

<p><b>How a Tick Can Make You Sick</b></p> <p><b>Module 2: Tick-er Tape Parade: What are ticks and what do they look like?</b></p>		

[www.LymeDiseaseAssociation.org](http://www.LymeDiseaseAssociation.org)

**Pat Smith**  
President  
Lyme Disease Association, Inc.

[www.LymeDiseaseAssociation.org](http://www.LymeDiseaseAssociation.org)  
1-888-366-6611  
[Lymeliter@aol.com](mailto:Lymeliter@aol.com)  
Pat Smith, President

Did you know that a single tick can make you sick and that ticks can transmit an illness called Lyme disease to you and to your pets? In this brief, online session, get ready to learn tons about ticks, the diseases that they carry, and how you can protect yourself and your pets from tick-borne illnesses. Ready? Let's go.

How a Tick Can Make You Sick | September 14, 2008 | Version 1



# Let's get started!

### COPYRIGHT

Copyright © 2008 Lyme Disease Association, Inc. All rights reserved.

LDA owns the rights to this presentation. This presentation may not be altered in any way. This presentation can be used in any educational or informational setting where no admission fees are charged and where no fees of any kind are charged in connection with this information. Any use must include attribution to the Lyme Disease Association. Direct any inquiries to

Lyme Disease Association, Inc.

PO Box 1438 Jackson, NJ 08527

[www.LymeDiseaseAssociation.org](http://www.LymeDiseaseAssociation.org)

## Pronunciations



*tularemia*

*ehrlichiosis*

*spirochete*

You will learn many words today that are difficult to pronounce. To help you, we have provided a PRONUNCIATION PAGE link on the Notes page of each slide.

### ***Borrelia burgdorferi***

Copy and paste the link into a browser window to open the Pronunciation Page in a new window. To return to the class, close the Pronunciation Page window.

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Today's topic



Over the next half-hour, we will review the following topic:

- **Tick-er Tape Parade:**  
What are ticks and what do they look like?



Other modules available in this series are:

- **Module 1: What is Lyme disease?**
- **Module 3: Keeping ticks at bay when you go out to play**
- **Module 4: Testing and treatment for Lyme disease**

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)



## **Tick-er Tape Parade:**

**What are ticks  
and  
what do they look like?**

## Tick-er Tape Parade



We've heard a lot about ticks in the previous module. Now let's meet some of these culprits up close and personal.

The photos on the next several slides show ticks in comparison to real world objects. This will give you an idea of how small these spider-like creatures really are.



Take a look....

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Tick-er Tape Parade: Deer Tick

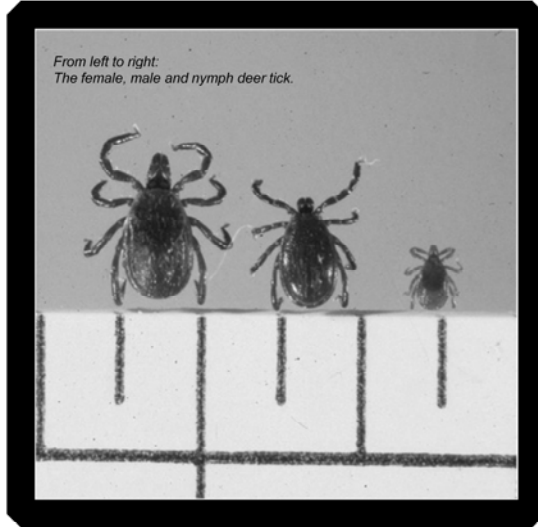


Photo courtesy of James L. Ocki, MA, MS

### ETYMOLOGY ALERT

**Nymph** | The immature form of an insect that does not change greatly as it grows.

Originally from the Greek *numphē*, nymph or bride.

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Tick-er Tape Parade: Deer Tick

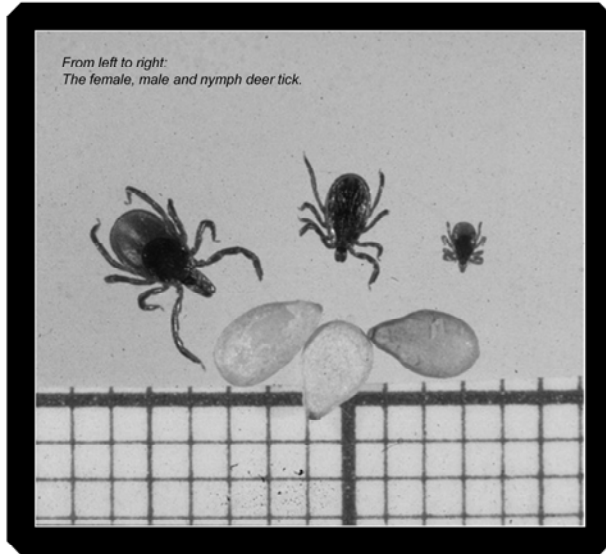


Photo courtesy of James L. Occhi, MA, MS

Here are some ticks compared to sesame seeds.

Notice how the adult female is about the same size as a sesame seed.

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)



## Tick-er Tape Parade: Deer Tick

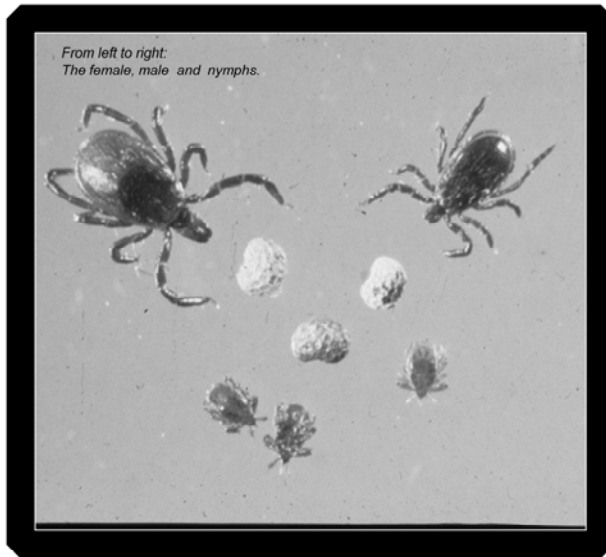


Photo courtesy of James L. Ocki, MA, MS

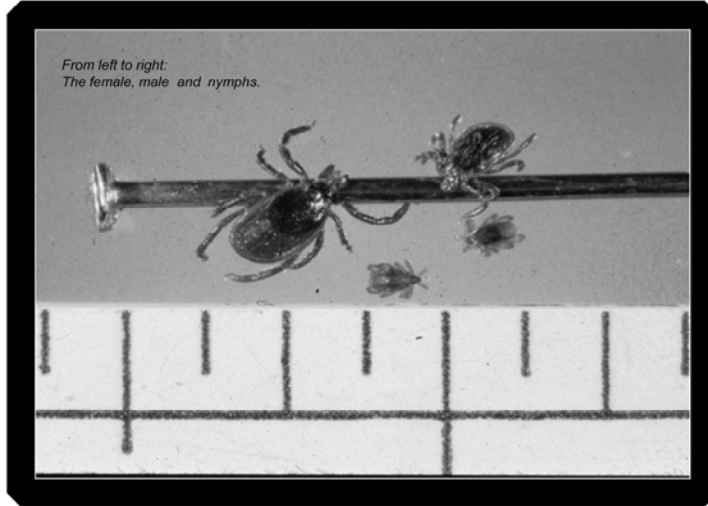
Here are some ticks compared to poppy seeds (white).

Note that the nymph ticks at the bottom of the slide are about the same size as the poppy seeds.

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Tick-er Tape Parade: Deer Tick



**Ticks atop a  
straight pin.**

Photo courtesy of James L. Occi, MA, MS

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Tick-er Tape Parade: Western Black Legged Tick



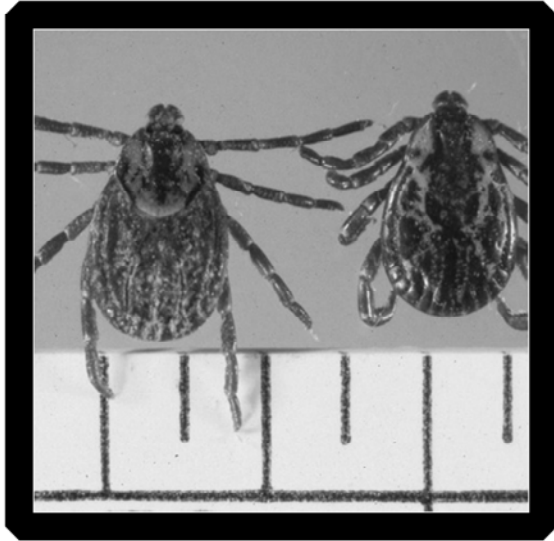
Here is our West Coast friend, the Western black legged tick.

Photo courtesy of Bob Lane, PhD

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Tick-er Tape Parade: American Dog Tick



Here's the  
American dog tick.

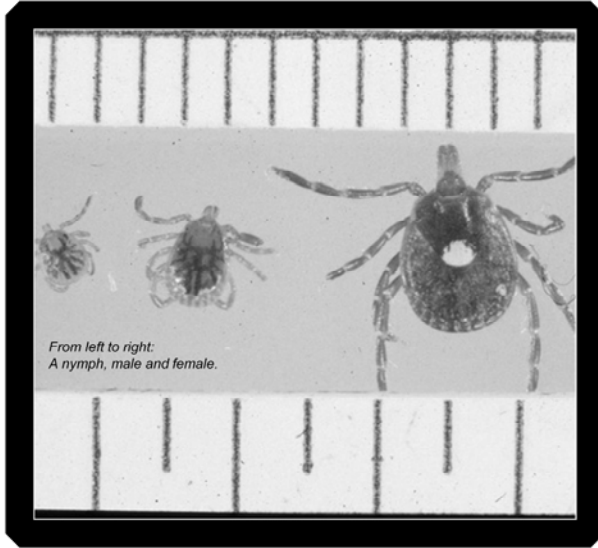


Photo courtesy of James L. Occi, MA, MS

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Tick-er Tape Parade: The Lone Star Tick



*From left to right:  
A nymph, male and female.*

**Here's the lone star tick.**

Photo courtesy of James L. Occi, MA, MS

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

**Tick-er Tape Parade:  
American Dog Tick, Deer Tick and Lone Star Tick**



**Here are four ticks  
atop a paper clip.**

*Far right:  
A female American dog tick.*

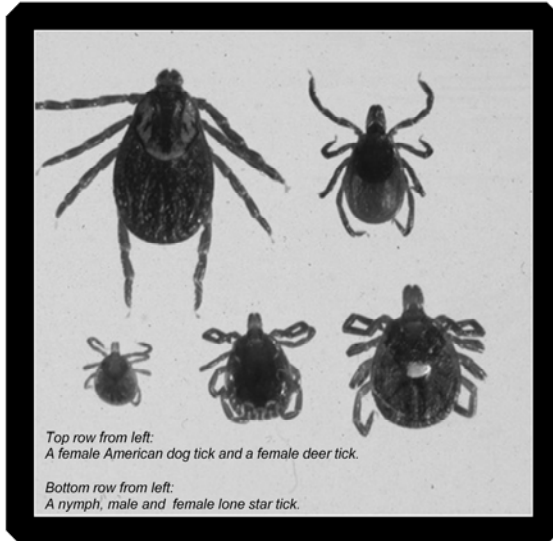
*Cluster, clockwise from top left:  
A nymph, male and female deer tick.*

Photo courtesy of James L. Occi, MA, MS

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

**Tick-er Tape Parade:  
American Dog Tick, Deer Tick and Lone Star Tick**



*Top row from left:  
A female American dog tick and a female deer tick.  
Bottom row from left:  
A nymph, male and female lone star tick.*

Photo courtesy of James L. Occi, MA, MS

**Not all kinds of ticks look the same.**

**Notice the differences in the colors, size and markings of each kind of tick.**

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

**Tick-er Tape Parade:  
American Dog Tick, Deer Tick and Lone Star Tick**

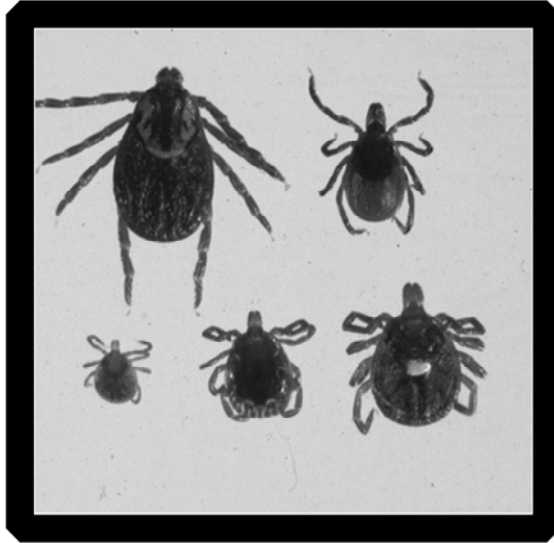


Photo courtesy of James L. Occi, MA, MS

**Don't let the differences  
fool you.**

**Each of these ticks can  
carry dangerous diseases.**

Pronunciation Guide:

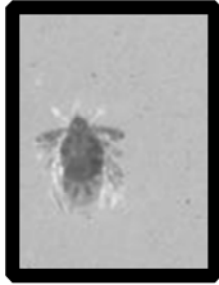
[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)



## The Tick Life Cycle

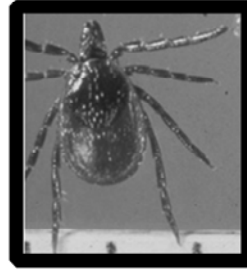


We expect different species of ticks to look different.  
However, the same tick can look different at different stages in its life.



A deer tick nymph.

versus



An adult female deer tick.

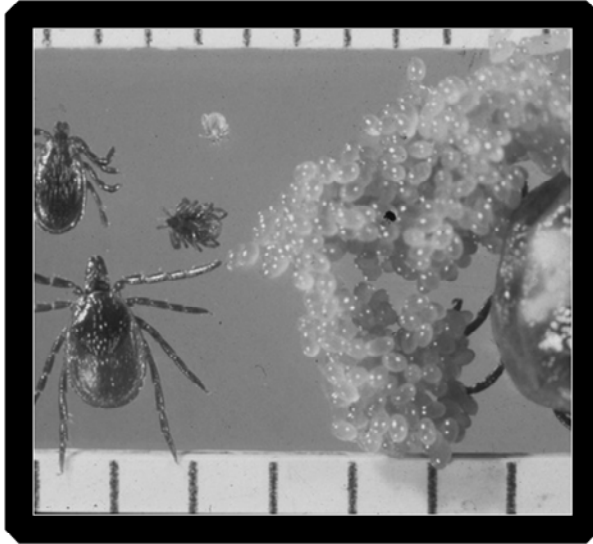
### REMEMBER:

Even though they look different, both of these ticks still can infect a human or animal with disease.

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Tick-er Tape Parade: Deer tick life cycle



Here are images of deer ticks at every stage in the tick life cycle.

Check it out....

Photo courtesy of James L. Occhi, MA, MS

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Tick-er Tape Parade: Deer tick life cycle

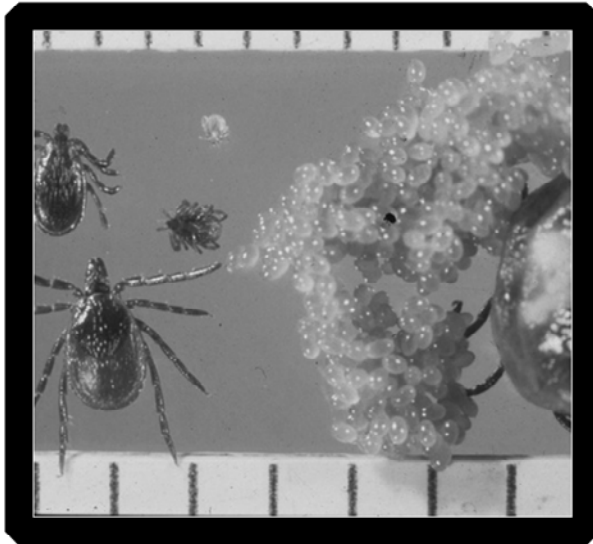


Photo courtesy of James L. Occhi, MA, MS

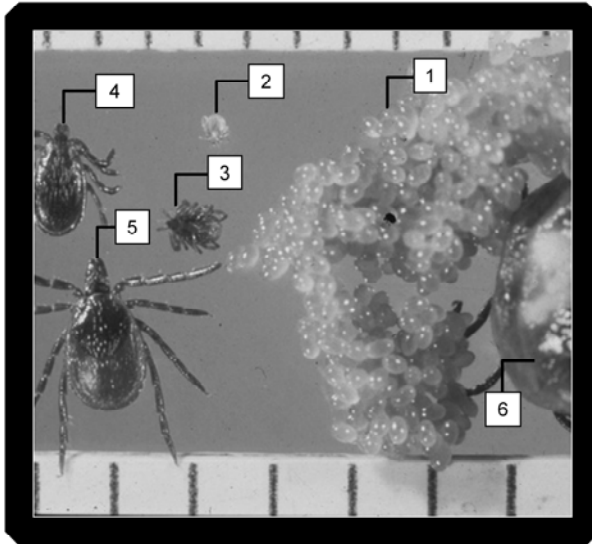
You start with an EGG—or in this case, thousands of them!

The eggs hatch into LARVAE, then molt to become NYMPHS, and finally grow to adulthood, like the ones shown here.

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Tick-er Tape Parade: Deer tick life cycle



1. Egg mass
2. Larva
3. Nymph
4. Male adult
5. Female adult
6. An engorged\* female

\* Engorged means that the tick is filled with blood after feeding on a host.

Photo courtesy of James L. Occi, MA, MS

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Tick-er Tape Parade: Ticks laying eggs



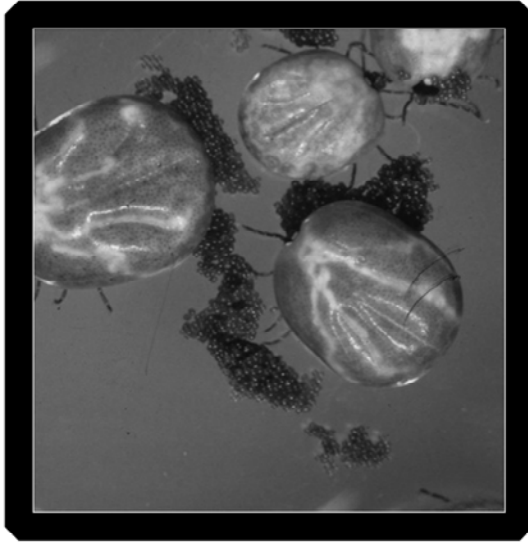
Here's a lone star tick  
laying eggs.

Photo courtesy of James L. Occi, MA, MS

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Tick-er Tape Parade: Ticks laying eggs



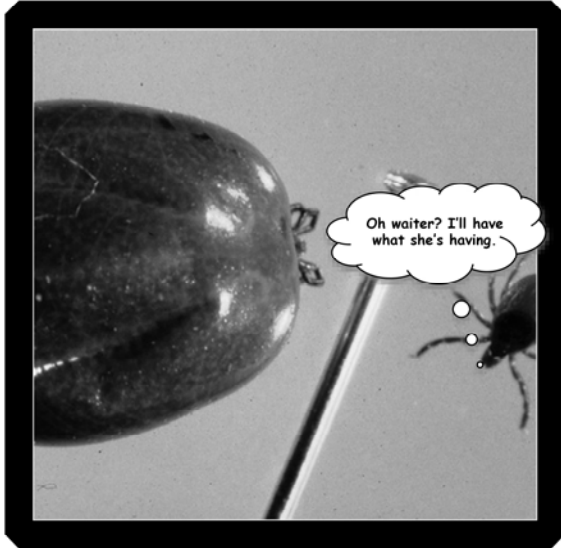
A group of lone star ticks laying eggs.

Photo courtesy of James L. Occi, MA, MS

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Tick-er Tape Parade: Fed and unfed ticks



From left to right:

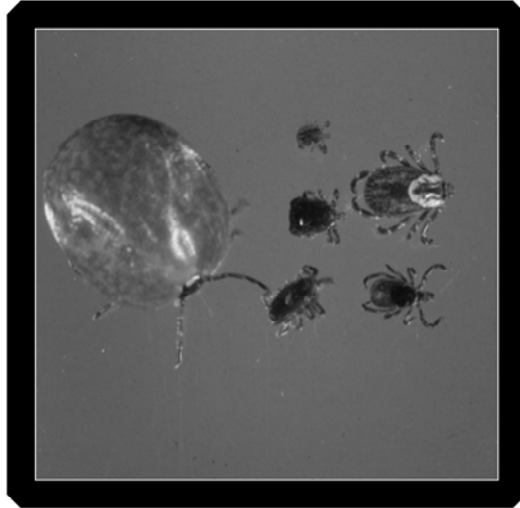
A well-fed female deer tick,  
a straight pin, and an unfed  
female adult deer tick.

Photo courtesy of James L. Occi, MA, MS

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Tick-er Tape Parade: Fed and unfed ticks



A fed lone star tick, far left,  
and various types of unfed  
ticks.

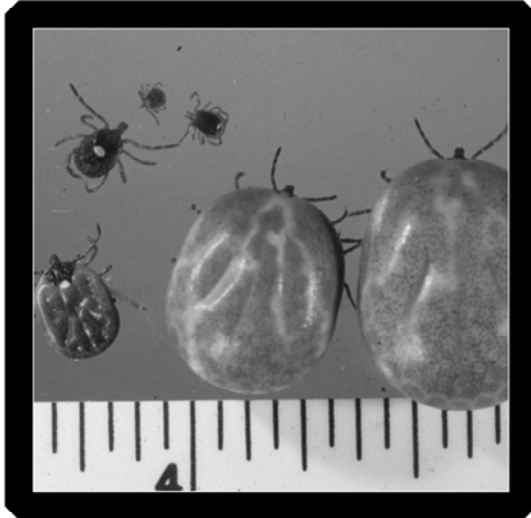
Photo courtesy of James L. Occi, MA, MS

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)



## Tick-er Tape Parade: Fed and unfed ticks



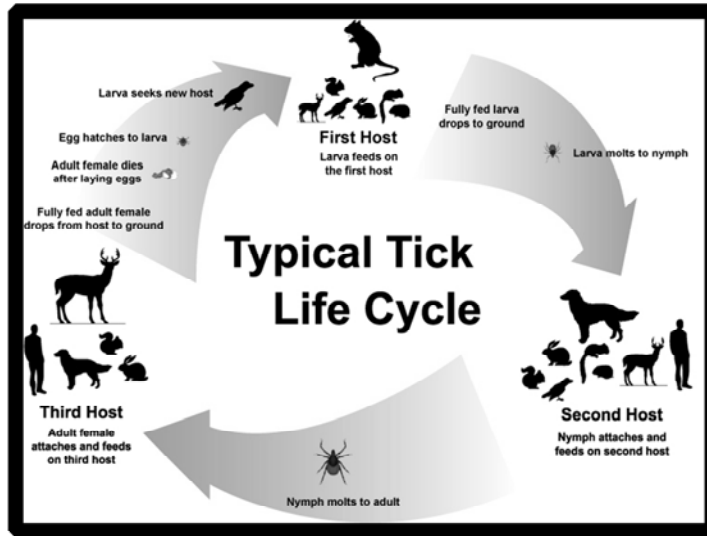
Lone star ticks in various stages of feeding.

Photo courtesy of James L. Occi, MA, MS

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Deer tick life cycle



Pronunciation Guide:

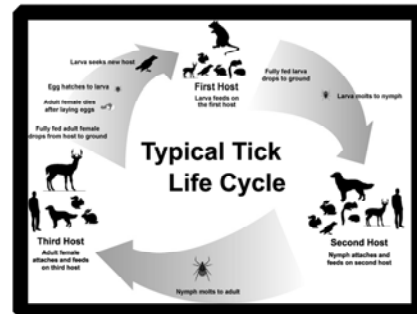
[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Deer tick life cycle



We've talked about how ticks transmit Lyme disease to pets and humans.

But how does the tick contract the bacteria in the first place?



Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## White-footed mouse



Meet the  
**WHITE-FOOTED MOUSE.**

Larval and nymph ticks can get  
the Lyme bacteria and other  
bugs after dining on a mouse  
like this one.



Photo courtesy of James L. Occi, MA, MS

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Deer provide a meal on the go



That's what I call  
fast food.

Deer are also part of the tick life cycle.

They provide meals — and transportation — for ticks.

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Deer provide a meal on the go



Here is a close-up of a deer's ear covered with ticks.

Photo courtesy of James L. Occi, MA, MS

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Ticks and children



**Lyme disease is most common in children between the ages of 5 and 9 years old.\***

*\*According to the Centers for Disease Control and Prevention.*

Photo courtesy of Pat Smith

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Where do you find ticks?



- Wooded areas
- Where woods meet the lawn
- Tall brush and grass
- Under leaves
- Under ground cover plants in the yard
- In stone walls and woodpiles
- Seldom on cut and raked lawns
- Under plants and leaves (to prevent dehydration)



Pronunciation Guide:

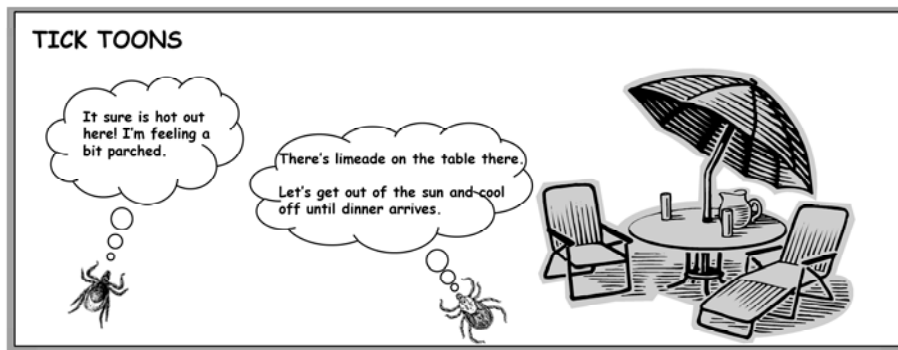
[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)





## Where do you find ticks?

Ticks like to hide in cool places and tend to avoid very sunny spots, to prevent dehydration.



Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## How do ticks get on you?



Many ticks, such as the deer tick and the American dog tick, climb small plants. Then they attach themselves to passing animals and people who brush against the plant.

When a tick uses this method of finding a host, it is called **QUESTING**.



Photo courtesy of James L. Occi, MA, MS

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## How do ticks get on you?



This American dog tick is questing on a blade of grass, like a tiny hitchhiker waiting at an off ramp for a ride.

Photo courtesy of James L. Occi, MA, MS

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## How do ticks get on you?



Here is a deer tick,  
questing on a plant.

Photo courtesy of James L. Occi, MA, MS

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)




## How does the tick eat?

The tick follows these steps to get a meal:

1. Spits a substance that numbs your skin
2. Cuts you open
3. Inserts its hollow straw-like hypostome to suck your blood

### ETYMOLOGY ALERT



**Hypostome** | A tiny, harpoon-like structure that the tick uses to anchor itself to a host. From International Scientific Vocabulary *hypo-* and the Greek *stoma*, mouth.

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)



## **How does the tick eat?**

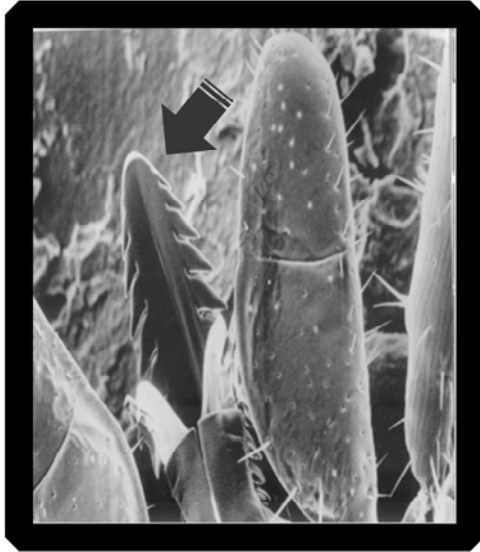
The tick follows these steps to get a meal:

4. **Spits a glue-like substance to cement itself to your body**
5. **Sucks your blood**
6. **During feeding, bacteria and other disease organisms in the tick flow into you**

Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)

## Up close and personal



The business end of the tick,  
a.k.a., the **HYPOSTOME**.

This is a magnified view of the  
straw-like structure (with  
barbs) that the tick uses to  
suck your blood.

Image courtesy of Manfred Bayer, MD

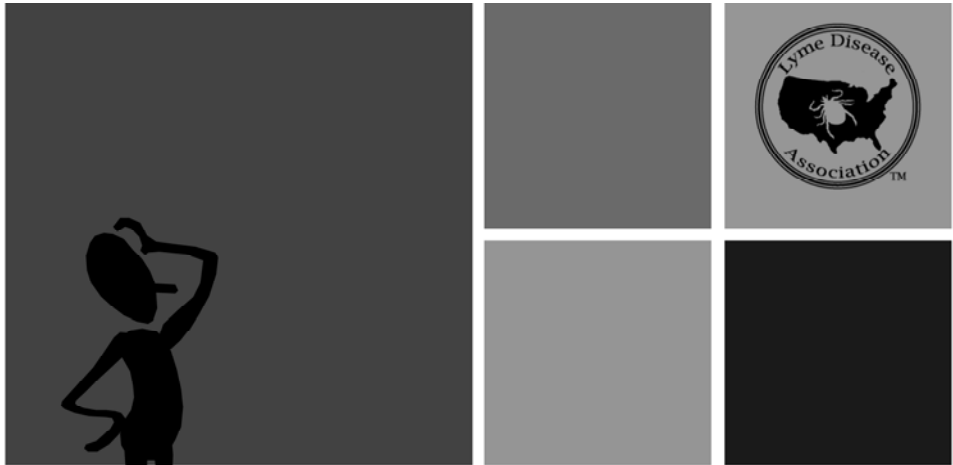
Pronunciation Guide:

[http://lymediseaseassociation.org/ledu/pron\\_guide.html](http://lymediseaseassociation.org/ledu/pron_guide.html)



**You have reached the end of  
Module 2:  
Tick-er Tape Parade:  
What are ticks and  
what do they look like?**





**Questions?**


[www.LymeDiseaseAssociation.org](http://www.LymeDiseaseAssociation.org)

If you have questions about any of the topics that we've discussed today, the LDA website,

**[www.LymeDiseaseAssociation.org](http://www.LymeDiseaseAssociation.org),**

offers lots of information so that you and your family can learn more!

In the meantime, be well and stay safe!

<p><b>THANKS!</b></p> <p>The Lyme Disease Association (LDA) thanks the following individuals for their help with various aspects of this project:</p>		

**James Occi, MA, MS; Ray Stricker, MD; Pat Smith, BA, and D.L. Singfield of Lytaker. LDA especially thanks the Clear Run Intermediate School in Tobyhanna, Pennsylvania and teachers Joanne Bohrman and Marlena Middleton who initiated the LDA presentation to the 6th and 7th graders in February 2007, which precipitated development of this project.**

**COPYRIGHT**

Copyright © 2008 Lyme Disease Association, Inc. All rights reserved.

LDA owns the rights to this presentation. This presentation may not be altered in any way. This presentation can be used in any educational or informational setting where no admission fees are charged and where no fees of any kind are charged in connection with this information. Any use must include attribution to the Lyme Disease Association. Direct any inquiries to

Lyme Disease Association, Inc.

PO Box 1438 Jackson, NJ 08527

[www.LymeDiseaseAssociation.org](http://www.LymeDiseaseAssociation.org)



**DISCLAIMER**

**This slideshow, How a Tick Can Make You Sick, is presented as educational and informational material only. The Lyme Disease Association (LDA) does not render medical or other professional services or advice.**

**If medical or other expert assistance is required, the services of a competent professional should be sought.**

**COPYRIGHT**

Copyright © 2008 Lyme Disease Association, Inc. All rights reserved.

LDA owns the rights to this presentation. This presentation may not be altered in any way. This presentation can be used in any educational or informational setting where no admission fees are charged and where no fees of any kind are charged in connection with this information. Any use must include attribution to the Lyme Disease Association. Direct any inquiries to

Lyme Disease Association, Inc.

PO Box 1438 Jackson, NJ 08527

[www.LymeDiseaseAssociation.org](http://www.LymeDiseaseAssociation.org)