

Test Summary

Peanut Component Panel

Peanut Component Testing

Please submit 0.1 mL refrigerated serum for each allergen and an additional 1.0 mL refrigerated serum if an IgE Serum is part of the panel.

Test Name	Test Code	CPT* Codes	Components
Peanut Component Panel	91681	86008x5	Ara h 2 (f423), Ara h 1 (f422), Ara h 3 (f424), Ara h 9 (f427), and Ara h 8 (f352)
Peanut, Total w/reflex to Peanut Component Panel	91747	Screen: 86003 Reflex: 86008x5	Peanut (f13); If Peanut (f13) IgE is ≥ 0.10 kU/L, Peanut Component Panel [Ara h 2 (f423), Ara h 1 (f422), Ara h 3 (f424), Ara h 9 (f427), and Ara h 8 (f352)] will be performed at an additional charge.

Clinical Use

- Assess risk of severe allergic reaction vs mild or localized reaction to peanut exposure

Clinical Background

The prevalence of peanut allergy in North American school-aged children is approximately 1%.¹ This allergy is often a lifelong condition,² and is the most common food-related cause of fatal allergic reactions in Western countries.³ Peanut allergy is typically diagnosed based on clinical history and peanut sensitization (ie, IgE antibody response to peanut extract during blood or skin prick testing). Sensitization, however, does not correlate with allergic symptoms in a large percentage of patients,^{4,5} and as many as 77% of peanut sensitized patients may not be at risk for a systemic reaction.⁶ This may be because most tests are based on crude natural peanut extracts that contain allergenic and non-allergenic components, and some of these components may crossreact with pollen or other allergens.

Over 13 allergenic components have been identified in peanuts.⁷ Of these, Ara h 1, 2, 3, 6, 8, and 9 are considered the most important markers of peanut sensitization and are predictive of an allergic response. Ara h 1, 2, and 3 are seed storage proteins, and sensitization to them is associated with a high risk of a systemic allergic reaction: 87% of the children with IgE reactivity have allergic symptoms, including anaphylaxis.⁸ Ara h 2 is a more important predictor of clinical peanut allergy than Ara h 1 and 3, and is the one most often associated with severe reactions.⁶ Ara h 6 sensitization is associated with IgE antibodies that crossreact with Ara h 2⁹;

rarely does sensitization to Ara h 6 occur in the absence of sensitization to Ara h 2.¹⁰

Ara h 8 is a pathogenesis-related (PR)-10 protein, and sensitization to it is associated with a low risk of systemic reaction and a moderate risk of mild, localized symptoms (ie, oral allergy syndrome). In a study of 144 children with IgE antibodies to Ara h 8 (but not Ara h 1-3), 89% were either peanut consumers or did not react to an oral food challenge with peanuts, while 9.7% of the children had mild oral cavity symptoms and 1 child developed mild gastrointestinal symptoms.¹¹ Ara h 8 crossreacts with pollens (eg, Birch and Birch-related tree pollen); Mittag et al showed that 20 patients with Birch pollen allergy and IgE antibodies to Ara h 8 exhibited oral allergy syndrome when exposed to peanut.¹²

Ara h 9 is a lipid transfer protein, and sensitization to it can result in systemic reactions, including anaphylaxis; 38% (6/16) of subjects sensitized to Ara h 9 were found to have severe symptoms after peanut exposure.⁹ People sensitized to Ara h 9 are often also sensitized to Ara h 1-3.¹³ Ara h 9 is not specific to peanut; it crossreacts with fruits with pits (eg, peaches).¹⁴

The Peanut Component Panel tests for IgE antibodies to peanut allergens Ara h 1, 2, 3, 8, and 9. Identifying sensitization to peanut component allergens can assist in assessing a patient's risk for a severe systemic reaction.

Individuals Suitable for Testing

- Individuals with a history of peanut sensitivity or with documented sensitization by blood or pin prick testing

Method

- Fluorescent enzyme immunoassay (FEIA) measurement of IgE antibodies to Ara h 1 (f422), Ara h 2 (f423), Ara h 3 (f424), Ara h 8 (f352), and Ara h 9 (f427)
- Analytical sensitivity: <0.1 kU/L

Reference Range

Ara h 1 (f422): <0.10 kU/L
Ara h 2 (f423): <0.10 kU/L
Ara h 3 (f424): <0.10 kU/L
Ara h 8 (f352): <0.10 kU/L
Ara h 9 (f427): <0.10 kU/L

Interpretive Information

Reactivity to Ara h 1, 2, or 3 is associated with a high risk for systemic reaction, including anaphylaxis. Reactivity to Ara h 9 is associated with a variable risk for systemic reaction, including anaphylaxis. Patients who exhibit reactivity to Ara h 1, 2, 3, and/or 9 should be counseled to avoid peanuts, foods that contain peanut products, and foods that have been processed in plants that also process peanuts.

Reactivity to Ara h 8 and nonreactivity to Ara h 1, 2, 3, and 9 indicates a low risk of a systemic allergic reaction. Patients with only Ara h 8 sensitization may consider taking an oral food challenge test, and, if negative, they may not have to avoid peanuts or peanut-containing foods.¹⁵

As with all diagnostic testing, results should be interpreted in light of a patient's history, physical examination, and results of other diagnostic testing.

References

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