

Overview

Useful For

Evaluation of individuals who present the signs of ariboflavinosis

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-overnight (12-14 hours) (infants-draw prior to next feeding)

Supplies: Amber Frosted Tube, 5 mL (T192)

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

Collection Instructions: Centrifuge within 2 hours of collection and aliquot into amber vial.

Reject Due To

Gross hemolysis Reject

Gross lipemia Reject

Gross icterus OK

Specimen Minimum Volume

0.5 mL

Specimen Stability Information

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

	Ambient		LIGHT PROTECTED
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Clinical & Interpretive

Clinical Information

There are 3 principle vitamin B2-active flavins found in nature riboflavin, riboflavin 5-phosphate (flavin mononucleotide: FMN), and riboflavin-5'-adenosyl-diphosphate (flavin adenosine dinucleotide: FAD). In biological tissues, FMN and FAD serve as prosthetic units for a large variety of flavoproteins, which are hydrogen carriers in oxidation-reduction processes.

Dietary 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. Severe riboflavin deficiency may affect the conversion of vitamin B6 to its coenzyme, as well as conversion of tryptophan to niacin.

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 preclude a health problem due to increased intake of riboflavin.

Reference Values

1-19 mcg/L

Interpretation

Low concentrations in the blood plasma are indicative of nutritional deficiency. Concentrations below 1 mcg/L are considered significantly diminished. Marginally low levels probably represent nutritional deficiency that should be corrected.

Cautions

Testing of nonfasting specimens or the use of dietary vitamin B2 supplementation can result in elevated plasma vitamin B2 concentrations.

Clinical Reference

1. Russell RM, Suter PM: Vitamin and trace mineral deficiency and excess. In: Fauci AS, Kasper DL, Braunwald E, et al. eds. *Harrison's Principles of Internal Medicine*. 17th ed. McGraw-Hill Book Company; 2008:441-449
2. Ball GFM: *Vitamins: Their role in the human body*. Oxford, Blackwell Publishing; 2004:289-299
3. McCormick DB: Riboflavin. In: Shils ME, Shike M, Ross AC, et al. *Modern Nutrition in Health and Disease*. 10th ed. Lippincott Williams and Wilkins; 2006:434-441
4. 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;48:1571-1577
5. Midttun O, Hustad S, Solheim E, et al: Multianalyte quantification of vitamin B6 and B2 species in the nanomolar range in human plasma by liquid chromatography-tandem mass spectrometry. *Clin Chem*. 2005;51:1206-1216
6. Capo-chichi CD, Gueant JL, Lefebvre E, et al: Riboflavin and riboflavin-derived cofactors in adolescent girls with anorexia nervosa. *Am J Clin Nutr*. 1999;69:672-678. doi: 10.1373/clinchem.2005.051169.
7. 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; 2018:639-718

Performance**Method Description**

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

PDF Report

No

Specimen Retention Time

2 weeks

Performing Laboratory Location

Rochester

Fees & Codes**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

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