MAYO CLINIC LABORATORIES

Test Definition: VITB2

Riboflavin (Vitamin B2), Plasma

Overview

Useful For

Assessment of riboflavin (vitamin B2) status

Assisting in the diagnosis of suspected vitamin B2 deficiency

Monitoring of vitamin B2 therapy

Method Name

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

Portions of this test are covered by patents held by Quest Diagnostics

NY State Available

Yes

Specimen

Specimen Type

Plasma Heparin

Shipping Instructions

Ship specimen in amber vial to protect from light.

Specimen Required

Patient Preparation:

Fasting: 12 hours, required; Infants should have specimen collected before next feeding

Supplies: Amber Frosted Tube, 5 mL (T915)

Collection Container/Tube:

Preferred: Green top (sodium or lithium heparin)

Acceptable: Light-green top (sodium or lithium heparin plasma gel)

Submission Container/Tube: Amber vial

Specimen Volume: 2 mL Plasma

Collection Instructions: Within 2 hours of collection, centrifuge and aliquot plasma into a amber vial.

Specimen Minimum Volume

Plasma: 0.5 mL

Reject Due To

Gross	OK

hemolysis	
Gross lipemia	Reject
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Plasma Heparin	Refrigerated (preferred)	28 days	LIGHT PROTECTED
	Ambient	72 hours	LIGHT PROTECTED
	Frozen	28 days	LIGHT PROTECTED

Clinical & Interpretive

Clinical Information

Riboflavin, which is commonly known as vitamin B2, is a water-soluble vitamin that is the precursor to the coenzymes flavin mononucleotide and flavin adenine dinucleotide. These coenzymes play a pivot role in a plethora of oxidation-reduction reactions, energy production, and metabolism of fats, drugs, and steroids.

Deficiency of riboflavin (ariboflavinosis) is characterized by sore throat, cheilosis (lesions on the lips), angular stomatitis (lesions on the angles of the mouth), glossitis (fissured and magenta-colored tongue), corneal vascularization, dyssebacia (red, scaly, greasy patches on the nose, eyelids, scrotum, and labia), and normocytic, normochromic anemia associated with pure red blood cell aplasia of the bone marrow. Riboflavin coenzymes play a key role in metabolism of vitamin B9 and vitamin B12, the activation of vitamin B6, and the conversion of tryptophan to vitamin B3. Therefore, deficiency of vitamin B2 can cause issues associated with other B vitamins as well. Early-stage symptoms of deficiency typically respond well to supplementation, but later stage anatomical changes cannot be reversed with therapy alone. Those at risk for vitamin B2 deficiency include those that are malnourished, vegan or vegetarian, individuals with hypothyroidism or adrenal insufficiency, pregnant and lactating women and their infants, and those on drugs with similar chemical structures such as tricyclic antidepressants.

In addition to dietary deficiency, there are rare inborn errors of metabolism, primarily involving loss of function of riboflavin transporters, which result in functional vitamin B2 deficiency. Many of these cases present with neurodegenerative features and/or hearing loss, which if left untreated can be fatal. In these cases, high-dose riboflavin supplementation is critical.

Riboflavin has a low level of toxicity and no case of riboflavin toxicity in humans has been reported. The limited absorptivity of riboflavin and its ready excretion in the urine normally precludes a health problem due to increased intake of riboflavin.

Reference Values

1-19 mcg/L

Interpretation

Low concentrations of vitamin B2 in the plasma are indicative of nutritional deficiency. Concentrations below 1 mcg/L are indicative of deficiency.

Cautions

Testing of nonfasting specimens or the use of dietary riboflavin (vitamin B2) supplementation can result in elevated plasma vitamin B2 concentrations. Reference intervals were established using specimens from individuals who were fasting.

Clinical Reference

1. Sodi R, Taylor A. Vitamins and trace elements. In: Rifai N, Horvath AR, Wittwer CT, eds. Tietz Fundamentals of Clinical Chemistry and Molecular Diagnostics. 8th ed. Elsevier; 2020:466-487
2. Riboflavin- Fact Sheet for Health Professionals. US Department of Health and Human Services, National Institutes of Health. Updated May 11, 2022. Accessed March 17, 2026. Available at https://ods.od.nih.gov/factsheets/Riboflavin-HealthProfessional/
3. Hustad S, McKinley MC, McNulty H, et al. Riboflavin, flavin mononucleotide, and flavin adenine dinucleotide in human plasma and erythrocytes at baseline and after low-dose riboflavin supplementation. Clin Chem. 2002;48(9):1571-1577
4. Balasubramaniam S, Christodoulou J, Rahman S. Disorders of riboflavin metabolism. J Inherit Metab Dis. 2019;42(4):608-619. doi:10.1002/jimd.12058
5. Suwannasom N, Kao I, Pruss A, Georgieva R, Baumler H. Riboflavin: the health benefits of a forgotten natural vitamin. Int J Mol Sci. 2020;21(3):950. doi:10.3390/ijms21030950
6. O'Callaghan B, Bosch AM, Houlden H. An update on the genetics, clinical presentation, and pathomechanisms of human riboflavin transporter deficiency. J Inherit Metab Dis. 2019;42(4):598-607. doi:10.1002/jimd.12053

Performance

Method Description

Riboflavin (vitamin B2) is extracted from plasma specimens with internal standard and then analyzed by liquid chromatography-tandem mass spectrometry.(Unpublished Mayo method)

PDF Report

No

Day(s) Performed

Monday, Wednesday, Friday

Report Available

2 to 5 days

Specimen Retention Time

2 weeks

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Superior Drive

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

CPT Code Information

84252

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
VITB2	Riboflavin (Vitamin B2), P	2924-9

Result ID	Test Result Name	Result LOINC® Value
61637	Riboflavin (Vitamin B2), P	2924-9