# Extracted Content from https://ndc.services.cdc.gov/case-definitions/alpha-gal-syndrome-ags-2022/

Alpha-gal Syndrome (AGS) 2022 Case Definition | CDC  
Skip directly to site content  
Skip directly to search  
An official website of the United States government  
Here's how you know  
Official websites use .gov  
A .gov website belongs to an official government organization in the United States.  
Secure .gov websites use HTTPS  
A  
lock  
(  
) or  
https://  
means you've safely connected to the .gov website. Share sensitive information only on official, secure websites.  
National Notifiable Diseases Surveillance System (NNDSS)  
Explore Topics  
Search  
Search  
Clear Input  
For Everyone  
About About National Notifiable Diseases Surveillance System  
What is Case Surveillance?  
Case Surveillance Modernization  
Infectious Disease Tables  
Non-Infectious Disease Data  
Technical Resource Center  
Case Surveillance in Action  
Contact Us  
View all  
Related Topics:  
NDC Application  
View All  
search  
close search  
search  
National Notifiable Diseases Surveillance System (NNDSS)  
Menu  
Close  
search  
For Everyone  
About About National Notifiable Diseases Surveillance System  
What is Case Surveillance?  
Case Surveillance Modernization  
Infectious Disease Tables  
Non-Infectious Disease Data  
Technical Resource Center  
Case Surveillance in Action  
Contact Us  
View All  
Related Topics  
NDC Application  
View All  
National Notifiable Diseases Surveillance System (NNDSS)  
About About National Notifiable Diseases Surveillance System  
What is Case Surveillance?  
Case Surveillance Modernization  
Infectious Disease Tables  
Non-Infectious Disease Data  
Technical Resource Center  
Case Surveillance in Action  
Contact Us  
View All  
September 19, 2022  
Case Definitions  
Message Mapping Guides  
Supporting Documents for Implementation  
Event Codes & Other Surveillance Resources  
Alpha-gal Syndrome (AGS)  
2022 Case Definition  
Alpha-gal Syndrome (AGS)  
2022 Case Definition  
NOTE:  
A surveillance case definition is a set of uniform criteria used to define a disease for public health surveillance. Surveillance case definitions enable public health officials to classify and count cases consistently across reporting jurisdictions. Surveillance case definitions are not intended to be used by healthcare providers for making a clinical diagnosis or determining how to meet an individual patient’s health needs.  
CSTE Position Statement(s)  
21-ID-07  
Background  
Alpha-gal Syndrome (AGS) is a hypersensitivity reaction to galactose-α-1,3-galactose (alpha-gal), found in non-primate mammalian meat and certain derivative products.  
1-5  
Unlike typical food allergies, symptoms are often delayed by two hours or more after exposure and can arise suddenly following years of safe meat consumption.  
6–8  
Evidence suggests that the bite of some tick species induces immunoglobulin E (IgE) antibodies to alpha-gal, sensitizing patients to subsequent alpha-gal exposures.  
1,9–12  
Symptoms typically include abdominal cramping, urticaria, and anaphylaxis.  
8  
Diagnosis relies on a history of symptoms following exposure to mammalian products, and an elevated serum IgE specific to alpha-gal.  
6  
AGS has been reported worldwide  
13  
; in the United States, it is most closely associated with lone star tick (  
Amblyomma americanum  
) bites.  
10  
Research has suggested that other tick species, including  
Ixodes  
spp., may also be associated with AGS development.  
14,15  
Reports of AGS in the scientific literature have been increasing over the last decade, but the true burden of cases is unknown. Additionally, much of the country may be at risk given the expanding geographic range of lone star and other ticks.  
16  
Responding to the increased diagnosis of cases and public interest, multiple states have expressed a desire to quantify the burden of AGS. The standardization of case definition and reporting criteria is necessary in order to characterize disease burden, compare interstate disease incidence, and monitor trends in patient demographics, morbidity, mortality, and geographic distribution of risk. This will inform public health recommendations and guidance. Preventing tick bites is the main strategy for AGS intervention  
1–3  
; disease surveillance could, therefore, inform activities to strengthen occupational health protocols of suspected risk groups and public health messaging regarding tick bite prevention behaviors, with the goal of reducing tick borne disease risk.  
11,17  
Clinical Criteria  
Acute onset of any one or more of the following allergic and/or gastrointestinal symptoms that occur 2–10 hours after ingestion of pork, beef, lamb, any other mammalian meat, or any mammalian-derived product (e.g. gelatin),  
OR  
within two hours after intramuscular, intravenous, or subcutaneous administration of alpha-gal-containing vaccination or medication:  
Abdominal pain  
Nausea  
Diarrhea  
Vomiting  
Heartburn/indigestion  
Hives  
Itching  
Anaphylaxis as diagnosed by a provider  
Swelling of one or more of the following: lips, tongue, throat, face, eyelids, or other associated structures  
Shortness of breath  
Cough  
Wheezing  
Acute episode of hypotension\*  
AND  
the absence of a clear alternative diagnosis.  
\* Normal values for systolic blood pressure vary by age. Hypotension is classified by systolic blood pressure <90 mmHg for ages 11+ years; < [70 mmHg + 2 x age] for ages 1 -10 years; <70 mmHg for ages less than 1 year.  
Laboratory Criteria  
Confirmatory laboratory evidence  
:  
Serum or plasma immunoglobulin E specific to alpha-gal (sIgE) ≥ 0.1 IU/mL or ≥ 0.1 kU/L.  
Presumptive laboratory evidence:  
An allergy skin test result that is interpreted by the ordering provider as consistent with alpha-gal allergy based on sensitivity to one or more mammalian meats (e.g., pork, beef, lamb) or other mammalian-derived products.  
Note: The categorical labels used here to stratify laboratory evidence are intended to support the standardization of case classifications for public health surveillance. The categorical labels should not be used to interpret the utility or validity of any laboratory test methodology.  
Criteria to Distinguish a New Case from an Existing Case  
A case should only be counted if not previously reported to public health authorities.  
Case Classification  
Suspect  
Meets confirmatory laboratory evidence with no clinical information available.  
Probable  
Meets clinical criteria  
AND  
presumptive laboratory evidence.  
Confirmed  
Meets clinical criteria  
AND  
confirmatory laboratory evidence.  
References  
Hashizume H, Fujiyama T, Umayahara T, Kageyama R, Walls AF, Satoh T. Repeated Amblyomma testudinarium tick bites are associated with increased galactose-α-1,3-galactose carbohydrate IgE antibody levels: A retrospective cohort study in a single institution. J Am Acad Dermatol 2018;78(6):1135-1141.e3.  
Kim MS, Straesser MD, Keshavarz B, et al. IgE to galactose-α-1,3-galactose wanes over time in patients who avoid tick bites. J Allergy Clin Immunol Pract 2020;8(1):364-367.e2.  
Prose R, Breuner NE, Johnson TL, Eisen RJ, Eisen L. Contact Irritancy and Toxicity of Permethrin-Treated Clothing for Ixodes scapularis, Amblyomma americanum, and Dermacentor variabilis Ticks (Acari: Ixodidae). J Med Entomol 2018;55(5):1217–24.  
Galili U. The alpha-gal epitope and the anti-Gal antibody in xenotransplantation and in cancer immunotherapy. Immunol Cell Biol 2005;83(6):674–86.  
Hilger C, Fischer J, Wölbing F, Biedermann T. Role and Mechanism of Galactose-Alpha-1,3-Galactose in the Elicitation of Delayed Anaphylactic Reactions to Red Meat. Curr Allergy Asthma Rep 2019;19(1):3.  
Commins SP, Satinover SM, Hosen J, et al. Delayed anaphylaxis, angioedema, or urticaria after consumption of red meat in patients with IgE antibodies specific for galactose-α-1,3-galactose. Journal of Allergy and Clinical Immunology 2009;123(2):426-433.e2.  
Platts-Mills TAE, Li R, Keshavarz B, Smith AR, Wilson JM. Diagnosis and Management of Patients with the α-Gal Syndrome. The Journal of Allergy and Clinical Immunology: In Practice 2020;8(1):15-23.e1.  
Commins SP, Jerath MR, Cox K, Erickson LD, Platts-Mills T. Delayed anaphylaxis to alpha-gal, an oligosaccharide in mammalian meat. Allergology International 2016;65(1):16–20.  
Mitchell CL, Lin F-C, Vaughn M, Apperson CS, Meshnick SR, Commins SP. Association between lone star tick bites and increased alpha-gal sensitization: evidence from a prospective cohort of outdoor workers. Parasites Vectors 2020;13(1):470.  
Commins SP, James HR, Kelly LA, et al. The relevance of tick bites to the production of IgE antibodies to the mammalian oligosaccharide galactose-α-1,3-galactose. J Allergy Clin Immunol 2011;127(5):1286-1293.e6.  
Fischer J, Lupberger E, Hebsaker J, et al. Prevalence of type I sensitization to alpha-gal in forest service employees and hunters. Allergy 2017;72(10):1540–7.  
Gonzalez-Quintela A, Dam Laursen AS, Vidal C, Skaaby T, Gude F, Linneberg A. IgE antibodies to alpha-gal in the general adult population: relationship with tick bites, atopy, and cat ownership. Clin Exp Allergy 2014;44(8):1061–8.  
van Nunen S. Tick-induced allergies: mammalian meat allergy, tick anaphylaxis and their significance. Asia Pac Allergy 2015;5(1):3–16.  
Young I, Prematunge C, Pussegoda K, Corrin T, Waddell L. Tick exposures and alpha-gal syndrome: A systematic review of the evidence. Ticks and Tick-borne Diseases 2021;12(3):101674.  
Crispell G, Commins SP, Archer-Hartman SA, et al. Discovery of Alpha-Gal-Containing Antigens in North American Tick Species Believed to Induce Red Meat Allergy. Front Immunol 2019;10:1056.  
Eisen RJ, Eisen L, Beard CB. County-Scale Distribution of Ixodes scapularis and Ixodes pacificus (Acari: Ixodidae) in the Continental United States. J Med Entomol 2016;53(2):349–86.  
Bellamy P. Sanderson WT, Winter K, Stringer JW, Kussainov N, Commins SP. Prevalence of alpha-gal sensitization among Kentucky timber harvesters and forestry and wildlife practitioners. The Journal of Allergy and Clinical Immunology: In Practice. 2020; S2213-2198(20)31353-2.  
Back to Top  
Sources  
Print  
Share  
Facebook  
LinkedIn  
Twitter  
Syndicate  
Content Source:  
Case Definitions  
Message Mapping Guides  
Supporting Documents for Implementation  
Event Codes & Other Surveillance Resources  
National Notifiable Diseases Surveillance System (NNDSS)  
NNDSS receives and shares case data from state, local, and territorial health departments to help public health monitor, control, and prevent serious diseases.  
View All  
About About National Notifiable Diseases Surveillance System  
What is Case Surveillance?  
Case Surveillance Modernization  
Infectious Disease Tables  
Non-Infectious Disease Data  
Technical Resource Center  
Case Surveillance in Action  
Contact Us  
View All  
Sign up for Email Updates  
Contact CDC  
Organization  
Policies  
Web Policies  
Languages  
Languages  
Español  
Language Assistance  
Archive  
CDC Archive  
Public Health Publications  
Contact Us  
About CDC  
Organization  
Policies  
Web Policies  
Languages  
Languages  
Español  
Language Assistance  
Archive  
CDC Archive  
Public Health Publications  
HHS.gov  
USA.gov