Test Definition: VITA

Vitamin A, S

Overview

Useful For

Diagnosing vitamin A deficiency and toxicity

Monitoring vitamin A therapy

Method Name

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

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

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

Collection Container/Tube:

Preferred: Red top

Acceptable: Serum gel

Submission Container/Tube: Plastic vial

Specimen Volume: 0.5 mL

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	OK
Gross lipemia	OK
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	28 days	

Specimen Type	Temperature	Time	Special Container
	Ambient	28 days	
	Frozen	28 days	

Clinical and Interpretive

Clinical Information

The level of vitamin A in the plasma or serum is a reflection of the quantities of vitamin A and carotene (provitamin A) ingested and absorbed by the intestine (carotene is converted to vitamin A by intestinal absorptive cells and hepatocytes).

Vitamin A plays an essential role in the function of the retina (adaptation to dim light), is necessary for growth and differentiation of epithelial tissue, and is required for growth of bone, reproduction, and embryonic development. Together with certain carotenoids, vitamin A enhances immune function, reducing the consequences of some infectious diseases.

Degenerative changes in eyes and skin are commonly observed in vitamin A deficiency. Poor adaptation of vision to darkness (night blindness) is an early symptom that may be followed by degenerative changes in the retina. In developing countries, vitamin A deficiency is the principal preventable cause of blindness. Severe or prolonged deficiency leads to dry eye (xerophthalmia) that can result in corneal ulcers, scarring, and blindness. Another important consequence of inadequate intake is acquired immunodeficiency disease, where an increased incidence of death is associated with deficient vitamin A levels. Increased susceptibility is associated with vitamin A deficiency. In patients with HIV, vitamin A deficiency is associated with increased disease progression and mortality.

Vitamin A in excess can be toxic. In particular, chronic vitamin A intoxication is a concern in normal adults who ingest more than 15 mg per day and children who ingest more than 6 mg per day of vitamin A over a period of several months. Manifestations are various and include dry skin, cheilosis, glossitis, vomiting, alopecia, bone demineralization and pain, hypercalcemia, lymph node enlargement, hyperlipidemia, amenorrhea, and features of pseudotumor cerebri with increased intracranial pressure and papilledema. Liver fibrosis with portal hypertension may also result. Congenital malformations, like spontaneous abortions, craniofacial abnormalities, and valvular heart disease have been described in pregnant women taking vitamin A in excess. Consequently, in pregnancy, the daily dose of vitamin A should not exceed 3 mg.

Reference Values

0-6 years: 11.3-64.7 mcg/dL

7-12 years: 12.8-81.2 mcg/dL

13-17 years: 14.4-97.7 mcg/dL

> or =18 years: 32.5-78.0 mcg/dL

Interpretation

The World Health Organization recommendations supplementation when vitamin A levels fall below 20.0 mcg/dL.

Severe deficiency is indicated at levels less than 10.0 mcg/dL.

Vitamin A values above 120.0 mcg/dL suggest hypervitaminosis A and associated toxicity.

Cautions

Acute ethanol ingestion may result in increased serum vitamin A levels.

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, pp 133-187

2. Ross AC: Vitamin A and carotenoids. In Modern Nutrition in Health and Disease. 10th edition. Edited by ME Shils, M Shike, AC Ross, et al. Philadelphia, Lippincott Williams and Wilkins, 2006, pp 351-375

3. Roberts NB. Taylor A. Sodi R: Chapter 37 Vitamins and Trace Elements. In Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. Edited by N Rifai, AR Horvath, CT Wittwer. Sixth edition. St. Louis, MO. Elsevier, 2018. pp 639-718

Performance

Method Description

Deuterated vitamin A (d[6]-all-trans retinol) is added to serum as an internal standard. Vitamin A (all-trans retinol) and the deuterated internal standard are extracted from the specimens using on-line turbulent flow HPLC and analyzed by liquid chromatography-tandem mass spectrometry using multiple reaction monitoring in positive mode.(Unpublished Mayo method)

PDF Report

No

Day(s) Performed

Monday through Friday

Report Available

2 to 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.

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

84590

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
VITA	Vitamin A, S	2923-1

Result ID	Test Result Name	Result LOINC Value
7597	Vitamin A	2923-1