

Ethyl Glucuronide/Ethyl Sulfate (EtG/EtS) Alcohol Metabolite Testing

FREQUENTLY ASKED QUESTIONS

Why Redwood Toxicology Laboratory?

Redwood Toxicology Laboratory (RTL) is one of the largest, full-service, independent drug and alcohol testing laboratories in the United States. RTL utilizes state of the art screening and confirmation methodologies for urine and oral fluid drug testing and is trusted by over 7,000 clients.

RTL offers numerous advantages to your agency, including the following:

- Extensive experience in performing forensic toxicology analysis for alcohol and drugs of abuse,
- Highly qualified scientific staff,
- State of the art instrumentation for the detection of alcohol and drugs of abuse,
- Excellent client services, and;
- Extensive quality assurance and quality control procedures that help to ensure accurate results.

What is Ethyl Glucuronide?

Ethyl glucuronide (EtG) is a direct metabolite of alcohol (ethanol). Its presence in urine may be used to detect recent ethanol ingestion, even after ethanol is no longer measurable. The presence of EtG in urine is an indicator that ethanol was ingested.

What is Ethyl Sulfate?

In addition to EtG, recent scientific studies have identified ethyl sulfate (EtS) as a second specific metabolite or biomarker of ethanol. For this reason, RTL tests and reports EtS, in conjunction with EtG, to confirm recent ethanol ingestion or exposure. The detection of EtG and EtS offers greater sensitivity and accuracy for determination of recent ethanol ingestion, than by detection of either biomarker alone.

How will my agency benefit by choosing RTL's EtG/EtS test?

Key benefits of using RTL's EtG/EtS test include:

- Detects recent usage more accurately and for a longer period of time than standard testing
- Ideal for zero tolerance and abstinence situations
- Strong indicator of ethanol ingestion within the previous 3 to 4 days
- EtG/EtS is only evident when ethanol is ingested and is not produced as a result of fermentation
- Allows monitoring in alcohol treatment programs

- Acts as an early warning system to detect trends towards relapse
- Tests are performed by LC/MS/MS on state of the art equipment for accuracy and reliability
- Fast turn-around time from receipt of specimen (48 hours* negative, 72 hours positive)
- EtG/EtS may be run on urine specimens in conjunction with other RTL drug testing panels
- Results available via internet, fax and U.S. mail
- Toll-free customer support and training services
- Expert witness and affidavit services available

How long can EtG/EtS be detected in urine?

Traditional laboratory methods detect the actual ethanol in the body, which reflects current use within the past few hours (depending on how much is ingested). The presence of EtG/EtS in urine indicates that ethanol was ingested within the previous 3 to 4 days, or approximately 80 hours after ethanol has been ingested. Therefore, EtG/EtS is a more accurate indicator of the recent ingestion of ethanol than measuring for the presence of ethanol itself.

How accurate and reliable is the EtG/EtS test?

EtG/EtS are direct metabolites of alcohol (ethanol), and their detection in urine is highly specific, similar to testing for other drugs. Add to this, RTL utilizes the most sophisticated, sensitive, and specific equipment and technology available. After first screening for presumptive positives, we quantitatively confirm EtG/EtS by LC/MS/MS (liquid chromatography/mass spectrometry/mass spectrometry). This combination of separate screening and confirmation methods provides highly accurate alcohol biomarker test results. As is the case with any laboratory test, it is also very important to obtain clinical correlation.

How much does RTL's EtG/EtS test cost?

For information about EtG/EtS pricing, contact the RTL sales staff toll-free at (800) 255-2159. Tested on state of the art equipment, this affordable test allows for accurate and reliable results.

How do I sign up for EtG/EtS testing?

There are two easy ways to request EtG/EtS testing.

1. Contact RTL. If you are not already a client, contact RTL to set up your account. Let us know that you are interested in EtG/EtS and indicate any other drugs you would like to test. Call us toll-free at (800) 255-2159.

- Choose “EtG” on your specimen labels. If you are an RTL client, simply choose “647 ETG” on your specimen collection / chain of custody labels. This code is pre-printed for all clients.

Can residual EtG/EtS be detected in the urine of long-term alcoholics who abstain?

Studies indicate that alcoholics in abstinence have no detectable levels of EtG/EtS in their urine after approximately 80 hours of detoxification.

What about urine ethanol produced by fermentation?

EtG/EtS is only detected in urine when ethanol is ingested. This is important since it is possible to have alcohol in urine without drinking. Ethanol in urine without drinking is due to the production of ethanol in vitro. Ethanol in vitro is spontaneously produced in the bladder or the specimen container itself, due to fermentation of urine samples containing sugars (diabetes) and yeast or bacteria. Since the ethanol produced is not metabolized by the liver, EtG/EtS will not be produced and will therefore not be detected in a urine containing ethanol as a result of fermentation.

How stable is EtG/EtS in urine?

Studies show that EtG/EtS is stable in urine for more than 4 days at room temperature. Recent experiments indicate that heating urine to 100°C actually increased the stability of EtG/EtS. Therefore, heat does not cause the breakdown of EtG/EtS, it actually increases stability. In addition, no artificial formation of EtG/EtS was found to occur following the prolonged storage of urine at room temperature fortified with 1% ethanol. Presence of some bacteria in urine may affect the stability of EtG, but EtS is found to be stable even in the presence of bacteria.

In general, what methods are used to detect EtG?

What method does RTL use?

Methods to detect EtG/EtS include immunoassay (EIA or ELISA), gas chromatography/mass spectrometry (GC/MS), liquid chromatography/mass spectrometry (LC/MS), and liquid chromatography/mass spectrometry/mass spectrometry (LC/MS/MS). Immunoassay methods are of limited specificity however are an adequate screening method. GC/MS and LC/MS methods are much more specific than immunoassay, and offer detection limits of approximately 500 ng/mL.

LC/MS/MS methods utilize the most technologically advanced instrumentation currently available in forensic and clinical toxicology and provide the highest sensitivity. Redwood utilizes an LC/MS/MS instrument for the confirmation of EtG, which has a limit of detection below 100 ng/mL for each compound.

Why do EtG cut-off values vary at different labs?

Various cut-off levels (100, 250, 500, or 1000 ng/mL) are suggested for use in EtG testing. Any EtG level over 100 ng/mL and EtS level over

25 ng/mL indicates exposure to ethanol. In order to provide alcohol abstinence programs with the most clinically relevant answer to whether or not recent ethanol ingestion has occurred, using a 100 ng/mL cut-off for EtG and a 25 ng/mL cut-off for EtS detection is the best and most definitive test available to answer this question. RTL uses a 100 ng/mL EtG cut-off level and a 25 ng/mL EtS cut-off level.

EtG Cut-off	Abuse Episodes Detected
1000 ng/mL	~80 – 90%
500 ng/mL	~90%
250 ng/mL	~98%
100 ng/mL	~99%

Will the use of incidental alcohol, such as mouthwash and Over-the-Counter (OTC) cough syrups trigger a positive result?

Tests show that “incidental exposure” to the chronic use of food products (vanilla extract), hygiene products, mouthwash, or OTC medications (cough syrups), which contain ethanol, can produce EtG concentrations in excess of 100 ng/mL. However, if measurable ethanol is detected (>.04 gm %) in the urine, and EtG is detected in excess of 100 ng/mL and EtS is also detected in excess of 25 ng/mL, then this is very strong evidence that beverage alcohol was ingested.

Most alcohol abstinence programs require an agreement to avoid all products containing alcohol, including; mouthwash, Nyquil®, OTC medications, etc. Consumption of these products could produce a positive test for ethanol and/or EtG/EtS and would thus violate the agreement.

What does a positive EtG test above 100 ng/mL and an EtS above 25 ng/mL mean?

A positive EtG test above 100 ng/mL and an EtS above 25 ng/mL indicates recent ethanol ingestion. The only way you can have EtG/EtS in the urine is if ethanol is in your body. In addition, using a 100/25 ng/mL cut-off nearly doubles the time of detection of recent ethanol detection versus the use of a 250 ng/mL EtG cut-off. In summary, the 100/25 ng/mL EtG/EtS cut-off is superior for monitoring purposes, and provides the most sensitive and definitive indicator of recent ethanol ingestion.

How will RTL report my EtG/EtS results?

RTL offers reporting for EtG/EtS via internet (www.webtoxicology.com), U.S. mail or facsimile. Please indicate your preferred method at the time of account set-up.

How can I get more information on EtG/EtS testing?

For more information about EtG/EtS testing, contact the RTL sales staff toll-free at (800) 255-2159.



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