MAYO CLINIC LABORATORIES

Test Definition: 5NTD

5'-Nucleotidase, Serum

Overview

Useful For

Aiding diagnosis and monitoring of hepatobiliary disease and bile duct obstructions

Ruling out bone pathology as the source of elevated serum alkaline phosphatase

Method Name

Coupled Enzyme Kinetic Assay

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 1 mL
Collection Instructions: Centrifuge and aliquot serum into plastic vial.

Specimen Minimum Volume

0.5 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	OK
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	14 days	

	Frozen	90 days	

Clinical & Interpretive

Clinical Information

5'-Nucleotidase (5'NT) is an enzyme that catalyzes the hydrolysis of the phosphate group from 5'-nucleotides. Increased enzyme levels in sera are associated with certain forms of liver disease, such as intra- or extra-hepatic obstruction, and particularly in cases of hepatic carcinoma and in mastectomy patients with recurrent metastases. 5'NT is specific to hepatobiliary disease, which can make it useful in conjunction with other liver enzyme activity assays, like gamma glutamyl transferase, to differentiate between an increase in alkaline phosphatase due to cholestatic liver disease rather than bone disease (Paget disease).

Reference Values

<4.6 U/L

For International System of Units (SI) conversion for Reference Values, see www.mayocliniclabs.com/order-tests/si-unit-conversion.html.

Interpretation

An elevation of 5'-nucleotidase (5'NT) activity may be seen in all forms of liver disease, although the highest elevations are seen in intra- or extra-hepatic biliary obstruction.

5'-nucelotidase may be more specific for intrahepatic cholestasis than gamma glutamyl transferase.

Elevation of 5'NT activity is not associated with skeletal disease. Thus, measurement of 5'NT in serum can be used to differentiate observed elevations of alkaline phosphatase due to skeletal disease vs. hepatobiliary disease.

Cautions

Alkaline phosphatase (ALP) is known to cross-react with 5'-nucleotidase (5'NT) measurements. Placental ALP of 100 U/L gives a 5'NT result of 0.27 U/L. Accordingly, specimens with elevations of any ALP isoenzyme significantly above normal circulating activity must be interpreted cautiously.

5'-nucleotidase is neither specific nor sensitive enough to be used as a cancer screen.

Do not interpret serum 5' NT activity as absolute evidence of the presence or the absence of malignant disease. Use serum 5' NT in conjunction with information from the clinical evaluation of the patient and other diagnostic procedures.

Values obtained with different assay methods or kits may be different and cannot be used interchangeably.

Clinical Reference

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2. Drummond GI, Masanobu Y. Nucleotide Phosphomonoesterases. In: Boyer, P.D. ed. The Enzymes. Vol 4. 3rd ed., Academic Press; 1971:337-354
3. Kim NK, Yasmineh WG, Treier EF, Goldman A, Theologides A. Value of alkaline phosphatase, 5'-nucleotidase,

gamma-glutamyltransferase, and glutamate dehydrogenase activity measurements (single and combined) in serum in diagnosis of metastasis to the liver. Clin Chem. 1977;23:2034-2038
4. van der Slik W, Persijn JP. Engelsman E, Riethorst A. Serum 5'-nucleotidase. Clin Biochem. 1970;3(1):59-80
5. Heinz F, Pilz R, Reckel S, Kalden JR, Haeckel RJ. A new spectrophotometric method for the determination of 5'-nucleotidase. J Clin Chem Clin Biochem. 1980;18(11):781-788
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7. Pincus MR, Carty RP. Clinical enzymology. In: McPherson RA, Pincus MR, eds. Henry's Clinical Diagnosis and Management by Laboratory Methods. 24th ed. Elsevier; 2022:chap 21
8. Sapey T, Mendler MH, Guyader D, et al. Respective value of alkaline phosphatase, gamma-glutamyl transpeptidase and 5' nucleotidase serum activity in the diagnosis of cholestasis: a prospective study of 80 patients. J Clin Gastroenterol. 2000;30(3):259-263
9. Singh Gill, DMP. Comparative Study of serum gamma glutamyltransferase, 5' nucleotidase and alkaline phosphatase in icteric and an-icteric biliary disease patients. Int Med J Malays. 2013;12(1):59-62. doi.org/10.31436/imjm.v12i1.2004
10. Junna Z, Gongde C, Jinying X, Xiu Z. Serum AFU, 5'-NT and AFP as Biomarkers for Primary Hepatocellular Carcinoma Diagnosis. Open Med (Wars). 2017;12:354-358. doi:10.1515/med-2017-0051

Performance

Method Description

The Diazyme 5'-Nucleotidase (5'NT) assay is a coupled enzyme kinetic method where 5'NT facilitates the enzymatic hydrolysis of 5'-monophosphate to form inosine which is converted to hypoxanthine by purine nucleoside phosphorylase. Hypoxanthine is then converted to uric acid and hydrogen peroxide (H2O2) by xanthine oxidase. H2O2 is further reacted with N-Ethyl-N-(2-hydroxy-3-sulfopropyl)-3-methylaniline and 4-aminoantipyrine in the presence of peroxidase to generate quinone dye which is monitored in a kinetic manner and is proportional to the 5'NT activity which can be determined photometrically by an increase in absorbance at 550 nm compared to a calibration curve. One unit of 5'NT is defined as the amount of 5'NT that generates one micromole of inosine from IMP per min at 37 degrees C. Testing is performed utilizing a closed development channel on the Roche cobas c502 module on the cobas 8000 analyzer.(Package insert: 5'-Nucleotidase Assay. Diazyme Laboratories, Inc.; 05/2022)

PDF Report

No

Day(s) Performed

Monday through Saturday

Report Available

1 to 3 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

83915

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
5NTD	5'-Nucleotidase, S	1690-7

Result ID	Test Result Name	Result LOINC® Value
5NTD	5'-Nucleotidase, S	1690-7