

## The Lyme disease vaccine <sup>[1]</sup>

Dear Alice,

I heard something recently about a new Lyme disease vaccine, and since I think Lyme disease season is coming up, can you tell me something about it?

—Tick-tock

### Answer

Dear Tick-tock,

Lyme disease <sup>[2]</sup> is a common illness; in fact, while 30,000 cases of Lyme disease in the US are reported annually to the Centers for Disease Control and Prevention (CDC), scientists estimate that there are closer to 300,000 cases annually. Lyme disease occurs when an infected tick bites a person, transmitting a strain of the *Borrelia* species bacteria to that individual. In terms of a vaccine, due to low demand and media coverage of a false link to arthritis, the previous Lyme disease vaccine, LYMERix, was taken off the market in 2002. Since 2014, there have been efforts to produce a new vaccine, including French company Valnexa's efforts since 2016. However, there's not a vaccine currently available on the market. In the meantime, people can continue to take other precautions to protect against Lyme disease during tick season (April to September in the US).

Given the lack of vaccine, prevention is the best bet for most people. According to the CDC, ticks like to hang out in habitats that have woods, shrubs, and tall grasses, especially in East Coast states ranging from Virginia to Maine, West Coast areas such as Northern California, and northern central states such as Wisconsin and Minnesota. If you plan to spend time in tick-infested areas during the high-risk season, here are some possible ways to protect yourself from these pesky bugs:

- Dress in light-colored apparel (to be able to see ticks more clearly), made of tightly woven material.
- Wear long sleeved shirts that are snug at the wrists.
- Wear long pants that are tucked into socks.
- Slip on high top, snug-fitting boots.

- Cover your head with a hat.
- Use insect repellent containing 20 percent or more DEET [3] on clothing and exposed skin. Other options include picaridin or IR3535 on exposed skin. Apply permethrin, an insecticide, on clothing.

If you live in a region that's prone to ticks, there are also several steps you might take to control the tick population around your home by taking actions such as keeping your yard free of debris and moist areas where ticks thrive. Also, try to mow the lawn frequently and clear any tall grass that could be housing ticks.

After spending time outside, examine your clothes, skin, scalp, and hair for ticks. Buddy up with a friend to check each other's difficult-to-see areas, such as the head, the back, and behind the ears. It takes approximately 36 hours for an attached deer tick to infect someone. If you spot a tick, remove it right away [4]. How? The CDC recommends using fine-pointed tweezers to securely grab onto the tick's head or mouthparts (where it's attached to the skin), and carefully detach the whole tick without breaking it apart. Next, kill the tick by putting it in an alcohol-filled container, and then throw it away. Afterwards, cleanse and disinfect your hands, tweezers, and bitten skin. Avoid using petroleum jelly, burning the tick, or using other irritants to attempt to dislodge it — all of which may increase your risk of infection. If bitten, you might want to quickly see a health care provider for possible assessment and treatment (if necessary).

If someone contracts Lyme disease, some symptoms they may experience include the erythema migrans rash [5], fatigue, swollen lymph nodes, fever, chills, and achy muscles. If it's caught before spreading throughout the body, it may be treated with prescription antibiotics such as doxycycline, amoxicillin, or cefuroxime axetil. Several studies show that most people recover when treated within a few weeks. A small percentage of people experience persistent symptoms for up to six months or longer, such as fatigue and muscle aches. This condition is known as post-treatment Lyme disease syndrome (PTLDS). Prolonged antibiotic therapy has been found to be ineffective and potentially harmful for patients with PTLDS, and ongoing research is needed to find effective treatment for PTLDS. If Lyme disease isn't addressed during the early stages, it can become disseminated Lyme disease [6]. Studies are being conducted to learn more about how to treat disseminated Lyme disease, but no effective treatments have been found as of yet.

In the meantime, while the Lyme disease vaccine is still in development, you might still cover up to avoid those pesky ticks making you sick!

Alice!

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