

Tick Borne Illness in Wisconsin

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Introduction

Woodland owner since 1981

Lifetime Member, Wisconsin Woodland Owners Association

Member of WWOA Publications Committee

Had my share of tick bites

Emergency Physician, Sacred Heart Hospital in Eau Claire

1981-2010

Currently working in wound care, 911 system, plasma industry



Disclaimers

No financial interest in any product relating to tick bites

But I wish I did.....

Tick Bites are common

Ticks number in the billions in our woodlands

They literally crawl all around us

Cause tens of thousands of persons in Wisconsin to become ill each year

Certain tick-borne illnesses can be fatal

Which creature is most likely to attack you with a potentially lethal bite?

Bear

Wolf

Moose

Alligator

Tiger

Mountain lion

Tick

Wisconsin is loaded with.....

Cheese

Beer

Packer fans

Deer

Deer Ticks

Lyme disease

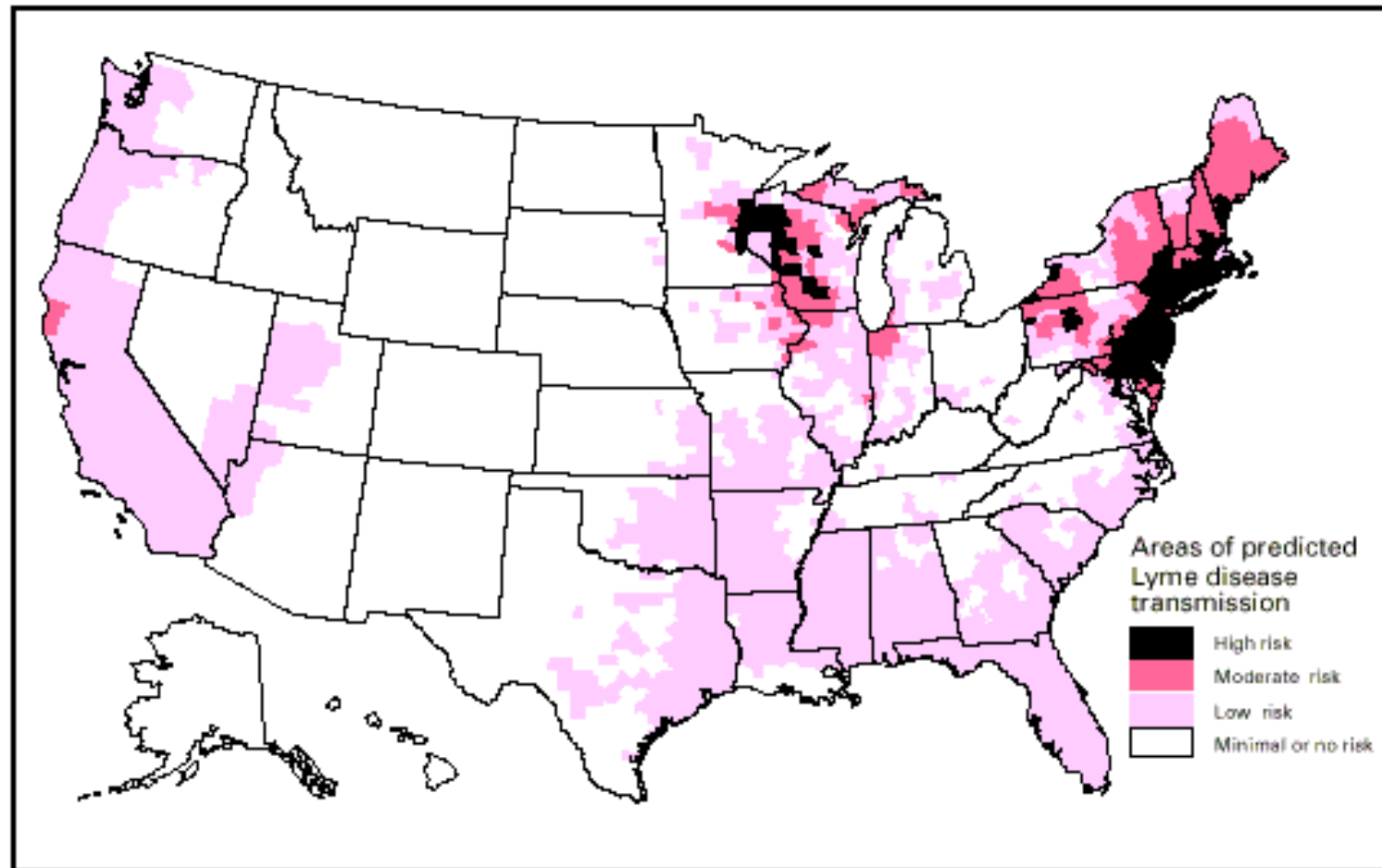
Lyme Disease

Named after location of first identified cases – Lyme, Connecticut

First identified and named in 1975

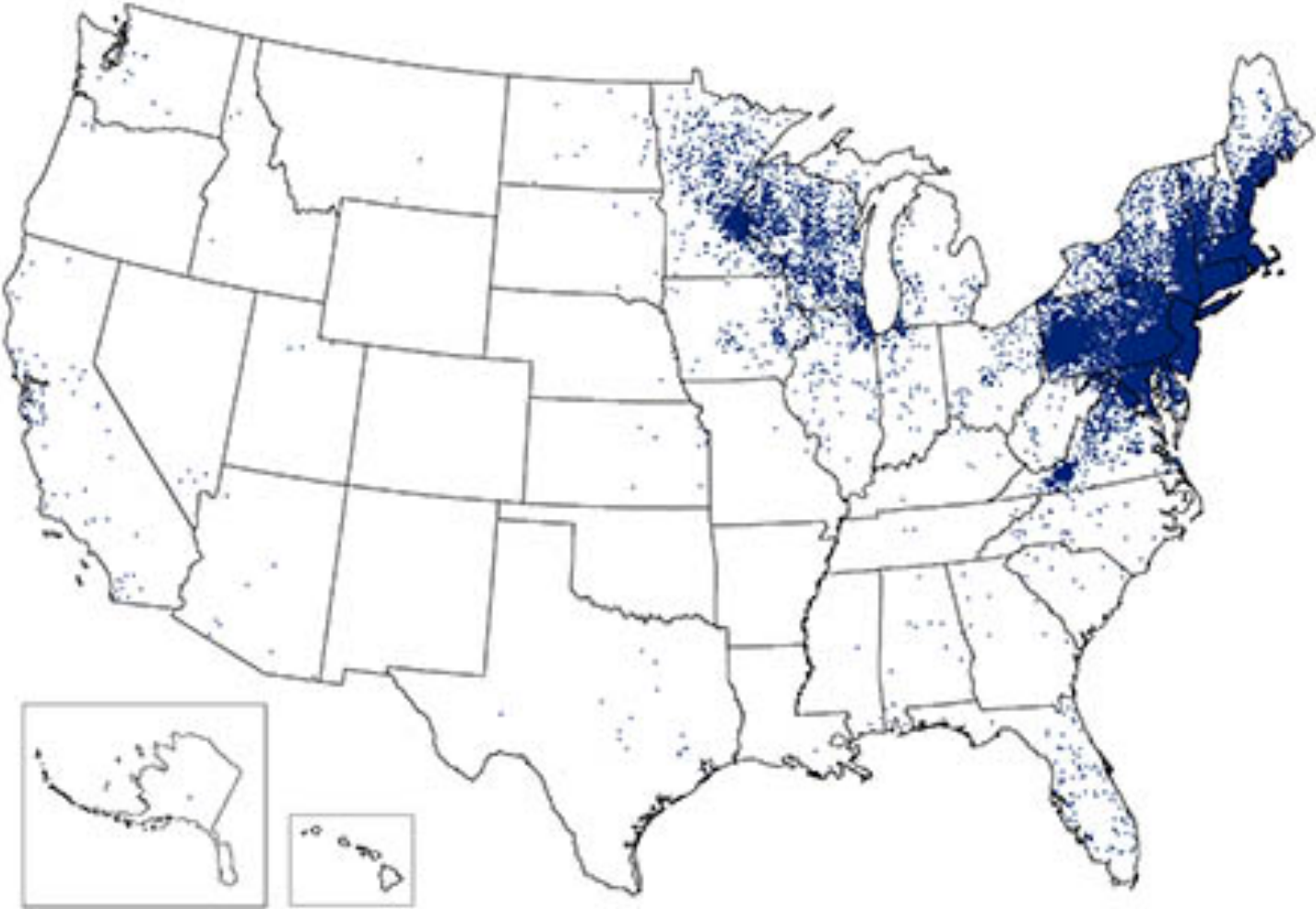
Two main areas of the country where it is endemic

National Lyme disease risk map with four categories of risk



Note: This map demonstrates an approximate distribution of predicted Lyme disease risk in the United States. The true relative risk in any given county compared with other counties might differ from that shown here and might change from year to year. Risk categories are defined in the accompanying text. Information on risk distribution within states and counties is best obtained from state and local public health authorities.

Reported Cases of Lyme Disease -- United States, 2015



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

How common is it?

Roughly 2000 cases per year reported in Wisconsin.

Known to be widely under-reported.

May be as many as ten times more cases than reported.

Officially about 30 cases per 100,000 persons per year.

Northwestern part of Wisconsin has highest incidence of Lyme – as much as ten times more cases of Lyme infection in NW than in SE.

Tick populations vary year to year.

Your risk is higher

Individuals who are in outdoor and wooded areas put themselves at the greatest risk.

Exposure far higher among forest workers than among the general population.

Some tick illnesses seem to be more common in older individuals.

How is Lyme disease spread?

Caused by bacteria – *Borrelia burgdorferi* most common

Bacteria carried to humans by black-legged “deer” tick

- *Ixodes scapularis*

Tick must ingest bacteria from an infected mammal

Then tick must latch on to a human, and stay on long enough to expect a large enough quantity of the bacteria to cause illness

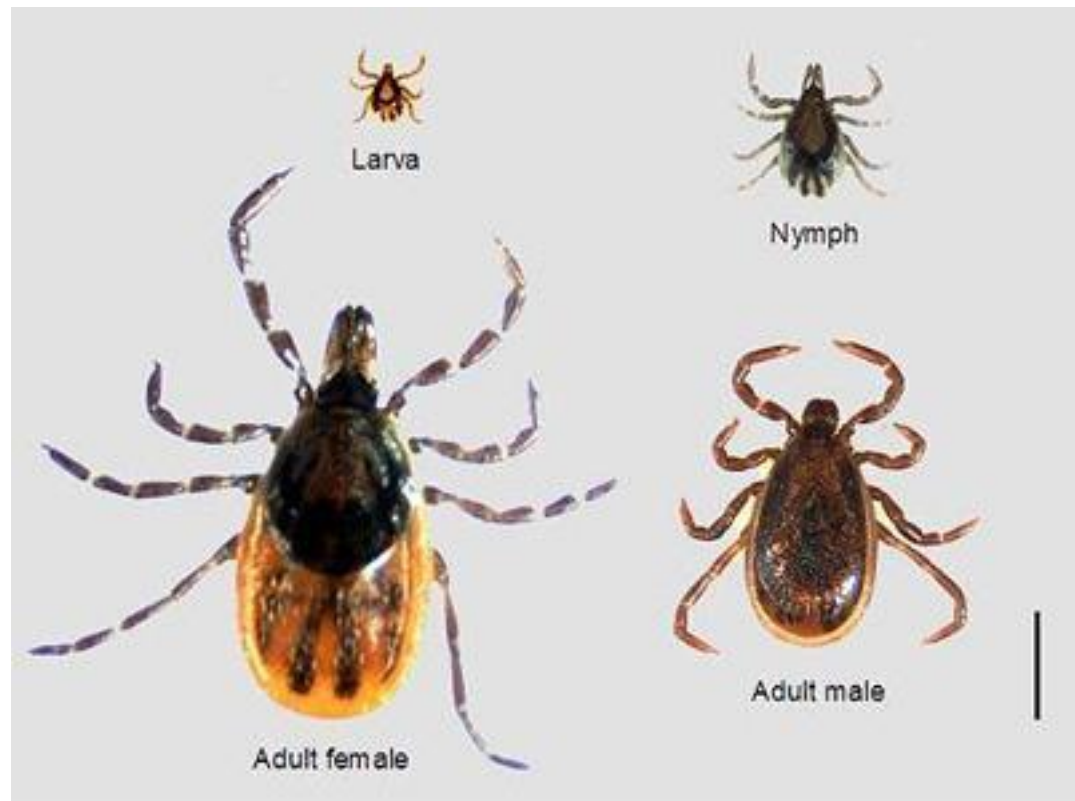
You cannot acquire Lyme disease simply by being near another infected individual.

It's the juvenile nymphs that cause trouble

They are small, like a freckle or poppy seed.

Adult ticks can also transmit the disease, but usually it's the nymphs.

Black-legged “deer” ticks







Blacklegged Tick (*Ixodes scapularis*)



Nymphs are freckle size



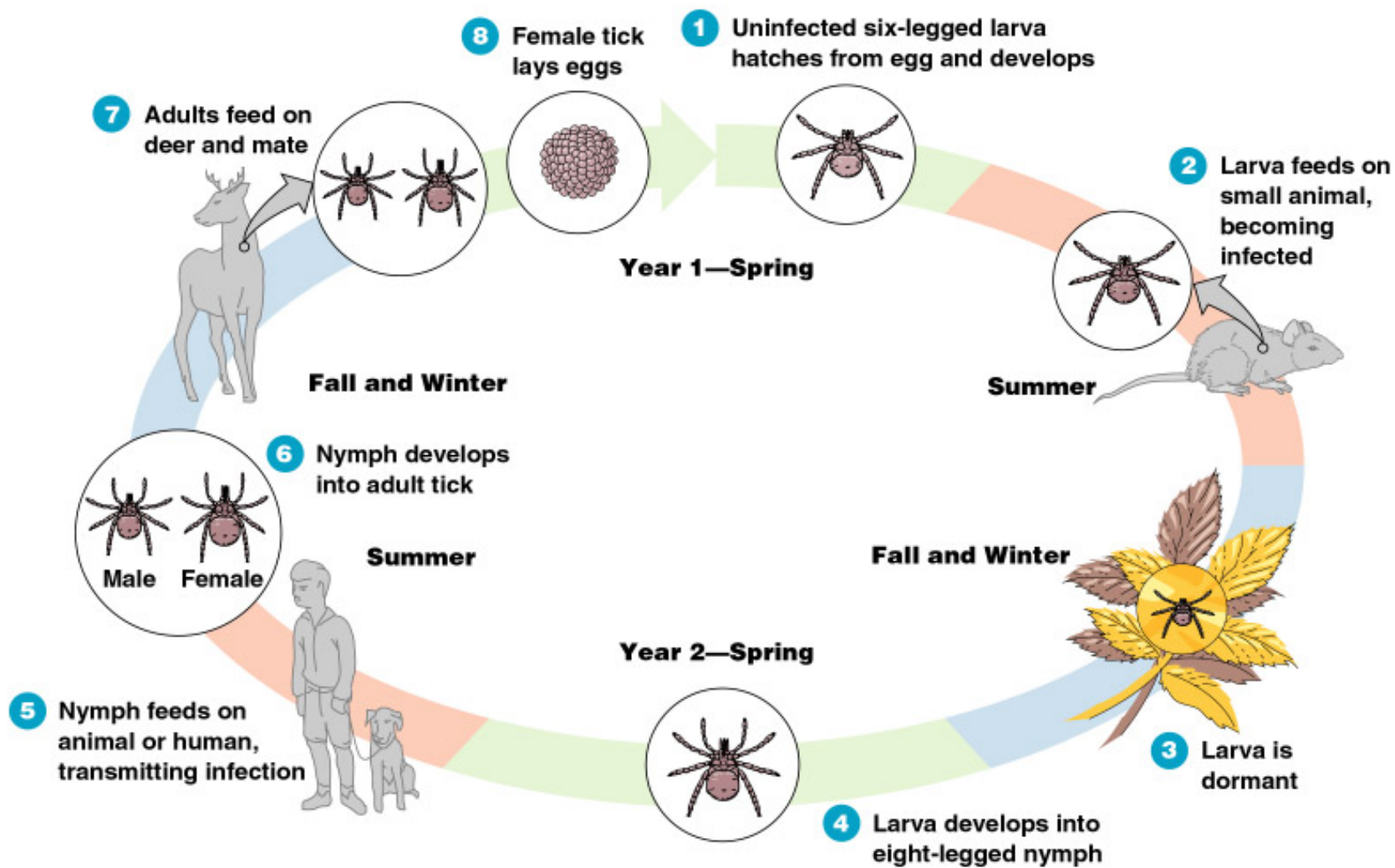
When are you at risk?

Most disease spreads in summer, as expected

Generally May through August

But can occur AT ANY TIME OF YEAR!

Ticks can be active enough in winter when temperature is above 40 degrees.



(a) The tick, *Ixodes scapularis*, has a two-year life cycle in which it requires three blood meals. The tick is infected by its first blood meal, and can pass on the infection to a human in its second.

Your individual risk may vary

Depends upon victim's general health prior to being bitten

Immune system

Medication

Intensity of the tick bite

Preventive measures

...and your symptoms may vary.

Some people remain completely asymptomatic

Most have fever, achiness, rash.

Many have fatigue, nausea, perhaps neurologic issues

Occasionally can lead to numbness, focal weakness, heart issues, headache, etc.

Some progress to a more severe illness, requiring intensive care

A very small minority will progress to death

You will have tick bites

Not a matter of if, but when.

No need to panic.

Don't rush off to the doctor.

Don't worry too much about recognizing the different kinds of ticks.

Bottom line: Remove any and all ticks that latch on.

Removing imbedded ticks.....

Countless ways

Ticks are stubborn about being removed

Most “best” ways are folklore

Nail polish, liquid soap, gasoline, hot objects, Vaseline

Others?

My personal favorite used to be.....

Grab the tick body with tweezers

Without pulling, simply twist the tick around several times

This essentially always gets the tick out intact

But, even if your way works, it may stimulate the tick to expel an increased amount of infective material.

The tick gets “ticked off”

The gospel on tick removal:

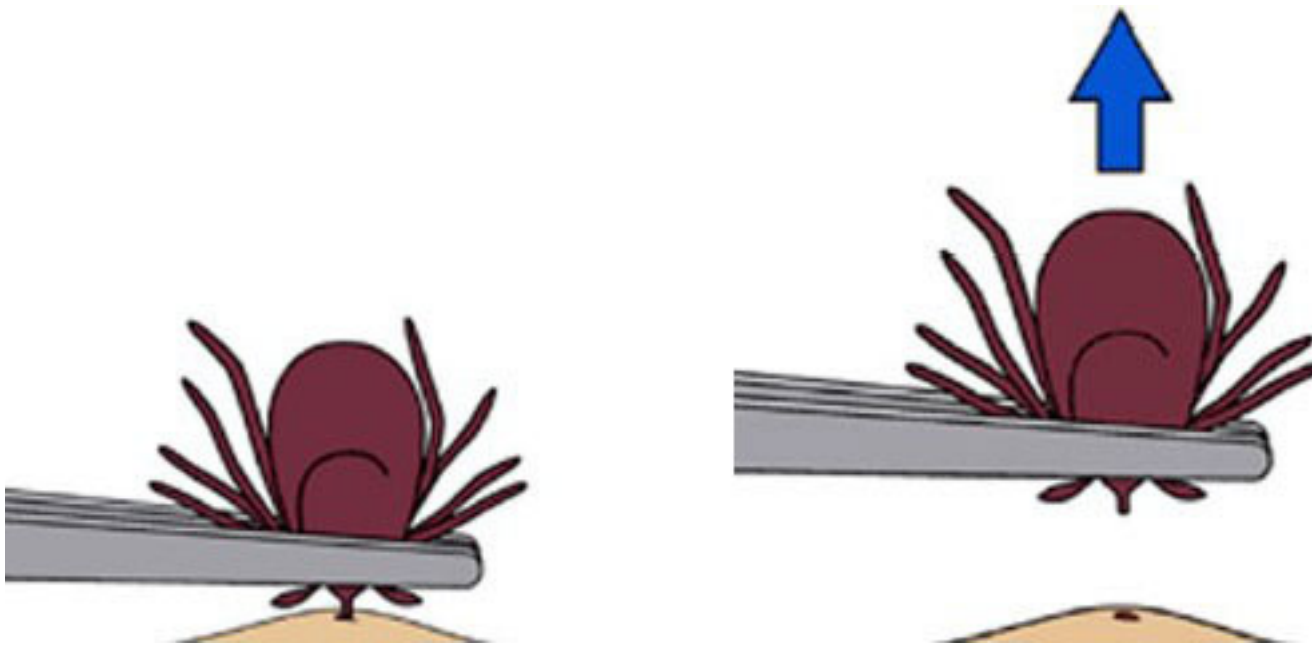
According to the Center for Disease Control:

Use fine-tipped tweezers to grasp the tick as close to the skin's surface as possible.

Pull upward with steady, even force. Don't twist or jerk the tick; this can cause the mouth-parts to break off and remain in the skin. If this happens, remove the mouth-parts with tweezers. If you are unable to remove the mouth easily with clean tweezers, leave it alone and let the skin heal.

After removing the tick, thoroughly clean the bite area and your hands with rubbing alcohol, an iodine scrub, or soap and water. Never crush a tick with your fingers.

Grab it close to your skin, and lift straight up.



Maybe add tweezers and alcohol wipes to your field gear or first aid kit

There are commercially-made tick removal devices that also reportedly work well

If all else fails for deeply imbedded ticks, the tick and surrounding skin can be excised by a doctor at an ER or Urgent Care clinic.

Then relax.

What's done is done.

No need to automatically start medication just because you had a tick bite.

Make an attempt to wash the area with alcohol, if available, or otherwise ordinary soap and water.

Washing may not help much, but your Mom would be proud.

Diagnosing Lyme Disease

Can be a confusing situation

Lyme can masquerade as other unrelated illnesses.

Symptoms are not going to show up for at least several days.

Symptoms sometimes do not occur until as much as two months later.

Doctors in other parts of the country may not think about Lyme as a possible cause.

Blood tests are sometimes inconclusive or misleading.

Early Signs and Symptoms of Lyme Disease:

Fever

Chills

Headache

Fatigue

Muscle aches

Swollen or aching joints

Swollen lymph nodes

Rash

Erythema migrans (EM) rash

Occurs in approximately 70 percent of infected persons

Begins at the site of a tick bite after a delay of 3 to 30 days (average is about 7 days)

Expands gradually over a period of days reaching up to 12 inches or more (30 cm) across

May feel warm to the touch but is rarely itchy or painful

Sometimes clears as it enlarges, resulting in a target or “bull’s-eye” appearance

May appear on any area of the body



Classic erythema migrans rash



Facial palsy



Swollen knee

Later Symptoms (weeks to months later)

- Severe headaches and neck stiffness
- Additional EM rashes on other areas of the body
- Arthritis with severe joint pain and swelling, particularly the knees and other large joints
- Facial palsy (loss of muscle tone or droop on one or both sides of the face)
- Intermittent pain in tendons, muscles, joints, and bones
- 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 in the hands or feet
- Problems with short-term memory

Good to know.....

A small bump or redness at the site of a tick bite that occurs immediately and resembles a mosquito bite, is common. This irritation generally goes away in 1-2 days and is not a sign of Lyme disease.

Any combination of symptoms can occur, such as fever without a rash, rash without a fever, headache without other aches, etc.

Very important to know.....

Because symptoms of Lyme disease can start many weeks after being bitten, you may find yourself visiting the doctor with a new illness well after being bitten. Because we don't always know we have been bitten, **ALWAYS TELL YOUR DOCTOR THAT BECAUSE OF YOUR WORK, YOU ARE AT HIGH RISK FOR LYME DISEASE** if you should become ill for any reason.

Also, if you know you have been bitten by a deer tick, be sure sure **CONSULT YOUR DOCTOR ABOUT ANY NEW OR UNEXPLAINED ILLNESS THAT BEGINS WITHIN THE FOLLOWING TWO MONTHS.**

Laboratory blood testing

Screening test is not 100% sensitive

Confirmatory test (Western blot) is not as reliable as we would like.

Testing is useless in the first few days after a bite.

Treatment

Usually easily treated with oral antibiotics

Doxycycline is the medication of first choice

Generally need 2-3 weeks of treatment

Generally a "wait and see" approach before starting medication is OK typically 5 to 10 days.

More likely to benefit from antibiotic right away if tick has been imbedded for several days, older patients (60+ years), patients with other concurrent illness, and pregnant patients.

Chronic Lyme Disease

also known as Secondary or Latent
Lyme

NASTY

Generally the result of untreated Lyme disease

Can develop after initial Lyme is treated

Can develop from antibodies even after all bacteria have been killed

Can develop months to years later

Can be resistant to treatment and become chronic and severe



Lucy





Then why not start doxycycline right away?

Not recommended

Most tick bites do not cause any problems

Only about one deer tick out of three actually carries Lyme disease

Disease is not felt to be spread unless the tick is attached more than 24 hours.

Antibiotics have side effects

Cost

Antibiotic resistance

Other tick-borne illnesses in Wisconsin

Anaplasmosis

- Formerly known as HGE, human granulocytic ehrlichiosis
- First case ever identified was in Wisconsin in 1990
- Becoming more common
- Transmitted in a similar way, by deer ticks and some other ticks
- Initial symptoms are similar to Lyme – fever, achiness, fatigue
- Perhaps followed by chills, loss of appetite, weakness, nausea, confusion
- Rash in less than 10% of cases.
- Can be fatal, though treatment with doxycycline is effective if started early
- My personal story

Rocky Mountain Spotted Fever

- Only 500-2500 cases per year in the US.
- Spread by Dermacentor or Levi tick
- Disease is found from Canada to Central America and coast to coast
- Hard to diagnose early on.
- Starts 1-2 weeks after bite as fever, headache, muscle pain, rash
- Can progress to neurologic damage, blindness, gangrene, death (3-5%)
- Start treatment ASAP – don't wait for lab tests
- Doxycycline is usually effective

Babesiosis

- Found mainly in northeastern US
- Very rare in Wisconsin, but transmitted by deer ticks
 - May have “co-infection” along with Lyme
- Starts in 1-4 weeks as fatigue, fever, sweats, anemia
- Similar to malaria
- Only a few labs have ability to test for this
- Treatment is with antibiotics

• Powassan Disease

- Transmitted by deer ticks, and other species of tick
- Very uncommon.
- About 5 deaths per year in the US
- A virus – antibiotic treatment is of no help
- Starts in 1-3 weeks with fever, headache, nausea, confusion
- Evolves to encephalitis in advanced cases, 10% fatality rate.

Tularemia

- Caused by bacteria, spread by numerous ticks and insects
- Can also spread by contact with infected animals, dead or alive
- Extremely rare: Less than one case per million persons
- Fever, fatigue, organ failure, sepsis
- Treated effectively with doxycycline

Many other even less likely diseases in
MI:

Relapsing fever

Typhus

Helvetica

Bartonella

Colorado tick fever

Congo hemorrhagic fever

Etc.

Find other things to worry about

Prevention

Fences don't keep ticks out of the woods

"No Trespassing" signs don't seem to work, either.

Even multiple layers of clothing somehow fail to prevent ticks from finding their way to your skin.

For what it's worth, the Center for Disease Control states we should...

Avoid exposure to tick habitats."

Avoid wooded and brushy areas with high grass and leaf litter."

Walk in the center of trails."

You and I are not going to do that.

O.....

Practical tips for tick bite prevention

Clothing

- Long sleeve shirt
- Cap
- Tuck pant legs into socks

- Color of clothing doesn't really matter, but light color clothing is often suggested to help make it easier to see ticks on clothes.

Tick repellents

- The best repellents contain DEET – diethyltoluamide
- DEET does not kill insects, but tends to be unpleasant for them and may give them some neurologic problems
- Look for products which have at least 20-30% of their fluid made up of DEET
- Apply this to clothing and exposed skin
- Effectiveness lasts at least several hours, typically 3-6 hours.
- Some sprays contain up to 100% DEET and may last up to 12 hours.
- Works to help repel mosquitoes, fleas, some other bugs

DEET precautions

Generally very safe

Usual common sense precautions – eyes, mouth, inhaling fumes, etc.

Do not used on open skin wounds

Avoid use on undergarments

Spray may be better than lotion, to avoid rubbing it deeper into skin.

Apply sunscreen first, then DEET 30 mins later if possible

Permethrin

An insecticide

Kills insects on contact

Used medically to treat lice, scabies – one treatment, directly on skin

Used directly on uniforms of military personnel and on mosquito nets to prevent malaria

Can remain effective on clothing for several weeks and through several washings

Tough on other insects (bees) and aquatic life

Generally safe, but may be toxic if used improperly

Lyme disease vaccine

A Lyme disease vaccine is no longer available. The vaccine manufacturer discontinued production in 2002, citing insufficient consumer demand.

Protection provided by this vaccine diminishes over time. Therefore, if you received the Lyme disease vaccine before 2002, you are probably no longer protected against Lyme disease.

Source: Center for Disease Control website

For further information

Center for Disease Control

- [CDC.gov](https://www.cdc.gov)

American Lyme Disease Foundation

- [ALDF.com](https://www.aldf.com)

Wikipedia

- [Wikipedia.com](https://www.wikipedia.com)

n Summary.....

Tick illnesses are a genuine health risk in Wisconsin

Your risk is higher when your exposure is higher

These illnesses are usually easy to treat but have to be treated EARLY to reduce the risk of long term complications

They are no joke.

Strongly consider preventive measures

DEET

Promethrin

Clothing options

Remove ticks promptly

Have access to tick removal tools

Never mind what kind of tick it is, but....

It's the little nymphs that threaten us most

Go on a tick hunt when you change clothes

If you get sick.....

Report ANY NEW or UNEXPLAINED ILLNESS that begins even as much as two months after a tick bite.

Mention to your doctor that your work and/or recreation involves frequent exposure to tick environments, because you can become infected without even knowing you were bitten.

Don't try to self-diagnose based on too little evidence

Remember that early treatment works best.

Far better to err on the side of treating possible causes, rather than delaying treatment of these potentially serious illnesses

ONWARD!

Beyond that, life always has its risks

Be aware, be vigilant, but keep it in perspective

You will be just fine

We are bigger than they are

Stay macho

