

Overview

Useful For

Assessment of circulating vitamin K1 concentration

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-collect prior to next feeding).

Collection Container/Tube:

Preferred: Red top

Acceptable: Serum gel

Submission Container/Tube: Plastic vial

Specimen Volume: 2 mL

Collection Instructions: Centrifuge and aliquot serum into a plastic vial within 2 hours of collection.

Specimen Minimum Volume

0.75 mL

Reject Due To

Gross hemolysis	OK
Gross lipemia	Reject
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	30 days	
	Ambient	30 days	
	Frozen	30 days	

Clinical & Interpretive

Clinical Information

Vitamin K1 or phylloquinone is part of a group of similar fat-soluble vitamins in which the 2-methyl-1,4-naphthoquinone ring is common. Phylloquinone is found in high amounts in leafy green vegetables and some fruits (avocado, kiwi). It is a required cofactor involved in the gamma-carboxylation of glutamate residues of several proteins. Most notably, the inactive forms of the coagulation factors prothrombin (factor II), factors VII, IX, and X, and protein S and protein C are converted to their active forms by the transformation of glutamate residues to gamma-carboxyglutamic acid (Gla). Other proteins such as those involved in bone metabolism, cell growth, and apoptosis also undergo this Gla transformation. Measurement of vitamin K1 (phylloquinone) in fasting serum is a strong indicator of dietary intake and status.

Reference Values

<18 years: Not established

> or =18 years: 0.10-2.20 ng/mL

Interpretation

Low vitamin K1 concentrations in the serum are indicative of insufficiency and poor vitamin K1 status.

Cautions

Testing of nonfasting specimens or the use of vitamin K1 supplementation can result in elevated serum vitamin K1 concentrations.

Clinical Reference

1. Office of Dietary Supplements: Vitamin K Fact Sheet for Health Professionals. National Institutes of Health; Updated March 29, 2021. Accessed April 22, 2022. Available at <https://ods.od.nih.gov/factsheets/vitaminK-HealthProfessional/>
2. Lippi G, Franchini M: Vitamin K in neonates: Facts and myths. *Blood Transfus.* 2011 Jan;9(1):4-9. doi: 10.2450/2010.0034-10
3. Greer FR: Vitamin K the basics-What's new? *Early Hum Dev.* 2010 Jul;86 Suppl 1:43-7. doi: 10.1016/j.earlhumdev.2010.01.015

Performance

Method Description

Deuterated stable isotope (vitamin K1-d7) is added to a serum sample as an internal standard. Protein is precipitated from the mixture by the addition of ethanol. Vitamin K1 and internal standard are extracted from the resulting supernatant by solid-phase extraction. Vitamin K1 and internal standard are then separated utilizing high-throughput liquid chromatography with analysis on a tandem mass spectrometer equipped with a heated nebulizer ion source using multiple-reaction monitoring.(Unpublished Mayo method)

PDF Report

No

Day(s) Performed

Monday through Friday

Report Available

2 to 4 days

Specimen Retention Time

14 days

Performing Laboratory Location

Rochester

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 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 US Food and Drug Administration.

CPT Code Information

84597

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
VITK1	Vitamin K1, S	9622-2

Result ID	Test Result Name	Result LOINC® Value
62167	Vitamin K1, S	9622-2