

## Overview

### Useful For

Evaluation of individuals with motor and sensory neuropathies

Monitoring vitamin E status of premature infants requiring oxygenation

Evaluation of persons with intestinal malabsorption of lipids

### Method Name

Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS)

### NY State Available

Yes

## Specimen

### Specimen Type

Serum

### Shipping Instructions

Ship specimen in amber vial to protect from light.

### Specimen Required

**Patient Preparation:** Fasting overnight (12-14 hours) (infants-draw prior to next feeding)

**Supplies:** Amber Frosted Tube, 5 mL (T192)

### Collection Container/Tube:

**Preferred:** Red top

**Acceptable:** Serum gel

**Submission Container/Tube:** Amber vial

**Specimen Volume:** 0.5 mL

**Collection Instructions:** Within 24 hours of collection, aliquot specimen into amber vial to protect from light.

### Forms

If not ordering electronically, complete, print, and send a [General Request](#) (T239) with the specimen.

### Specimen Minimum Volume

0.25 mL

### Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject

Gross icterus	OK
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### Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	44 days	LIGHT PROTECTED
	Frozen	44 days	LIGHT PROTECTED
	Ambient	7 days	LIGHT PROTECTED

### Clinical and Interpretive

#### Clinical Information

Vitamin E (alpha-tocopherol) contributes to the normal maintenance of biomembranes, the vascular and nervous systems, and provides antioxidant protection for vitamin A. The level of vitamin E in the plasma or serum after a 12- to 14-hour fast reflects the individual's reserve status.

The current understanding of the specific actions of vitamin E is very incomplete. The tocopherols (vitamin E and related fat-soluble compounds) function as antioxidants and free-radical scavengers, protecting the integrity of unsaturated lipids in the biomembranes of all cells and preserving retinol (vitamin A) from oxidative destruction. Vitamin E is known to promote the formation of prostacyclin in endothelial cells and to inhibit the formation of thromboxanes in thrombocytes, thereby minimizing the aggregation of thrombocytes at the surface of the endothelium. Those influences on thrombocyte aggregation may be of significance in relation to risks for coronary atherosclerosis and thrombosis.

Deficiency of vitamin E in children leads to reversible motor and sensory neuropathies; this problem also has been suspected in adults. Premature infants who require an oxygen-enriched atmosphere are at increased risk for bronchopulmonary dysplasia and retrolental fibroplasia; supplementation with vitamin E has been shown to lessen the severity of, and may even prevent, those problems.

Deficiencies of vitamin E may arise from poor nutrition or from intestinal malabsorption. At-risk persons, especially children, include those with bowel disease, pancreatic disease, chronic cholestasis, celiac disease, cystic fibrosis, and intestinal lymphangiectasia. Infantile cholangiopathies that may lead to malabsorption of vitamin E include intrahepatic and extrahepatic biliary atresia, paucity of intrahepatic bile ducts, arteriohepatic dysplasia, and rubella-related embryopathy. In addition, low blood levels of vitamin E may be associated with abetalipoproteinemia, presumably as a result of a lack of the ability to form very low-density lipoproteins and chylomicrons in the intestinal absorptive cells of affected persons.

Vitamin E toxicity has not been established clearly. Chronically excessive ingestion has been implicated as a cause of thrombophlebitis, although this has not been definitively verified.

#### Reference Values

0-17 years: 3.8-18.4 mg/L

> or =18 years: 5.5-17.0 mg/L

#### Interpretation

Therapeutic Ranges:

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0-17 years: 3.8-18.4 mg/L

> or =18 years: 5.5-17.0 mg/L

Significant deficiency: <3.0 mg/L

### Cautions

Testing of nonfasting specimens or the use of vitamin supplementation can result in elevated serum vitamin concentrations. Reference values were established using specimens from individuals who were fasting.

### Clinical Reference

1. Ball GFM: Vitamins: Their role in the human body. Oxford, Blackwell Publishing. 2004:234-255
2. Traber MG: Vitamin E. In: Shils ME, Shike M, Ross AC, et al. Modern Nutrition in Health and Disease. 10th ed. Lippincott Williams and Wilkins; 2006:434-441
3. Roberts NB, Taylor A, Sodi R: Vitamins and trace elements. In: Rifai N, Horvath AR, Wittwer CT, eds. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 6th ed. Elsevier; 2018:chap37

### Performance

#### Method Description

Deuterated vitamin E (d[6]-alpha-tocopherol) is added to serum as an internal standard. Vitamin E (alpha-tocopherol) and the deuterated internal standard are extracted from the specimens and analyzed by liquid chromatography-tandem mass spectrometry. (Unpublished Mayo method)

#### PDF Report

No

#### Day(s) and Time(s) Test Performed

Monday through Friday

#### Analytic Time

2 days

#### Maximum Laboratory Time

5 days

#### Specimen Retention Time

14 days

#### Performing Laboratory Location

Rochester

### Fees and 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 Regional Manager. For assistance, contact [Customer Service](#).

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**Test Classification**

This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the U.S. Food and Drug Administration.

**CPT Code Information**

84446

**LOINC® Information**

Test ID	Test Order Name	Order LOINC Value
VITE	Vitamin E, S	1823-4

Result ID	Test Result Name	Result LOINC Value
2350	A-Tocopherol, Vitamin E	1823-4