Overview

Useful For
Monitoring of compliance utilizing buprenorphine
Detection and confirmation of the illicit use of buprenorphine

Highlights
Detection of buprenorphine and norbuprenorphine in urine for compliance testing.

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

NY State Available
Yes

Specimen

Specimen Type
Urine

Advisory Information
For screening buprenorphine alone, order BUPS / Buprenorphine Screen, Random, Urine immunoassay.

For comprehensive opioid screening, order TOPSU / Targeted Opioid Screen, Random, Urine.

For situations where chain of custody is required, a Chain of Custody Kit (T282) is available. For chain-of-custody testing, order BUPMX / Buprenorphine and Norbuprenorphine, Chain of Custody, Random, Urine.

Additional Testing Requirements
If urine creatinine is required or adulteration of the sample is suspected, the following test should be requested, ADULT / Adulterants Survey, Random, Urine. For additional information, refer to ADULT / Adulterants Survey, Random, Urine.

Specimen Required

Supplies: Aliquot Tube, 5 mL (T465)

Collection Container/Tube: Plastic urine container

Submission Container/Tube: Aliquot tube, 5 mL

Specimen Volume: 5 mL

Collection Instructions:

1. No preservative.
2. If submitting for multiple tests on 1 order, submit 5 mL per test ordered in a single plastic urine container.
Forms
If not ordering electronically, complete, print, and send a Therapeutics Test Request (T831) with the specimen.

Specimen Minimum Volume
1 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>
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<tbody>
<tr>
<td>Urine</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
Clinically, buprenorphine is utilized as a substitution therapy for opioid dependence and as an analgesic. Buprenorphine is a partial agonist of the mu-opioid receptor. These mu binding sites are discretely distributed in the human brain, spinal cord, and other tissue. The clinical effects of mu receptor agonists are sedation, euphoria, respiratory depression, and analgesia. As a partial mu receptor agonist, buprenorphine's clinical effects are decreased, giving buprenorphine a wider safety margin.(1) Buprenorphine has a prolonged duration of activity. The combination of decreased clinical effects and prolonged activity gives buprenorphine the added advantage of a delayed and decreased withdrawal syndrome, compared to other opioids.(1) Compared to morphine, buprenorphine is 25 to 40 times more potent.(1) As with any opioid, abuse is always a concern. To reduce illicit use of buprenorphine, it is available mixed with naloxone in a ratio of 4:1. When the combination is taken as prescribed, only small amounts of naloxone will be absorbed. However, if the combination is transformed into the injectable form, naloxone then acts as an opioid receptor antagonist.

Buprenorphine is metabolized through N-dealkylation to norbuprenorphine through cytochrome P450 3A4. Both parent and metabolite then undergo glucuronidation. Norbuprenorphine is an active metabolite possessing one-fifth of the potency of its parent. The glucuronide metabolites are inactive.(1)

The primary clinical utility of quantification of buprenorphine in urine is to identify patients that have strayed from opioid dependence therapy.

Reference Values
Negative

Cutoff concentrations:
Buprenorphine: 5.0 ng/mL
Norbuprenorphine: 2.5 ng/mL

**Interpretation**
The presence of buprenorphine above 5.0 ng/mL or norbuprenorphine above 2.5 ng/mL is a strong indicator that the patient has used buprenorphine.

**Cautions**
Urine concentrations do not correlate well with serum drug levels and are not intended for therapeutic drug management.

**Clinical Reference**

**Performance**

**Method Description**
Buprenorphine and its major metabolite (norbuprenorphine) are liberated from conjugation by enzyme hydrolysis. Acetonitrile is added to the sample and an aliquot of the supernatant is diluted with water. Analysis is performed by liquid chromatography-mass spectrometry/mass spectrometry using multiple reaction monitoring.(Unpublished Mayo method)

**PDF Report**
No

**Day(s) and Time(s) Test Performed**
Monday, Wednesday, Friday

**Analytic Time**
3 days

**Maximum Laboratory Time**
5 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
80348
G0480 (if appropriate)

LOINC® Information

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<th>Order LOINC Value</th>
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<td>BUPM</td>
<td>Buprenorphine and Metabolite, U</td>
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<table>
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<tr>
<td>48296</td>
<td>Norbuprenorphine</td>
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