Overview

Useful For
Detection of in utero drug exposure to marijuana (tetrahydrocannabinol) 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 THCMX / 11-nor-Delta-9-Tetrahydrocannabinol-9-Carboxylic Acid (Carboxy-THC) Confirmation, Chain of Custody, Meconium.

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

Container/Tube: Stool container

Specimen Volume: 1 g (approximately 1 teaspoon)

Collection Instructions: Collect entire random meconium specimen.

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

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

Reject Due To

<table>
<thead>
<tr>
<th>Grossly bloody</th>
<th>Reject; Pink OK</th>
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<tbody>
<tr>
<td>Stool Diapers</td>
<td>Reject</td>
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Specimen Stability Information

<table>
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<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
<th>Special Container</th>
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<tbody>
<tr>
<td>Meconium</td>
<td>Frozen (preferred)</td>
<td>28 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Refrigerated</td>
<td>21 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ambient</td>
<td>14 days</td>
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Clinical and Interpretive

Clinical Information

Marijuana and other psychoactive products obtained from the plant Cannabis sativa are the most widely used illicit drugs in the world. Marijuana has unique behavioral effects that include feelings of euphoria and relaxation, altered time perception, impaired learning and memory, lack of concentration, and mood changes (eg, panic reactions and paranoia).

Cannabis sativa produces numerous compounds collectively known as cannabinoids including delta-9-tetrahydrocannabinol (THC), which is the most prevalent and produces most of the characteristic pharmacological effects of smoked marijuana. THC undergoes rapid hydroxylation by the cytochrome (CYP) enzyme system to form the active metabolite 11-hydroxy-THC. Subsequent oxidation of 11-hydroxy-THC produces the inactive metabolite 11-nor-delta-9-tetrahydrocannabinol-9-carboxylic acid (THC-COOH; carboxy-THC). THC-COOH and its glucuronide conjugate have been identified as the major end-products of metabolism. THC is highly lipid soluble, resulting in its concentration and prolonged retention in fat tissue.

Cannabinoids cross the placenta, but a dose-response relationship or correlation has not been established between the amount of marijuana use in pregnancy and the levels of cannabinoids found in meconium, the first fecal matter passed by the neonate. 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 deposition from bile or through swallowing 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.

Reference Values

Negative

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

Cutoff concentrations

Tetrahydrocannabinol carboxylic acid (marijuana metabolite) by LC-MS/MS: 10 ng/g

Interpretation

The presence of 11-nor-delta-9-tetrahydrocannabinol-9-carboxylic acid at 10 ng/g or greater is indicative of in utero drug exposure up to 5 months before birth.

Cautions

No significant cautionary statements.

Clinical Reference


**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. (Unpublished Mayo method)

**PDF Report**

No

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

Monday through Sunday

**Analytic Time**

2 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**

80349

G0480 (if appropriate)

**LOINC® Information**
### Test Definition: THCM

Carboxy-THC Confirmation, M

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