Beyond The Bite: Understanding Ticks And Alpha-Gal




Fort Scott, KS

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How To Avoid Tick Bites


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Overview Of Presentation: What To Expect

- Introduction
- Tick Types
- Tick Biology And Ecology
- Tick Management
- Questions And Discussion




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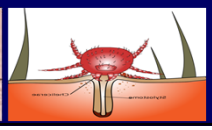
Biting vs. Feeding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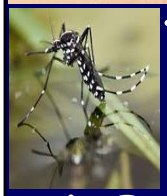
Biting Bugs Of Concern To People (Human Health Issue)

* Ticks
* Chiggers



* Mosquitoes

* Spiders
* Oak Leaf Itch Mite

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What Are Ticks?

* Ticks Are Blood Sucking Ectoparasites That Feed On Mammals, Birds, And Reptiles




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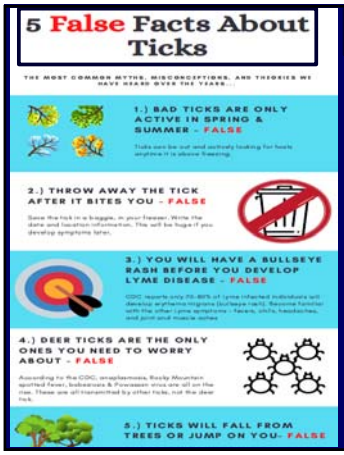

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Families Of Ticks

* Ixodidae: Hard Ticks


* Argasidae: Soft Ticks


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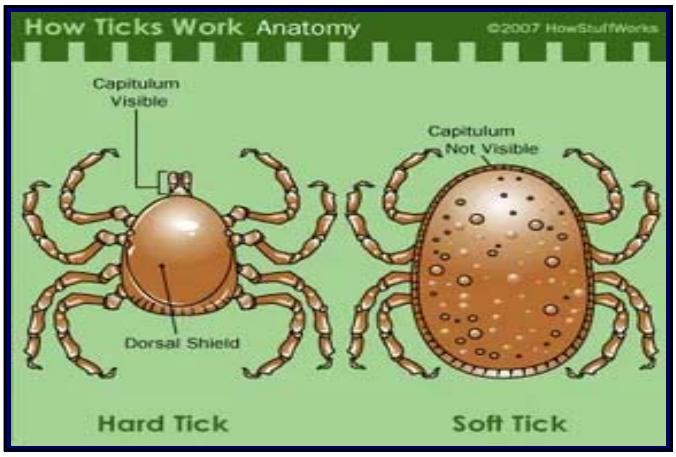

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Ticks Of Kansas

* American Dog Tick (*Dermacentor variabilis*): Vector Of Rocky Mountain Spotted Fever


* Lone Star Tick (*Amblyomma americanum*)

* Brown Dog Tick (*Rhipicephalus sanguineus*)

* Black Legged Tick (*Ixodes scapularis*): Vector Of Lyme Disease (*Borrelia burgdorferi*)


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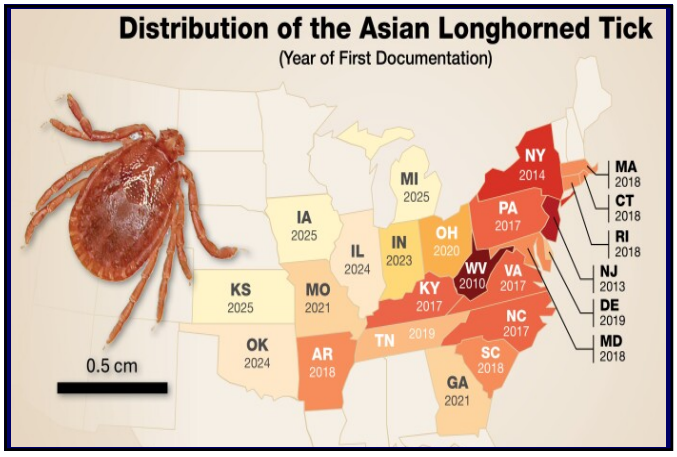

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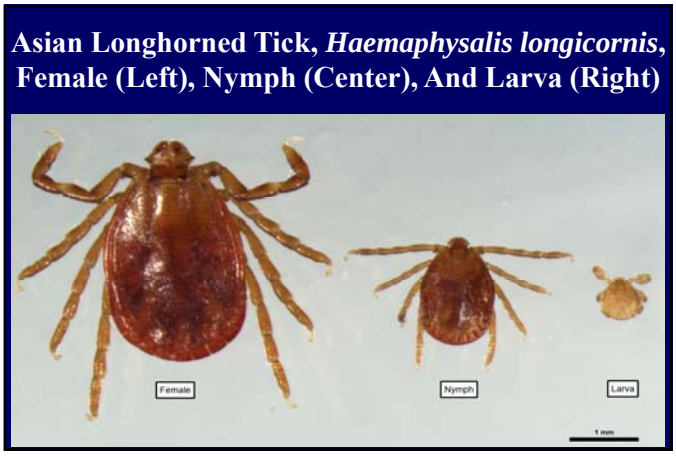

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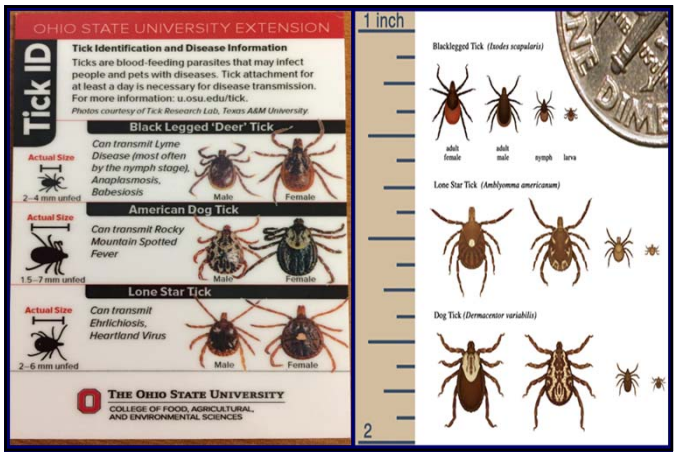

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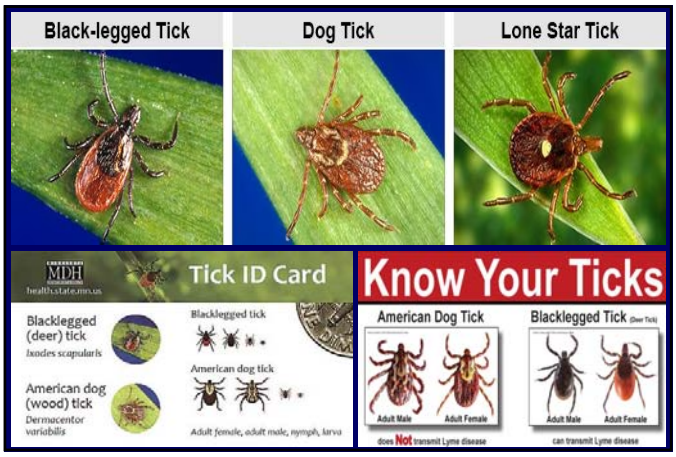

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Ticks: Biology And Ecology

* Feed on the blood of humans and animals.
* Females, depending on species, can lay between 3,000 and 8,000 eggs during their lifespan.
* Found in areas with vegetation around the edge of forests, along forest trails, and grassy fields.
* Ticks move onto grasses, weeds, and brush and wait for a host (human) to contact vegetation. Ticks are found a few inches or feet aboveground on vegetation.

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Habitat Where Ticks Could Be Present

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Ticks Questing On Grass Blades

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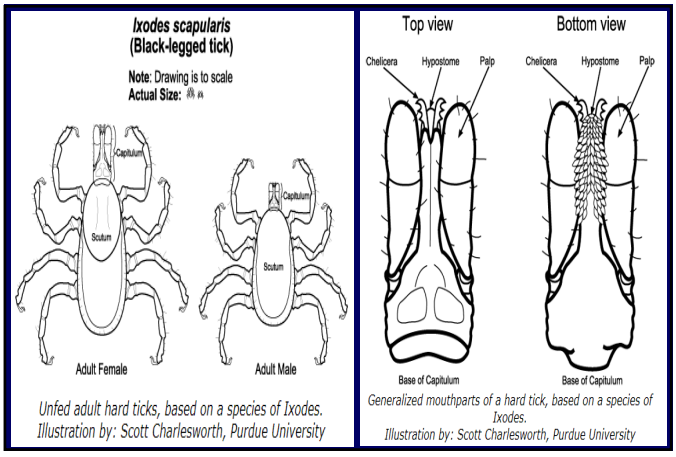

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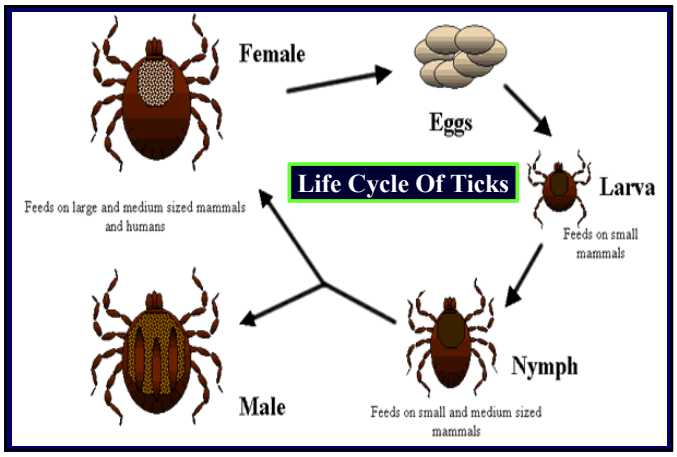

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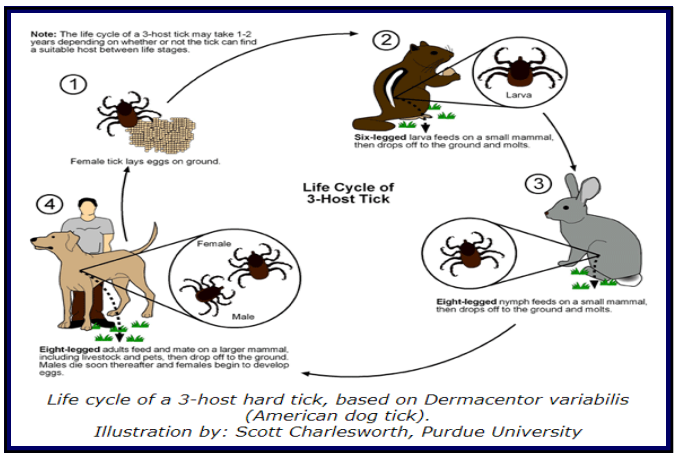

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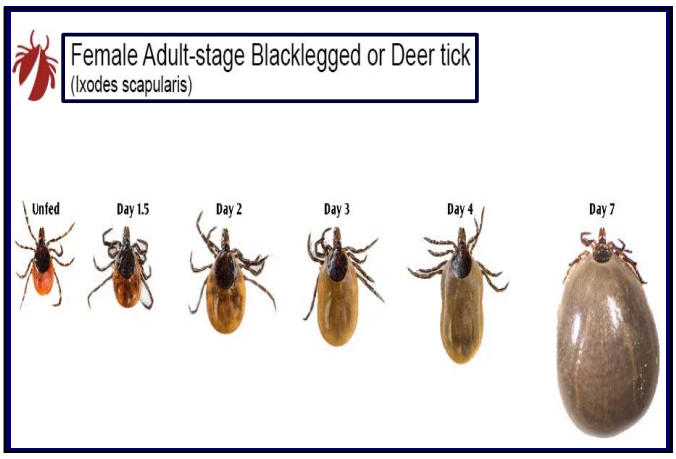

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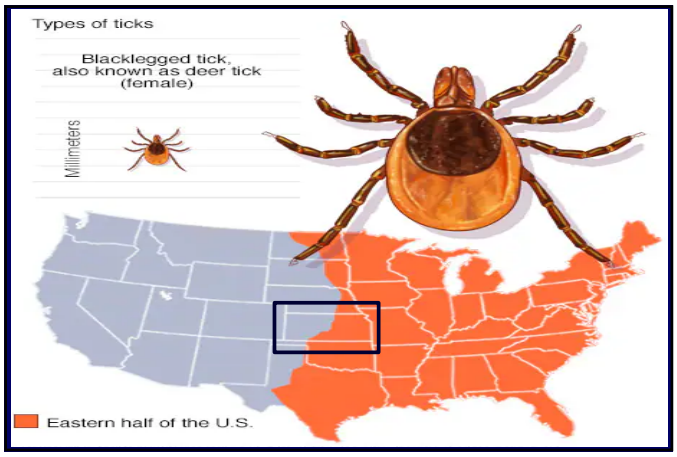

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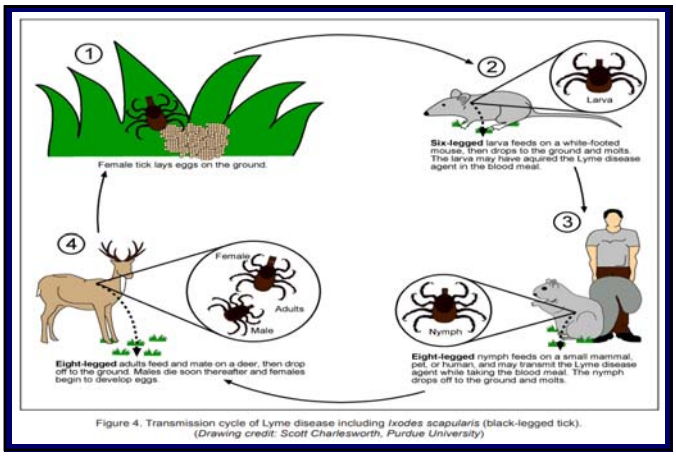

Figure 4. Transmission cycle of Lyme disease including *Ixodes scapularis* (black-legged tick).
(*Drawing credit: Scott Charlesworth, Purdue University*)

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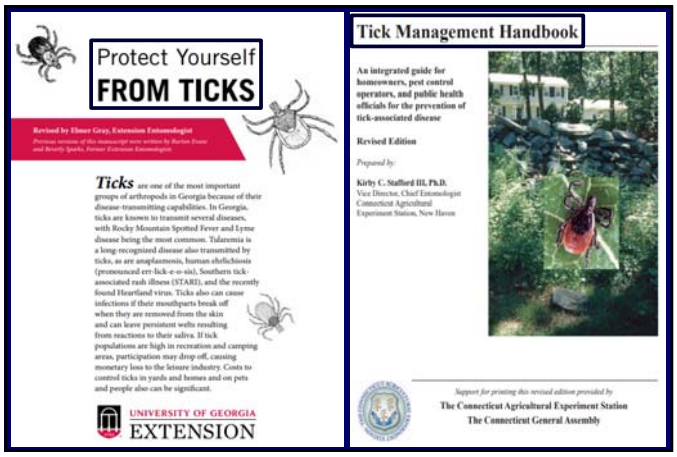

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Check for updates

Validating a common tick survey method: cloth-dragging and line transects

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Abstract
Cloth-dragging is the most widely-used method for collecting and counting ticks, but there are few studies of its reliability. By using cloth-dragging, we applied a replicated line transects survey method, in two areas in Sweden with different *Ixodes ricinus* tick-densities (low at Grimsö and high at Bogesund) to evaluate developmental stage specific repeatability, agreement and precision in estimates of tick abundance. 'Repeatability' was expressed as the Intraclass Correlation Coefficient (ICC), 'agreement' with the Total Deviation Index (TDI) and 'precision' by the coefficient of variation (CV) for a given dragging distance. Repeatability (ICC) and agreement (TDI) were higher for the most abundant instar (nymphs) and in the area of higher abundance. At Bogesund tick counts were higher than at Grimsö and so also repeatability, with *fair* to *substantial* ICC estimates between 0.22 and 0.75, and TDI ranged between 1 and 44.5 counts of difference (thus *high* to *moderate* agreement). At Grimsö, ICC was *poor* to *moderate* and ranged between 0 and 0.59, whereas TDI remained low with estimates lower or equal to 1 count (thus *high* agreement). Despite a 100-fold lower abundance at Grimsö, the same level of precision for nymphs could be achieved with a 70% increase of dragging effort. We conclude that the cloth-dragging technique is useful for surveying ticks' and primarily to estimate abundance of the nymphal stage, whereas it rarely will be recommended for larvae and adults.

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How Can You Protect Yourself Against Ticks?

Use Repellents Such As—DEET (N,N-diethyl-meta-toluamide), IR3535, Picaridin, Or Permethrin (Do Not Apply To Skin)

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Repellents (Left) And Contact Insecticide (Right) That Can Be Used To Provide Protection Against Ticks

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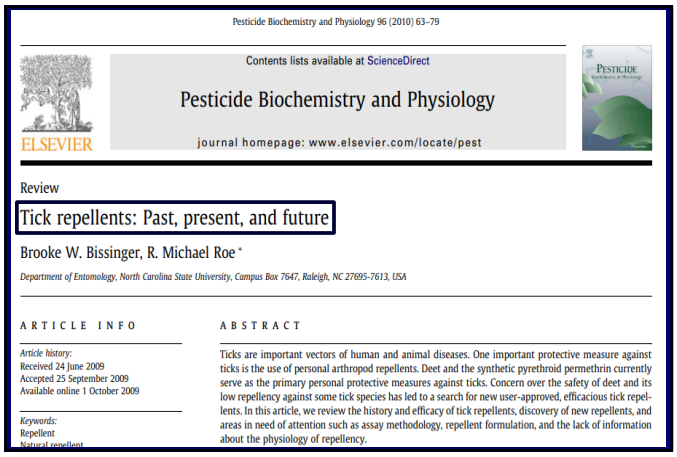

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Review

Tick repellents: Past, present, and future

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ABSTRACT

Ticks are important vectors of human and animal diseases. One important protective measure against ticks is the use of personal arthropod repellents. Deet and the synthetic pyrethroid permethrin currently serve as the primary personal protective measures against ticks. Concern over the safety of deet and its low repellency against some tick species has led to a search for new user-approved, efficacious tick repellents. In this article, we review the history and efficacy of tick repellents, discovery of new repellents, and areas in need of attention such as assay methodology, repellent formulation, and the lack of information about the physiology of repellency.

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Before You Go Outdoors

- **Know where to expect ticks.** Ticks live in grassy, brushy, or wooded areas, or even on animals. Spending time outside walking your dog, camping, gardening, or hunting could bring you in close contact with ticks. Many people get ticks in their own yard or neighborhood.
- **Treat clothing and gear** with products containing 0.5% permethrin. Permethrin can be used to treat boots, clothing and camping gear and remain protective through several washings. Alternatively, you can buy permethrin-treated clothing and gear.
- **Use Environmental Protection Agency (EPA)-registered insect repellents** containing DEET, picaridin, IR3535, Oil of Lemon Eucalyptus (OLE), para-menthane-diol (PMD), or 2-undecanone. EPA's helpful search tool can help you find the product that best suits your needs. Always follow product instructions. Do not use products containing OLE or PMD on children under 3 years old.
- **Avoid Contact with Ticks**
  - Avoid wooded and brushy areas with high grass and leaf litter.
  - Walk in the center of trails.

Caution: entering tick habitat!

Deer ticks may be found in habitats with:
- Leafy trees
- Brush and shrubs
- Leaf litter layer

American Dog ticks may be found in habitats with:
- Tall grasses
- Shrubs
- Open areas

For more information visit: www.maine.gov/dhhs/vectorborne

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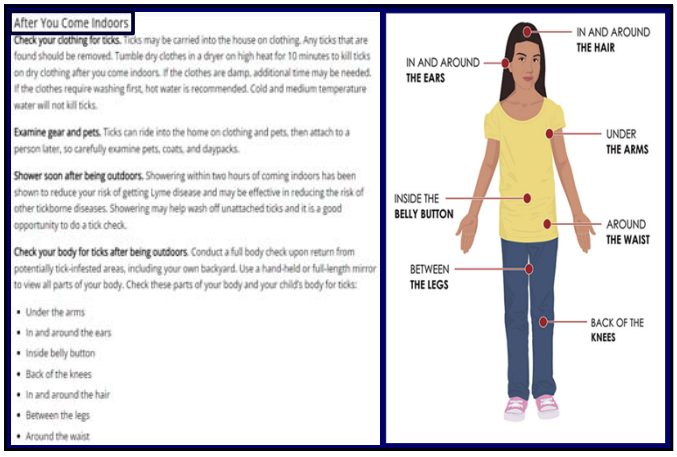

After You Come Indoors

Check your clothing for ticks. Ticks may be carried into the house on clothing. Any ticks that are found should be removed. Tumble dry clothes in a dryer on high heat for 10 minutes to kill ticks on dry clothing after you come indoors. If the clothes are damp, additional time may be needed. If the clothes require washing first, hot water is recommended. Cold and medium temperature water will not kill ticks.

Examine gear and pets. Ticks can ride into the home on clothing and pets, then attach to a person later, so carefully examine pets, coats, and daypacks.

Shower soon after being outdoors. Showering within two hours of coming indoors has been shown to reduce your risk of getting Lyme disease and may be effective in reducing the risk of other tickborne diseases. Showering may help wash off unattached ticks and it is a good opportunity to do a tick check.

Check your body for ticks after being outdoors. Conduct a full body check upon return from potentially tick-infested areas, including your own backyard. Use a hand-held or full-length mirror to view all parts of your body. Check these parts of your body and your child's body for ticks:

- Under the arms
- In and around the ears
- Inside belly button
- Back of the knees
- In and around the hair
- Between the legs
- Around the waist

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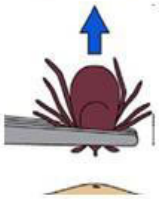
How to Remove a Tick

Step 1: Use fine-tipped tweezers to grasp the tick as close to the skin's surface as possible. The goal is to remove the entire tick including its head and mouth.

Step 2: Pull upward with steady, even pressure. Do not twist or jerk the tick!



Step 3: Clean the bite area and your hands with rubbing alcohol, an iodine scrub, or soap and water.

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Tick bites and red meat allergy

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Abstract

Purpose of review—A novel form of anaphylaxis has been described that is due to IgE antibody (Ab) directed against a mammalian oligosaccharide epitope, galactose-alpha-1, 3-galactose (alpha-gal). Ongoing work regarding the cause and distribution of this IgE response is reviewed.

Recent findings—Our recent work has identified a novel IgE Ab response that has been associated with two distinct forms of anaphylaxis: immediate-onset anaphylaxis during first exposure to intravenous cetuximab and delayed-onset anaphylaxis 3–6 h after ingestion of mammalian food products (e.g. beef and pork). Further studies strongly suggested that tick bites were a cause, if not the only significant cause, of IgE Ab responses to alpha-gal in the United States and internationally.

Summary—Large numbers of patients with IgE Ab to alpha-gal continue to be identified in the USA and globally. Clinicians should be aware of this IgE response as the reactions often appear to be idiopathic because of the significant delay between eating mammalian meat and the appearance of symptoms.

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Lone Star tick bites triggering red meat allergies in more people across US, physician says

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What Is The Association Between These Two Items?

Lone Star Tick **Red Meat**

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Ticks And Relationship With Meat Allergies

* Alpha Gal Syndrome: tick bites lead to allergic reactions after eating meat.
* The gut of a lone star tick, *Amblyomma americanum*, after feeding on a mammal (e.g. raccoon or mouse) becomes filled with a carbohydrate based molecule called alpha galactose.
* Alpha galactose enters the body when an infected lone star tick feeds on a human, which stimulates the immune system to produce antibodies that will ward off the molecule.
* However, if the immune system encounters alpha galactose again, then a life threatening allergic reaction may occur.

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So, What Is The Problem?

* Well, meat products, such as beef, lamb, and pork contain alpha galactose. So, anyone having been bitten by a lone star tick, and then later consuming meat, may develop an allergic reaction.
* Fish and chicken can be eaten without concern because they do not have the antigens associated with alpha galactose.

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General Guidelines To Protect Yourself Against Ticks

* Use repellents.
* Wear light colored clothing (white or yellow).
* Wear longsleeved shirts and long pants.

* Insert pant legs into socks.
* Perform tick checks regularly.

* Take a shower after coming in from the outdoors.

* Remove ticks immediately.
* Get the tick identified as soon as possible.

* Wash clothing after visiting areas that are at risk of ticks.
* Regularly mow areas to remove tick habitats.

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This Is One Of The Best Ways To Avoid Getting Bitten By Ticks ☺

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Ticks Are Not All That Bad ☺

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Ticks in Kansas. MF2653. 2025.

https//bookstore.ksre.ksu.edu/pubs/MF2653.pdf

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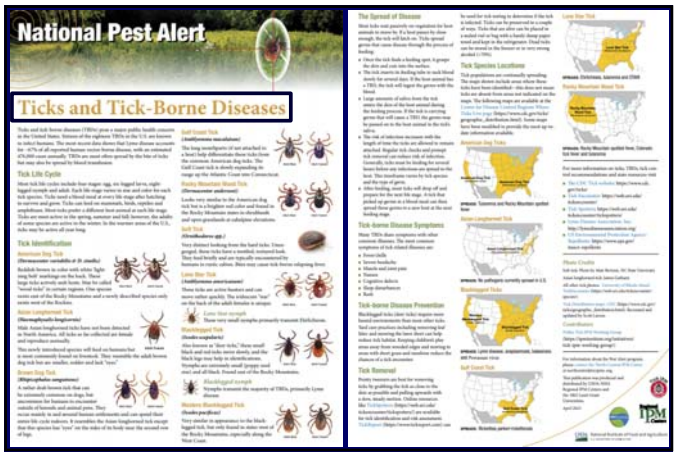

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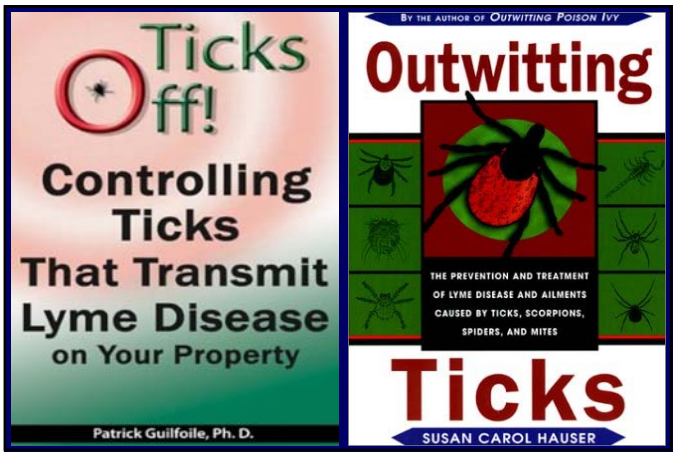

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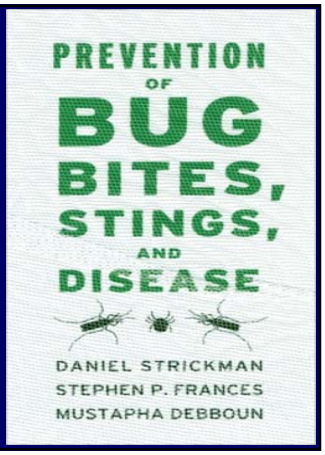

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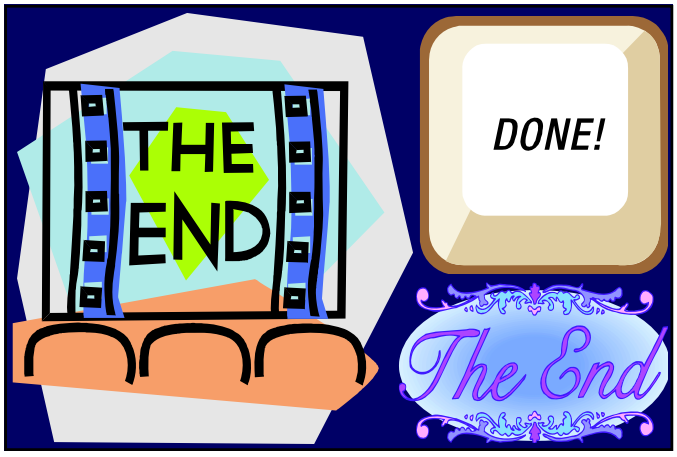

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