MAYO CLINIC LABORATORIES

Test Definition: ACE

Angiotensin Converting Enzyme, Serum

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 furylacryloylphenylalanylglycylglycine (FAPGG) into an amino acid furylacrylophenylalanine (FAP) and the dipeptide glycylglycine (GG). The linear kinetic of this cleavage reaction is measured by recording the decrease in absorbance at 340nm. The final ACE activity in U/L in the patient sample is determined using a calibration curve generated from the measured calibrator value.(Package insert: Buhlmann ACE Kinetic; 07/2023)

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