MAYO CLINIC LABORATORIES

Test Definition: PCPMC

Phencyclidine (PCP) Confirmation, Meconium

Overview

Useful For

Detection of in utero to phencyclidine (PCP) exposure up to 5 months before birth

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 PCPMX / Phencyclidine (PCP) 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-colored specimen	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

Phencyclidine (PCP) was originally developed as an anesthetic in the 1950s but later was abandoned because of a high frequency of postoperative delirium with hallucinations. It was classed as a dissociative anesthetic because, in the anesthetized state, the patient remains conscious with staring gaze, flat facies, and rigid muscles.(1) PCP binds with high affinity to sites located in the cortex and limbic structures, resulting in blocking of N-methyl-D-aspartate (NMDA)-type glutamate receptors.(1) PCP became a drug of abuse in the 1970s because of its hallucinogenic effects.(1,2)

PCP is approximately 65% protein bound and has a volume of distribution of 5.3 to 7.5 L/kg. The drug is metabolized by the liver via oxidative hydroxylation and has a dose-dependent half-life ranging from 7 to 46 hours.(2)

Meconium is the first fecal material passed by the neonate. Meconium forms in the first trimester of pregnancy but is seldom excreted before the 34th week. It is composed of approximately 70% water, bile acids, cholesterol, squamous cells, protein and drug metabolites, and no bacteria are normally present. Prebirth excretion of meconium is a sign of fetal distress.

Because drugs and metabolites can accumulate in meconium, assessment of meconium for the presence of illicit drugs can be an indicator of maternal drug use during pregnancy. Illicit drug use during pregnancy can have a profound effect on fetal development.

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.(3) 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.(4) 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.(3)

Reference Values

Negative
Positives are reported with a quantitative liquid chromatography tandem mass spectrometry result.
Cutoff concentration: 5 ng/g

Interpretation

The presence of phencyclidine (PCP) in meconium is indicative of in utero drug exposure up to 5 months before birth.

Cautions

No significant cautionary statements.

Clinical Reference

1. O'Brien CP. Drug addiction and drug abuse. In: Brunton LL, Lazo JS, Parker KL, eds. Goodman and Gilman's the Pharmacological Basis of Therapeutics. 11th ed. McGraw-Hill Book Company; 2006
2. Baselt RC. Phencyclidine. In: Baselt RC, ed. Disposition of Toxic Drugs and Chemicals in Man. 10th ed. Biomedical Publications; 2014
3. Ostrea EM Jr, Brady MJ, Parks PM, Asensio DC, Naluz A. Drug screening of meconium in infants of drug-dependent mothers: an alternative to urine testing. J Pediatr. 1989;115(3):474-477
4. Ahanya SN, Lakshmanan J, Morgan BL, Ross MG. Meconium passage in utero mechanisms, consequences, and management. Obstet Gynecol Surv. 2005;60(1):45-56; quiz 73-74
5. Langman LJ, Bechtel LK, Holstege CP. Clinical toxicology. In: Rifai N, Chiu RWK, Young I, Burnham C-AD, Wittwer CT, eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023:chap 43
6. Langman LJ, Rushton AM, Thomas D, et al. Drug testing in support of the diagnosis of neonatal abstinence syndrome: The current situation. Clin Biochem. 2023;111:1-10. doi:10.1016/j.clinbiochem.2022.11.002

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
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 Definition: PCPMC

Phencyclidine (PCP) Confirmation, Meconium

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

83992

G0480 (if appropriate)

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
PCPMC	PCP Confirmation, Meconium	92816-8

Result ID	Test Result Name	Result LOINC® Value
89069	PCP Confirmation, Meconium	92816-8
29905	Interpretation	69050-3