Test Definition: B6PRO

Vitamin B6 Profile (PLP and PA), P

Overview

Useful For

Determining the overall success of a vitamin B6 supplementation program

Diagnosis and evaluation of hypophosphatasia

Profile Information

Test ID	Reporting Name	Available Separately	Always Performed
PLP	Pyridoxal 5-Phosphate (PLP), P	Yes	Yes
B6PA	Pyridoxic Acid (PA), P	No	Yes

Method Name

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

NY State Available

Yes

Specimen

Specimen Type

Plasma Heparin

Shipping Instructions

Ship specimen in amber vial to protect from light.

Specimen Required

Patient Preparation:

1. Fasting-overnight (12-14 hours) (infants-collect prior to next feeding).

2. Patient must not ingest vitamin supplements for 24 hours before specimen collection.

Supplies: Amber Frosted Tube, 5 mL (T192)

Collection Container/Tube: Green top (sodium or lithium heparin) or plasma gel separator tube (PST)

Submission Container/Tube: Amber vial

Specimen Volume: 1 mL

Collection Instructions: Centrifuge at 4 degrees C within 2 hours of collection, then aliquot all plasma into amber vial.

Specimen Minimum Volume

0.75 mL

Reject Due To

Gross hemolysis	OK
Gross lipemia	OK
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Plasma Heparin	Refrigerated (preferred)	7 days	LIGHT PROTECTED
	Frozen	14 days	LIGHT PROTECTED

Clinical and Interpretive

Clinical Information

Vitamin B6 is a complex of 6 vitamers: pyridoxal, pyridoxol, pyridoxamine, and their 5'-phosphate esters. Due to its role as a cofactor in a number of enzymatic reactions, pyridoxal 5-phosphate (PLP) has been determined to be the biologically active form of vitamin B6.

Vitamin B6 deficiency is a potential cause of burning mouth syndrome and a possible potentiating factor for carpal tunnel and tarsal tunnel syndromes. Persons who present with chronic, progressive nerve compression disorders may be deficient in vitamin B6 and should be evaluated. Vitamin B6 deficiency is associated with symptoms of scaling of the skin, severe gingivitis, irritability, weakness, depression, dizziness, peripheral neuropathy, and seizures. In the pediatric population, deficiencies have been characterized by diarrhea, anemia, and seizures.

Markedly elevated PLP in conjunction with low levels of pyridoxic acid are observed in cases of hypophosphatasia, a disorder characterized by low levels of alkaline phosphatase and a range of skeletal abnormalities.

Reference Values

PYRIDOXAL 5-PHOSPHATE

5-50 mcg/L

PYRIDOXIC ACID

3-30 mcg/L

Interpretation

Levels for fasting individuals falling in the range of 3 to 30 mcg/L for pyridoxic acid (PA) and 5 to 50 mcg/L for pyridoxal 5-phosphate (PLP) are indicative of adequate nutrition.

The following are interpretative guidelines based upon PLP and PA results:

-If PLP is >100 mcg/L and PA is < or =30 mcg/L:

-The increased PLP is suggestive of hypophosphatasia. Consider analysis of serum alkaline phosphatase isoenzymes (ALKI / Alkaline Phosphatase, Total and Isoenzymes, Serum) and urinary phosphoethanolamine (AAPD / Amino Acids, Quantitative, Random, Urine)

-If PLP is >100 mcg/L and PA is 31 to 100 mcg/L or PLP is 81 to 100 mcg/L and PA is < or =30 mcg/L:

-The increased PLP is likely related to dietary supplementation; however a mild expression of hypophosphatasia cannot be excluded. Consider analysis of serum alkaline phosphatase isoenzymes (ALKI / Alkaline Phosphatase, Total and Isoenzymes, Serum) and urinary phosphoethanolamine (AAPD / Amino Acids, Quantitative, Random, Urine).

-If PLP is 51 to 80 mcg/L or PLP is 81 to 100 mcg/L and PA is >30 mcg/L or PLP is >100 mcg/L and PA is >100 mcg/L:

-The elevated PLP is likely due to dietary supplementation.

Cautions

Reference ranges were established using healthy fasting volunteers who abstained from vitamin supplementation for 24 hours prior to specimen collection. Vitamin supplementation and nonfasting may result in elevated plasma vitamin concentrations.

Clinical Reference

1. Kimura M, Kanehira K, Yokoi K: Highly sensitive and simple liquid chromatographic determination in plasma of B6 vitamins, especially pyridoxal 5'-phosphate. J Chromatogr A. 1996;722(1-2):296-301

2. Ball GFM, ed: Vitamins: Their Role in the Human Body. Blackwell Publishing; 2004:310-325

3. Mackey AD, Davis SR, Gregory JF III: Vitamin B6. In: Shils ME, Shike M, Ross AC, et al. eds. Modern Nutrition in Health and Disease. 10th ed. Lippincott Williams and Wilkins; 2006:452-461

Performance

Method Description

The stable isotope pyridoxal 5-phosphate-d2 and/or pyridoxic acid-d2 is added to plasma as an internal standard. Meta-phosphoric acid solution is then added to precipitate the proteins. Following sedimentation of the proteins, an aliquot of the clarified supernatant fluid is subjected to separation of pyridoxal 5-phosphate, pyridoxic acid, and internal standards from other plasma components by reverse-phase high performance liquid chromatography (HPLC) with quantitation by tandem mass spectrometry (LC-MS/MS).(Unpublished Mayo method)

PDF Report

No

Day(s) Performed

Monday through Thursday, Sunday

Report Available

1 to 7 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

82542-Quantitative

84207-Pyridoxal phosphate (vitamin B6)

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
B6PRO	Vitamin B6 Profile (PLP and PA), P	95266-3

Result ID	Test Result Name	Result LOINC Value
61065	Pyridoxic Acid (PA), P	1688-1
4047	Pyridoxal 5-Phosphate (PLP), P	30552-4