

Overview

Useful For

Identifying amphetamines (and methamphetamines), opiates, as well as metabolites of cocaine and marijuana in meconium specimen

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. Since the evidence of illicit drug use during pregnancy can be cause for separating the baby from the mother, a complete chain of custody ensures that the test results are appropriate for legal proceedings.

Reflex Tests

Test Id	Reporting Name	Available Separately	Always Performed
COKMX	Cocaine and metabolite Conf, CoC, M	Yes	No
OPTMX	Opiate Confirmation, CoC, M	Yes	No
THCMX	Carboxy-THC Confirmation, CoC, M	Yes	No
AMPMX	Amphetamines Confirmation, CoC, M	Yes	No

Additional Tests

Test Id	Reporting Name	Available Separately	Always Performed
COCH	Chain of Custody Processing	No	Yes

Testing Algorithm

Testing begins with immunoassay screen. Positives are confirmed and quantitated by liquid chromatography tandem mass spectrometry at an additional charge.

Method Name

Enzyme-Linked Immunosorbent Assay (ELISA)

NY State Available

Yes

Specimen

Specimen Type

Meconium

Specimen Required

Container/Tube: Chain of Custody Meconium Kit (T653) includes the specimen containers, seals, and documentation required

Specimen Volume: 1 g (approximately 1 teaspoon)

Collection Instructions: Collect entire random meconium specimen.

Additional Information:

1. Specimen that arrives with a broken seal does not meet the chain-of-custody requirements.
2. The laboratory recommends sending chain-of-custody specimens by overnight shipment.

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

0.45 g (approximately 0.5 teaspoon)

Reject Due To

Grossly bloody	Reject, Pink OK
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Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Meconium	Frozen (preferred)	14 days	
	Refrigerated	24 hours	

Clinical & Interpretive

Clinical Information

Illicit drug use during pregnancy is a major social and medical issue. Drug abuse during pregnancy is associated with significant perinatal complications, which include a high incidence of stillbirths, meconium-stained fluid, premature rupture of the membranes, maternal hemorrhage (abruption placenta or placenta praevia), and fetal distress.(1) In the neonate, the mortality rate, as well as morbidity (eg, asphyxia, prematurity, low birthweight, hyaline membrane distress, infections, aspiration pneumonia, cerebral infarction, abnormal heart rate and breathing problems, and drug withdrawal) are increased.(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 10th to 12th week of gestation and slowly moves into the colon by the 16th week of gestation.(3) Therefore, the presence of drugs in meconium has been proposed to be indicative of in utero drug exposure up to 5 months before birth, a longer historical measure than is possible by urinalysis.(2)

Chain of custody is a record of the disposition of a specimen to document each individual who collected, handled, and 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

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

Cutoff concentrations by enzyme-linked immunosorbent assay:

Amphetamines : 100 ng/g

Methamphetamine: 100 ng/g

Benzoylcegonine (cocaine metabolite): 100 ng/g

Opiates by ELISA: 100 ng/g

Tetrahydrocannabinol carboxylic acid (marijuana metabolite): 20 ng/g

Interpretation

The limit of quantitation varies for each of these drug groups.

-Amphetamines: >100 ng/g

-Methamphetamines: >100 ng/g

-Cocaine and metabolite: >100 ng/g

-Opiates: >100 ng/g

-Tetrahydrocannabinol carboxylic acid: >20 ng/g

Cautions

No significant cautionary statements

Clinical Reference

1. Ostrea EM Jr: Understanding drug testing in the neonate and the role of meconium analysis. *J Perinat Neonatal Nurs.* 2001 Mar;14(4):61-82; quiz 105-106
2. Ostrea EM Jr, Brady MJ, Parks PM, et al: Drug screening of meconium in infants of drug-dependent mothers: an alternative to urine testing. *J Pediatr.* 1989 Sep;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 Jan;60(1):45-56; quiz 73-74
4. Langman LJ Bechtel LK, Meier BM, Holstege C: Clinical toxicology. In: Rifai N, Horvath AR, Wittwer CT, eds. *Tietz Textbook of Clinical Chemistry and Molecular Diagnostics.* 6th ed. Elsevier; 2018:832-887

Performance**Method Description**

Meconium specimen is homogenized in a buffer. The homogenate is analyzed by enzyme-linked immunosorbent assay (ELISA) to detect the presence of drug. If drug presence is indicated by a positive result of ELISA, liquid chromatography tandem mass spectrometry analysis is performed to verify the presence of the drug. (Unpublished Mayo method)

PDF Report

No

Day(s) Performed

Monday through Saturday

Report Available

1 to 2 days

Specimen Retention Time

2 weeks

Performing Laboratory Location

Rochester

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. This test has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

80307

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
DSM4X	Drugs of Abuse Screen 4, CoC, M	49046-6

Result ID	Test Result Name	Result LOINC® Value
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36172	Amphetamine	26959-7
36173	Methamphetamine	27289-8
36174	Cocaine	26956-3
36175	Opiate	29158-3
36176	Tetrahydrocannabinol	26893-8
36177	Chain of Custody	77202-0