

## Overview

### Useful For

Assessing sensitization to various inhalant allergens commonly found in Alaska

Defining the allergen responsible for eliciting signs and symptoms

Identifying allergens:

- Responsible for allergic disease and/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

### Special Instructions

- [Allergens - Immunoglobulin E \(IgE\) Antibodies](#)

### 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              |
| 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              |
| ALDR    | Grey Alder, IgE            | Yes                  | Yes              |
| BIR     | Silver Birch, IgE          | Yes                  | Yes              |
| CTWD    | Cottonwood, IgE            | Yes                  | Yes              |
| MUG     | Mugwort, IgE               | Yes                  | Yes              |
| SORR    | Red Sorrel, IgE            | Yes                  | Yes              |

### 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](#) in Special Instructions**Specimen Required****Container/Tube:****Preferred:** Red top**Acceptable:** Serum gel**Specimen Volume:** 1.3 mL**Forms**[If not ordering electronically, complete, print, and send an Allergen Test Request \(T236\)](#) with the specimen.**Reject Due To**

Gross hemolysis OK

Gross lipemia OK

**Specimen Minimum Volume**

1.1 mL

**Specimen Stability Information**

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

**Clinical & Interpretive**

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**Clinical Information**

Immunoglobulin E (IgE) is one of the 5 classes of immunoglobulins, 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 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 helminthes.

The function of IgE is also 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 IgEs 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 mite, 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     | <0.35    | Negative       |

|   |           |                   |
|---|-----------|-------------------|
| 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 |

Reference values apply to all ages.

**Total IgE:**

| Results Reported in kU/L |                    |
|--------------------------|--------------------|
| Age                      | Reference interval |
| 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 the allergens that may be responsible for eliciting signs and symptoms.

**Cautions**

An elevated concentration of total IgE is not diagnostic for allergic disease, and must be interpreted in the clinical context of the patient, including age, gender, 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 IgEs may be warranted.

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Testing for allergen-specific IgE antibodies is not useful in patients previously treated with immunotherapy to determine if residual clinical sensitivity exists, or in patients in whom the medical management does not depend upon identification of allergen specificity.

Some individuals with clinically insignificant sensitivity to allergens may have measurable levels of IgE antibodies in serum, and 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: Chapter 55: Allergic diseases. In Henry's Clinical Diagnosis and Management by Laboratory Methods. 23rd edition. Edited by RA McPherson, MR Pincus. Elsevier, 2017, pp 1057-1070
2. Bernstein IL, Li JT, Bernstein DI, et al: Allergy diagnostic testing: An updated practice parameter. Ann Allergy Asthma Immunol 2008 Mar;100(3 Suppl 3):S1-148

### 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 is then 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, Uppsala, Sweden Rev 06/2019)

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 is 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. Issued August 2000, revised June 2010)

**PDF Report**

No

**Specimen Retention Time**

14 days

**Performing Laboratory Location**

Rochester

**Fees & Codes**

**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 15-Each individual allergen

**LOINC® Information**

| Test ID | Test Order Name              | Order LOINC Value |
|---------|------------------------------|-------------------|
| RPR18   | Resp Profile, Reg 18, Alaska | 51991-8           |

| Result ID | Reporting Name             | LOINC®  |
|-----------|----------------------------|---------|
| ALDR      | Grey Alder, IgE            | 15284-3 |
| ALTN      | Alternaria Tenuis, IgE     | 6020-2  |
| ASP       | Aspergillus Fumigatus, IgE | 6025-1  |
| BIR       | Silver Birch, IgE          | 15283-5 |
| CAT       | Cat Epithelium, IgE        | 6833-8  |
| 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  |
| IGE       | Immunoglobulin E (IgE), S  | 19113-0 |

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|      |                    |        |
|------|--------------------|--------|
| MUG  | Mugwort, IgE       | 6183-8 |
| PENL | Penicillium, IgE   | 6212-5 |
| SORR | Red Sorrel, IgE    | 6244-8 |
| TIMG | Timothy Grass, IgE | 6265-3 |