Alcohol Use Markers

Indications for Ordering

• Screening tests to rule out acute alcohol ingestion
• May be useful for general screening in the assessment of ethanol exposure in the contexts of compliance and/or abuse
• Aid in monitoring alcohol abstinence

Test Description

Ethyl Glucuronide Screen with Reflex to Confirmation, Urine
• Qualitative enzyme immunoassay/quantitative liquid chromatography-tandem mass spectrometry (LC-MS/MS)
• Positive screen result is confirmed by LC-MS/MS

Ethyl Glucuronide and Ethyl Sulfate Confirmation, Urine
• Quantitative LC-MS/MS

Tests to Consider

Primary Tests

Ethyl Glucuronide Screen with Reflex to Confirmation, Urine
2007912
• Screen with reflex testing is preferred method for ruling out ethanol exposure
• Identifies recent ethanol exposure within 1-4 days after ingestion
• Results do not accurately correlate with amount or frequency of ethanol use

Ethyl Glucuronide and Ethyl Sulfate, Urine, Quantitative
2007909
• May be useful in the assessment of ethanol exposure in the contexts of compliance and/or abuse
• Identifies recent ethanol exposure within 1-4 days after ingestion
• Results do not accurately correlate with amount or frequency of ethanol use

Related Tests

Tests for acute ethanol use
• Ethyl Glucuronide Screen Only, Urine 2012695
• Ethanol, Serum or Plasma – Medical 0090120
• Drugs of Abuse Test, Alcohol, Urine – Screen with Reflex to Confirmation/Quantitation 0092280
• Alcohols 0090131
• Alcohol, Urine, Quantitative 2010136

Tests for chronic ethanol use

• Carbohydrate Deficient Transferrin for Alcohol Use 0070412
  o Identify alcohol abuse or abuse relapse
  o Will detect chronic ethanol use (≥40 g/day for 2 weeks)
• Phosphatidylethanol (PEth) 2012130
  o Identify chronic heavy ethanol use for up to 28 days

Disease Overview

Clinical issues

• Acute ethanol intoxication beyond the first 24 hours is not reliably predicted by serum testing
• Ethyl glucuronide and ethyl sulfate
  o Direct metabolites of ethanol
  o Can be detected up to 80 hours in urine after ethanol ingestion
    ▪ Good marker of acute alcohol ingestion
    ▪ May be useful in short-term monitoring for abstinence
• Carbohydrate deficient transferrin (CDT)
  o Transferrin (plasma iron transport protein) contains 2 N-linked glycan chains that differ in their degree of branching, showing bi-, tri-, and tetra-antennary structures
    ▪ Each N-glycan chain branch terminates with a sialic acid molecule
  o The level of disialo-, monosialo-, and asialo-transferrin isoforms is normally low or undetectable
    ▪ Level of these CDTs is markedly increased by alcohol abuse
  o This test is most useful for long-term abstinence monitoring (up to 2 weeks)

Test Interpretation

Analytical sensitivity

Ethyl Glucuronide and Ethyl Sulfate Confirmation, Urine
• Limit of quantification is 100 ng/mL
Results
Ethyl Glucuronide Screen with Reflex to Confirmation, Urine
• Cutoff for positive screen is set at 500 ng/mL

Ethyl Glucuronide and Ethyl Sulfate Confirmation, Urine
• Reported as a concentration
• Analytical range is 100-10,000 ng/mL

Carbohydrate Deficient Transferrin
• Reported as percent
  o Result ≥1.7% supports alcohol use >40g/day
  o Result <1.4% does not support alcohol use >40g/day over the prior 2 weeks
  o Inconclusive – 1.4-1.6% reported as inconclusive

Limitations
Ethyl Glucuronide and Ethyl Sulfate Confirmation, Urine
• Incidental exposure from ethanol-containing products may be detected

Ethyl Glucuronide Screen with Reflex to Confirmation, Urine
• False positive results may be caused by microbial formation or fermentation, ethanol-containing products (eg, hand sanitizer, mouthwash)
• False negative results may be caused by bacterial degradation, >4 days since ethanol ingestion

Carbohydrate Deficient Transferrin
• Cannot be used in individuals suspected of having congenital glycosylation disorders
• Advanced liver damage (including severe chronic viral hepatitis) and antiepileptic drug therapy can increase CDT levels
• Interference in quantitation may be caused by
  o Severe icterus
  o Genetic variants of transferrin
  o Excess monoclonal or polyclonal immunoglobulins