Lyme Disease Basics

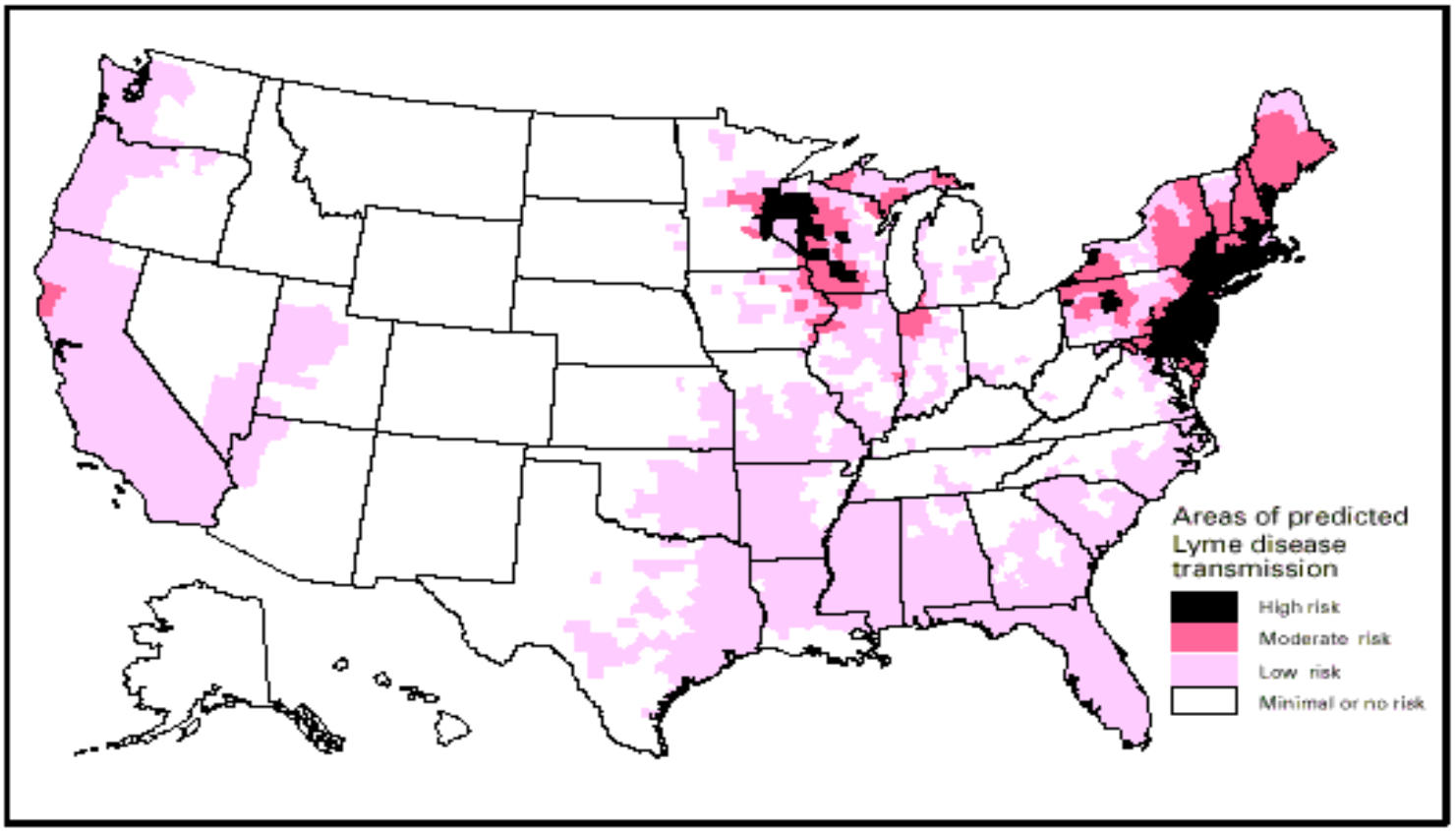
Harford County Health Department

Bureau of Environmental Health

Background Information

- Lyme disease was first identified in 1977 in Lyme, Connecticut when a group of mothers noticed that an unusually high number of children living in that geographic region had arthritic symptoms, particularly in their knees.
- Lyme disease is the most commonly reported vector-borne illness in the United States. The geographic distribution of cases is highly focused, with the majority of reported cases occurring in the northeastern and north-central states (figure 1). During 1992--2006, the number of reported cases more than doubled (figure 2).
- The true impact of Lyme disease is probably not known because it is often misdiagnosed and is considered to be greatly under reported.
- The Lyme disease infection is caused by a spirochete bacterium known as Borrelia burgdorferi. The bacteria lives in small animals like mice, squirrels, and birds and is acquired by the Black Legged Tick when obtaining a blood meal (*Ixodes scapularis*). (figure 3).

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.

Source of Risk Map; Occupational Safety and Health Administration

Figure 1

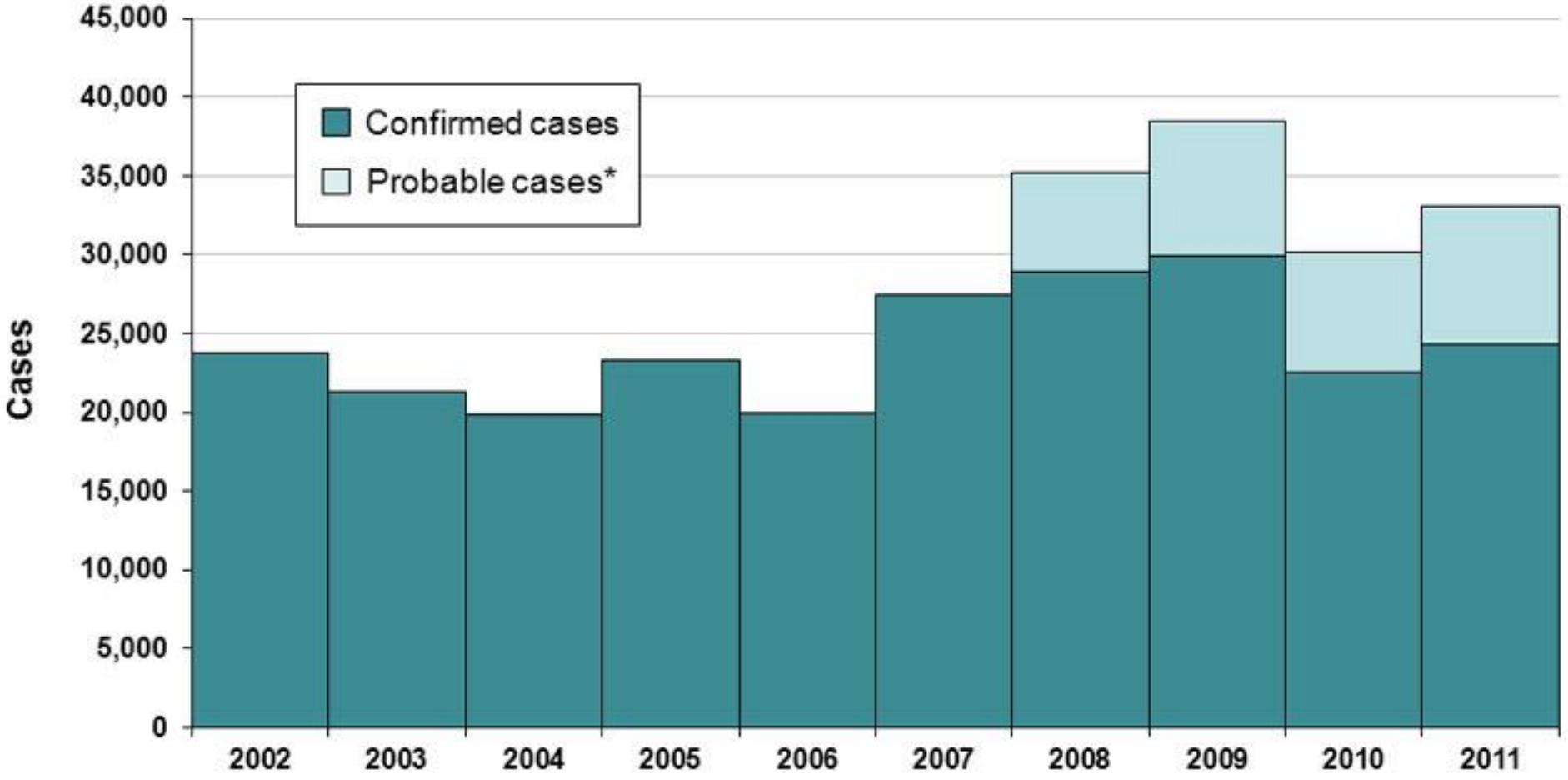
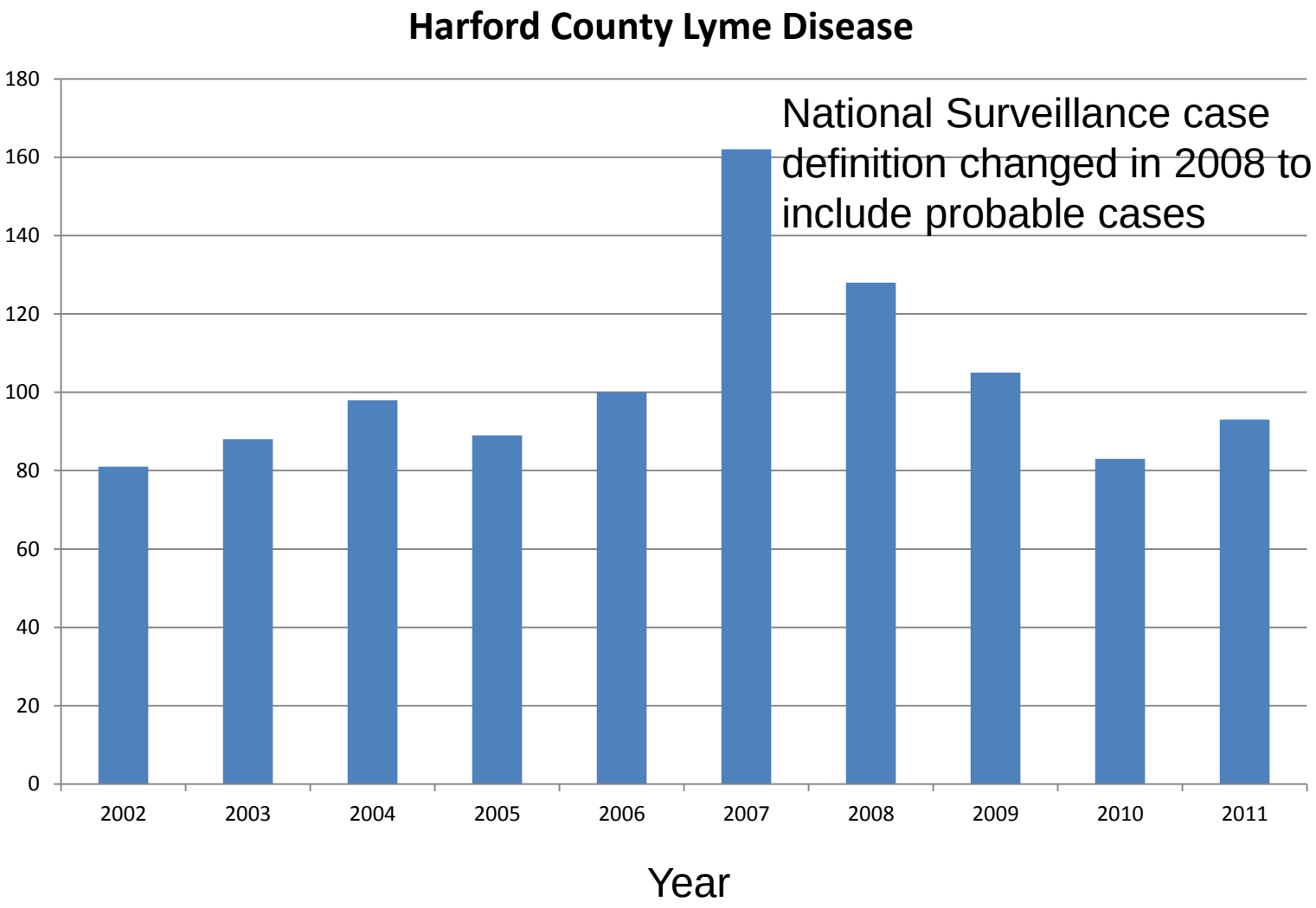
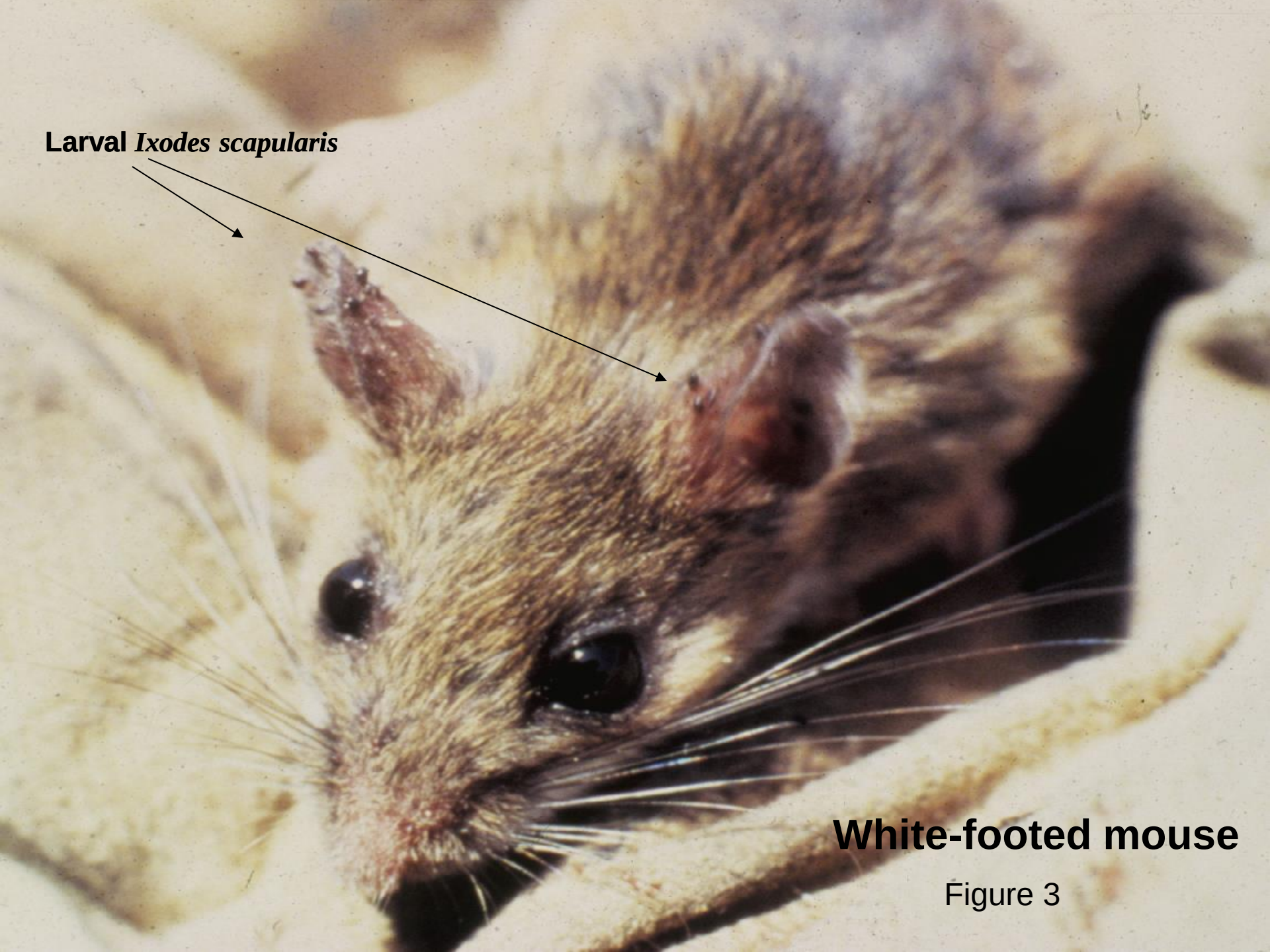


Figure 2. *National Surveillance case definition revised in 2008 to include probable cases (source CDC)



In 2008 the Health Department's Lyme disease educational and outreach efforts began in earnest.



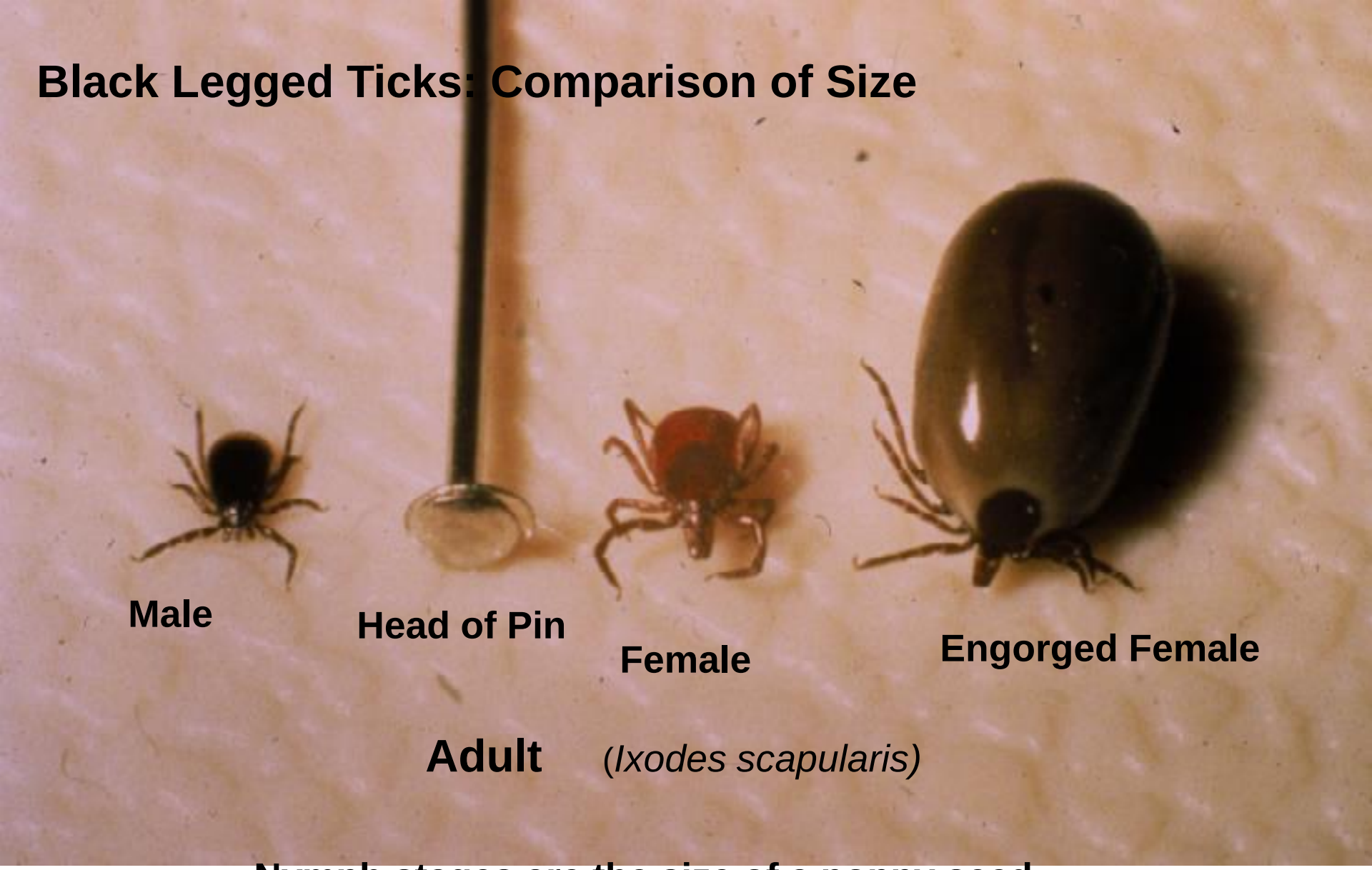
White-footed mouse

Figure 3

Size of Black Legged Ticks and their attachment to humans

- In order for humans to sustain a Lyme disease infection a nymph or adult stage tick must be attached for a period of at least 24 hours. Many Lyme disease researchers believe this period to be longer, approaching 48 hours.

- Black legged ticks are very small. Adults are approximately the size of a pin head (figure 4a). Females are slightly larger, males are slightly smaller. Early nymph stages have been compared to the size of the poppy seed and the size of newly hatched larvae have been compared to a period at the end of a sentence or a grain of pepper. Figure 4b shows the relative size of the different life stages in relation to the size of a dime.



Nymph stages are the size of a poppy seed
Larval stage size of a period at the end of sentence (MDH)

Figure 4a

Black Legged Ticks: Comparison of Size During Various Life Stages

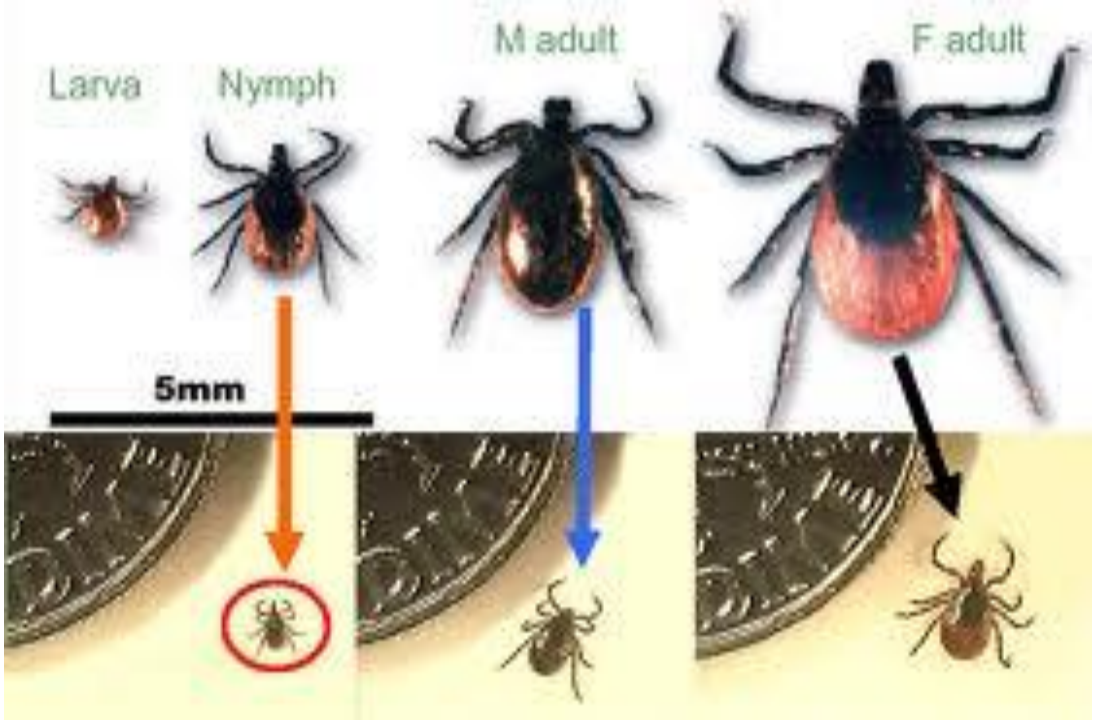
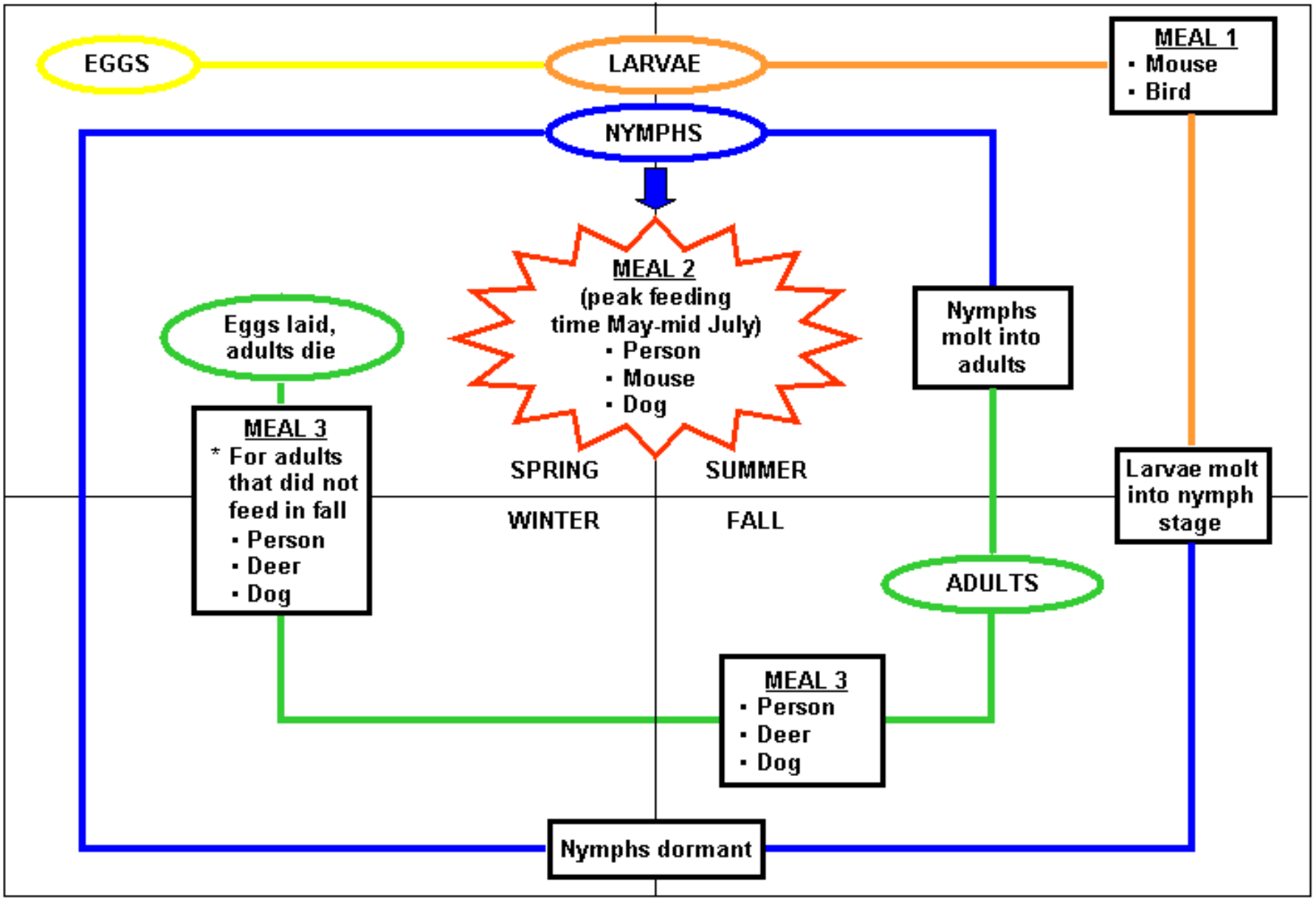


Figure 4b

Nymph stages are the size of a poppy seed

Larval stage size of a period at the end of sentence

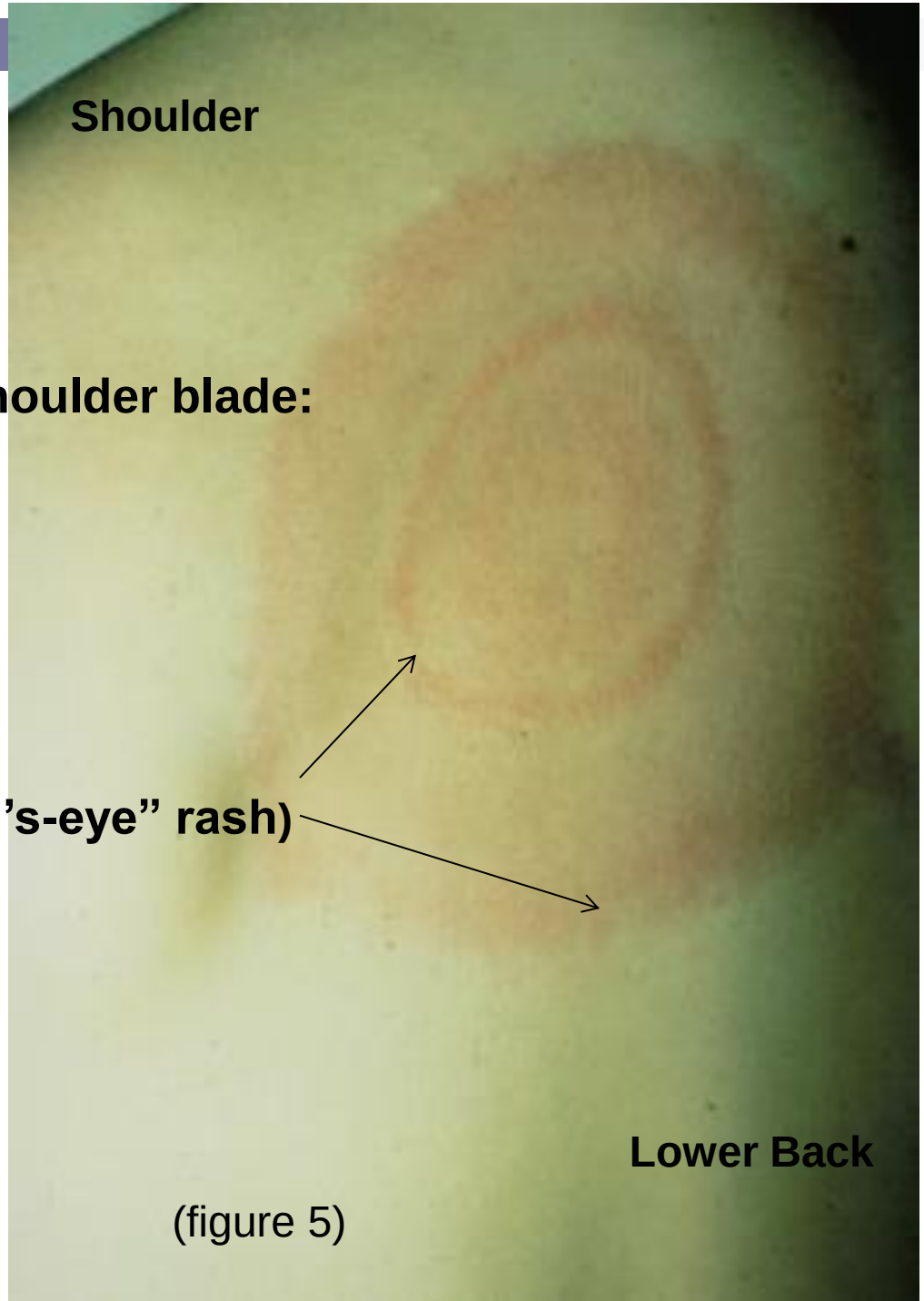
Two Year Life Cycle of Deer Tick (*Ixodes scapularis*)



Symptoms of Lyme Disease

- **Early symptoms of Lyme disease appear 3 to 32 days after the bite of an infected tick which was attached for at least 24 hours.** Early symptoms include the following:
- Chills
- Fever
- Headache
- Stiff neck
- Swollen lymph nodes
- Joint pain 60% of cases
- Bull's eye rash (Erythema migrans) 80% of confirmed or probable cases (figure 5)

Erythema migrans **on shoulder blade:**
80% cases



(figure 5)

Diagnosis and Treatment of Lyme disease

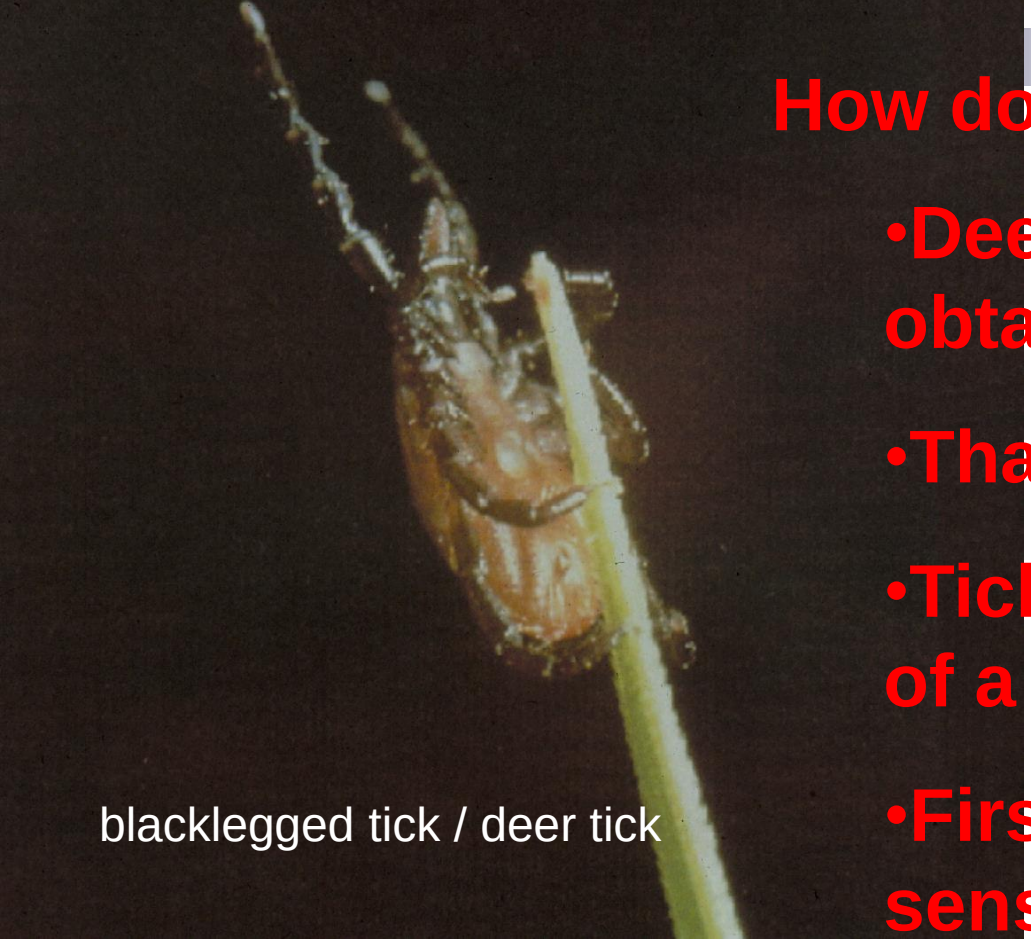
- Blood tests done in the early stage of illness can be negative, so early diagnosis is usually based on symptoms and patient history.
- Commonly used antibiotics include doxycycline, amoxicillin, and cefuroxime. The usual course of the antibiotics is 14 days.
- A report from the Infectious Diseases Society of America (IDSA) indicates that the maximum treatment period for oral antibiotics is 30 days.

Harford County Health Department believes maximum personal protection is accomplished in 5 Ways:

1. Permethrin treated (protective) clothing. Available in Spray bottle. Becoming more available (Sawyer™)
2. 20-30% Deet on exposed skin (e.g. Deep Woods Off™) Use according to directions.
3. Routine tick checks (look very closely). Use magnifying glass and good lighting.
4. Avoid tick habitat in woods and at home. Create buffers from tick habitat around your home.
5. Prompt/proper removal of attached ticks.

4) Avoidance of Primary Tick Habitat


TAKE ONE



blacklegged tick / deer tick

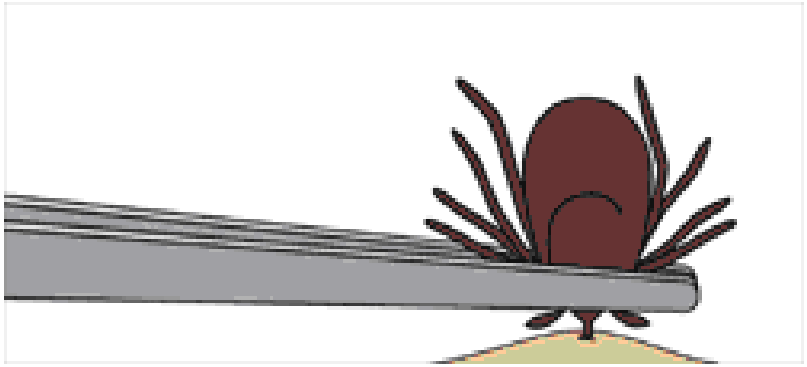
Questing Behavior

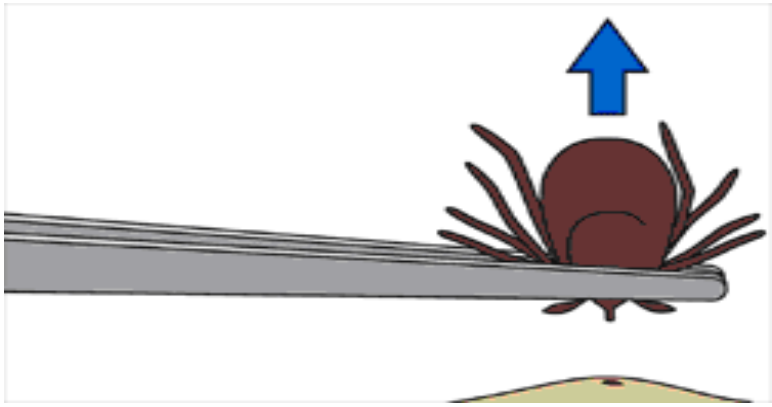
How does the tick find me?

- Deer tick needs host to obtain a blood meal
- That host can be you
- Tick positions itself on tip of a blade of grass
- First set of legs have sensory organs and are outstretched
- Tick senses heat from our bodies and CO_2 from our breath

5) Proper Tick Removal

Figure: Proper removal of ticks [Courtesy of CDC].





Remove a tick from your skin as soon as you notice it. Use fine-tipped tweezers to firmly grasp the tick very close to your skin. With a steady motion, pull the tick's body away from your skin. Then clean your skin with soap and warm water. Throw the dead tick away with your household trash.

Avoid crushing the tick's body. Do not be alarmed if the tick's mouthparts remain in the skin. Once the mouthparts are removed from the rest of the tick, it can no longer transmit the Lyme disease bacteria. If you accidentally crush the tick, clean your skin with soap and warm water or alcohol. Don't use petroleum jelly, a hot match, nail polish, or other products to remove a tick.

Health Department Major Outreach Initiatives

2008 Lyme disease Awareness and Prevention Presentations to interested County Agencies, Community, Civic, and Religious Groups

- Started to bring more detailed information to the public in a format where they could ask questions and express their concerns about Lyme disease.
- 20 presentations conducted to date; 30-45 minutes in length. Average group size 25 persons.

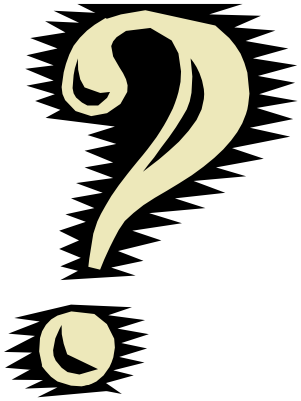
2011 Harford County Public Schools/School Health Nurse Internet In-Service Training Module

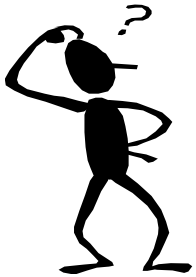
- Harford County Health Department developed a power point presentation that all school health nurses were required to complete.
- The presentation contained valuable information, including, notable symptoms, tick removal, and information to present to parents . The training was very well received.

2011-2012 Lyme and Other Tick Borne Diseases Prevention Study (LTDPS). Well timed application of Acaricide.

- Collaborative effort between CDC, Maryland (DHMH).
- Harford County was one of only three counties invited to participate.
- Information available this summer or early fall

Questions?





Please Contact Me:

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- Website www.harfordcountyhealth.com look under Quick links for Lyme disease
- CDC www.cdc.gov/lyme