Overview

Useful For
Determination of heroin use

Method Name
Gas Chromatography-Mass Spectrometry (GC-MS)

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 6MAMX / 6-Monoacetylmorphine, Chain of Custody, Random, Urine.

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

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

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

2.1 mL
Test Definition: 6MAMU
6-MAM Confirmation, U

Reject Due To

<table>
<thead>
<tr>
<th>Condition</th>
<th>Result</th>
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</thead>
<tbody>
<tr>
<td>Gross hemolysis</td>
<td>OK</td>
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<tr>
<td>Gross icterus</td>
<td>OK</td>
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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>Frozen</td>
<td>14 days</td>
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</tr>
<tr>
<td></td>
<td>Ambient</td>
<td>72 hours</td>
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Clinical and Interpretive

Clinical Information

Heroin (diacetylmorphine) is a semisynthetic opiate that is closely related to morphine. It is no longer used clinically in the United States, though elsewhere it is used for rapid relief of pain.(1) Like morphine and other opiates, its relaxing and euphoric qualities make heroin a popular drug of abuse. Heroin is commonly injected intravenously, although it can be administered by other means such as snorting, smoking, or inhaling vapors.

Heroin shares the core structure of morphine, with the addition of 2 acetyl groups, which are thought to enhance its permeation into the central nervous system.(2,3) Heroin is metabolized by sequential removal of these acetyl groups; loss of first acetyl group converts heroin into 6-monoacetylmorphine (6-MAM) and loss of the second acetyl group converts 6-MAM to morphine, the dominant metabolite of heroin.(2,3) Heroin is rarely found intact in urine, since only 0.1% of a dose is excreted unchanged. 6-MAM is a unique metabolite of heroin, and its presence is a definitive indication of recent heroin use. Like heroin, 6-MAM has a very short half-life and detection window.

Reference Values

Negative

Cutoff concentrations:

6-MAM

<5 ng/mL

Interpretation

The presence of 6-monoacetylmorphine (6-MAM) in urine is definitive for recent heroin use. However, the absence of 6-MAM does not rule-out heroin use because of its short half-life. 6-MAM is typically only detectable within 24 hours of heroin use. 6-MAM is further metabolized into morphine, which may be detected 1 to 2 days after 6-MAM is no longer measurable. Morphine will typically be found in a specimen containing 6-MAM.(2,3)

Cautions

While 6-monoacetylmorphine (6-MAM) is metabolized to morphine, the presence of morphine alone is not sufficient evidence to prove heroin use. 6-MAM is the only definitive metabolite of heroin.
Clinical Reference


Performance

Method Description

6-Monoacetylmorphine is extracted using solid phase extraction techniques. The eluent is evaporated, reconstituted in organic solvent, and then derivatized. It is then analyzed by gas chromatography-mass spectrometry using selected ion monitoring. (Unpublished Mayo method)

PDF Report

No

Day(s) and Time(s) Test Performed

Tuesday

Analytic Time

2 days

Maximum Laboratory Time

6 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

80356

G0480 (if appropriate)

### LOINC® Information

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<th>Test Order Name</th>
<th>Order LOINC Value</th>
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<td>6-MAM Confirmation, U</td>
<td>19593-3</td>
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<tr>
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<th>Test Result Name</th>
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<td>29898</td>
<td>6-MAM Interpretation</td>
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