Overview

Useful For
Monitoring compliance of benzodiazepines such as alprazolam, flunitrazepam, chlordiazepoxide, diazepam, flurazepam, lorazepam, and triazolam

Method Name
Gas Chromatography-Mass Spectrometry (GC-MS) Confirmation with Quantitation

NY State Available
Yes

Specimen

Specimen Type
Urine

Advisory Information
1. For situations where chain of custody is required, a Chain-of-Custody Kit (T282) is available. For chain-of-custody testing, order BENZX / Benzodiazepines Confirmation, Chain of Custody, Random, Urine.

2. Additional drug panels and specific requests are available. Call 800-533-1710 or 507-266-5700.

3. If urine creatinine is required or adulteration of the sample is suspected, order ADULT / Adulterants Survey, Random, Urine.

Specimen Required
Supplies: Urine Tubes, 10 mL (T068)

Container/Tube: Plastic, 10-mL urine tube

Specimen Volume: 10 mL

Collection Instructions:
1. Collect a random urine specimen.
2. No preservative.

Additional Information:
1. No specimen substitutions.

2. STATS are not accepted for this test.

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

Specimen Minimum Volume
Test Definition: BENZU
Benzodiazepines Confirmation, U

5 mL

Reject Due To

<table>
<thead>
<tr>
<th>Gross hemolysis</th>
<th>OK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross icterus</td>
<td>OK</td>
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</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>Urine</td>
<td>Refrigerated (preferred)</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frozen</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ambient</td>
<td>72 hours</td>
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Clinical and Interpretive

Clinical Information
Benzodiazepines are any of a group of compounds having a common molecular structure and acting similarly as depressants of the central nervous system. As a class of drugs, benzodiazepines are among the most commonly prescribed drugs in the western hemisphere because of their efficacy, safety, low addiction potential, minimal side effects, and high public demand for sedative and anxiolytic agents.

Reference Values
Negative

Cutoff concentrations:

Nordiazepam by GC-MS
<100 ng/mL

Oxazepam by GC-MS
<100 ng/mL

Lorazepam by GC-MS
<100 ng/mL

Temazepam by GC-MS
<100 ng/mL

OH-ethyl-flurazepam by GC-MS
<100 ng/mL
Test Definition: BENZU
Benzodiazepines Confirmation, U

7-NH-clonazepam by GC-MS
<100 ng/mL

Alpha-OH-alprazolam by GC-MS
<100 ng/mL

7-NH-flunitrazepam by GC-MS
<50 ng/mL

Alpha-OH-triazolam by GC-MS
<100 ng/mL

**Interpretation**

Benzodiazepines are extensively metabolized, and the parent compounds are not detected in urine. This test screens for (and confirms) the presence of:

- Nordiazepam, oxazepam (metabolites of chlordiazepoxide)
- Nordiazepam, oxazepam and temazepam (metabolites of diazepam)
- Lorazepam
- Hydroxyethylfluorazepam (metabolite of flurazepam)
- Alpha hydroxyalprazolam (metabolite of alprazolam)
- Alpha hydroxytriazolam (metabolite of triazolam)
- 7-aminoclonazepam (metabolite of clonazepam)
- 7-aminoflunitrazepam (metabolite of flunitrazepam)

The clearance half-life of long-acting benzodiazepines is more than 24 hours. It takes 5 to 7 half-lives to clear 98% of a drug dose. Therefore, the presence of a long-acting benzodiazepine greater than the limit of quantification indicates exposure within a 5 to 20-day interval preceding specimen collection. Following a dose of diazepam, the drug and its metabolites appear in the urine within 30 minutes. Peak urine output is reached between 1 and 8 hours. See Mayo Clinic Laboratories Drugs of Abuse Testing Guide for additional information including metabolism, clearance (half-life), and approximate detection times.

**Cautions**

No significant cautionary statements

**Clinical Reference**


832-887


### Method Description

Benzodiazepines are extracted using a solid-phase extraction procedure and then analyzed by gas chromatography/mass spectrometry. (Unpublished Mayo method)

### PDF Report

No

### Day(s) and Time(s) Test Performed

Monday through Friday; Varies

### Analytic Time

3 days

### Maximum Laboratory Time

6 days

### Specimen Retention Time

14 days

### 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

80346

G0480 (if appropriate)

### LOINC® Information

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<th>Test Order Name</th>
<th>Order LOINC Value</th>
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### Test Definition: BENZU
Benzodiazepines Confirmation, U

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