MAYO CLINIC LABORATORIES

# Test Definition: PCPMX

Phencyclidine Confirmation, CoC, M

## Overview

### Useful For

Detection of in utero drug exposure up to 5 months before birth

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.

### Additional Tests

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

### NY State Available

Yes

## Specimen

### Specimen Type

Meconium

### Specimen Required

**Supplies:** 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 Meconium Kit (T653).
2. If not ordering electronically, complete, print, and send a Therapeutics Test Request (T831) with the specimen.

### Reject Due To

| | |
|---|---|
| Grossly bloody specimen | Reject |
| Pink-colored specimen | OK |

### Specimen Minimum Volume

0.3 g (approximately 1/4 teaspoon)

### 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 (Vd) 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 10th to 12th week of gestation, and slowly moves into the colon by the 16th 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)
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 result.
Cutoff concentration: 5 ng/g

### Interpretation

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

### Cautions

Because the results of this test may have legal ramifications, it is recommended that testing be performed using chain of custody. A kit including all the materials necessary to complete chain of custody is available to ensure the test results are appropriate for legal proceedings.

### 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 Sep;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 Jan;60(1):45-56; quiz 73-74
5. 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 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 (LC-MS/MS).(Unpublished Mayo method)

### PDF Report

No

### Specimen Retention Time

2 weeks

### Performing Laboratory Location

Rochester

## Fees & Codes

### 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

83992
G0480 (if appropriate)