OneStep
Multiple Drugs
RapiCard & Dip InstaTest

IVD See external Label 2°C 30°C 1 Test

INTENDED USE

Cortez Diagnostics DOA Panel RapiCup is an immunochromato-graphy based one step in vitro test. It is designed for qualitative determination of drug substances in human urine specimens. The cut-off concentrations for each drug using our test is listed as below:

Amphetamine	1000 ng/ml of d-amphetamine
Barbiturate	300 ng/ml of secobarbital
Benzodiazepine	300 ng/ml of oxazepam
Buprenorphine (Subutex)	10 ng/ml of buprenorphine-3-β-d glucoronide
Cocaine	300 ng/ml of benzoylecgonine
EDDP	100 ng/ml of EDDP
MDMA (Ecstasy)	500 ng/ml of MDMA
Methadone	300 ng/ml of methadone
Methamphetamine	1000 ng/ml of (+)methamphetamine
Opiate*	300 ng/ml of morphine
Opiate II*	2000 ng/ml of morphine
Oxycodone	100 ng/ml of oxycodone
Phencyclidine	25 ng/ml of phencyclidine
Propoxyphene	300 ng/ml of nor-propoxyphene
Tricyclic antidepressants (TCA)	1000 ng/ml of Nortriptyline
Cannabinoid (THC)	50 ng/ml of 11-nor-Δ^9-THC-9-COOH

This assay provides only a preliminary analytical test result. A more specific alternative chemical method must be used in order to obtain a confirmed analytical result. Gas chromatography/ mass spectrometry (GC/MS) has been established as the preferred confirmatory method by the Substance Abuse Mental Health Services Administration (SAMHSA). Clinical consideration and professional judgment should be applied to any drug of abuse test result, particularly when preliminary positive results are indicated.

** SAMHSA recommends a cut-off concentration of 2000 ng/ml for Opiates Test*

SUMMARY AND EXPLANATION

Amphetamines are a class of potent sympathominetic agents with therapeutic applications. The most common amphetamines are d-amphetamine and d, l-amphetamine. Amphetamines are central nervous stimulants that cause the neutrotransmitters epinephrine, norepinephrine and dopamine to be released into the brain and body giving users feelings of euphoria, alertness, and increased energy. Chronic abuse of amphetamaine leads to tolerance and drug reinforcement effect. Cardiovascular responses to amphetamine include increased blood pressure and cardiac arrhythmias. More acute responses produce anxiety, paranoia, hallucinations and psychotic behavior. Amphetamine is metabolized by a number of pathways. In general, acid urine promotes excretion whereas alkaline urine retards it. In 24 hours, approximately 79% of the amphetamine dose is excreted in acid urine and about 45% in alkaline urine. Typically, about 20% is excreted as unchanged amphetamine. Unchanged amphetamine can be detected up to 1 –2 days after use.

Barbiturates are a group of prescription drugs that are frequently abused. They can depress the central nervous system. Acute higher dose induces exhilaration, sedation and respiratory depression. More acute responses produce respiratory collapse and coma. The effects of short-acting barbiturates, such as secobarbital last 3 to 6 hours. The effects of long-acting barbiturates such as phenobarbital last 10 to 20 hours. Short-acting barbiturates normally remain detectable in urine for 4 to 6 days, while long-acting barbiturates can be detected for up to 30 days. Barbiturates are excreted in the urine in unchanged forms, hydroxylated derivatives, carboxylated derivatives and glucuronide conjugates.

Benzodiazepines are a class of widely prescribed central nervous system depressants which have anxiolytic, hypnotic, anticonvulsant and muscle relaxant effects. Chronic abuse can result inb addiction and tardive dyskinnesia. Acute higher doses lead to drowsiness, dizziness, muscle relaxation, lethargy, coma and possible death. The effects of benzodiazepines use last 4 – 8 hours. Many of the benzodiazepines share a commonmetabolic route, and are excreted as oxazepam and its glucuronide in urine. Oxazepam is detectable in the urine for up to 7 days after drug use.

Buprenorphine: is a derivative of thebaine, is an opioid that has been marketed in the United States as the Schedule V paranteral analgesic Buprenex.I In 2003, based on a reevaluation of available evidence regarding the potential for abuse, devirsion, addiction, and side effect, the DEA reclassified buprenorphine from a Schedule V to a Schedule III narcotic. Buprenorphine resembles morphine structurally but has a linger duration of action than morphine and can be administrated sublingually as an analgesic. In October 2002, FDA approved the use of a buprenorphine monotherapy product, Subutex, and a buprenorphine/naloxone combination product, Suboxone, for the treatment of opioid addiction. Subutex and Suboxone are the first narcotic drugs available under the US Drug Act (DATA) of 2003 for the treatment fof opiate dependence that can be prescribed in the US in a physician's work place. It has also been shown that buprenorphine has abuse potential and amy itself cause dependency. In addition, a number of deaths have been recorded as a result of overdose with intravenously injected buprenorphine in conjunction with other psychotropic drugs such as benzodiazepines. Buprenorphine is metabolized primarily by n-dealkylation to form glucuronide-buprenorphine and glucuronide-norbuprenorphine.

Cocaine. Derived from the leaves of cocoa plant, cocaine is a potent central nervous system stimulant as well as a local anesthetic. Some of the psychological effects induced by cocaine are: euphoria, confidence and a sense of increased energy, accompanied by increased heart rate, dilation of the pupils, fever, tremors and sweating. Continued ingestion of cocaine could induce tolerances and physiological dependency which leads to its abuse. Cocaine is used by smoking, intravenous, intransal or oral administration and excreted in the urine primarily as benzoylecgonine in a short period. Benzoylecgonine has a biological half-life of 5 – 8 hours, which is much longer than that of cocaine (0.5 – 1.5 hours), and can be generally detected for 12 – 72 hours after cocaine use or exposure.

EDDP- 2-Ethylidine-1,5-dimethyl-3,3-diphenylpyrrolidine, is the primary metabolite of methadone. Methadone is a controlled substance and is used for detoxification and maintenance of opiate dependant patients. Patients on methadone maintenance may exhibit methadone (parent) levels that account for 5-50% of the dosage and 3-25% of EDDP in urinary excretion during the first 24 hours. The detection of EDDP is more beneficial than traditional methadone screening, in that EDDP exists only in urine from individuals that ingested methadone. The tampering of specimens by spiking the urine with methadone can be prevented. Secondly, renal clearance of EDDP is not affected by

urinary pH, therefore **the EDDP test provides a more accurate result of methadone ingestion than the methadone parent screen.**

MDMA Methylenedioxymethamphetamine (Ecstasy) is a designer drug first synthesized in 1914 by a German drug company for the treatment of obesity. Those who take the drug frequently report adverse effects, such as increased muscle tension and sweating. MDMA is not clearly a stimulant, although it has, in common with amphetamine drugs, a capacity to increase blood pressure and heart rate. MDMA does produce some perceptual changes in the form of increased sensitivity to light, difficulty in focusing, and blurred vision in some users. Its mechanism of action is thought to be via release of the neurotransmitter serotonin. MDMA may also release dopamine, although the general opinion is that this is a secondary effect of the drug. The most pervasive effect of MDMA, occurring in almost all people who have taken a reasonable dose of the drug, is to produce a clenching of the jaws. The MDMA Ecstasy Test Strip yields a positive result when Methylenedioxymeth-amphetamine in urine exceeds 500ng/ml.

Methadone is a synthetic opioid, clinically available. It is used clinically for the treatment of severe pain and in maintenance programs for morphine and heroine addicts. Methadone acts on the central nervous and cardiovascular systems to produce respiratory and circulatory depression. Methadone also produces miosis and increases the tone of smooth muscle in the lower gastrointestinal tract while decreasing the amplitude of contractions. Acute higher doses induce analgesia, sedation, respiratory depression and coma. After methadone administration, the major urinary excretion products are methadone and its metabolites, EDDP and EMDP. Large individual variations in the urine excretion of methadone are output of methadone from 5-22%. Typically, following a 5 mg oral dose, methadone and EDDP account for 5% of the dose in the 24-hour urine. In those individuals on maintenance therapy, methadone may account for 5 to 50% of the dose in the 24-hour urine and EDDP may account for 3 to 25% of the dose.

Methamphetamine is the most popular systhetic derivative of the amphetamines. It is a potent sympathomimetic agent with therapeutic applications. Acute large doses lead to enhanced stimulation of the central nervous system and induce euphoria, alertness, reduced appetite, and a sense of increased energy and power. More acute response produces anxiety, paranoia, psychotic behavior, and cardiac dysrhythmias. Methamphetamine is excreted in the urine as amphetamine and oxized and deaminated derivatives. However, 10-40% of methamphetamine is excreted unchanged. Methamphetamine is generally detectable in the urine for 3 to 5 days after use.

Opiate Opioid analgesics comprised of a large group of substances that control pain by depressing the central nervous system. Acute high dose used by abusers or addicts can cause depressed coordination, disrupted decision, decreased respiration, hypothermia and coma. Morphine is excreted unmetabolized and is the marker metabolic product of opiates. Morphine and morphine glucuronide is detectable in urine for several days after opiate ingestion.

Oxycodone is known as Oxycontin, Roxicodone and is an ingredient of Percodan, Percocet, Roxicet and Tylox. Oxycodone is a semi-synthetic opiates derived from opium. Like other opiates, oxycodone is characterized by its analegestic properties, and the tendency for users to form a physical dependency and develop tolerance with extended use. Oxycodone is usually administered in combination with non-opiate analegesics such as acetaminophen and salicylates for the relief of moderate to severe pain. Oxycodone is a central nervous system depressant that may cause drowsiness, dizziness, lethargy, weakness and confusion. Toxicity in an overdose of oxycodone can lead to stupor, coma, muscle flaccidity, severe respirator ydepression, hypotension, and stripiac arrest. Oxycodone is metabolized by N- and O-demethylation. One of the metabolites, oxymorphone, is a potent narcotic analgesic, while the other, noroxycodone, is relatively inactive. Between 33 to 61% of a single dose of oxycodone is excreted in a 24 hour urine collection and consists of 13-19% free oxycodone, 7-29% glucuronide conjugated oxycodone, 13-14% glucuronide conjugated oxymorphone and an unknown amount of noroxycodone. The detection time window of oxycodone is 1-3 days following use.

Phencyclidine, commonly known as PCP, is a hallucinogan which interacts with dopamine, cholinergic and adrenergic systems. It has dose dependent stimulant, depressant, hallucinogenic and psychological effects. PCP is mostly administered by oral or intravenously. Even moderate amount of PCP, from 5 to 100 ng/ml, can result in psychotic, violent and self-destruction. At high does, from 100 to 500 ng/ml, PCP can cause convulsions, hypertion, prolonged coma, absent peripheral sensation, a nd even death. PCP is metabolized via hydroxylation, oxidation, and conjugateion with glucuronic acid in the liver. About 10% of the does is excreted in urine as unchanged drug. PCP can be detected in the urine for 7 to 8 days after drug administration. For chronic users, PCP may persist in urine for 2 to 4 weeks. The length of time following drug use for which a positive result may occur is dependent upon several factors, including the frequency and amount of drug, metabolic rate, excretion rate, drug half-life, and the drug user's age, weight, activity, and diet.

Propoxyphene is a prescription drug for the relief of pain. Although slightly less selective than morphine, Propoxyphene binds primarily to opioid receptors and produces analgesia and other CNS effects that are similar to those seen with morphine-like opioids. It is likely that at equianalgesic doses the incidence of side effects such as nausea, anorexia, constipation, abdominal pain, and drowsiness are similar to those of codeine. After oral administration, concentrations of Propoxyphene in plasma reach their highest values at 1 to 2 hours. There is great variability between subjects in the rate of clearance and the plasma concentrations that are achieved. The percentage of excreted unchanged Propoxyphene in urine is less than 1%. In humans, the major route of metabolism is N-demethylation to yield norpropoxyphene. Norpropoxyphene has a longer half-life (30 to 36 hours) than parent Propoxyphene (6 to 12 hours), and its accumulation with repeated doses may be responsible for some of the observed toxicity.

TCA Tricyclic antidepressants (TCAs) are type of prescription drugs for the treatment of depressive disorders. Tricyclic Antidepressants consists of two main chemical classes. The tertiary amines boost serotonin levels and are usually prescribed for insomnia, irritability and overstimulation; these include amitryptiline, Imipramine and doxepin. The secondary amines which include nortryptiline, desipramine and Protriptyline, enhance norepinephrine levels and are prescribed for fatigue; withdrawal and inertness. TCA abuse can result in respiratory depression. Convulsions, blood pressure deviation, severe cardiac conditions, and coma. TCAs are taken orally or sometimes by injection. TCAs are excreted in the urine mostly in the form of metabolites for up to ten (10) days.

THC. The agents of Marijuana that cause various biological effects in humans are called cannabinoid. Cannabinoid is a central nervous stimulant that alters mood and sensory perceptions, produces loss of coordination, impairs short term memmory, and produces symptoms of anxiety, paranoia, depression, confusion, hallucination, and increased heart rate. Large doses of cannabinoid could cause the development of tolerances and physiological dependency and lead to abuse. A tolerance to the cardiac and psychotropic effects can occur and withdrawal syndrome produces restlessness, insomnia, anorexia abd nausea. Δ^9-THC is the primary active ingredient in cannabinoids. The main metabolite excreted in the urine is 11-nor-Δ^9-THC-9-COOH, which are found within hours of exposure and remain detectable in the urine for 3-10 days after smoking.

TEST PRINCIPLE

Each component strip of DOA Panel is based on the principle of specific immunochemical reaction between antibodies and antigen to analyze particular compound in human urine specimen. The assay relies on the competition for binding antibody. When drug is present in the urine specimen, it competes with drug conjugate for the limited amount of antibody-dye conjugate. When the amount of drug is equal or more than the cut-off, it will prevent the binding of drug conjugate to the antibody. Therefore, a positive urine specimen will not show a colored band on the test line zone, indicating a positive result, while the presence of a colored band indicates a negative result.

A control line **(c)** is present in the test window to work as procedural control. This colored band should always appear on the control line zone if the test device is stored in good condition and the test is performed appropriately.

SPECIMEN COLLECTION AND PREPARATION

Fresh urine does not require any special handling or pretreatment. Specimen should be collected in a clean, dry, plastic or glass container. If the assay is not performed immediately, urine specimen may be refrigerated at 2-8°C or frozen up to 7 days.

Specimens should be brought to room temperature before testing. Urine specimens exhibiting a large amount of precipitate orturbidity should be centrifuged or allowed to settle before testing. Avoid contact with skin by wearing gloves and proper laboratory attire.

MATERIALS AND COMPONENTS

Materials provided with the test kits

1. Cortez Diagnostics DOA Panel Test Card. The amount of each coated antigen and/or antibody on the strip is less than 1.0 mg for antigen conjugate and is less than 1.0 mg for goat anti-mouse IgG antibody.
2. Test zone: contains drug bovine protein antigen conjugates.
3. Control zone: contains Goat anti-mouse IgG antibody
4. Conjugate pad: contains mice monoclonal anti-drug antibody.
5. Instruction for use.

Materials required but not provided

1. Urine collection container.
2. Timer or clock.

ASSAY PROCEDURE

1. Bring all materials and specimens to room temperature.
2. Remove the Cortez Diagnostics DOA Panel RapiCard from the sealed foil pouch.
3. Place the sample pad end into the urine specimen being careful to hold each pad in the urine without touching the plastic card.
4. Hold the card in the urine for 20 seconds, remove from the urine and replace the cap.
5. Read the results in 5 ~ 10 minutest after adding the sample.

➢ Do not interpret the result after 10 minutes.

RESULTS

➢ **Negative:** Two colored bands form on any strip of the card. The appearance of two colored bands, one in test line zone and the other in control line zone, indicates negative result for that particular test(s). The negative result does not indicate the absence of drug in the specimen, it only indicates the level of tested drug in the specimen is less than cut-off level.

➢ **Positive:** One colored band form on any strip of the card. One colored band appears in control line zone. No colored band is found in test line zone. This is an indication the level of tested drug(s) in the specimen is above the cut-off level.

➢ **Invalid:** If there is no colored band in control line zone of any strip, the test result is invalid. Retest the sample with a new device.

QUALITY CONTROL

Good Laboratory practice recommends the daily use of control materials to validate the reliability of device. Control materials should be assayed as clinical specimen and challenging to the assay cutoff concentration, e.g., 25% above and below cutoff concentration. If controls values do not fall within establish range, assay results are invalid. Control materials which are not provided with this test kit are commercially available.

The Cortez Drugs of Abuse Test provides a built-in process control with a different antigen/antibody reaction at the control region (C). This control line should always appear regardless the presence of drug or metabolite. If the control line does not appear, the test device should be discarded and the obtained result is invalid. The presence of this control band in the control region serve as 1) verification that sufficient volume is added, 2) that proper flow is obtained.

PERFORMANCE CHARACTERISTICS

A. Accuracy

The accuracy of the DOA test was evaluated in each component strip and compared to GC/MS method at the following concentration: d-amphetamine 1000ng/ml (AMP) , secobarbital 300 ng/m (BAR) , oxazepam 300 ng/ml (BZO), buprenorphine-3-β-d-glucoronide 10ng/ml (BUP), benzoylecgonine 300ng/ml (COC), EDDP 100ng/ml, methadone 300 ng/ml (MTD), (+)methamphetamine 1000 ng/ml (MET), Methyldioxymethamphetamine 500 ng/ml (MDMA), phencyclidine 25 ng/ml (PCP), morphine 300 ng/ml (OPI), morphine 2000 ng/ml (OPI II), oxycodone 100ng/ml (OXY), and 11-nor-Δ9-THC-9-COOH 50ng/ml (THC), Nortriptyline 1000 ng/ml (TCA). The results of each component strip are listed below:

1. **Amphetamine** The accuracy of the Amphetamine test was evaluated in comparison to GC/MS method at a cut-off of 1000 ng/ml. Eighty one (81) urine specimens with GC/MS confirmed d-amphetamine concentration were evaluated in this study. The results are summarized and presented below:

	(-)		(+)		
Cortez AMP Test	GC/MS Negative (Less than –25% cut off)	Near cutoff negative (between –25% and c/o	Near cutoff positive (between c/o and +25%	GC/MS Positive (greater than +25% cut off)	Percent agreement with GC/MS
Positive	1	4	5	33	90.5
Negative	47	6	2	2	91.4
Total	48	10	7	35	

Positive % agreement: 90.5, Negative % agreement: 91.4
Nine (9) specimens were found discrepant between the new screening method and the GC/MS method. When compared those data, 67% (6 out of 9) of the discrepancy specimens were found between +25% to –25% of cutoff concentration (750-1250 ng/ml).

2. **Barbiturate** The accuracy of the Barbiturate test was evaluated in comparison to GC/MS at a cut-off of 300 ng/ml of secobarbital. One hundred and nineteen (119)urine specimens with GC/MS confirmed barbiturate concentration were evaluated in this study. The results are summarized and presented below:

Cortez BAR Test	(-) GC/MS Negative (Less than –25% cut off)	(-) Near cutoff negative (between –25% and c/o	(+) Near cutoff positive (between c/o and +25%	(+) GC/MS Positive (greater than +25% cut off)	Percent agreement with GC/MS
Positive	0	0	8	36	100.0
Negative	59	13	3	0	95.8
Total	59	13	11	36	

Positive % agreement:100, Negative % agreement: 95.8.
Three (3) specimens were found discrepant between the Cortez BAR and GC/MS method. When compared those data, 100% (3 out of 3) of the discrepancy specimens were found between cut-off and +25% cut-off concentration (300 – 375 ng/ml).

3. **Benzodiapine** The accuracy of the benzodiazepine test was evaluated in comparison to GC/MS at a cut-off of 300 ng/ml of oxazepam. One hundred and four (104) urine specimens with GC/MS confirmed oxazepam concentration were evaluated in this study. The results are summarized and presented below:

Cortez BZD Test	(-) GC/MS Negative (Less than –25% cut off)	(-) Near cutoff negative (between –25% and c/o	(+) Near cutoff positive (between c/o and +25%	(+) GC/MS Positive (greater than +25% cut off)	Percent agreement with GC/MS
Positive	6	3	6	44	98.0
Negative	39	5	1	0	83.0
Total	45	8	7	44	

Positive % agreement: 98.0, Negative % agreement: 83.0

Ten specimens were found discrepant between the Cortez BZD and GC/MS method. When compared those data, 40% (4 out of 10) of the discrepancy specimens were found between –25% and +25% cut-off concentration (225 – 375 ng/ml).

4. **Buprenorphine** The accuracy of the Buprenorphine test was evaluated in comparison to GC/MS at a cut-off of 10 ng/ml of buprenorphine-3-β-d-glucoronide. One hundred and one (101) urine specimens with confirmed buprenorphine-3-β-d-glucoronide concentrations were evaluated in this study. The results are summarized and presented below:

Cortez BUP Test	(-) GC/MS Negative (less than -25% cut off)	(-) Near cutoff negative (between –25% and c/o	(+) Near cutoff positive (between c/o and +25%	(+) GC/MS Positive (greater than +25% cut off)	Percent agreement with GC/MS
Positive	0	1	12	34	97.9
Negative	42	8	1	0	98.0
Total	42	9	13	34	

Positive % agreement: 97.9, Negative % agreement: 98.0.

Two (2) specimens were found discrepant between the Cortez BUP and GC/MS method. When compared those data, 50% (1out of 2) of the discrepancy specimens were found between -25% cut-off and cut-off concentration (7.5 – 10 ng/ml).

5. **Cocaine** The accuracy of the cocaine test was evaluated in comparison to GC/MS at a cut-off of 300 ng/ml of benzoylecgonine. One hundred and two (102) urine specimens with GC/MS confirmed benzoylecgonine concentration were evaluated in this study. The results are summarized and presented below:

Cortez COC Test	(-) GC/MS Negative (Less than –25% cut off)	(-) Near cutoff negative (between –25% and c/o	(+) Near cutoff positive (between c/o and +25%	(+) GC/MS Positive (greater than +25% cut off)	Percent agreement with GC/MS
Positive	0	2	3	45	97.9
Negative	46	5	0	1	96.2
Total	46	7	3	46	

Positive % agreement: 97.9, Negative % agreement: 96.2
Three (3) specimens were found discrepant between the Cortez COC and GC/MS method. When compared those data, 67% (2 out of 3) of the discrepancy specimens were found between –25% and cut-off concentration (225 –300 ng/ml).

6. **EDDP** The accuracy of the methadone metabolite (EDDP) test was evaluated in comparison to GC/MS method at a cut-off of 100 ng/mL EDDP. One hundred and sixty (160) specimens with EDDP concentration confirmed by GC/MS were evaluated.

Cortez EDDP Test	(-) GC/MS Negative (Less than –25% cut off)	(-) Near cutoff negative (between –25% and c/o	(+) Near cutoff positive (between c/o and +25%	(+) GC/MS Positive (greater than +25% cut off)	Percent agreement with GC/MS
Positive	0	2	8	70	97.5
Negative	70	8	2	0	97.5
Total	70	10	10	70	

Positive agreement = 97.5% Negative agreement = 97.5%
Four (4) specimens were found discrepant between the Cortez EDDP and GC/MS method. When compared those data, 100% (4 out of 4) of the discrepancy specimens were found between –25% and +25% cut-off concentration (75 – 125 ng/ml).

7. **MDMA** The accuracy of methylendioxyamphetamine (MDMA) test was evaluated in comparison to GC/MS at a cut-off of 500 ng/ml of MDMA. One hundred and eleven (111) urine specimens with GC/MS confirmed MDMA concentration were evaluated in this study. The results are summarized and presented below:

Cortez MDMA Test	(-) GC/MS Negative (Less than –25% cut off)	(-) Near cutoff negative (between –25% and c/o	(+) Near cutoff positive (between c/o and +25%	(+) GC/MS Positive (greater than +25% cut off)	Percent agreement with GC/MS
Positive	0	2	7	45	94.5
Negative	46	8	3	0	96.4
Total	46	10	10	45	

Positive % agreement: 94.5, Negative % agreement: 96.3

Five (5) specimens were found discrepant between the Cortez MDMA and GC/MS method. When compared those data, 100% (5 out of 5) of the discrepancy specimens were found between –25% and +25% cut-off concentration (375 – 625 ng/ml).

8. **Methadone** The accuracy of the Cortez MTD test was evaluated in comparison to GC/MS at a cut-off of 300 ng/ml of methadone. One hundred and nineteen urine specimens with confirmed methadone concentrations were evaluated in this study. The results are summarized and presented below:

Cortez MTD Test	(-) GC/MS Negative (Less than –25% cut off)	(-) Near cutoff negative (between –25% and c/o	(+) Near cutoff positive (between c/o and +25%	(+) GC/MS Positive (greater than +25% cut off)	Percent agreement with GC/MS
Positive	0	0	9	49	96.7
Negative	50	9	2	0	100
Total	50	9	11	49	

Positive % agreement: 96.7, Negative % agreement: 100.
Two (2) specimens were found discrepant between the Cortez MTD and GC/MS method. When compared those data, 100% (2 out of 2) of the discrepancy specimens were found between cutoff and +25% cut-off concentration (300-375 ng/ml).

9. **Methamphetamine** The accuracy of the methamphetamine test was evaluated in comparison to GC/MS at a cut-off of 1000 ng/ml of (+)methamphetamine. Ninety nine urine (99) specimens with GC/MS confirmed (+)methamphetamine concentration were evaluated in this study. The results are summarized and presented below:

Cortez MET Test	(-) GC/MS Negative (Less than –25% cut off)	(-) Near cutoff negative (between –25% and c/o	(+) Near cutoff positive (between c/o and +25%	(+) GC/MS Positive (greater than +25% cut off)	Percent agreement with GC/MS
Positive	0	0	4	41	91.8
Negative	44	6	4	0	100
Total	44	6	8	41	

Positive % agreement: 91.8, Negative % agreement: 100
Four (4) specimens were found discrepant between the Cortez MET and GC/MS method. When compared those data, 100% (4 out of 4) of the discrepancy specimens were found between cut-off and +25% cut-off concentration (1000 – 1250 ng/ml).

10. **Opiate** The accuracy of the opiates test was evaluated in comparison to GC/MS at a cut-off of 300 ng/ml of morphine. One hundred and twenty three (123) urine specimens with GC/MS confirmed morphine and codeine concentrations were evaluated in this study. The results are summarized and presented below:

Diagnostic Automation/ Cortez Diagnostics, Inc.
21250 Califa St, Suite 102 and 116, Woodland Hills, CA 91367 USA Phone: 818-591-3030, Fax : 818-591-8383
Email: onestep@rapidtest.com Website: www.rapidtest.com

	(-)		(+)		
Cortez OPI Test	GC/MS Negative (Less than –25% cut off)	Near cutoff negative (between –25% and c/o	Near cutoff positive (between c/o and +25%	GC/MS Positive (greater than +25% cut off)	Percent agreement with GC/MS
Positive	0	2	5	70	94.9
Negative	35	7	1	3	95.5
Total	35	9	6	73	

Positive % agreement: 94.9, Negative % agreement: 95.5
Six (6) specimens were found discrepant between the Cortez OPI and GC/MS method. When compared those data, 50% (3 out of 6) of the discrepant specimens were found between –25% and +25% cut-off concentration (225 – 375 ng/ml).

11. **Opiate II** The accuracy of Cortez Opiates II Test was evaluated in comparison to GC/MS at a cut-off of 2,000ng/ml of morphine. One hundred and eight (108) urine specimens with confirmed morphine and codeine concentrations were evaluated in this study. The results are summarized and presented below:

	(-)		(+)		
Cortez OPI II	GC/MS Negative (Less than –25% cut off)	Near cutoff negative (between –25% and c/o	Near cutoff positive (between c/o and +25%	GC/MS Positive (greater than +25% cut off)	Percent agreement with GC/MS
Positive	0	0	10	40	94.3
Negative	45	10	3	0	100.0
Total	45	10	13	40	

Positive % agreement: 94.3, Negative % agreement: 100.0.
Three specimens were found discrepant between Cortez Opiates Test and GC/MS method. When compared those data, 100% (3 out of 3) of the discrepancy specimens were found between cut-off and +25% cut-off concentration (2000 – 2500 ng/ml).

12. **Oxycodone** The accuracy of the oxycodone test was evaluated in comparison to GC/MS method at a cut-off of 100 ng/ml. One hundred and forty (140) urine specimens with GC/MS confirmed oxycodone concentration were evaluated in this study. The results are summarized and presented below:

	(-)		(+)		
Cortez OXY Test	GC/MS Negative (Less than –25% cut off)	Near cutoff negative (between –25% and c/o	Near cutoff positive (between c/o and +25%	GC/MS Positive (greater than +25% cut off)	Percent agreement with GC/MS
Positive	0	0	2	52	93.1
Negative	77	5	3	1	100
Total	77	5	5	53	

Positive % agreement: 93.1, Negative % agreement: 100
Four specimens were found discrepant between Cortez OXY and the GC/MS method. When compared those data, 75% (3 out of 4) of the discrepancy specimens were found between cut-off and +25% of cutoff concentration (100-125 ng/ml).

13. **Phencyclidine** The accuracy of the PCP test was evaluated in comparison to GC/MS at a cut-off of 25 ng/ml of phencyclidine. Ninety nine (99) urine specimens with GC/MS confirmed phencyclidine concentration were evaluated in this study. The results are summarized and presented below:

	(-)		(+)		
Cortez PCP Test	GC/MS Negative (Less than –25% cut off)	Near cutoff negative (between –25% and c/o	Near cutoff positive (between c/o and +25%	GC/MS Positive (greater than +25% cut off)	Percent agreement with GC/MS
Positive	1	0	5	36	87.2
Negative	45	6	2	4	98.1
Total	46	6	7	40	

Positive % agreement: 87.2, Negative % agreement: 98.1
Seven (7) specimens were found discrepant between the Cortez PCP and GC/MS method. When compared those data, 28.6% (2 out of 7) of the discrepancy specimens were found between cut-off and +25% cut-off concentration (25-31.3 ng/ml).

14. **Propoxyphene** The accuracy of Cortez Propoxyphene Test was evaluated in comparison to GC/MS method at a cut-off of 300 ng/ml of nor-propoxyphene. Ninety one (91) propoxyphene positive specimens with GC/MS confirmed nor-Propoxyphene concentration and fourty (40) were evaluated in this study.

	(-)		(+)		
Cortez PPX Test	GC/MS Neg. (Less than –25% cut off)	Near cutoff Neg. (between –25% and c/o	Near cutoff Pos. (between c/o and +25%	GC/MS Pos. (greater than +25% cut off)	Percent agreement with GC/MS
Positive	0	3	9	71	97
Negative	40	7	1	0	98
Total	40	10	10	71	N = 131

Positive % agreement: 97, Negative % agreement: 98
Four specimens were found discrepant between the Cortez PPX and GC/MS method. When compared to those data, 100% (4 out of 4 of the discrepancy specimens were found to be between -25% abd +25% cut-off concentration (225 – 372 ng/ml).

15. **TCA** The accuracy of the TCA test was evaluated in comparison to GC/MS at a cut-off of 1000 ng/ml of Nortriptyline. Ninety-eight (98) urine specimens with GC/MS confirmed Nortriptyline concentration were evaluated in this study. The results are summarized and presented below:

	(-)		(+)		
Cortez TCA Test	GC/MS Negative (Less than –25% cut off)	Near cutoff negative (between –25% and c/o	Near cutoff positive (between c/o and +25%	GC/MS Positive (greater than +25% cut off)	Percent agreement with GC/MS
Positive	0	2	7	25	91.7
Negative	53	8	3	0	96.8
Total	53	10	10	25	

Positive % agreement: 91.7, Negative % agreement: 96.8
Five (5) specimens were found discrepant between the Cortez TCA and GC/MS method. When compared those data, 100% of the discrepancy specimens were found between –25% and +25% cut-off concentration (750 – 1250 ng/ml).

16. **THC** The accuracy of the Cortez THC test was evaluated in comparison to GC/MS at a cut-off of 50 ng/ml of 11-nor-Δ^9-THC-9-COOH. One hundred (100) and fourteen urine specimens with GC/MS confirmed 11-nor-Δ^9-THC-9-COOH concentration were evaluated in this study. The results are summarized and presented below:

	(-)		(+)		
Cortez THC Test	GC/MS Negative (Less than –25% cut off)	Near cutoff negative (between –25% and c/o	Near cutoff positive (between c/o and +25%	GC/MS Positive (greater than +25% cut off)	Percent agreement with GC/MS
Positive	4	3	7	30	97.4
Negative	50	5	1	0	88.7
Total	54	8	8	30	

Positive % agreement: 97.4, Negative % agreement: 88.7
Eight (8) specimens were found discrepant between the Cortez THC and GC/MS method. When compared those data, 50% (4 out of 8) of the discrepancy specimens were found between –25% and +25% cut-off concentration (37.5 – 62.5 ng/ml).

B. Sensitivity

The cut-off concentrations (sensitivity level) of DOA panel test are determined to be: AMP 1000 ng/ml, BAR, 300 ng/ml, BZO 300 ng/ml, BUP 10 ng/ml, COC 300 ng/ml, EDDP 100 ng/ml, MDMA 500ng/ml, MTD 300 ng/ml, MET 1000 ng/ml, OPI 300 ng/ml, OPI II 2000 ng/ml, OXY 100 ng/ml, PCP 25 ng/ml, TCA 1000 ng/ml, and THC 50 ng/ml.

Precision

The precision of DOA panel tests were determined by conducting the test with spiked controls and interpreted the results by three individuals to verify the random error of visual interpretation. The results of 50% above and 50% below cut-off specimens are 100% agreed by three observers:

Tested Drug	Concentration (ng/ml)	Number tested	Corrected result	% Corrected result
AMP	500	40	40	100
	1500	40	40	100
BAR	150	40	40	100
	450	40	40	100
BZO	150	40	40	100
	450	40	40	100
BUP	5	40	40	100
	15	40	40	100
COC	150	40	40	100
	450	40	40	100
EDDP	50	40	40	100
	150	40	40	100
MTD	150	40	40	100
	450	40	40	100
MDMA	250	40	40	100

	750	40	40	100
MET	500	40	40	100
	1500	40	40	100
OPI I	150	40	40	100
	450	40	40	100
OPI II	1000	40	40	100
	3000	40	40	100
OXY	50	40	40	100
	150	40	40	100
PCP	12.5	40	40	100
	37.5	40	40	100
PPX	150	40	40	100
	450	40	40	100
TCA	500	40	40	100
	1500	40	40	100
THC	25	40	40	100
	75	40	40	100

C. Specificity

The specificity for DOA panel test were tested by adding various drugs, drug metabolites, and other compounds that are likely to be present in urine. All compounds were prepared in drug-free normal human urine.

1. Interference testing

The DOA panel test performance at cut-off level is not affected when pH and Specific Gravity ranges of urine specimen are at 4.5 to 9.0 and 1.005 to 1.035.

The following substances were tested and confirmed did not interfere with DOA panel tests at the listed concentrations.

Glucose	2000 mg/dl,
Human albumin	2000 mg/dl
Human hemoglobin	10 mg/dl,
Urea	4000 mg/dl
Uric acid	10 mg/dl

2. Specificity

The following table lists compounds that are detected by DOA panel test which produced positive results when tested at levels equal or greater than the concentrations listed below:

Tests	Compounds	Cut-off (ng/ml)
Amphetamine	D-Amphetamine	1,000
	D/L-Amphetamine	2,000
	L-Amphetamine	30,000
	(+)-methamphetamine	>100,000
	(±)-3,4-Methylenedioxyamphetamine (MDA)	2,000
	(±)-3,4-Methylenedioxymethamphetamine (MDMA, Ecstasy)	>100,000
	(±)-3,4-Methylenedioxyethylamphetamine (MDEA)	
Barbiturate	Alphenal	100
	Barbital	150
	Pentobarbital	150
	Phenobarbital	150
	Amobarbital	300
	Secobarbital	300
	Butalbital	5,000
Benzodiazepines	Nitrazepam	500
	Chloradiazepoxide HCl	500
	Clobazam	300
	Desmethyldiazepam	200
	Oxazepam	300
	Temazepam	300
	Alprazolam	2000
	Bromazepam	300
	Diazepam	300
	Flunitrazepam	2000
	Flurazepam	20,000
	Lorazepam	>100,000
	Clonazepam	>100,000
Buprenorphine	Buprenorphine-3-β-d-glucoronide	10
	Buprenorphine	200
Cocaine	Benzoylecgonine	300
	Cocaine	30,000
EDDP	EDDP	100
	EMDP	200,000
	Methadone	500,000
Methadone	Methadone	300
	Methadol	300
	Norpropoxyphene	>100 ,000
MDMA (Ecstasy)	(±)3,4Methylenedioxymethamphetamine (Ecstasy)	500
	(±)3,4-MDA	500
	(+)Methamphetamine	100,000
Methamphetamine	(+)Methamphetamine	1000
	(±)3,4Methylenedioxymethamphetamine (Ecstasy)	1000
	d-Amphetamine	>100 ,000
	l-Amphetamine	>100 ,000
	(±)3,4Methylenedioxyamphetamine	>100 ,000
	Chloroquine	>100 ,000
	(-)Ephedrine	>100 ,000
	β-Phenylethylamine	>100 ,000
	Procaine	>100 ,000
	d-Pseudoephedriine	>100 ,000
	Randitidinr	
Opiate	Morphine	300
	Morphine-3-β-glucuronide	300
	Codeine	300
	Ethylmorphine	300
	Hydromrphone	300
	Nalorphine	750
	Heroin	1250
	Hydrocodone	1250
	Normorphine	2000
	Norcodeine	2500
	Naloxone	25,000
	Natrexone	100,000
	Oxycodone	>100 ,000
Opiate II	Ethylmorphine	1,000
	Morphine	2,000
	Morphine-3-β-glucuronide	2,000
	Codeine	2,000
	6-Acetylmorphine	2,000
	Dihydrocodone	2,000
	Heroin	5,000
	Hydrocodone	7,500
	Hydromrphone	7,500
	Nalorphine	15,000
	Normorphine	20,000
	Norcodeine	100,000
	Naloxone	100,000
	Oxycodone	100,000
Oxycodone	Oxycodone	100
	Dihydrocodeine	20,000
	Codeine	100,000
	Hydromorphone	100,000
	Morphine	>100 ,000
	Acetylmorphine	>100 ,000
	Buprenorphine	>100 ,000
	Ethylmorphine	>100 ,000
Phencyclidine	PCP	25
	Tramadol	50,000
	N-Demethyl-cis-tramadol	100 ,000
	O-Demethyl-cis-tramadol	> 100 ,000
	Norpropoxyphene	> 100 ,000
PPX	Norpropoxyphene	300
	Propoxyphene	300
TCA	Nortriptyline	1000
	Protriptyline	1000
	Imipramine	1000
	Desipramine	1000
	Amitriptyline	1000
	Doxepin	1000
	Nordoxepin	1000
	Promazine	500
	Trimipramine	2000
	Perphenazine	>100 ,000
	Chlorpromazine	>100 ,000
	Clomipramine	>100 ,000
THC	11-nor-△9-THC-9-COOH	50
	11-nor-△8-THC-9-COOH	37.5
	11-hydroxy-△9-THC	5000
	△8-Tetrahydrocannabinol	15000
	△9-Tetrahydrocannabinol	25000

The following compounds show no cross-reactivity at concentration up to 100 μg/ml unless specified.

Diagnostic Automation/ Cortez Diagnostics, Inc.
21250 Califa St, Suite 102 and 116, Woodland Hills, CA 91367 USA Phone: 818-591-3030, Fax : 818-591-8383
Email: onestep@rapidtest.com Website: www.rapidtest.com

4-Acetamidophenol	Deoxyephedrine	Imipramine	Promethazine
Acetaminophen	Dextromethorphan	Ibuprofen	Pseudoephedrine
Acetylsalicylic acid	Digitoxin	Isoproterenol	Quinine antidine
Amikacin	Digoxin	Ketamine	Salicyclic
Amitriptyline	Diphenhydramine	Lidocaine	Tetracycline
Arterenol	Ecgonine	Meperidine	Tetrahydrozoline
Aspartame	Ecgonine methyl ester	Methaquaalone	Theophylline
Ascorbic acid	Ephedrine	Methylphenidate	Thioridazine
Atrophine	Epinephrine	Neomycin	Trifluoperazine
Caffeine	Gentisic acid	Niacinamide	Tryptophan
Camphor	Guaiacol glycer ester	Perphenazine	Tyramine
Chloroquine	Histamine	Penicillin G	
Chlopheniramine	Hydrochlorothiazide	Phenylethylamine-α	
Cortisone	Homatrophine	Phenylpropanolamine	

5. Use a new urine specimen cup for each sample to avoid cross contamination.

STORAGE

1. The test device should be stored at 2 to 30^{O}C and will be effective until the expiration date stated on the package. The product is humidity-sensitive and should be used immediately after being open. Any improperly sealed product should be discarded.

LIMITATION OF PROCEDURE

The assay is designed for use with human urine only. A positive result with any of the tests indicates only the presence of a drug/metabolite and does not indicate or measure intoxication. There is a possibility that technical or procedural error as well other substances in certain foods and medicines may interfere with the test and cause false results. Please refer "**SPECIFICITY"** section for lists of substances that will produce either positive results, or that do not interfere with test performance. If a drug/metabolite is found present in the urine specimen, the assay does not indicate frequency of drug use or distinguish between drug of abuse and certain foods and medicines.

EXPECTED VALUES

The DOA Panel Test is a qualitative assay. It identifies the drug(s) in human urine at its cut-off concentration or higher. The concentration of the drug(s) can not be determined by this assay. The test is intended to distinguish negative result from presumptive positive result. All positive results must be confirmed using an alternate method, preferably GC/MS.

PRECAUTION

1. For in vitro diagnostic and forensic use only.
2. Do not use the product beyond the expiration date.
3. Handle all specimens as potentially infectious.
4. Humidity sensitive product, do not open foil pouch until it is ready to be used.

REFERENCES

1. Urine testing for drugs of abuse, NIDA Research Monograph 73 (1986)
2. Steven B. Karch, Drugs of abuse hand book, CRC Press, 1st. Ed. (1998)
3. Ray H. Liu and Bruce A. Goldberger, Handbook of workplace drug testing, AACC Press, Washington DC (1995)

ISO 13485
ISO 9001

Diagnostic Automation/ Cortez Diagnostics, Inc.
21250 Califa St, Suite 102 and 116, Woodland Hills, California 91367 USA

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