have long-term, serious health impact

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A tick bite can give you more than one disease

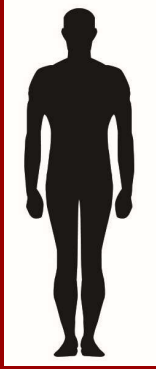
Alpha-Gal Meat Allergy

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Prevention

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Who Gets Lyme Disease?



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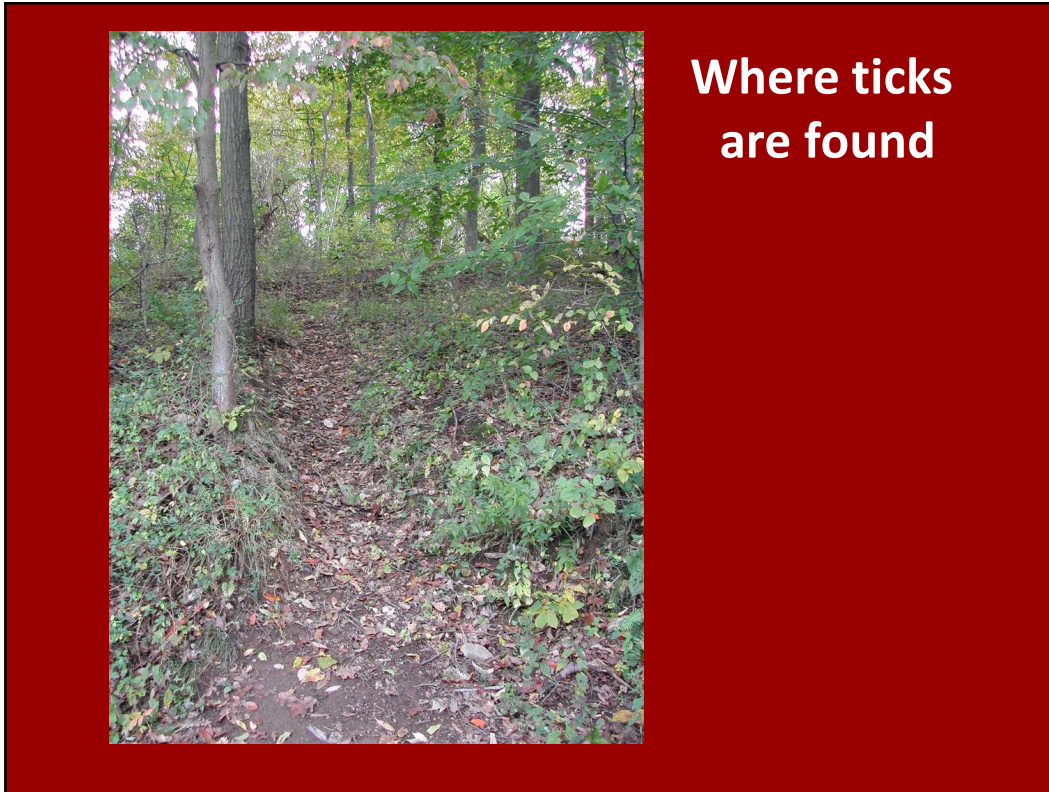
Deer Ticks (*Ixodes scapularis*)

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Where ticks are found



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White-footed Mouse and other small mammals are the reservoir for Lyme disease



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Deer maintain the tick population



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Deer can have over 3000 ticks



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Deer maintain the tick population

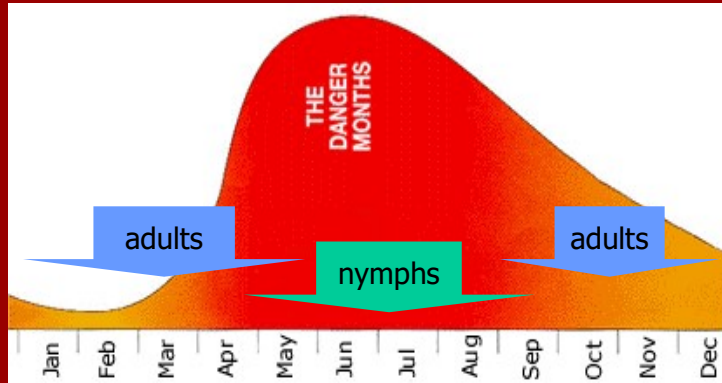
When the deer population is reduced in an area, the tick population crashes



Abundance of *Ixodes scapularis* (Acari: Ixodidae) after the complete removal of deer from an isolated offshore island, endemic for Lyme Disease.
 Rand PW, Lubelczyk C, Holman MS, Lacombe EH, Smith RP Jr.
 PMID: 15311475 (2003)

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The dangerous months



anytime - even in winter!

Ron Hamlen, PhD – Lyme Disease Association of Southeastern Pennsylvania, Inc.

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Personal protection



- Long pants
- Long sleeves
- Pants tucked into socks
- Hat

Permethrin spray

On clothing

or

DEET on skin

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Insect Repellent Options



DEET-Based

"Natural"-Based

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Permethrin permanently-treated clothing

(InsectShield and others)

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You can also have your own clothing treated

See the Insect Shield web site for details

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Tick check and removal

- **Always** check after being out doors (*check by another person, if possible*)
- **Take a shower**
- Check hairline and where clothes fit tightly
- Remove any tick promptly with fine-pointed tweezers, do not squeeze tick, pull gently straight out
- **No length of attachment time is considered safe**
- **Do not use petroleum jelly, alcohol, detergent, match or cigarette**
- You may want to save tick in a plastic bag with a moistened cotton ball for identification and/or testing
- **Check with your doctor promptly**



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Tick check and removal



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Washing clothes does not kill ticks, even with hot water

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Ticks will be killed in a dryer on high-heat.

It takes up to an hour.

(longer if clothes are wet)

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Points to Remember

1. You get Lyme disease from a tick bite

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2. Lyme disease can cause permanent disability

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4. The bull's-eye rash is diagnostic for Lyme disease
5. **Short-term treatment does not always work**

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1. You get Lyme disease from a tick bite
2. Lyme disease can cause permanent disability
3. Blood tests are very unreliable
4. The bull's-eye rash is diagnostic for Lyme disease
5. Short-term treatment does not always work
6. **Many people get more than just Lyme disease from a tick bite**

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Points to Remember

1. You get Lyme disease from a tick bite
2. Lyme disease can cause permanent disability
3. Blood tests are very unreliable
4. The bull's-eye rash is diagnostic for Lyme disease
5. Short-term treatment does not always work
6. Many people get more than just Lyme disease from a tick bite
7. You should be properly protected every time you are in tick habitat

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Points to Remember

8. This disease is controversial and more research is needed

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www.LymeBasics.org

For help finding a doctor or other questions:

610-388-7333