MAYO CLINIC LABORATORIES

Test Definition: TOSU

Targeted Opioid Screen, Random, Urine

Overview

Useful For

Determining compliance or identifying illicit opioid drug use using urine specimens

This test is **not intended for** employment-related testing.

Profile Information

Test Id	Reporting Name	Available Separately	Always Performed
LPPO	List prescribed opioids	No	Yes
TOPSU	Targeted Opioid Screen, U	No	Yes

Special Instructions

- Clinical Toxicology CPT Code Client Guidance

Highlights

This test uses high-resolution accurate mass spectrometry to identify 33 different opioids and metabolites where immunoassays are not adequate.

This test offers lower detection limits than previous Mayo Clinic Laboratories-offered screens.

This test has the ability to detect "spiked" samples.

Method Name

Liquid Chromatography Tandem Mass Spectrometry, High-Resolution Accurate Mass (LC-MS/MS HRAM)

NY State Available

Yes

Specimen

Specimen Type

Urine

Additional Testing Requirements

In most cases, no additional testing is needed after the qualitative targeted opioid test is performed if the parent drug or metabolites found are consistent with the patient's prescribed medications. However, if an unexpected opioid parent drug or metabolites are found, confirmatory testing can be requested at an additional charge.

Specimen Required

Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube: Plastic urine container
Submission Container/Tube: Plastic, 5-mL tube
Specimen Volume: 1 mL
Collection Instructions:
1. Collect a random urine specimen.
2. No preservative

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

Specimen Minimum Volume
0.5 mL

Reject Due To

Gross hemolysis	Reject
Gross icterus	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Urine	Refrigerated (preferred)	14 days	
	Ambient	72 hours	
	Frozen	28 days	

Clinical & Interpretive

Clinical Information
Opioids are a large class of medications commonly used to relieve acute and chronic pain or help manage opioid abuse and dependence. Medications that fall into this class include buprenorphine, codeine, fentanyl, hydrocodone, hydromorphone, methadone, morphine, oxycodone, oxymorphone, tapentadol, tramadol, and others. Opioids work by binding to the opioid receptors that are found in the brain, spinal cord, gastrointestinal tract, and other organs.

Common side effects of opioids include drowsiness, confusion, nausea, constipation, and, in severe cases, respiratory depression. These are dose dependent and vary with tolerance. These medications can also produce physical and psychological dependence and have a high risk for abuse and diversion, which is one of the main reasons many professional practice guidelines recommend compliance testing in patients prescribed these medications.

Opioids are readily absorbed from the gastrointestinal tract, nasal mucosa, lungs, and after subcutaneous or intermuscular injection. Opioids are primarily excreted from the kidney in both free and conjugated forms. This assay does not hydrolyze the urine sample and looks for both parent drugs and metabolites (including glucuronide forms). The detection window for most opioids in urine is approximately 1 to 3 days with longer detection times for some

compounds (ie, methadone).

Reference Values

Not detected (Positive results are reported with qualitative "Present" results)

Cutoff concentrations:
Codeine: 25 ng/mL
Codeine-6-beta-glucuronide: 100 ng/mL
Morphine: 25 ng/mL
Morphine-6-beta-glucuronide: 100 ng/mL
6-monoacetylmorphine: 25 ng/mL
Hydrocodone: 25 ng/mL
Norhydrocodone: 25 ng/mL
Dihydrocodeine: 25 ng/mL
Hydromorphone: 25 ng/mL
Hydromorphone-3-beta-glucuronide: 100 ng/mL
Oxycodone: 25 ng/mL
Noroxycodone: 25 ng/mL
Oxymorphone: 25 ng/mL
Oxymorphone-3-beta-glucuronide: 100 ng/mL
Noroxymorphone: 25 ng/mL
Fentanyl: 2 ng/mL
Norfentanyl: 2 ng/mL
Meperidine: 25 ng/mL
Normeperidine: 25 ng/mL
Naloxone: 25 ng/mL
Naloxone-3-beta-glucuronide: 100 ng/mL
Methadone: 25 ng/mL
2-Ethylidene-1,5-dimethyl-3,3-diphenylpyrrolidine (EDDP): 25 ng/mL
Propoxyphene: 25 ng/mL
Norpropoxyphene: 25 ng/mL
Tramadol: 25 ng/mL
O-desmethyltramadol: 25 ng/mL
Tapentadol: 25 ng/mL
N-desmethyltapentadol: 50 ng/mL
Tapentadol-beta-glucuronide: 100 ng/mL
Buprenorphine: 5 ng/mL
Norbuprenorphine: 5 ng/mL
Norbuprenorphine glucuronide: 20 ng/mL

Interpretation

If an opioid or its corresponding metabolites is identified (present), it indicates that the patient has used the respective opioid in the recent past. The absence of expected opioids or their metabolites may indicate noncompliance, inappropriate timing of specimen collection relative to drug administration, poor drug absorption, diluted or adulterated urine, or limitations of testing. The concentration of the drug must be greater than or equal to the cutoff to be reported as present. If a specific drug concentration is required, the laboratory must be contacted within 2 weeks of specimen

collection/testing to request quantification by a second analytical technique at an additional charge.

Cautions
No significant cautionary statements

Clinical Reference
1. Gutstein HB, Akil H. Opioid analgesics. In: Brunton LL, Lazo JS, Parker KL, eds. Goodman and Gilman's: The Pharmacological Basis of Therapeutics. 11th ed. McGraw-Hill; 2006:chap 21
2. Rovine T, Ferrero CL, American Pain Society. Chronic Pain in America: Roadblocks to Relief. Roper Starch Worldwide, Inc; 1999. Updated October 2, 2001. Accessed December 13, 2024. Available at http://accurateclinic.com/wp-content/uploads/2016/04/Chronic-Pain-In-America-Roadblocks-To-Relief-1999.pdf
3. Magnani B, Kwong T. Urine drug testing for pain management. Clin Lab Med. 2012;32(32):379-390
4. Langman LJ, Bechtel LK, Holstege CP. Clinical toxicology. In: Rifai N, Chiu RWK, Young I, Burnham CAD, Wittwer CT, eds. Tietz Textbook of Laboratory Medicine. 7th ed. St Louis, MO: Elsevier; 2023:chap 43
5. Jannetto PJ, Bratanow NC, Clark WA, et al. Executive Summary: American Association of Clinical Chemistry Laboratory Medicine Practice Guideline-using clinical laboratory tests to monitor drug therapy in pain management patients. J Appl Lab Med. 2018;2(4):489-526

Performance

Method Description
The urine sample is diluted with internal standard and then analyzed by liquid chromatography tandem mass spectrometry using a high resolution-accurate mass orbi-trap detector.(Unpublished Mayo method)

PDF Report
No

Day(s) Performed
Monday through Sunday

Report Available
2 to 4 days

Specimen Retention Time
14 days

Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Superior Drive

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

G0481
80364 (if appropriate for select payers)

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
TOSU	Targeted Opioid Screen, U	95796-9

Result ID	Test Result Name	Result LOINC® Value
42323	Codeine	19411-8
42324	Codeine-6-beta-glucuronide	89310-7
42325	Morphine	19597-4
42326	Morphine-6-beta-glucuronide	89308-1
42327	6-monoacetylmorphine	19321-9
42328	Hydrocodone	19482-9
42329	Norhydrocodone	89304-0
42330	Dihydrocodeine	19446-4
42331	Hydromorphone	19486-0
42332	Hydromorphone-3-beta-glucuronide	89309-9
42333	Oxycodone	19642-8
42334	Noroxycodone	89303-2
42335	Oxymorphone	19646-9
42336	Oxymorphone-3-beta-glucuronide	89301-6
42337	Noroxymorphone	89302-4
42338	Fentanyl	59673-4
42339	Norfentanyl	43199-9
42340	Meperidine	19532-1
42341	Normeperidine	27920-8
42342	Naloxone	42618-9
42343	Naloxone-3-beta-glucuronide	89307-3
42344	Methadone	19550-3
42345	EDDP	93495-0
42346	Propoxyphene	19429-0
42347	Norpropoxyphene	19632-9
42348	Tramadol	19710-3
42349	O-desmethyltramadol	86453-8

42350	Tapentadol	72485-6
42351	N-desmethyltapentadol	89306-5
42352	Tapentadol-beta-glucuronide	89300-8
42353	Buprenorphine	93494-3
42354	Norbuprenorphine	82371-6
42355	Norbuprenorphine glucuronide	89305-7
65059	Opioid Interpretation	69050-3
LPPO	List prescribed opioids	29305-0