MAYO CLINIC LABORATORIES

Test Definition: PETH

Phosphatidylethanol Confirmation, Blood

Overview

Useful For

Verifying abstinence or use of ethanol, especially in liver transplant candidates/patients

Special Instructions

- Clinical Toxicology CPT Code Client Guidance

Method Name

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

NY State Available

Yes

Specimen

Specimen Type

Whole Blood EDTA

Specimen Required

Container/Tube: Lavender top (EDTA)

Specimen Volume: 1 mL

Collection Instructions:

1. Do not use alcohol to clean arm. Use alternative (such as Betadine**,** also known as Povidone Iodine) to cleanse site before specimen collection.

2. Draw blood in tubes smaller than 10 mL if possible.

3. Do not centrifuge.

4. Send whole blood specimen in original tube. **Do not aliquot.**

Forms

If not ordering electronically, complete, print, and send 1 of the following with the specimen:

-Therapeutics Test Request (T831)

-General Test Request (T239)

-Renal Diagnostics Test Request (T830)

Specimen Minimum Volume

0.5 mL

Reject Due To

Gross lipemia	OK

Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Whole Blood EDTA	Frozen (preferred)	28 days	
	Refrigerated	14 days	

Clinical & Interpretive

Clinical Information

Phosphatidylethanol (PEth) is a direct biomarker for alcohol (ethanol) intake. In presence of ethanol, phosphatidylcholine is converted to PEth on the red blood cell membrane by the phospholipase D enzyme. PEth homologues (16:0/18:1 [POPEth: 1-palmitoyl-2-oleoyl-sn-glycero-3-phosphoethanol] and 16:0/18:2 [PLPEth: 1-palmitoyl-2-linoleoyl-sn-glycero-3-phosphoethanol]) levels correlate with the amount of alcohol consumed within the previous 2 weeks and may be detected in the blood up to 2 to 4 weeks after excessive alcohol consumption. POPEth and PLPEth comprise approximately 60% of all observed PEth homologues in the blood.(1)

Reference Values

Negative (<10 ng/mL)

Cutoff concentrations by liquid chromatography tandem mass spectrometry:

PEth 16:0/18:1 (POPEth): 10 ng/mL

PEth 16:0/18:2 (PLPEth): 10 ng/mL

Interpretation

POPEth (1-Palmitoyl-2-oleoyl-sn-glycero-3-phosphoethanol):

A result of 20 ng/mL to 200 ng/mL is considered evidence of moderate ethanol consumption, while results over 200 ng/mL indicate heavy ethanol consumption. However, the Center for Substance Abuse Treatment advises caution in interpretation and use of biomarkers alone to assess alcohol use. Results should be interpreted in the context of all available clinical and behavioral information.(2)

PLPEth (1-Palmitoyl-2-linoleoyl-sn-glycero-3-phosphoethanol):

There are no current clinical reference limits for this phosphatidylethanol (PEth) homologue.

PEth 16:0/18:1 (POPEth)

Less than 10 ng/mL: Not detected

10-19 ng/mL: Abstinence or light alcohol consumption (<2 drinks per day for several days a week)

20-200 ng/mL: Moderate alcohol consumption (up to 4 drinks per day for several days a week)

Greater than 200 ng/mL: Heavy alcohol consumption or chronic alcohol use (at least 4 drinks per day several days a week)

PEth 16:0/18:2 (PLPEth): Reference ranges are not well established.

Cautions

No significant cautionary statements

Clinical Reference

1. Helander A, Zheng Y. Molecular species of the alcohol biomarker phosphatidyethanol in human blood measured by LC-MS. Clin Chem. 2009:55:(7):1395-1405. doi:10.1373/clinchem.2008.120923
2. Substance Abuse and Mental Health Services Administration (SAMHSA) and National Institute on Alcohol Abuse and Alcoholism. Medication for the Treatment of Alcohol Use Disorder: A Brief Guide. HHS Publication No. (SMA) 15-4907. SAMHSA; 2015
3. Ulwelling W, Smith K. The PEth blood test in the security environment: What it is; why it is important; and interpretative guidelines. J Forensic Sci. 2018;63(6):1634-1640. doi:10.1111/1556-4029.13874
4. Hakim F, Wiart JF, Menard O, Allorge D, Gaulier JM. Dosage sanguin du phosphatidylethanol Phosphatidylethanol blood analysis. Ann Biol Clin (Paris). 2019;77(6):638-644. French. doi:10.1684/abc.2019.1499
5. Langman LJ, Bechtel LK, Holstege CP. Clinical toxicology. In: Rifai N, Chiu RWK, Young I, Burnham CAD, Wittwer CT, eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023:chap 43

Performance

Method Description

The received whole blood sample is diluted and mixed with internal standard and clinical laboratory reagent water, extracted using supported liquid extraction, and analyzed by an in-house developed liquid chromatography tandem mass spectrometry method.(Unpublished Mayo method)

PDF Report

No

Day(s) Performed

Monday through Sunday

Report Available

2 to 5 days

Specimen Retention Time

14 days

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.

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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

G0480

80321 (if appropriate for select payers)

Clinical Toxicology CPT Code Client Guidance

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
PETH	Phosphatidylethanol Confirmation, B	101506-4

Result ID	Test Result Name	Result LOINC® Value
617481	PEth 16:0/18:1 (POPEth) by LC-MS/MS	97607-6
617482	PEth 16:0/18:2 (PLPEth) by LC-MS/MS	97606-8
617483	PEth Interpretation	69050-3