A MONTHLY BULLETIN

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Alpha-gal Syndrome

An unusual consequence of tick bites, an allergy to certain foods, was identified in the past few decades. While not common in Washington, cases could occur either due to exposures during travel or, rarely, to local exposures.

Tickborne Diseases

Ticks are known to carry a wide range of pathogens that can affect humans, with many of the diseases tracked as notifiable conditions in Washington. Some of these tickborne diseases are endemic to Washington state and reported every year. These include Lyme disease, relapsing fever, and tularemia. There are also rare endemic tickborne conditions such as anaplasmosis, babesiosis, spotted fevers, and tick paralysis reported less frequently.

Other infections, such as ehrlichiosis or Powassan virus and even African tick bite fever, may result from residents having exposures to ticks outside Washington. The state also maintains surveillance for ticks

Alpha-Gal Syndrome

While tickborne diseases have been well described for a long time, an entirely different condition associated with tick bites has been recognized for recently: alpha-gal syndrome is an allergy that can develop after tick bites from some species of ticks. The causative molecule is galactose-α-1,3-galactose (simplified to "alpha-gal"), an oligosaccharide. This molecule occurs in the tissues of most non-primate mammals but not in the tissues of primates including humans. The same molecule is present in the saliva of specific tick species.

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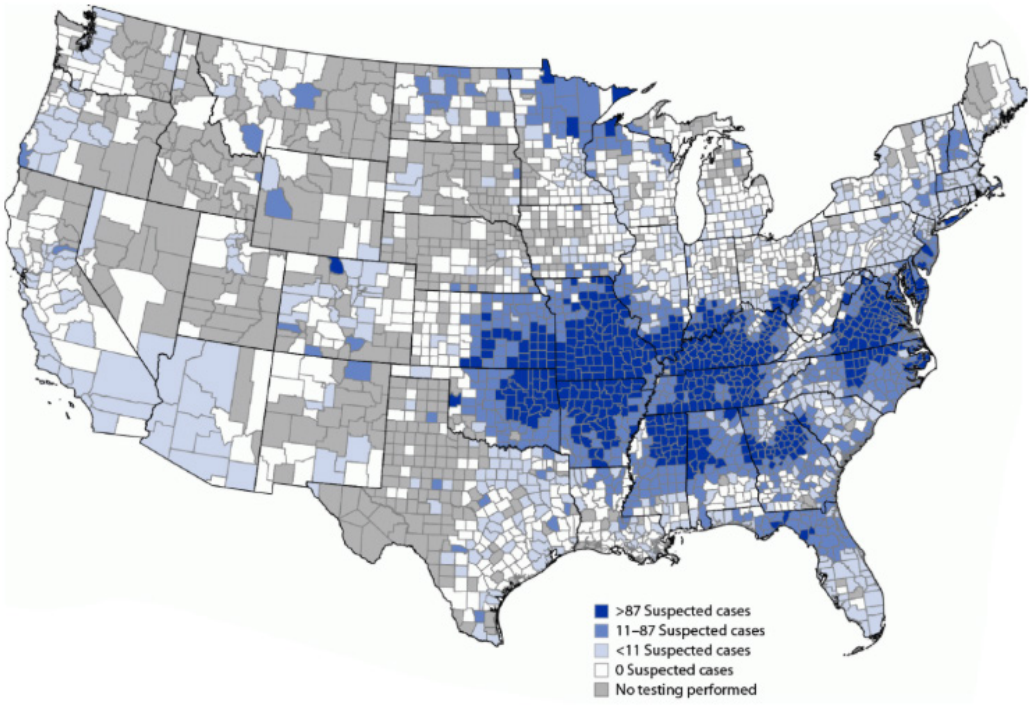
A tick bite can introduce saliva containing the oligosaccharide into a person, which activates the immune system. Subsequent exposure to alpha-gal, such as when eating red meat, results in an allergic reaction ranging from hives, mouth swelling, or indigestion to hypotension, difficulty breathing, or full anaphylaxis. A severe reaction can become life threatening, and at least one fatal case has been reported in the U.S. Unlike other food-related allergies, which tend to happen soon after exposure, the alpha-gal allergic reaction is often delayed, occurring 2 to 6 hours after a person consumes a food or product containing alpha-gal.

The Centers for Disease Control and Prevention (CDC) estimate that as many as 450,000 people in the United States may have alpha-gal syndrome. The tick most typically associated with the syndrome is the lone star tick (*Amblyomma americanum*). This tick is most commonly found in southeastern and southcentral states. Residents or travelers to the region who engage in outdoor activities are potentially at risk of a tick bite. Of note, the geographic distribution of suspected alpha-gal syndrome cases closely overlaps the range of the lone star tick (Figure 1). This tick is not known to live in Washington.

Figure 1. Geographic distribution of suspected alpha-gal syndrome cases per 1 million population per year – United States, 2017-2022



https://www.cdc.gov/mmwr/volumes/72/wr/mm7230a2.htm?s_cid=mm7230a2_w

Other ticks in the United States may be associated with the alpha-gal syndrome, which may explain cases without exposures in high risk regions. The other ticks include the blacklegged tick (*Ixodes scapularis*) and the western blacklegged tick (*Ixodes pacificus*); the latter occurs in parts of Washington and was reported to be associated with a case of alpha-gal syndrome occurring in a resident of the state (see Resources). Ticks in other parts of the world including Europe and Australia may also induce the syndrome.

Interventions

People with alpha-gal syndrome can no longer tolerate foods that contain alpha-gal; it is recommended that people diagnosed with the condition avoid consuming these products. The range of foods and other products with alpha-gal is extensive:

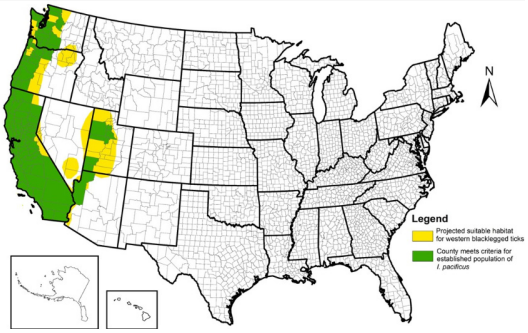
- Meats including organs: beef, pork, lamb, venison, rabbit
- Dairy: milk, milk products
- Meat or dairy derivatives sometimes causing reactions: suet, tallow, lard, glycerin, gelatin and bouillon of beef or pork origin, bovine extract, bovine or porcine heart valve used for tissue transplant
- Magnesium stearate which is produced with the saturated fat stearic acid (can be from an animal source) and used for coating medications and in various foods and pharmaceuticals

The degree of sensitivity to alpha-gal containing products varies among cases. Dairy and gelatin may be tolerated by some individuals, while others are unable to eat a wide variety of items. Sources of foods that are not of mammalian origin such as poultry, eggs, and seafood do not contain alpha-gal and should be tolerated after the development of alpha-gal syndrome. The allergic reaction may decrease over time without additional tick bites.

Food labels can indicate the presence of milk or meat-derived additives. Those who are highly sensitive to such products need to check labels carefully. Potential triggers such as gelatin or magnesium stearate may be particularly challenging to identify.

Testing for alpha-gal syndrome through IgE antibody levels is commercially available. Providers are encouraged to report cases to increase understanding of the syndrome. Of particular concern are suspected case patients without travel outside of the West Coast, which could indicate local ticks such as *Ixodes* species as an exposure risk for alpha-gal syndrome (Figure 2). Local health jurisdictions in Washington can contact the Office of Communicable Disease Epidemiology for assistance investigating suspected cases of this emerging disease.

Figure 2. Projected suitable habitat for *Ixodes pacificus* ticks and counties with established *Ixodes pacficus* populations through 2024



https://www.cdc.gov/ticks/data-research/facts-stats/western-blacklegged-tick-surveillance.html

Preventing tick bites is the only preventive measure for alpha-gal syndrome and for other tickborne diseases. When in tick habitat, such as grassy, brushy, or wooded areas, wear light colored, tightly woven clothes with long sleeves. Use an EPA-registered tick repellent to exposed skin and treat clothes and gear with permethrin. All stages of the ticks can produce sensitivity including tiny larvae. Shower soon after being outdoors to wash off unattached ticks. Perform a thorough tick-check to identify and safely remove attached ticks. After spending time in tick habitat it is also important to protect pets and to check pets and gear because they can transport ticks into a household.

Resources

Centers for Disease Control and Prevention

Overview: https://www.cdc.gov/alpha-gal-syndrome/about/index.html

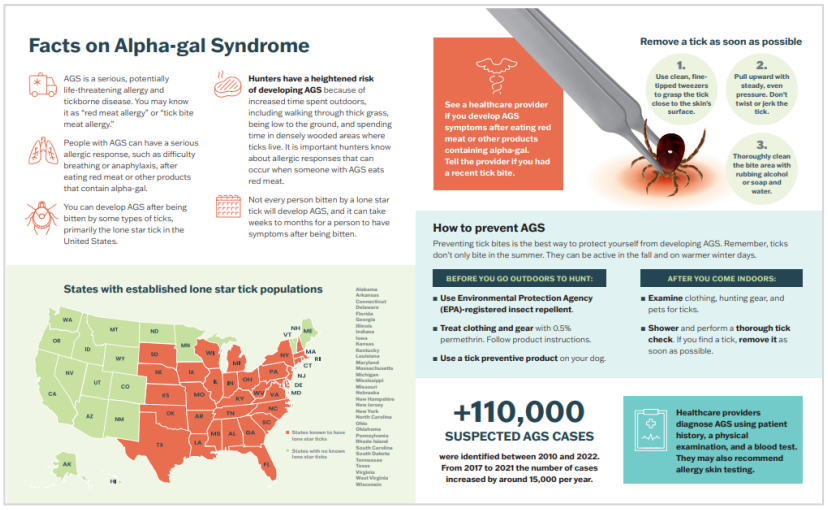
Clinical diagnosis and testing:
https://www.cdc.gov/alpha-gal-syndrome/hcp/diagnosis-testing/index.html

Communication resources:
https://www.cdc.gov/alpha-gal-syndrome/communication-resources/index.html

Geographic distribution of cases in the United States:
https://www.cdc.gov/mmwr/volumes/72/wr/mm7230a2.htm?s_cid=mm7230a2_w

Case report of alpha-gal syndrome in Washington:
https://wwwnc.cdc.gov/eid/article/31/4/24-0577_article

Department of Health resources (including diseases, educational materials, ticks found in Washington, and tick identification: https://doh.wa.gov/community-and-environment/pests/ticks



https://www.cdc.gov/alpha-gal-syndrome/media/pdfs/2025/06/alpha-gal-syndrome-brochure-hunters-p_1.pdf