Test Definition: RPR9

Respiratory Profile, Region 9, Great Plains (KS, ND, NE, SD), Serum

Overview

Useful For

Assessing sensitization to various inhalant allergens commonly found in the Great Plains region including Kansas, North Dakota, Nebraska, and South Dakota

Defining the allergen responsible for eliciting signs and symptoms

Identifying allergens:
-Responsible for allergic response or anaphylactic episode
-To confirm sensitization prior to beginning immunotherapy
-To investigate the specificity of allergic reactions to insect venom allergens, drugs, or chemical allergens

This test is **not useful for** patients previously treated with immunotherapy to determine if residual clinical sensitivity exists or in whom the medical management does not depend upon identification of allergen specificity.

Profile Information

Test Id	Reporting Name	Available Separately	Always Performed
IGE	Immunoglobulin E (IgE), S	Yes	Yes
DP	House Dust Mites/D.P., IgE	Yes	Yes
DF	House Dust Mites/D.F., IgE	Yes	Yes
CAT	Cat Epithelium, IgE	Yes	Yes
DOGD	Dog Dander, IgE	Yes	Yes
BERG	Bermuda Grass, IgE	Yes	Yes
TIMG	Timothy Grass, IgE	Yes	Yes
COCR	Cockroach, IgE	Yes	Yes
PENL	Penicillium, IgE	Yes	Yes
CLAD	Cladosporium, IgE	Yes	Yes
ASP	Aspergillus Fumigatus, IgE	Yes	Yes
ALTN	Alternaria Tenuis, IgE	Yes	Yes
BXMPL	Box Eld/Maple, S, IgE	Yes	Yes
CED	Mountain Cedar, IgE	Yes	Yes
OAK	Oak, IgE	Yes	Yes
ELM	Elm, IgE	Yes	Yes
CTWD	Cottonwood, IgE	Yes	Yes
ASHW	White Ash, IgE	Yes	Yes
MULB	Mulberry, IgE	Yes	Yes
SRW	Short Ragweed, IgE	Yes	Yes
RUSS	Russian Thistle, IgE	Yes	Yes
SORR	Red Sorrel, IgE	Yes	Yes

NETT	Nettle, IgE	Yes	Yes

Special Instructions

- Allergens - Immunoglobulin E (IgE) Antibodies

Method Name

Fluorescence 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

Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 1.6 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

1.4 mL

Reject Due To

Gross hemolysis	OK
Gross lipemia	OK

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information

Immunoglobulin E (IgE) is one of the 5 immunoglobulin classes and is defined by the presence of the epsilon heavy chain. It is the most recently described immunoglobulin, having first been identified in 1966. IgE exists as a monomer and is present in blood circulation at very low concentrations, approximately 300-fold lower than that of IgG. The physiologic role of IgE is not well characterized, although it is thought to be involved in defense against parasites, specifically helminths.

The function of IgE is distinct from other immunoglobulins in that it induces activation of mast cells and basophils through the cell-surface receptor Fc epsilon RI. Fc epsilon RI is a high-affinity receptor specific for IgE present at a high density on tissue-resident mast cells and basophils. Because of this high-affinity interaction, almost all IgE produced by B cells is bound to mast cells or basophils, which explains the low concentration present in circulation. Cross-linking of the Fc epsilon RI-bound IgE leads to cellular activation, resulting in immediate release of preformed granular components (histamine and tryptase) and subsequent production of lipid mediators (prostaglandins and leukotrienes) and cytokines (interleukin-4 and interleukin-5).

Elevated concentrations of IgE may occur in the context of allergic disease. However, increases in the amount of circulating IgE can also be found in various other diseases, including primary immunodeficiencies, infections, inflammatory diseases, and malignancies. Total IgE measurements have limited utility for diagnostic evaluation of patients with suspected allergic disease. In this scenario, testing for the presence of allergen-specific IgE may provide more information.

Clinical manifestations of allergic disease result from activation of mast cells and basophils, which occurs when Fc epsilon RI-bound IgE antibodies interact with allergen.

In vitro serum testing for specific IgE antibodies may provide an indication of the immune response to an allergen that may be associated with allergic disease.

The allergens chosen for testing often depend upon the age of the patient, history of allergen exposure, season of the year, and clinical manifestations. Sensitization to inhalant allergens (dust mites, mold, and pollen inhalants) primarily occurs in older children, adolescents, and adults and usually manifests as respiratory disease (rhinitis and asthma).

Reference Values

Specific IgE:

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.

Total IgE:

Age	Reference interval (in kU/L)
0-5 months	< or =13
6-11 months	< or =34
1 and 2 years	< or =97
3 years	< or =199
4-6 years	< or =307
7 and 8 years	< or =403
9-12 years	< or =696
13-15 years	< or =629
16 and 17 years	< or =537
18 years and older	< or =214

Interpretation

Elevated concentrations of total IgE may be found in a variety of clinical diseases, including allergic disease, certain primary immunodeficiencies, infections, inflammatory diseases, and malignancies.

Detection of allergen-specific IgE antibodies in serum (class 1 or greater) indicates an increased likelihood of allergic disease as opposed to other etiologies and defines allergens that may be responsible for eliciting signs and symptoms.

Cautions

An elevated concentration of total IgE is not diagnostic for allergic disease, and it must be interpreted in the clinical context of the patient, including age, sex, travel history, potential allergen exposure, and family history.

A normal concentration of total IgE does not eliminate the possibility of allergic disease. In patients with a high index of suspicion for allergic disease, testing for allergen-specific IgE may be warranted.

Some individuals with clinically insignificant sensitivity to allergens may have measurable levels of IgE antibodies in serum, and test results must be interpreted in the clinical context.

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

1. Homburger HA, Hamilton RG: Allergic diseases. In: McPherson RA, Pincus MR, eds. Henry's Clinical Diagnosis and Management by Laboratory Methods. 23rd ed. Elsevier; 2017:1057-1070
2. Bernstein IL, Li JT, Bernstein DI, et al. Allergy diagnostic testing: an updated practice parameter. Annals Allergy Asthma and Immunol 2008; 100:S1-S148

Performance

Method Description

Specific IgE:
Specific IgE from the patient's serum reacts with the allergen of interest, which is 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; Rev 06/2020)

Total IgE:
Anti-IgE, covalently coupled to ImmunoCAP, reacts with the IgE in a serum specimen. After washing, enzyme-labeled anti-IgE antibodies are added to form a complex. After incubation, unbound enzyme-labeled anti-IgE is washed away, and the bound complex incubated with a developing agent. After stopping the reaction, fluorescence of the eluate in the well is measured. The fluorescence is directly proportional to the concentration of IgE in the test specimen.(Package insert: Phadia CAP System IgE FEIA. Phadia; Rev 10/2019)

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

Test Definition: RPR9

Respiratory Profile, Region 9, Great Plains (KS, ND, NE, SD), Serum

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.

CPT Code Information

82785-IgE
86003 x 22-Each individual allergen

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
RPR9	Resp Profile, Reg 9, Great Plains	94593-1

Result ID	Test Result Name	Result LOINC® Value
ALTN	Alternaria Tenuis, IgE	6020-2
ASHW	White Ash, IgE	6278-6
ASP	Aspergillus Fumigatus, IgE	6025-1
BERG	Bermuda Grass, IgE	6041-8
BXMPL	Box Eld/Maple, S, IgE	7155-5
CAT	Cat Epithelium, IgE	6833-8
CED	Mountain Cedar, IgE	6178-8
CLAD	Cladosporium, IgE	53760-5
COCR	Cockroach, IgE	6078-0
CTWD	Cottonwood, IgE	6090-5
DF	House Dust Mites/D.F., IgE	6095-4
DOGD	Dog Dander, IgE	6098-8
DP	House Dust Mites/D.P., IgE	6096-2
ELM	Elm, IgE	6109-3
IGE	Immunoglobulin E (IgE), S	19113-0
MULB	Mulberry, IgE	6281-0
NETT	Nettle, IgE	6186-1
OAK	Oak, IgE	6189-5
PENL	Penicillium, IgE	6212-5
RUSS	Russian Thistle, IgE	6234-9
SORR	Red Sorrel, IgE	6244-8
SRW	Short Ragweed, IgE	6085-5
TIMG	Timothy Grass, IgE	6265-3