MAYO CLINIC LABORATORIES

Test Definition: ETGX

Ethyl Glucuronide Confirmation, Chain of Custody, Random, Urine

Overview

Useful For

Monitoring abstinence in clinical and justice system settings using ethyl glucuronide and ethyl sulfate as direct biomarkers or metabolites of ethanol

This chain-of-custody test is intended to be used in a setting where the test results can be used definitively to make a diagnosis.

Chain of custody is required whenever the results of testing could be used in a court of law. Its purpose is to protect the rights of the individual contributing the specimen by demonstrating that it was always under the control of personnel involved with testing the specimen; this control implies that the opportunity for specimen tampering would be limited.

Additional Tests

Test Id	Reporting Name	Available Separately	Always Performed
COCH	Chain of Custody Processing	No	Yes
ADLTX	Adulterants Survey, CoC, U	Yes	Yes

Testing Algorithm

Adulterants testing will be performed on all chain-of-custody urine samples as per regulatory requirements.

Method Name

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

NY State Available

Yes

Specimen

Specimen Type

Urine

Specimen Required

Supplies: Chain of Custody Kit (T282)
Container/Tube: Chain-of-custody kit containing the specimen containers, seals, and documentation is required.
Specimen Volume: 5 mL
Collection Instructions: Collect specimen in the provided container, seal, and submit with the associated documentation to satisfy the legal requirements for chain-of-custody testing.

Additional Information: Submitting less than 5 mL will compromise our ability to perform all necessary testing.

Forms

1. Chain of Custody Request is included in the Chain-of-Custody Kit (T282).
2. If not ordering electronically, complete, print, and send a Therapeutics Test Request (T831) with the specimen.

Specimen Minimum Volume

2.5 mL

Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Urine	Refrigerated (preferred)	28 days	
	Frozen	28 days	
	Ambient	72 hours	

Clinical & Interpretive

Clinical Information

Ethyl glucuronide and ethyl sulfate are minor metabolites of ethanol that are detectable in body fluids following alcohol consumption and, less commonly, following extraneous exposure. Ethyl glucuronide (EtG) and ethyl sulfate (EtS) are direct biomarkers or metabolites of ethanol. EtG and EtS can be detected up to 5 days in urine using a cutoff of 500 ng/mL.(1)

Chain of custody is a record of the disposition of a specimen to document each individual who collected, handled, and performed the analysis. When a specimen is submitted in this manner, analysis will be performed in such a way that it will withstand regular court scrutiny.

Reference Values

Negative
Cutoff concentrations: 500 ng/mL

Interpretation

A positive interpretation will be given if either the ethyl glucuronide result is greater than or equal to 250 ng/mL or the ethyl sulfate is greater than or equal to 100 ng/mL.

A "high" positive (ie, >1000 ng/mL) may indicate:
-Heavy drinking on the same day or previously (ie, previous day or 2)
-Light drinking the same day

A "low" positive (ie, 500-1000 ng/mL) may indicate:
-Previous heavy drinking (ie, previous 1-3 days)
-Recent light drinking (ie, past 24 hours)
-Recent intense "extraneous" exposure (ie, within 24 hours or less)

A "very low" positive (ie, 100-500 ng/mL) may indicate:
-Previous heavy drinking (ie, 1-3 days)
-Previous light drinking (ie, 12-36 hours)
-Recent "extraneous" exposure

Cautions

Incidental exposure to alcohol in many daily use products (ie, hand sanitizers, mouthwash) may result in detectable levels of ethyl glucuronide (EtG) and ethyl sulfate (EtS).

In addition, upper respiratory infections as well as beta-glucuronidase hydrolysis may lower levels of EtG but do not seem to affect EtS.(2)

EtG/EtS results should be interpreted in the context of all available clinical and behavioral information.

Clinical Reference

1. Reisfield GM, Goldberger BA, Crews BO, et al. Ethyl glucuronide, ethyl sulfate, and ethanol in urine after sustained exposure to an ethanol-based hand sanitizer. J Anal Toxicol. 2011;35(2):85-91. doi:10.1093/anatox/35.2.85
2. Substance Abuse and Mental Health Services Administration (SAMSHA) Advisory: The role of biomarkers in the treatment of alcohol use disorders, 2012 Revision. HHS; 2012;11(2):1-7. doi:10.1037/e558582006-001
3. 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 assay uses an ethyl glucuronide recombinant antibody. It is based on the competition of ethyl glucuronide labeled enzyme glucose-6-phosphate dehydrogenase (G6PD) and the free drug in the urine sample for the fixed amount of antibody binding sites. In the absence of the free drug in the sample, the antibody binds the drug enzyme conjugate and enzyme activity is inhibited. This creates a dose response relationship between drug concentration in the urine and enzyme activity. The enzyme G6PD activity is determined at 340 nm spectrophotometrically by the conversion of nicotinamide adenine dinucleotide (NAD[+] to NADH.(Package insert: ETG. Immunalysis; 03/2019)

The urine sample is diluted with internal standard in 0.1% formic acid for detection by tandem mass spectrometry.(Unpublished Mayo method)

PDF Report

No

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Day(s) Performed
Monday, Wednesday, Friday

Report Available
3 to 5 days

Specimen Retention Time
14 days

Performing Laboratory Location
Rochester

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
80307
80321
G0480 (if appropriate)

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
ETGX	Ethyl Glucuronide Conf, CoC, U	93705-2

Result ID	Test Result Name	Result LOINC® Value
36850	Ethyl Sulfate	58425-0
36853	ETG Immunoassay Screen	93706-0
63418	Ethyl Glucuronide	58378-1
36852	Chain of Custody	77202-0
36851	Ethyl Gluc/Sulfate Interpretation	59462-2