

Prevent and Treat Tick Bite

1. Personal Prevention –

- a. Most tick borne infections are spread by the nymph form of the tick, which hatches in early spring. Peak Lyme disease activity is in May-July, but infection can take place in fall, or even in winter if there is a thaw. Learn how to decrease ticks on your property at websites like:
http://www.tickencounter.org/prevention/protect_your_yard
<http://www.wikihow.com/Get-Rid-of-Ticks-Around-Your-Home>
<http://www.ilads.org/>
- b. Spray Permethrin (Sawyer or other brand) on your clothes (or tents, sleeping bags if camping). Permethrin is safe for humans, but it is not used on skin because its efficacy disappears quickly.
- c. BugBeWear provides permethrin treated clothes: <http://www.bugbewear.com>
Or you can get your own clothes treated with permethrin by Insect Shield
(good for 70 washings): http://www.insectshield.com/IS_Your_Own_Clothes/default.aspx
- d. Always tuck pants cuffs into socks when hiking where you might brush against grasses or other plants. Wear a hat as some species of ticks drop from trees.
- e. Spray exposed skin with an effective insect repellent – such as the ones listed here
 - i. Deet (Deep Woods Off, Ultrathon, Sawyer Family Repellent) is safe for children >2 months of age, but the American Academy of Pediatrics recommends using formulations with less than 30% deet
 - ii. Herbal (Skedaddle) contains citronella, lemongrass oil, and peppermint
 - iii. Picaridin (Sawyer product) is a newer compound that some people tolerate better on the skin, though others complain it is slightly oily.
- f. Use tick collars on your pets year round. These help but are not 100% effective. Animals are susceptible to tick-borne infections, and can bring ticks into the house. In some cases, Seresto will kill a tick in the animal's hair before it has a chance to attach.
<http://www.petparents.com/products.aspx/about/seresto?subId=howitworks>

2. Body checks – After you have been outdoors, be sure to check everywhere, especially under waistbands or in skin folds – ticks like the groin area.

- a. Shake “outside” clothes in a safe area to dislodge any ticks. Then place them in a closed laundry bag or hamper
- b. Do not leave clothes on the floor of rooms where people sleep, as ticks can climb onto beds and attach to sleeping people.
- c. Try to wash your clothes as quickly as possible when you come in from outdoors, and dry in a very hot dryer (which is often more effective at killing ticks than soap and water.)

3. Removal - If you find a tick, remove it using a needle nosed tweezers, or a tick remover such as TickEase <http://www.buytickease.com>

- a. It is a good idea to wear disposable plastic gloves when handling the tick, to avoid getting infectious agents on your hands and spreading them into little cuts, eyes, etc.
- b. Here is a video that shows the proper way to remove a tick:
<http://www.ilads.org/lyme/what-to-do-if-bit-by-tick.php>.
- c. Try to grasp the tick as close to or on the head as possible
- d. Pull out with a steady, firm pressure

- e. Place the tick into a screw-cap vial or plastic bag to send to a tick-testing lab, and/or bring to a doctor.
- f. You can treat the local site by washing with soap and water, and/or swabbing with alcohol or an antiseptic.
- g. Keep your gloves on when you wash the tweezers in soap and water, then rub them with alcohol before putting them away. Throw away the gloves and wash your hands.

4. Get immediate antibiotic treatment

- a. The treatment of tick bite is controversial. The standard recommendation is a single dose of doxycycline (in adults) or amoxicillin in children. However ILADS (International Lyme and Associated Diseases Society) recommends more prolonged treatment.
 - i. I have attached one copy of the ILADS comprehensive review article that you can show to a doctor. The paper is 41 pages long, so you may want to just show the tables and refer the health care professional to the full article.
 - ii. The review article can be reached on line as an open-access article, entitled: Evidence assessments and guideline recommendations in Lyme disease: the clinical management of known tick bites, erythema migrans rashes and persistent disease. **Expert Rev. Anti Infect. Ther.** 12(9), 1103–1135 (2014)
 - iii. The direct URL for the article is this:
<http://informahealthcare.com/action/doSearch?field1=Contrib&text1=cameron&logicalOpe1=AND&field2=Title&text2=Evidence+assessments+and+guideline+recommendations+in+Lyme+disease&logicalOpe2=AND&field3=AllField&text3=&search=Search&publication=41301576&filter=multiple&AfterYear=2014&BeforeYear=2015&sortBy=Ppub&pageSize=20>
- b. Evidence from the 1980's suggested that a tick needed to stay attached for 24 hours or longer in order to transmit *Borrelia*. Standard textbooks and "UptoDate" continue to promulgate this view. However, many reports, as well as recent animal experiment, show that the attachment time for transmission is much shorter – in the range of minutes. In addition some species of *Borrelia* (such as *Borrelia miyamotoi*) may be transmitted from the bite of the tiniest form of the tick – the larva. Larvae only attach for minutes.
- c. Cornell University estimates that more than 50% of ticks in the North East carry *Borrelia burgdorferii*
- d. Do NOT wait for an erythema migrans (Bull's eye) rash to form. Fewer than half of people who develop Lyme disease experience the rash.
- e. Unfortunately most current medical guidelines recommend a "wait and see" approach. Therefore it is important to be firm in your request for a full course of empiric ILADS-recommended treatment.
 - i. 100 – 200 mg doxycycline twice daily for 20 days. Doxy is better tolerated with food. Sun protection and the concomitant use of probiotics to prevent *C. difficile* colitis are required.
 - ii. Amoxicillin 50 mg/kg in divided doses for children.

5. Consider taking the following steps

- a. Submit the tick for testing to a tick testing lab for tick-borne infections. But understand that negative results from a lab do not provide any definite reassurance that you did not get infected with bacteria or viruses from the tick. Seriously consider starting antibiotics while waiting for results. Prompt therapy is very important. Live ticks should be sent within 2 weeks of removal

- b. Testing labs include Northern Arizona University, IGeneX, U of Massachusetts Lab of Medical Zoology, Clongen Labs, Imugen, Analytical Services, University of Michigan, University of Connecticut, Cornell University, Tic-Kit.
- c. Other infections include: Anaplasmosis, Lyme disease, Babesiosis, Bartonellosis, Tularemia, Erlichiosis, Rocky Mountain spotted fever, Borrelia miyamotoi, STARI (Southern tick associated rash illness – probably Borrelia transmitted by a different tick)
- d. But be aware that ticks also transmit Powassan and other viruses, as well as other organisms that may or may not cause harm, and are not tested for.
- e. By testing the tick, infectious agents other than Lyme might be identified.
- f. The presence of other organisms could alert your doctor to tailor your treatment to eradicate any early stealth infection.

6. What to do if you miss the tick bite but develop a bulls' eye (or atypical) rash

- a. Take a picture of the rash.
- b. Bring the ILADs guideline document to your doctor. (special attention to page 1107)
- c. Antibiotic choices include **4 – 6 weeks** of :
 - i. amoxicillin 1500-2000 mg daily,
 - ii. cefuroxime 500 mg twice daily,
 - iii. doxycycline 100 mg twice daily, OR
 - iv. azithromycin 250-500 mg daily
- d. For children the dosages are:
 - i. amoxicillin 50 mg/kg/day in 3 divided doses not to exceed 1500 mg/d
 - ii. cefuroxime 20-30 mg/kg/day in 2 doses not to exceed 1000 mg/d
 - iii. azithromycin 10 mg/kg on day 1 then 5-10 mg/kg daily
 - iv. doxycycline is alternative for children older than 8 years

What to keep in your Tick Bite Kit

- 1. Small container with
 - a. Two sided tick remover such as “Tick-ease”
<http://www.buytickease.com>
 or straight needle-nosed tweezers
 - b. magnifier
 - c. alcohol swabs
 - d. plastic zip lock bag or screw top vial
 - e. plastic or nitrile gloves
- 2. Permethrin clothing treatment
- 3. Deet or other spray and/or lotions to prevent insect bite

Permethrin spray application
for clothes, tents, sleeping bags, packs

Apply to clothes outdoors

Shake well before using.

Affix trigger pump to container for application. A test application may be made in an inconspicuous place before widespread application.

1. Select well ventilated outdoor area protected from wind and lay out the clothing to be treated (shirt, pants, socks)
2. Hold container 6-8 inches away from surface of the clothing and spray to lightly moisten the entire surface of the fabric
3. Continue spraying over entire outfit until the outer surface of the fabric is moist enough to cause a slight color change or darkening. Pay special attention to socks, pant cuffs, and shirt cuffs.
4. Turn clothing over and treat the other side as described in 1 and 2
5. Hang the clothing to dry for at least 2 hours before wearing
6. For 6 weeks protection use 6 oz per set of clothes. For 2 week protection use 3 ounces per set of clothes.

Note: Permethrin is not harmful to people if it comes in contact with skin. But it is NOT EFFECTIVE against tick bite, because it is too short acting to block the ticks.