Test Definition: AMPHM

Amphetamine-Type Stimulants Confirmation, Meconium

Overview

Useful For

Detecting in utero exposure to amphetamine-type stimulants up to 5 months before birth

Special Instructions

- Clinical Toxicology CPT Code Client Guidance

Method Name

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

NY State Available

Yes

Specimen

Specimen Type

Meconium

Ordering Guidance

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
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

Grossly bloody	Reject; Pink OK
Stool Diapers	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Meconium	Frozen (preferred)	28 days	
	Ambient	28 days	
	Refrigerated	28 days	

Clinical & Interpretive

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-methylenedioxymethamphetamine (MDMA, Ecstasy); 3,4-methylenedioxyamphetamine (MDA); and 3,4-methylenedioxyethylamphetamine (MDEA).(1) Methamphetamine has become a drug of choice among stimulant abusers because of its availability and ease of production.

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.(1)

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.(2) 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.(3) 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.(2)

Intrauterine drug exposure to amphetamines has been associated with maternal abruption, prematurity, and decreased growth parameters, such as low birthweight.(4) Some intrauterine amphetamine-exposed infants may develop hypertonia, tremors, and poor feeding and abnormal sleep patterns.(5)

Reference Values

Negative

Positives are reported with a quantitative liquid chromatography tandem mass spectrometry (LC-MS/MS) result.

Cutoff concentrations for LC-MS/MS testing:
Amphetamine: 20 ng/g
Methamphetamine: 20 ng/g
3,4-Methylenedioxyamphetamine: 20 ng/g
3,4-Methylenedioxyethylamphetamine: 20 ng/g
3,4-Methylenedioxymethamphetamine: 20 ng/g

Interpretation

The presence of any of the following: amphetamine; methamphetamine; 3,4-methylenedioxyamphetamine; 3,4-methylenedioxymethamphetamine; or 3,4-methylenedioxyethylamphetamine at greater than 20 ng/g is indicative of in utero exposure up to 5 months before birth.

Cautions

No significant cautionary statements

Clinical Reference

1. Baselt RC. Disposition of Toxic Drugs and Chemical in Man. 12th ed. Biomedical Publications; 2020
2. Ostrea EM Jr, Brady MJ, Parks PM, Asensio DC, Naluz. Drug screening of meconium in infants of drug-dependent mothers: an alternative to urine testing. J Pediatr. 1989;115(3):474-477
3. Ahanya SN, Lakshmanan J, Morgan BL, Ross MG. Meconium passage in utero: mechanisms, consequences, and management. Obstet Gynecol Surv. 2005;60(1):45-56
4. Kwong TC, Ryan RM. Detection of intrauterine illicit drug exposure by newborn drug testing. National Academy of Clinical Biochemistry. Clin Chem. 1997;43(1):235-242
5. Dixon SD. Effects of transplacental exposure to cocaine and methamphetamine on the neonate. West J Med. 1989;150(4):436-442
6. Langman LJ, Bechtel LK, Holstege CP. Clinical toxicology. In: Rifai N, Chiu RWK, Young I, Burnham CD, Wittwer CT, eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023:chap 43

Performance

Method Description

Meconium is mixed with internal standard and extracted with methanol. The methanolic extract is further processed by solid phase extraction. The extract is analyzed by liquid chromatography tandem mass spectroscopy.(Unpublished Mayo method)

PDF Report

No

Day(s) Performed

Monday through Sunday

Report Available

2 to 3 days

Specimen Retention Time

2 weeks

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Superior Drive

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Fees & 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 account representative. 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. It has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

G0480
80324 (if appropriate for select payers)
80359 (if appropriate for select payers)
Clinical Toxicology CPT Code Client Guidance

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
AMPHM	Amphetamines, Confirmation, M	69021-4

Result ID	Test Result Name	Result LOINC® Value
31854	Amphetamine	43934-9
31855	Methamphetamine	69022-2
31856	3,4-methylenedioxyamphetamine	69023-0
31858	3,4-methylenedioxyethylamphetamine	69024-8
31857	3,4-methylenedioxymethamphetamine	69025-5
31882	Interpretation	69050-3
31883	Chain of Custody	77202-0