MAYO CLINIC LABORATORIES

Test Definition: GGT

Gamma-Glutamyltransferase (GGT), Serum

Overview

Useful For

Diagnosing and monitoring hepatobiliary disease, it is currently the most sensitive enzymatic indicator of liver disease

Ascertaining whether observed elevations of alkaline phosphatase are due to skeletal disease (normal gamma-glutamyltransferase: GGT) or reflect the presence of hepatobiliary disease (elevated GGT)

A screening test for occult alcoholism

Method Name

Photometric Rate

NY State Available

Yes

Specimen

Specimen Type

Serum

Necessary Information

Patient's age and sex are required.

Specimen Required

Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 0.5 mL
Collection Instructions: Centrifuge and aliquot serum into a plastic vial within 2 hours of collection.

Specimen Minimum Volume

0.25 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	OK
Gross icterus	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	7 days	
	Ambient	7 days	
	Frozen	365 days	

Clinical & Interpretive

Clinical Information

Gamma-glutamyltransferase (GGT) is primarily present in kidney, liver, and pancreatic cells. Small amounts are present in other tissues. Even though renal tissue has the highest level of GGT, the enzyme present in the serum appears to originate primarily from the hepatobiliary system, and GGT activity is elevated in any and all forms of liver disease. It is highest in cases of intra- or posthepatic biliary obstruction, reaching levels some 5 to 30 times normal. GGT is more sensitive than alkaline phosphatase (ALP), leucine aminopeptidase, aspartate transaminase, and alanine aminotransferase in detecting obstructive jaundice, cholangitis, and cholecystitis; its rise occurs earlier than with these other enzymes and persists longer. Only modest elevations (2-5 times normal) occur in infectious hepatitis, and in this condition, GGT determinations are less useful diagnostically than are measurements of the transaminases. High elevations of GGT are also observed in patients with either primary or secondary (metastatic) neoplasms. Elevated levels of GGT are noted not only in the sera of patients with alcoholic cirrhosis but also in the majority of sera from persons who are heavy drinkers. Studies have emphasized the value of serum GGT levels in detecting alcohol-induced liver disease. Elevated serum values are also seen in patients receiving drugs such as phenytoin and phenobarbital, and this is thought to reflect induction of new enzyme activity.

Normal values are observed in various muscle diseases and in renal failure. Normal values are also seen in cases of skeletal disease, children older than 1 year, and in healthy pregnant women-conditions in which ALP is elevated.

Reference Values

Males
0-11 months: <178 U/L
12 months-6 years: <21 U/L
7-12 years: <24 U/L
13-17 years: <43 U/L
> or =18 years: 8-61 U/L

Females
0-11 months: <178 U/L
12 months- 6 years: <21 U/L
7-12 years: <24 U/L
13-17 years: <26 U/L
> or =18 years: 5-36 U/L

Interpretation

An elevation of gamma-glutamyltransferase (GGT) activity is seen in any and all forms of liver disease, although the

highest elevations are seen in intra- or posthepatic biliary obstruction. Elevated values can also indicate alcoholic cirrhosis or individuals who are heavy drinkers.

The finding of increased GGT and alkaline phosphatase (ALP) activity is consistent with hepatobiliary disease.

The finding of normal GGT activity and increased ALP activity is consistent with skeletal disease.

Cautions

Gamma-glutamyltransferase activity is inducible by drugs such as phenytoin and phenobarbital and, therefore, elevations should not be considered indicative of liver disease until drug use is ruled out. Elevations are also seen after ingestion of alcoholic beverages.

In very rare cases, gammopathy, in particular, type IgM (Waldenstrom macroglobinemia) may cause unreliable results.

Clinical Reference

1. Tietz Textbook of Clinical Chemistry. Edited by CA Burtis, ER Ashwood. WB Saunders Company, Philadelphia, 1994
2. Heiduk M, Page I, Kliem C, et al: Pediatric reference intervals determined in ambulatory and hospitalized children and juveniles. Clin Chim Acta 2009:406:156-161

Performance

Method Description

This is an enzyme colorimetric method (rate method) where gamma-glutamyltransferase (GGT) transfers the gamma-glutamyl group of the substrate (L-gamma-glutamyl-3-carboxy-4-nitroanilide) to glycylglycine. The amount of 5-amino-2-nitrobenzoate liberated is proportional to the GGT activity and can be determined photometrically.(Package insert: Roche Diagnostics Cobas 6000 GGT-2 reagent, Indianapolis, IN, 46256; 2017-01, V 10.0)

PDF Report

No

Day(s) Performed

Monday through Sunday

Report Available

Same day/1 to 2 days

Specimen Retention Time

1 week

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Main Campus

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 has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information

82977

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
GGT	Gamma Glutamyltransferase (GGT), S	2324-2

Result ID	Test Result Name	Result LOINC® Value
GGT	Gamma Glutamyltransferase (GGT), S	2324-2