Overview

Useful For
Confirming and monitoring ethylene glycol toxicity

Method Name
GasChromatography-FlameIonizationDetection(GC-FID)

NY State Available
Yes

Specimen

Specimen Type
Serum Red

Specimen Required
Container/Tube: Red top

Submission Container/Tube: Plastic vial

Specimen Volume: 2 mL

Collection Instructions:
1. Centrifuge and remove serum from red blood cells within 2 hours of draw.
2. Aliquot serum to submission container.

Forms
If not ordering electronically, complete, print, and send a Therapeutics Test Request (T831) with the specimen.

Specimen Minimum Volume
0.3 mL

Reject Due To

<table>
<thead>
<tr>
<th>Condition</th>
<th>Action</th>
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</thead>
<tbody>
<tr>
<td>Gross hemolysis</td>
<td>Reject</td>
</tr>
<tr>
<td>Gross lipemia</td>
<td>Reject</td>
</tr>
<tr>
<td>Gross icterus</td>
<td>Reject</td>
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</tbody>
</table>

Specimen Stability Information

<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
<th>Special Container</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum Red</td>
<td>Refrigerated (preferred)</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ambient</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frozen</td>
<td>14 days</td>
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Clinical and Interpretive

Clinical Information
Ethylene glycol, present in antifreeze products, may be ingested accidentally or for the purpose of inebriation or suicide. Ethylene glycol itself is relatively nontoxic, and its initial central nervous system (CNS) effects resemble those of ethanol. However, metabolism of ethylene glycol by alcohol dehydrogenase results in the formation of a number of acid metabolites, including oxalic acid and glycolic acid. These acid metabolites are responsible for much of the toxicity of ethylene glycol.

Three stages of ethylene glycol overdose occur. Within the first few hours after ingestion, there is transient excitation followed by CNS depression. After a delay of 4 to 12 hours, severe metabolic acidosis develops from accumulation of acid metabolites. Finally, delayed renal insufficiency follows deposition of oxalate in renal tubules.

Ethylene glycol toxicity is treated with 4-methylpyrazole (4-MP; fomepizole) or ethanol to saturate the enzyme alcohol dehydrogenase and prevent conversion of ethylene glycol to its toxic metabolites.

Reference Values
Toxic concentration: > or =20 mg/dL

Interpretation
Toxic concentrations greater than or equal to 20 mg/dL may cause intoxication, central nervous system (CNS) depression, metabolic acidosis, renal damage and hypocalcemia. Ingestion of ethylene glycol can be fatal if patients do not receive immediate medical treatment.

Cautions
Propionic acid produced in the rare inborn error of metabolism methylmalonic acidemia may be confused with ethylene glycol in the gas chromatographic assay.

Clinical Reference


Performance

Method Description
Ethylene glycol is quantitated in serum by precipitating serum protein with methanol. The supernatant and analyzed by gas chromatography with flame ionization detection.(Unpublished Mayo method)

PDF Report
No
Day(s) and Time(s) Test Performed
Monday through Sunday; Varies

Analytic Time
1 day

Maximum Laboratory Time
2 days

Specimen Retention Time
2 weeks

Performing Laboratory Location
Rochester

Fees and 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 Regional Manager. 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. This test has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Code Information
80320
G0480 (if appropriate)

LOINC® Information

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<th>Test Order Name</th>
<th>Order LOINC Value</th>
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<tr>
<td>ETGL</td>
<td>Ethylene Glycol, S</td>
<td>5646-5</td>
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<table>
<thead>
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<tbody>
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<td>8749</td>
<td>Ethylene Glycol, S</td>
<td>5646-5</td>
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