Overview

Useful For
Determination of heroin use in urine specimens handled through the chain-of-custody process

Additional Tests

<table>
<thead>
<tr>
<th>Test ID</th>
<th>Reporting Name</th>
<th>Available Separately</th>
<th>Always Performed</th>
</tr>
</thead>
<tbody>
<tr>
<td>COCH</td>
<td>Chain of Custody Processing</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>ADLTX</td>
<td>Adulterants Survey, CoC, U</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Testing Algorithm
Testing for adulterants will be performed on all chain of custody urine samples per regulatory requirements.

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

NY State Available
Yes

Specimen

Specimen Type
Urine

Advisory Information
This test is for situations that require the chain-of-custody process. For testing not requiring chain of custody, order 6MAMU / 6-Monoacetylmorphine Confirmation, Random, Urine.

Specimen Required
Supplies: Chain of Custody Kit (T282)

Container/Tube: Chain-of-Custody Kit containing the specimen containers, seals, and documentation required.

Specimen Volume: 10 mL

Collection Instructions: Collect specimen in the container provided, seal, and submit with the associated documentation to satisfy the legal requirements for chain-of-custody testing.

Forms
1. Chain-of-Custody Request is included in the Chain-of-Custody Kit (T282).

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

Specimen Minimum Volume
2.1 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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</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>
<td></td>
</tr>
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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.

Chain of custody is required whenever the results of testing could be used in a court of law. Its purpose is to protect the rights of the individual contributing the specimen by demonstrating that it was under the control of personnel involved with testing the specimen at all times; this control implies that the opportunity for specimen tampering would be limited. This includes a record of the disposition of a specimen to document the personnel who collected it, who handled it, and who performed the analysis. When a specimen is submitted in this manner, analysis will be performed in such a way that it will withstand regular court scrutiny.

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
Test Definition: 6MAMX
6-MAM Confirmation, CoC, U

- 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>6MAMX</td>
<td>6-MAM Confirmation, CoC, U</td>
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<td>6-Monoacetylmorphine by GC/MS</td>
<td>19593-3</td>
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<tr>
<td>36119</td>
<td>6-MAM Interpretation</td>
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<td>Chain of Custody</td>
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