

Dutchess County Department of Health Presents:

Frequently Asked Questions

About Tick-Borne Disease Prevention

I. Introduction

Q: There is already a lot of information online about ways to prevent tick-borne disease. What makes this FAQ any different?

A: In 2014, as a part of the [Community Health Improvement Plan](#) (CHIP), the Dutchess County Department of Health identified tick-borne illness as a major topic of interest for county residents. While there is a wide-variety of information available regarding tick-borne disease prevention, the CHIP Committee found a need for reliable, science-based information identifying proven tick-borne disease prevention methods. This FAQ was developed in partnership with the Cary Institute for Ecosystem Studies and is based on an extensive literature review of published scientific studies regarding various prevention methods. When scientific evidence does not exist or is not clear cut, we note this.

The goal of this FAQ is to take the scientific information found and make it understandable for a wide audience. For those individuals wanting to learn more about each topic, we have provided links to fully referenced descriptions of the science behind prevention strategies. This installment is on the subject of personal protection measures. Future installments will address property management strategies to prevent tick-borne disease.

Q: What are the most common tick-borne diseases in Dutchess County?

A: Lyme disease is by far the most frequently diagnosed tick-borne disease in Dutchess County. Anaplasmosis and babesiosis also occur commonly. Ehrlichiosis, Powassan Virus encephalitis, Rocky Mountain spotted fever, and tularemia are diagnosed infrequently.

More information about local trends and rates of tick-borne disease can be found in Dutchess County's most recent [Community Health Assessment](#); and our [Tick Bite Avoidance document](#).

Q: What can I do to decrease my risk of getting a tick-borne disease?

A: In order to reduce the risk of getting a tick-borne disease, the CDC recommends the following:

- Be especially mindful of the risk of being bitten by ticks during the warmer months of the year.
- Use repellents such as DEET on skin and permethrin on clothing.
- Avoid wooded and brushy areas where ticks prefer to live.
- Walk in the center of trails when hiking.
- Shower promptly after returning inside.
- Do frequent and thorough body checks for ticks.
- Examine gear and pets for ticks before returning indoors.
- Put clothes in the dryer on high heat for an hour to kill ticks that might be in clothing.

The questions and answers that follow look at the science behind these and other personal protection recommendations. Protection measures are grouped into the following categories: avoiding ticks, protective clothing, tick repellents, and tick checks and tick removal.

For more information on the effectiveness of prevention measures, can be found in our [Protection Measure Overview document](#).

II. Avoiding Ticks

Q: At what time of year am I most at risk for getting bitten by a tick?

A: Most cases of Lyme disease and other tick-borne diseases happen in the late spring and early summer when juvenile ticks called nymphs are active and out in high numbers. Nymphs are thought to be responsible for most cases of disease because their small size makes them difficult to find and remove quickly. June and July are the riskiest months for tick bites. Risk is lowest from December through March. Adult tick numbers peak in the spring, and again in the fall. Adult ticks survive the winter, so exposure is possible year round. The greatest care should be taken to avoid the places ticks live, and routinely do careful tick-checks, during the warmer months of the year.

More information on the seasonality and risk of tick-borne diseases can be found in our [Tick Bite Avoidance document](#). Tick-check and removal information may also be found in our [Tick Check document](#).

Q: In what places am I at greatest risk for being bitten by a tick?

A: Forests contain the highest numbers of ticks. Comparing forests, deciduous (broad leaf) forests with shrubs covering the ground contain more ticks than coniferous (evergreen) forests or wetlands. Small wooded areas, like those often found between houses in neighborhoods, tend to contain more ticks than large continuous forests. Within forests, the most ticks are found in areas with three or more inches of ground cover, and the fewest are found in areas where bare earth is visible. Nymphs are found most commonly in leaf litter or on low growing plants near ground level. Adult ticks may be found in the leaf litter or in brush or shrubs less than a three feet high.

In the northeastern United States, It is common for people to be bitten by ticks on their own property. On residential properties, the most ticks are found in wooded areas, followed by unmaintained edges between lawns and wooded areas, gardens, and lawns. Lawns next to wooded areas have more ticks than lawns that do not border wooded areas. Properties in densely populated villages present less risk for tick bites.

For more information about tick habitats, please see our [Tick Bite Avoidance document](#).

Q: What outdoor activities put me at the greatest risk for getting a tick bite?

A: Common sense dictates that activities taking place in places with the most ticks (the woods) present the biggest risk for contracting a tick-borne disease. Within wooded areas, time spent on the ground or sitting on logs presents greater risk for acquiring a tick as compared to walking.

Evidence for consistently risky activities have been difficult to document scientifically, probably due to the great variability in places used for work and play. In certain studies, hunting, clearing brush, extended periods spent gardening, attending children's sporting activities, and picnicking outside of designated areas in parks have been found to be risk factors for tick-borne disease.

More information about activities and risk of tick-borne disease, please see our [Tick Bite Avoidance document](#).

Q: Does walking in the center of the trail when hiking reduce my risk of being bitten by a tick?

A: Walking in the center of trails is a common recommendation to decrease the likelihood of being bitten by ticks. To our knowledge, no scientific studies have been done to put this recommendation to the test. Based on existing evidence, if bare ground is visible in the center of trails, then it is possible that walking in the center may be beneficial.

For more information about avoiding risk factors for tick-borne disease, please see our [Tick Bite Avoidance document](#).

III. Protective Clothing

Q: What clothes should I wear to keep ticks off of me?

A: Clothing can be used to block ticks from contacting the skin. Long pants tucked into socks and a long-sleeved shirt tucked into pants are commonly recommended. Wearing light colors is recommended to make it easier to see dark colored ticks so they can be brushed off before they have a chance to find exposed skin. Some studies have found that people consistently following these recommendations are at decreased risk for getting a tick-borne disease, but other studies have not. For more information about these studies, please see our [Clothing document](#).

Q: Does wearing long pants tucked into socks really work to prevent tick bites?

A: To our knowledge, no scientific studies have examined this question. Surveys have found that the majority of people are unwilling to tuck their pants into their socks, and, in general, many people don't wear the recommended protective clothing because they are concerned about appearance, or find it uncomfortable in warm weather. For more information about protective clothing, please see our [Clothing document](#).

Q: Does it matter what kind of shoes I wear?

A: Since ticks are usually found close to the ground, it stands to reason that wearing shoes provides important protection from ticks. There is some evidence to show that boots offer the most protection from tick bites. One study in the northeastern United States found more ticks on people when they wore sneakers as compared to when they wore hiking boots. However, a study in California (please note, differences exist between ticks in California and ticks in the northeastern United States) found no differences in the number of ticks crawling on people when they wore boots, sneakers, or sandals. For more information about these studies, please see our [Clothing document](#).

Q: Is there something I can put on my clothes to make them more protective?

A: The most effective products to repel and kill ticks on clothing contain permethrin. Permethrin is designed for use on clothing and outdoor gear, not skin. It has consistently been found to work better and last longer on clothing than repellents containing DEET that are commonly used on skin. Permethrin dip or spray applied to clothing is effective for two weeks and through several washings. Commercially made permethrin impregnated clothing available through retailers like LL Bean and Orvis stays effective through at least seventy washes. A 93% decrease in the incidence

of tick bites was seen in a study of outdoor workers wearing permethrin impregnated clothing as compared to those wearing untreated clothing.

Safety Note: Always follow repellent label directions carefully. Do NOT apply permethrin directly to the skin. Allow treated clothing to dry completely before wearing, as directed by the label on the permethrin product.

For more information about permethrin, please see our [Repellents document](#).

Q: What clothes should I treat with permethrin?

A: Treating typical summer clothing (shorts, t-shirts, sneakers and socks) with permethrin has been shown to make tick bites more than three times less likely to occur. The biggest “bang for your buck” can be obtained from wearing permethrin treated shoes and socks. Treating shoes and socks has been shown to decrease tick bites by 74%. Keep in mind, the highest degree of protection will be achieved when the least possible skin is exposed, and all outer layers of clothing contain permethrin. For more information about permethrin, please see our [Repellents document](#).

Q: What’s the best way to kill ticks that may still be alive on my clothes after I take them off?

A: The most effective way to kill ticks that may be alive and crawling on clothes or gear is to put them in an automatic dryer, set on hot, for one hour. Washing machines are not effective at killing ticks, even on hot settings, and even with detergent added. For more information, please see our [Tick Check document](#).

IV. Tick Repellents

Q: Do repellents work?

A: Like all of the protective measures suggested, repellents can help decrease tick exposure, but they do not provide 100% protection from tick bites. Some, but not all, surveys have found that people who use insect repellents run less risk of getting tick-borne diseases. Tick repellents can only be expected to work if they are used consistently (every time you are in a place where you might get a tick), if you choose a product that has been proven to do what it says it can do on the label, and if you follow the directions on the label. More information about specific repellents can be found in the remaining questions in this section and in our [Repellents document](#).

Q: What products are most effective to spray on my skin?

A: Scientific studies comparing repellents don’t provide a clear answer to the question of what repellent is most effective on skin, but they do give us a list of products likely to work well. The CDC recommends using products that contain **20-30% DEET** on exposed skin, but DEET is not the only active ingredient that is effective when applied to skin. Repellents containing the following active ingredients also have been shown to be effective in scientific studies: **IR3535, 2-Undecanone, Picaridin, and p-Menthane-3,8-diol (PMD)**.

Product formulation also affects how well a repellent works. In general, products that contain the active ingredients in higher concentrations tend to be more effective than those with active ingredients in lower concentrations. Products that are oil or polymer based tend to last longer than water or alcohol based products.

There is no way to know how well a product works if it hasn't undergone testing for safety and effectiveness. Repellents registered by the Environmental Protection Agency (EPA) have to undergo testing to show that they can do what their labels say they can do. If a product is not registered by the EPA, it has not had to meet this standard. EPA registered products will have an EPA registration number displayed on their label. Some, but not all, EPA registered products will also display a new graphic showing what insects are repelled and for how long. The EPA graphic can be viewed at: <http://www2.epa.gov/insect-repellents/repellency-awareness-graphic>

For more information on the effectiveness of repellents, please see our [Repellents document](#).

Q: I see a lot of products advertised, how do I know which one to choose?

A: For the greatest assurance that a product will be effective, we recommend you choose an EPA-registered repellent. This still leaves many products to choose from. The EPA provides a useful online tool to help consumers choose which repellent best meets their needs. It provides a searchable database of EPA registered products labeled for use on **skin**. Users can search based on what they want to repel (ticks, mosquitoes, or both), and how long they need the product to be effective. The tool produces a list of registered products that meet the search criteria, providing product name, duration of action, active ingredient, and percent active ingredient. This tool can be found at: <http://cfpub.epa.gov/oppref/insect/index.cfm#searchform>.

To learn more about the science behind the many different active ingredients and types of repellents on the market, please see our [Repellents document](#).

Q: Why are products containing DEET the most frequently recommended tick repellants?

A: DEET is the most common active ingredient in repellents on the market, and has been in use for over fifty years. Due to this long history, there is a large body of evidence supporting its effectiveness. 20% DEET is commonly used as the standard for comparison for other repellents. Products with higher DEET concentrations tend to be more effective and last longer. Some formulations, such as the product LIPODEET, are able to produce extended durations of activity with lower DEET concentrations. Over the years there have been occasional reports of DEET toxicity, but a recent review of safety data did not find a link between use of DEET and severe adverse events. With all insect repellents, it is important to follow label directions to reduce risk of potential side effects. For more information about DEET, please see our [Repellents document](#).

Q: Are there any other EPA registered repellents as effective as DEET?

A: The CDC recommends the use of products containing the active ingredients picaridin or IR3535 for people looking for an alternative to DEET. Products containing these ingredients have performed well in studies comparing them to products containing DEET. One study found IR3535 to be more repellent to blacklegged tick nymphs than a similar concentration of DEET. The active ingredient 2-undecanone has also been found to be as repellent to ticks as DEET in some laboratory studies. For more science on tick repellants, please see our [Repellents document](#).

Q: I prefer to use natural products whenever possible. Are there any natural products that are effective against ticks?

A: It is important to remember that “natural” is not necessarily the same thing as safe. Some natural ingredients may be safer to use than man-made ingredients, and may have the environmental advantage of being biodegradable. However, some natural ingredients are toxic, some are skin irritants, and some contain carcinogens. Many of the “minimum risk pesticides” that are the active ingredients in non-EPA registered repellents come from the essential oils of plants. The majority of these products have not undergone testing for effectiveness. Testing that has been completed has shown that effectiveness tends to be limited by a tendency to evaporate. This can be overcome with high concentrations, but high concentrations tend to cause skin irritation. Plant derived pesticides are an active area of scientific research. For more information on repellent alternatives, please see the “Repellent Alternatives” section of our [Repellents document](#).

In order to choose a repellent that is both safe and effective, we recommend that you choose an **EPA registered product**. EPA registered tick repellents that contain plant-derived active ingredients include oil of lemon eucalyptus, 2-undecanone (made from wild tomato plants), and p-Menthane-3,8-diol (made from leaves of the Australian lemon-scented gum tree). Other EPA registered active ingredients like permethrin and IR3535 are man-made copies of plant derived chemicals. For more information on repellents, please see our [Repellents document](#).

Q: What products work best when sprayed on clothes?

A: The most effective products to repel and kill ticks on clothing contain permethrin. Permethrin is designed for use on clothing and outdoor gear, not skin. It has consistently been found to work better and last longer on clothing than repellents containing DEET. For more information about permethrin, refer to the Protective Clothing section (Section III) of this FAQ or our [Repellents document](#) for more detailed information and references.

V. Tick Checks and Tick Removal

Q: What are the best ways to check for ticks?

A: The CDC recommends the following:

- Bathe or shower as soon as possible after outdoor activities to wash off ticks that may be crawling on you, and to more easily find ticks that have attached.
- Do a full body tick check using a mirror. Parents should help children. Look closely at the places ticks commonly attach: under the arms, in and around the ears, in the belly button, behind the knees, between the legs, around the waist, and in the hair.
- Ticks can hitch a ride into your house on pets or gear. Examine pets and gear for ticks too!
- Tumble clothing and gear in a dryer on high heat for an hour to kill remaining ticks.

More information about laundering to kill ticks can be found in the Protective Clothing section (Section III) of this FAQ, or our [Tick Check document](#).

Q: Do tick checks reduce my risk of getting a tick-borne disease?

A: Most surveys show that tick checks result in some reduction in the risk of getting a tick-borne disease. The rationale for frequent tick checks is that, in general, transmission rates of tick-borne

disease increase with duration of tick attachment. In other words, even if you are bitten by a tick carrying a disease, you are less likely to get that disease if you remove the tick in a short amount of time. More information on the risk reduction provided by frequent tick checks can be found in our [Tick Check document](#).

Q: How often should I do tick checks?

A: Tick checks should be done as soon as possible after leaving the places where ticks are most commonly found (woodlands and the borders between woods and other environments). In places like Dutchess County where ticks and tick-borne disease are very common, it's easy to come into contact with ticks without even realizing you've been in a risky environment. Especially during the warmer months of the year when most tick bites occur, it is a good idea to do a tick check at least once every 24 hours. Most people find tick checks are easier to remember if they are made part of the daily routine, for instance, each night after taking a shower.

In general, the sooner a tick is safely removed the less likely it is to transmit disease. This is because most tick-borne diseases have a "grace period," or period of tick attachment prior to disease transmission. Research has shown there is a grace period of about 36 hours for Lyme disease. Duration of grace periods is not as well defined for other agents. Research suggests that anaplasmosis and babesiosis are unlikely to be transmitted if ticks are attached less than 24 hours. In contrast, there does not appear to be any grace period prior to transmission of the Powassan virus. More information on grace periods can be found in our [Tick Check document](#).

Q: If I find an attached tick, what's the best way to remove it?

A: The CDC recommends the following:

1. "Use fine-tipped tweezers to grasp the tick as close to the skin's surface as possible.
2. Pull upward with steady, even pressure. Don't twist or jerk the tick; this can cause the mouth-parts to break off and remain in the skin. If this happens, remove the mouth-parts with tweezers. If you are unable to remove the mouth easily with clean tweezers, leave it alone and let the skin heal.
3. After removing the tick, thoroughly clean the bite area and your hands with rubbing alcohol, an iodine scrub, or soap and water.

Avoid folklore remedies such as "painting" the tick with nail polish or petroleum jelly, or using heat to make the tick detach from the skin. Your goal is to remove the tick as quickly as possible--not waiting for it to detach."

The basis for these recommendations are scientific studies showing that "passive" removal methods (techniques meant to encourage ticks to detach without pulling) don't work, and increase risk of disease transmission. Using a hot match poses the additional risk of causing burns to the skin. Scientific studies have not found one type of tool or technique (pulling straight vs twisting) for pulling out ticks to be consistently more effective than others. There is a lot of variability in terms of the species and size of tick you are attempting to remove. Fine tipped tweezers, a common item in most houses, used in the manner described above, are a reasonable choice for tick removal. For more information on tick removal methods, please see our [Tick Check document](#).

Q: After I remove an attached tick, what should I do with it?

A: Tick species identification and measurements of engorgement may provide information useful in assessing the risk of disease transmission, and deciding if prophylaxis (medication intended to prevent disease) for Lyme disease is warranted. Prophylaxis should be given within 72 hours of tick removal. If a physician thinks prophylaxis is warranted, it should not be delayed while waiting for tick testing results.

Some labs offer testing for specific disease-causing agents in ticks, but such testing is not generally considered useful because it is unlikely to alter decision making about treatment. Such tests do not indicate if the disease(s) have been transmitted to the patient. False negatives are also common with these tests, so they may in fact provide a false sense of reassurance. For more information on tick testing, please visit our [Tick Check document](#).