

## Overview

### Useful For

Evaluation of patients with suspected sarcoidosis

### Method Name

Spectrophotometry (SP)

### NY State Available

Yes

## Specimen

### Specimen Type

Serum

### Necessary Information

The use of angiotensin converting enzyme (ACE)-inhibiting antihypertensive drugs will cause decreased ACE values. Patients taking ACE inhibitors, such as captopril and enalapril, will have extremely low or unmeasurable ACE activity. Indicate on the request form if the patient is on ACE inhibitors.

### Specimen Required

#### Collection Container/Tube:

**Preferred:** Serum gel

**Acceptable:** Red top

**Submission Container/Tube:** Plastic vial

**Specimen Volume:** 0.5 mL

**Collection Instructions:** Centrifuge and aliquot serum into a plastic vial

### Forms

If not ordering electronically, complete, print, and send 1 of the following forms with the specimen:

-[General Request](#) (T239)

-[Cardiovascular Test Request](#) (T724)

### Specimen Minimum Volume

0.5 mL

### Reject Due To

|                 |        |
|-----------------|--------|
| Gross hemolysis | Reject |
| Gross lipemia   | Reject |

|               |        |
|---------------|--------|
| Gross icterus | Reject |
|---------------|--------|

## Specimen Stability Information

| Specimen Type | Temperature              | Time     | Special Container |
|---------------|--------------------------|----------|-------------------|
| Serum         | Refrigerated (preferred) | 7 days   |                   |
|               | Ambient                  | 24 hours |                   |
|               | Frozen                   | 180 days |                   |

## Clinical & Interpretive

### Clinical Information

Angiotensin converting enzyme (ACE) is integral to the renin-angiotensin system (RAS), which maintains blood pressure by regulation of fluid volume and vascular tension. Its peptidase action on the decapeptide angiotensinogen I results in the hydrolysis of a terminal histidyl leucine dipeptide and the formation of the octapeptide angiotensin II, a potent vasoconstrictor that increases blood pressure.

ACE activity is increased in sarcoidosis, a systemic granulomatous disease that commonly affects the lungs. In sarcoidosis, ACE is thought to be produced by epithelioid cells and macrophages of the granuloma.

ACE activity reflects the severity of sarcoidosis: 68% positivity in those with stage I sarcoidosis, 86% in stage II sarcoidosis, and 91% in stage III sarcoidosis.

Other conditions such as Gaucher disease, leprosy, untreated hyperthyroidism, psoriasis, premature infants with respiratory distress syndrome, adults with amyloidosis, and histoplasmosis have been associated with increased serum ACE activity.

### Reference Values

> or =18 years: 16-85 U/L

0-17 years: Angiotensin converting enzyme activity may be 20-50% higher in healthy children compared to healthy adults.

For SI unit Reference Values, see <https://www.mayocliniclabs.com/order-tests/si-unit-conversion.html>

### Interpretation

An elevation in the level of serum angiotensin converting enzyme (ACE), along with radiographic evidence of infiltrates or adenopathy and organ biopsies showing noncaseating epithelial granulomas is suggestive of a diagnosis of sarcoidosis.

Normal, healthy children and infants are known to have ACE activity levels greater than the adult reference interval.

### Cautions

Spinal fluid angiotensin converting enzyme (ACE) activity to aid the diagnosis of neurosarcoidosis has been reported; however, there is insufficient evidence to support ACE being used for this purpose.

**Clinical Reference**

1. Liebermann J: Elevation of serum angiotensin-converting-enzyme (ACE) level in sarcoidosis. *Am J Med.* 1975;59:365-372
2. Rodriguez GE, Shin BC, Abernathy RS, Kendig EL Jr: Serum angiotensin-converting enzyme activity in normal children and in those with sarcoidosis. *J Pediatr.* 1981;99:68-72
3. Personal observations from a Mayo pediatric normal range study using a manual method (Hana)
4. Maguire GA, Price CP: A continuous monitoring spectrophotometric method for the measurement of angiotensin-converting enzyme in human serum. *Ann Clin Biochem.* 1985;22:204-210
5. Allen DW, Rajagopal V: Other adjunctive drugs for coronary intervention: beta-blockers, calcium-channel blockers, and angiotensin-converting enzyme inhibitors. In: Tropol EJ, Teirstein P, eds. *Textbook of Interventional Cardiology.* 8th ed. Elsevier; 2020:214-222

**Performance****Method Description**

Angiotensin converting enzyme (ACE) catalyzes the conversion of angiotensin I to angiotensin II. The enzyme also mediates the cleavage of the synthetic substrate *N*-(3-[2-furyl]acryloyl)-L-phenylalanylglycylglycine (FAPGG) into an amino acid derivative and a dipeptide. The kinetic of this cleavage reaction is measured by recording the decrease in absorbance at 340 nm.(Package insert: Buhlmann ACE Kinetic; 01/2013)

**PDF Report**

No

**Day(s) Performed**

Monday through Friday

**Report Available**

1 to 3 days

**Specimen Retention Time**

7 days

**Performing Laboratory Location**

Mayo Clinic Laboratories - Rochester Main Campus

**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.

**CPT Code Information**

82164

**LOINC® Information**

| Test ID | Test Order Name                  | Order LOINC® Value |
|---------|----------------------------------|--------------------|
| ACE     | Angiotensin Converting Enzyme, S | 2742-5             |

| Result ID | Test Result Name                 | Result LOINC® Value |
|-----------|----------------------------------|---------------------|
| ACE       | Angiotensin Converting Enzyme, S | 2742-5              |