MAYO CLINIC LABORATORIES

Test Definition: DOGPF

Dog Dander, IgE, with Reflex to Dog Dander Components, IgE, Serum

Overview

Useful For

Evaluating patients with suspected dog dander allergy

Reflex Tests

Test Id	Reporting Name	Available Separately	Always Performed
DOGPR	Dog Dander Components, IgE, S	No	No

Testing Algorithm

Testing begins with analysis of dog dander IgE. If dog dander IgE is negative (<0.10 kU/L), testing is complete.

If dog dander IgE is 0.10 kU/L or more, then 6 dog dander components (Can f 1, Can f 2, Can f 3, Can f 4, Can f 5, Can f 6) are performed at an additional charge.

Special Instructions

- Allergens - Immunoglobulin E (IgE) Antibodies

Highlights

The determination of the relative amount of IgE antibody to total dog dander and IgE antibodies to specific dog dander components, may aid in assessment of the potential strength and type of allergenic response to dog dander.

IgE antibody to total dog dander extract will initially be tested.

If detectable total specific dog dander IgE antibody is present, additional component dog dander allergen antibody testing will be performed. This is comprised of testing for IgE antibodies to the potential allergens Can f 1, Can f 2, Can f 3, Can f 4, Can f 5, and Can f 6.

Method Name

Fluorescent Enzyme Immunoassay (FEIA)

NY State Available

Yes

Specimen

Specimen Type

Serum

Ordering Guidance

For a listing of allergens available for testing, see Allergens - Immunoglobulin E (IgE) Antibodies

Specimen Required

Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 1 mL
Collection Instructions: Centrifuge and aliquot serum into a plastic vial.

Forms

If not ordering electronically, complete, print, and send an Allergen Test Request (T236) with the specimen.

Specimen Minimum Volume

0.7 mL

Reject Due To

Gross hemolysis	OK
Gross lipemia	OK
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	14 days	
	Frozen	90 days	

Clinical & Interpretive

Clinical Information

Dog (canine) dander allergy is one of the most common epidermal allergies in the United States, with an estimated prevalence of sensitization of approximately 10%. Overall, allergies to dogs and cats may afflict up to 20% of the world's population, and the prevalence appears to be increasing over time. The assessment of dog allergen-related sensitivity and allergy is dependent upon the presence of compatible clinical symptoms in the context of exposure, with support from identification of potential canine-specific IgE allergen antibodies either by skin testing or in vitro serology testing.

There is a correlation between elevated total dog (canine) IgE allergen antibodies and an increased likelihood of a clinical allergic response. Once an elevated antibody response to total dog dander IgE extract is established, assessment for the presence of specific IgE antibodies to the most common dog allergenic components will be performed, which can yield

additional, potentially useful information for clinical assessment of dog allergy and sensitization. During dog component allergen IgE antibody testing, the presence of IgE antibodies specific for potentially allergenic individual proteins, namely Can f 1, Can f 2, Can f 3, Can f 4, Can f 5, and Can f 6, are individually assessed. The determination of the relative amount of IgE antibody to specific dog components can aid in assessment of the potential strength and type of allergenic response. However, the correlation between total serum IgE testing and skin testing is not ideal, with estimates of 52% concordance. In vitro testing has generally focused on assessing for the presence of total IgE serum antibodies to total dog allergen extracts and has overall estimated sensitivities of 75% in symptomatic individuals.

Canis familiaris allergen 1 (Can f 1) is a major allergen and is a salivary lipocalin protein found in all homes with dogs. Particles containing Can f 1 can remain airborne and can be inhaled. Several studies have demonstrated that approximately half of the individuals with dog allergies have IgE antibodies directed exclusively to the Can f 1 component. Increasing IgE antibody concentrations against lipocalins, such as Can f 1, correlates with the severity of asthma. Sensitization to Can f 1 in childhood was significantly associated with symptoms to dog allergy at age 16 years, and high levels of antibodies to Can f 1 were strongly associated with asthma in a population-based study of 19 year olds. Can f 1 is the most dominant dog allergen, although only 64% of individuals who are allergic to dogs react to Can f 1. While Can f 1 can be reliably used to identify dog-allergic individuals who sensitized to Can f 1, sensitivity for detecting potential dog allergy (and allergen sensitization) increases if multiple allergen components are assayed.

Can f 2 is a salivary lipocalin protein and an allergen present in dog hair and dander. Sensitivity to Can f 2 is associated with high levels of bronchial inflammation and is more common among patients with severe asthma. It is believed that sensitized patients with reactivity to Can f 2 will always react to Can f 1.

Can f 3 is a serum albumin allergen found in dog dander, hair, epithelia, saliva, and in house dust and is considered an intermediate dog allergy component. Sensitization to Can f 3 is associated with increased risks of current asthma, current allergic rhinitis, and concomitant asthma and allergic rhinitis.(1) There is observed cross-reactivity of Can f 3 patient IgE antibodies with albumins from many species, including the cat allergen Fel d 2, which may cause sensitization.

Can f 4 is the most abundantly detected allergen in dog fur and a major allergen component of dog hair and dander extracts. Sensitization to the lipocalin Can f 4 is associated with asthma and serves as a marker for clinically relevant dog allergy. Assessment of antibodies to Can f 4, in combination with other dog allergens, may improve the reliability of dog allergy assessment.

Can f 5 is a prostatic kallikrein component of dog hair and dander produced by intact (unneutered) male dogs. Approximately two-thirds of individuals who are allergic to canines demonstrate IgE reactivity to Can f 5. Additionally, a substantial proportion of those individuals are monosensitized to Can f 5 and react specifically to intact male dogs rather than female dogs or castrated male dogs. Sensitization to Can f 5 is associated with asthma and rhinoconjunctivitis symptoms and can contribute to polysensitization in individuals with IgE responses to multiple animal allergen molecules. Due to cross-reactivity with prostate-specific antigen of human seminal plasma, sensitization to Can f 5 may also contribute to the occurrence of human sexual disorders, including infertility.

Can f 6 is a major dog allergen present in dog dander. Sensitization to Can f 6 is associated with dog-related rhinitis and asthma. Can f 6 shares extensive cross-reactivity with other mammalian lipocalins, particularly cat and horse, and thus contributes to multi-animal allergic sensitization and potential resulting clinical respiratory symptoms.

Polysensitization to multiple allergens should be considered during the evaluation of dog component assay results. In a study of 75 patients with clinical allergy, the majority exhibited IgE antibodies reactive with Can f 1 and Can f 2. Asthma and decreased lung function were most strongly associated with sensitization to a group of 27 components, including Can f 1, Can f 2, and Can f 3. Polysensitization to 3 or more allergen molecules from dogs was a better predictor of dog allergy-related symptoms than results of IgE antibody tests utilizing total dog allergen extracts. Most dog-sensitized children are reactive to more than one dog allergen component, with co-sensitization to Can f 5 and Can f 1/Can f 2 conferring higher asthma risks. Reducing canine exposure should be considered if co-reactivity to these components is present.

Table. Specific Dog Allergens

Allergen	Most common reaction type	Selected potential cross-reactivity with other allergens
Can f1 (lipocalin)	One of the major dog component allergens. For individuals with clinical allergy symptoms to dogs, approximately half show antibody reactivity to Can f 1. Increased severity of asthma symptoms	Some cross-reactivity with cat component Fel d7, which is a lipocalin
Can f2 (lipocalin)	Bronchial inflammation -Sensitivity to Can f 2 is associated with high levels of bronchial inflammation and is more common among patients with severe asthma. -Sensitized patients with reactivity to Can f 2 will also react to Can f 1.(2,3)	Can f 1, limited cross-reactivity with Fel d 4
Can f3 (serum albumin)	Sensitization to Can f 3 is associated with increased risks of asthma and allergic rhinitis. Serum albumins are a minor allergen in animal dander but can play a significant role as cross-reacting allergens.	Antibodies against this component may indicate cross-reactivity associated with albumins from humans, pigs, cattle, cats (Fel d2), sheep, horses, mice, and rats.
Can f4 (lipocalin)	Asthma -Sensitization to lipocalins such as Can f 4 are	Minor cross-reactivity with Can f1, Can f2, Equ c1, Fel d4

	associated with asthma -Can f 4 is considered a major allergen component of dog dander	
Can f5 (kallikrein)	Asthma, rhinoconjunctivitis symptoms -In the absence of other component sensitization, there may be reduced/absent allergic symptoms in the presence of female or neutered male dogs.	Same protein family as cows, horses, rats, rabbits, mice, and guinea pigs. There is no observed cross-reactivity between Can f 5 and Can f 1, Can f 2, or Can f 3 (1). Can f 5 cross-reacts with prostate-specific antigen (PSA) of human seminal plasma
Can f6 (lipocalin)	Dog-related rhinitis and asthma	Can f 6 lipocalin sensitized individuals may also react to horse and cat lipocalins. This can be responsible for co-sensitization among these animals.

Reference Values

Class	IgE kU/L	Interpretation
0	<0.10	Negative
0/1	0.10-0.34	Borderline/equivocal
1	0.35-0.69	Equivocal
2	0.70-3.49	Positive
3	3.50-17.4	Positive
4	17.5-49.9	Strongly positive
5	50.0-99.9	Strongly positive
6	> or =100	Strongly positive

Concentrations of 0.70 kU/L or more (class 2 and above) will flag as abnormally high.
Reference values apply to all ages.

Interpretation

When detectable total dog dander IgE antibody is present (> or =0.10 IgE kUa/L), additional specific component IgE antibody testing will be performed. If at least one potential specific allergenic dog dander component IgE is detectable (> or =0.10 IgE kUa/L), an interpretative report will be provided.

When the sample is negative for total dog dander IgE antibody (<0.10 IgE kUa/L), additional testing for specific dog component IgE antibodies will not be performed. Negative IgE results for total dog dander antibody may indicate a lack of sensitization to potential dog allergenic components.

Cautions

Clinical correlation of results from in vitro IgE testing with patient history of allergic or anaphylactic responses to dogs is

recommended.
-Negative results for IgE to total dog dander and any dog allergenic components do not completely exclude the possibility of clinically relevant allergic responses upon exposure to dog dander.
-Positive results for IgE to total dog dander or any potential dog allergenic components are not diagnostic for dog allergy and only indicate patient may be sensitized to dog dander or a cross-reactive allergen.

Testing for IgE antibodies may not be useful in patients previously treated with immunotherapy to determine if residual clinical sensitivity exists or in patients whose medical management does not depend upon the identification of allergen specificity.

False-positive results for IgE antibodies may occur in patients with markedly elevated serum IgE (>2500 kU/L) due to nonspecific binding to allergen solid phases.

Clinical Reference

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Performance

Method Description

Specific IgE from the patient's serum reacts with the allergen of interest, covalently coupled to an ImmunoCAP. After washing away nonspecific IgE, enzyme-labeled anti-IgE antibody is added to form a complex. After incubation, unbound anti-IgE is washed away, and the bound complex incubated with a developing agent. After stopping the reaction, the fluorescence of the eluate is measured. Fluorescence is proportional to the amount of specific IgE present in the patient's sample (ie, the higher the fluorescence value, the more IgE antibody is present).(Package insert: ImmunoCAP System Specific IgE FEIA. Phadia AB; Rev 06/2020)

PDF Report

No

Day(s) Performed

Monday through Friday

Report Available

Same day/1 to 3 days

Specimen Retention Time

14 days

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Superior Drive

Fees & Codes

Fees

- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

Test Classification

This test has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

Test Definition: DOGPF

Dog Dander, IgE, with Reflex to Dog Dander Components, IgE, Serum

CPT Code Information

86003

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
DOGPF	Dog Dander Component Reflex, S	6098-8

Result ID	Test Result Name	Result LOINC® Value
DOGD1	Dog Dander, IgE, S	6098-8