Overview

Useful For
Detection of in utero exposure to amphetamine-type stimulants up to 5 months before birth

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

NY State Available
Yes

Specimen

Specimen Type
Meconium

Advisory Information
For chain-of-custody testing, order AMPMX / Amphetamine-Type Stimulants Confirmation, Chain of Custody, Meconium.

Specimen Required
Supplies: Stool container. Small (Random), 4 oz (T288)

Container/Tube: Stool container (T288)

Specimen Volume: 1 g (approximately 1 teaspoon)

Collection Instructions: Collect entire random meconium specimen.

Specimen Minimum Volume
0.3 g (approximately 1/4 teaspoon)

Reject Due To

| Other       | Grossly bloody reject, Pink OK; stool, diapers |

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>Meconium</td>
<td>Frozen (preferred)</td>
<td>28 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ambient</td>
<td>28 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Refrigerated</td>
<td>28 days</td>
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Clinical and Interprete
Clinical Information

Several stimulants and hallucinogens chemically related to phenylethylamine are referred to collectively as the amphetamine-type stimulants (amphetamines). Generally, this refers to the prescription and illicit amphetamines including amphetamine; methamphetamine; 3,4-methylenedioxyamphetamine (MDMA, Ecstasy); 3,4-methylenedioxymethamphetamine (MDA); and 3,4-methylenedioxyethylamphetamine (MDEA). Methamphetamine has become a drug of choice among stimulant abusers because of its availability and ease to synthesize.

The metabolism of amphetamine consists of hydroxylation and deamination followed by conjugation with glucuronic acid. Methamphetamine is metabolized to amphetamine; both should be present in urine after methamphetamine use. Both MDMA and MDEA are metabolized to MDA.

The disposition of drug in meconium is not well understood. The proposed mechanism is that the fetus excretes drug into bile and amniotic fluid. Drug accumulates in meconium either by direct deposit from bile or through swallowing of amniotic fluid. The first evidence of meconium in the fetal intestine appears at approximately the tenth to twelfth week of gestation, and slowly moves into the colon by the sixteenth week of gestation. Therefore, the presence of drugs in meconium has been proposed to be indicative of in utero drug exposure during the final 4 to 5 months of pregnancy, a longer historical measure than is possible by urinalysis.

Intrauterine drug exposure to amphetamines has been associated with maternal abruption, prematurity, and decreased growth parameters such as low-birth weight. Some intrauterine amphetamine-exposed infants may develop hypertonia, tremors, and poor feeding and abnormal sleep patterns.

Reference Values

Negative

Positives are reported with a quantitative LC-MS/MS result.

Cutoff concentrations:

AMPHETAMINE BY LC-MS/MS
50 ng/g

METHAMPHETAMINE BY LC-MS/MS
50 ng/g

3,4-METHYLENEDIOXYAMPHETAMINE BY LC-MS/MS
50 ng/g

3,4-METHYLENEDIOXYMETHAMPHETAMINE BY LC-MS/MS
50 ng/g

3,4-METHYLENEDIOXYMETHAMPHETAMINE BY LC-MS/MS
50 ng/g

Interpretation

The presence of any 1 of the following: amphetamine; methamphetamine; 3,4-methylenedioxyamphetamine;
3,4-methylenedioxymethamphetamine; or 3,4-methylenedioxyethylamphetamine at greater than 50 ng/g is indicative of in utero exposure up to 5 months before birth.

Cautions
No significant cautionary statements.

Clinical Reference
1. Disposition of Toxic Drugs and Chemical in Man. Edited by RC Baselt. Foster City, CA, Biochemical Publications, 2008 pp 83-86; 947-952; 993-999


Performance

Method Description
Meconium is mixed with internal standard and broken down with acetic acid. The sample is then extracted with methanol and further processed by solid-phase extraction. The extract is analyzed by liquid chromatography-tandem mass spectrometry. (Pichini S, Pacifici R, Pellegrini M, et al: Development and validation of a high-performance liquid chromatography-mass spectrometry assay for determination of amphetamine, methamphetamine, and methylenedioxy derivatives in meconium. Anal Chem 2004;76:2124-2132)

PDF Report
No

Day(s) and Time(s) Test Performed
Monday through Sunday; Varies

Analytic 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
80324
80359
G0480 (if appropriate)

LOINC® Information

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<th>Test Order Name</th>
<th>Order LOINC Value</th>
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