

## **Ticks and Mosquitoes and Bedbugs, Oh My!**

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The usual disclaimer: this document should not be considered actual medical advice. Questions or concerns should be discussed with one's health care provider. I have no conflicts of interest to declare.

### **Ticks and Mosquitoes**

**Why is this an issue?** In Virginia, there are 3 species of ticks and 3 species of mosquitoes that are known to spread disease to humans. Ticks and mosquitoes are the top two insect vectors of human disease. We are human; we spend time outdoors; we wander around in tall grass (e.g. Marshall Manor); we wander around near pools of water; we smell good to bugs.

**Executive summary:** Avoid ticks and mosquitoes. Do careful tick checks. Remove ticks carefully. Remain alert for fevers, *with or without rashes*, after exposure

**Style tips for the bug-averse:** Do not spray insect repellents under clothing. Apply insect repellent to exposed skin and to clothes. Wear long sleeved shirts and long pants (yes, I know it is hot and humid). Tuck pants into socks/boots. Wear light-colored clothing (makes ticks easier to spot). Ticks start on your shoes and crawl up, but if your pants are tucked in, they have to work harder to find your skin, and they are more exposed to the permethrin (see below). Mosquitoes do not bite through clothing.

**Insect repellents:** DEET (~30%, e.g. Deep Woods Off®) is traditionally considered the best bet. It can be toxic to babies and the elderly, although recent opinion is that it is less toxic than initially thought. In its July 2015 issue, Consumer Reports (CR) tested a number of nonDEET repellents and found several to be equally effective against ticks. These are based on picaridin 20% or lemon eucalyptus 30%. In April, 2016, CR evaluated mosquito repellents and again found DEET and picaridin to be effective. CR has recommended: Sawyer Fisherman's Formula Picaridin®, Repel Lemon Eucalyptus®, Repel Scented Family®, and Natrepel 8 hour®. Some other organizations (e.g. apparently, the FDA) suggest that picaridin is less effective against ticks than it is against mosquitoes. If you are using both insect repellent and sunscreen, apply the sunscreen first.

**Insecticides:** Recommend permethrin, which is possibly somewhat less toxic than DEET, can be sprayed on clothing or purchased built in, and lasts through several washings. It is apparently not as effective a repellent, but it may kill bugs that have landed on you before they get a chance to bite.

**If you notice a tick, remove it on-site. Gentle removal!** Do not squeeze the tick. Rocky Mountain Spotted Fever and tularemia have been contracted by squishing. Do not apply Vaseline®. Do not apply gasoline, ether, or lighter fluid. Do not apply a lighted cigarette. Definitely do not apply gasoline, ether, or lighter fluid and then apply a lighted cigarette. If the tick's head remains in place, do not manipulate it.

**Afterward:** Remove clothing promptly (really, do this at home, not on-site), which facilitates a careful tick check, which can be more effective (and more fun) with help. Note especially the thigh, groin, axilla, and scalp. Launder clothing, to remove any DEET (and sweat – remember the long sleeves). Bathe within 2 hours (for esthetics if nothing else). Circle any tick bites, and follow them daily. Promptness is a virtue, but note that ticks must be attached for: 36 hours to transmit Lyme disease, 24 hours for ehrlichiosis and anaplasmosis (Rocky Mountain Spotted Fevers), and 6 hours for Rocky Mountain Spotted Fever.

### **Bedbugs:**

First: put your luggage in the bathroom

Pull back sheets, check mattresses, especially folds and seams

Check under mattress, use a flashlight

Use luggage rack

Store luggage in large, plastic trash bag (!?)

Upon return: Tumble clothes in hot drier for 30 minutes. Store luggage in a very hot or very cold garage or attic

**Final words:** Don't confuse ticks with chiggers, which are larval mites and although annoying, do not spread disease *Take seriously a fever in Virginia in the summertime even without a rash or history of tick bite!* Local transmission of Zika and dengue is not yet a problem in Virginia, but with the large number of imported cases, it is probably only a matter of time. Stay tuned. Virginian mosquitoes have already spread West Nile and chikungunya locally