PAP Rapid Test Dipstick (Urine)
Package Insert

REF DPAP-101/111 | English

A rapid test for the qualitative detection of Papaverine in human urine.
For medical and other professional in vitro diagnostic use only.

【INTENDED USE】

The PAP Rapid Test Dipstick (Urine) is a rapid chromatographic immunoassay for the detection of papaverine in urine at a cut-off concentration of 500ng/ml.

This assay provides only a qualitative, preliminary analytical test result. A more specific alternate chemical method must be used in order to obtain a confirmed analytical result. Gas chromatography/mass spectrometry (GC/MS) is the preferred confirmatory method. Clinical consideration and professional judgment should be applied to any drug of abuse test result, particularly when preliminary positive results are used.

【SUMMARY】

Papaverine (latin papaverine,"popy") is an opiu alkaloid antispasmodic drug,used primarily in the treatment of visceral spasm and vasospasm(especially those involving the intestines,heart,or brain),and occasionally in the treatment of eretile dysfunction.It is used in the treatment of acute mesenteric ischemia.While it is found in the opium poppy,papaverine differs in both structure and pharmacological action from the analgesic (morphine-related)opium alkaloids(opiates). [3]

Papaverine is found as a contaminantin some hroin and can be used by forensic laboratories in heroin profiling to identify its source. The metabolites can aslo be found in the urine of herin users,allowing street heroin to be distinguished from pharmaceutical.[4-5]

Papaverine (4-(3′, 4′-dimethoxybenzyl)-6, 7-dimethoxy-quinoline, Mw 339), as one of benzyl isoquinoline alkaloids, was used clinically as a bronchodilator to relaxes various smooth muscles, smooth musculature of the larger blood vessels, especially coronary, systemic peripheral and pulmonary arteries to increase cerebral blood flow [1] .

By the in vitro metabolic experiment, there were five metabolites in liver microsomal incubation solution and two metabolites in intestinal flora incubation solution.[2]

The PAP Rapid Test Dipstick (Urine) is a rapid urine-screening test that can be performed without the use of an instrument. The test utilizes the antibody to selectively detect elevated levels of Papaverine in urine. The Papaverine Test Dipstick (Urine) yields a positive result when the Papaverine in urine exceeds the cut-off level.

【PRINCIPLE】

The PAP Rapid Test Dipstick (Urine) is an immunoassay based on the principle of competitive binding. Drugs which may be present in the urine specimen compete against the drug conjugate for binding sites on the antibody.

During testing, a urine specimen migrates upward by capillary action. Papaverine if present in the urine specimen below the cut-off level, will not saturate the binding sites of the antibody in the test. The antibody coated particles will then be captured by immobilized Papaverine-protein conjugate and a visible colored line will show up in the test line region. The colored line will not form in the test line region if the Papaverine level exceeds the cut-off level, because it will saturate all the binding sites of anti-Papaverine antibody.

A drug-positive urine specimen will not generate a colored line in the test line region because of drug competition, while a drug-negative urine specimen or a specimen containing a drug concentration less than the cut-off will generate a line in the test line region. To serve as a procedural control, a colored line will always appear at the control line region indicating that proper volume of specimen has been added and membrane wicking has occurred.

【REAGENTS】

The test contains mouse monoclonal anti-Papaverine antibody coupled particles and Papaverine-protein conjugate. A goat antibody is employed in the control line system.

【PRECAUTIONS】

- For medical and other professional *in vitro* diagnostic use only. Do not use after the expiration date.
- The test should remain in the sealed pouch or closed canister until use.
- All specimens should be considered potentially hazardous and handled in the same manner as an infectious agent.
- The used test should be discarded according to local regulations.

【STORAGE AND STABILITY】

Store as packaged at room temperature or refrigerated (2-30°C). The test is stable through the expiration date printed on the sealed pouch or label of the closed canister. The test must remain in the sealed pouch or closed canister until use. **DO NOT FREEZE**. Do not use beyond the expiration date.

NOTE: Once the canister has been opened, the remaining test(s) are stable for 50 days only.

【SPECIMEN COLLECTION AND PREPARATION】

Urine Assay

The urine specimen must be collected in a clean and dry container. Urine collected at any time of the day may be used. Urine specimens exhibiting visible particles should be centrifuged, filtered, or allowed to settle to obtain a clear specimen for testing.

Specimen Storage

Urine specimens may be stored at 2-8°C for up to 48 hours prior to testing. For prolonged storage, specimens may be frozen and stored below -20°C. Frozen specimens should be thawed and mixed before testing.

【MATERIALS】

Materials Provided

- Test Dipsticks
- Package insert

Materials Required But Not Provided

- Specimen collection containers
- Timer

【DIRECTIONS FOR USE】

Allow test, urine specimen, and/or controls to reach room temperature (15-30°C) prior to testing.

1. Bring the pouch to room temperature before opening it. Remove the Test Dipstick from the sealed pouch and use it within one hour.
2. With arrows pointing toward the urine specimen, **immerse the Test Dipstick vertically in the urine specimen for at least 10-15 seconds**. Do not pass the maximum line (MAX) on the Test Dipstick when immersing the strip. See the illustration below.
3. Place the test dipstick on a non-absorbent flat surface, start the timer and wait for the colored line(s) to appear. **Read results at 5 minutes.** Do not interpret the result after 10 minutes

【INTERPRETATION OF RESULTS】

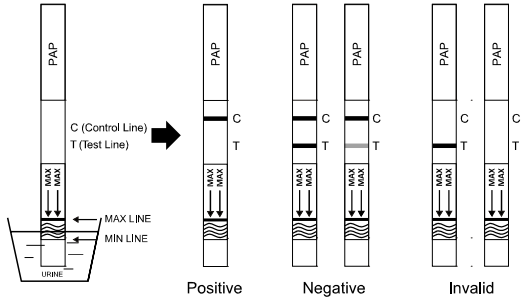
(Please refer to the illustration)

NEGATIVE:* Two colored lines appear. One colored line should be in the control line region (C), and another apparent colored line should be in the test line region (T). This negative result indicates that the Papaverine concentration is below the detectable cut-off level.

***NOTE:** The shade of color in the test line region (T) may vary, but it should be considered negative whenever there is even a faint colored line.

POSITIVE: One colored line appears in the control line region (C). No line appears in the test line region (T). This positive result indicates that the papaverine concentration exceeds the detectable cut-off level.

INVALID: Control line fails to appear. Insufficient specimen volume or incorrect procedural techniques are the most likely reasons for control line failure. Review the procedure and repeat the test with a new test. If the problem persists, discontinue using the test kit immediately and contact your local distributor.



【QUALITY CONTROL】

A procedural control is included in the test. A colored line appearing in the control line region (C) is considered an internal procedural control. It confirms sufficient specimen volume, adequate membrane wicking and correct procedural technique.

Control standards are not supplied with this kit; however, it is recommended that positive and negative controls be tested as good laboratory testing practice to confirm the test procedure and to verify proper test performance.

【LIMITATIONS】

1. The PAP Rapid Test Dipstick (Urine) provides only a qualitative, preliminary analytical result. A secondary analytical method must be used to obtain a confirmed result. Gas chromatography/mass spectrometry (GC/MS) is the preferred confirmatory method.
2. It is possible that technical or procedural errors, as well as other interfering substances in the urine specimen may cause erroneous results.
3. Adulterants, such as bleach and/or alum, in urine specimens may produce erroneous results regardless of the analytical method used. If adulteration is suspected, the test should be repeated with another urine specimen.
4. A positive result indicates presence of the drug or its metabolites but does not indicate level of intoxication, administration route or concentration in urine.
5. A negative result may not necessarily indicate drug-free urine. Negative results can be obtained when drug is present but below the cut-off level of the test.
6. Test does not distinguish between drugs of abuse and certain medications.

【EXPECTED VALUES】

This negative result indicates that the Papaverine concentration is below the detectable level of 500ng/ml. Positive result means the concentration of Papaverine is above the level of 500ng/ml. The PAP Rapid Test Dipstick has a sensitivity of 500ng/ml

【PERFORMANCE CHARACTERISTICS】

Accuracy

A side-by-side comparison was conducted using The PAP Rapid Test Dipstick (Urine) and GC/MS at the cut-off of 500ng/ml. Testing was performed on 85 clinical specimens previously collected from subjects present for Drug Screen Testing. The following results were tabulated:

Method		GC/MS		Total Results
PAP Rapid Test Dipstick	Results	Positive	Negative	
	Positive	24	1	25
	Negative	1	59	60
Total Results		25	60	85
% Agreement		96.0%	98.3%	97.6%

Analytical Sensitivity

A drug-free urine pool was spiked with Papaverine at the following concentrations: 0ng/ml, 250ng/ml, 375ng/ml, 500ng/ml, 625ng/ml, 750ng/ml and 1500ng/ml. The result demonstrates >99% accuracy at 50% above and 50% below the cut-off concentration. The data are summarized below:

PAP Concentration (ng/mL)	Percent of Cut-off	n	Visual Result	
			Negative	Positive
0	0	30	30	0
250	-50%	30	30	0
375	-25%	30	29	1
500	Cut-off	30	15	15
625	+25%	30	1	29
750	+50%	30	0	30
1500	3X	30	0	30

Analytical Specificity

The following table lists compounds that are positively detected in urine by the PAP Rapid Test Dipstick (Urine) at 5 minutes.

Compound	Concentration (ng/mL)	Compound	Concentration (ng/mL)
Papaverine	500	Diflunisal	1,000,000
Methortrexate	650,000	Methedrone	500,000
Pragablin	500,000	Phenelzine	8,000
Quinine	4,000		

Precision

A study was conducted at three hospitals by laypersons using three different lots of product to demonstrate the within run, between run and between operator precision. An identical dipstick of coded specimens containing, according to GC/MS, no Papaverine,25% Papaverine above and below the cut-off and 50% Papaverine above and below the 500ng/ml cut-off was provided to each site. The following results were tabulated:

papaverine Concentration (ng/mL)	n per Site	Site A		Site B		Site C	
		-	+	-	+	-	+
0	10	10	0	10	0	10	0
250	10	10	0	10	0	10	0
375	10	9	1	9	1	9	1
625	10	2	8	1	9	2	8
750	10	0	10	0	10	0	10

Effect of Urinary Specific Gravity

Fifteen urine specimens of normal, high, and low specific gravity ranges were spiked with 250ng/ml and 750ng/ml of Papaverine.The PAP Test Dipstick (Urine) was tested in duplicate using the fifteen neat and spiked urine specimens. The results demonstrate that varying ranges of urinary specific gravity do not affect the test results.

Effect of Urinary pH

The pH of an aliquoted negative urine pool was adjusted to a pH range of 5 to 9 in 1 pH unit increments and spiked with Papaverine to 250ng/ml and 750ng/ml. The spiked, pH-adjusted urine was tested with the PAP Rapid Test Dipstick (Urine) in duplicate. The results demonstrate that varying ranges of pH do not interfere with the performance of the test.

Cross-Reactivity

A study was conducted to determine the cross-reactivity of the test with compounds in either drug-free urine or papaverine positive urine. The following compounds show no cross-reactivity when tested with the PAP Rapid Test Dipstick (Urine) at a concentration of 100 μg/ml.

Non Cross-Reacting Compounds

4-Acetamidophenol	Deoxycorticosterone	(+) 3,4-Methylenedioxy-amphetamine	Prednisolone
Acetophenetidin	Dextromethorphan	(+) 3,4-Methylenedioxy-methamphetamine	Prednisone
N-Acetylprocainamide	Diazepam	Methylphenidate	Procaine
Acetylsalicylic acid	Diclofenac	Methyprylon	Promazine
Aminopyrine	Verapamil	Morphine-3-β–D-glucuronide	Promethazine
Amitryptyline	Digoxin	Nalidixic acid	D,L-Propanolol
Amobarbital	Diphenhydramine	Nalorphine	D-Propoxyphene
Amoxicillin	Doxylamine	Naloxone	D-Pseudoephedrine
Ampicillin	Ecgonine hydrochloride	Naltrexone	Quinidine
L-Ascorbic acid	Ecgonine methylester	Naproxen	Methoxyphenamine
D,L-Amphetamine	(-)-ψ-Ephedrine	Niacinamide	Ranitidine
L-Amphetamine	Erythromycin	Nifedipine	Salicylic acid
Apomorphine	β-Estradiol	Norcodein	Secobarbital
Aspartame	Estrone-3-sulfate	Norethindrone	Serotonin (5-Hydroxytyramine)
Atropine	Ethyl-p-aminobenzoate	D-Norpropoxyphene	Sulfamethazine
Benzilic acid	Fenoprofen	Noscapine	Sulindac
Benzoic acid	Furosemide	D,L-Octopamine	Temazepam
Benzoylecgonine	Gentisic acid	Oxalic acid	Tetracycline
Benzphetamine	Hemoglobin	Oxazepam	Tetrahydrocortisone, 3-Acetate
Bilirubin	Hydralazine	Oxolinic acid	Tetrahydrocortisone 3 (β-D-glucuronide)
(±)-Brompheniramine	Hydrochlorothiazide	Oxycodone	Tetrahydrozoline
Caffeine	Hydrocodone	Oxycortone	Thebaine
Cannabidiol	Hydrocortisone	Oxymetazoline	Thiamine
Chloralhydrate	O-Hydroxyhippuric acid	p-Hydroxy-methamphetamine	Thioridazine
Chloramphenicol	3-Hydroxytyramine	Phenylpropanolamine	D, L-Thyroxine
Chlordiazepoxide	Ibuprofen	Penicillin-G	Tolbutamine
Chlorothiazide	Imipramine	Pentazocine	Triamterene
(±) Chlorpheniramine	Iproniazid	Pentobarbital	Trifluoperazine
Chlorpromazine	(±) - Isoproterenol	Perphenazine	Trimethoprim
Chlorquine	Isoxsuprine	Phencyclidine	Trimipramine
Cholesterol	Ketamine	Zomepirac	Tryptamine
Clomipramine	Ketoprofen	Phenobarbital	D, L-Tryptophan
Clonidine	Labetalol	Phentermine	Tyramine
Cocaine hydrochloride	Levorphanol	L-Phenylephrine	D, L-Tyrosine
Codeine	Loperamide	Phenylethylamine	Uric acid
Cortisone	Maprotiline		
(-) Cotinine	Meprobamate		
Creatinine	Methadone		

【BIBLIOGRAPHY】

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Index of Symbols

	Attention, see instructions for use	Σ	Tests per kit	EC REP	Authorized Representative
IVD	For in vitro diagnostic use only		Use by		Do not reuse
2°C 30°C	Store between 2-30°C	LOT	Lot Number	REF	Catalog #
	Do not use if package is damaged		Manufacturer		Consult Instructions for Use

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Number: 146066000
Effective Date: 2019-06-26