

URINE DRUGS OF ABUSE SCREEN
By DrugSmart Cup

Principle

The DrugSmart Cup is a rapid urine screening test that can be performed without the use of an instrument. The test utilizes a mixture of antibodies and antigens to selectively detect elevated levels of the following drugs in urine: Amphetamines (AMP), Benzodiazepines (BZD), Cocaine (COC), Opiates (OPI), Cannabinoids (THC), Oxydodone (OXY), Methadone (MTD), and Methamphetamine (MET).

The DrugSmart Cup is an immunoassay based on the principle of competitive binding. Drugs which may be present in the urine specimen compete against their respective drug conjugate for binding sites on their specific antibody.

During testing, a urine specimen migrates upward by capillary action. If a drug is present above the cut-off concentration the drug will saturate all the binding sites of the antibody. A colored line will not form in the test line region. However, a drug that is absent or present in the urine specimen below its cut-off concentration, will not saturate the binding sites of its specific antibody. The end result will be the presence of a colored line on the test strip.

A drug-positive urine specimen will not generate a colored line in the specific test line region of the strip because of drug competition while a drug-negative urine specimen will generate a line in the test line region because of the absence of drug competition.

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.

Interferences

- A. There is a possibility that technical (using an expired cup for example) or procedural errors (reading the cup after 10 minutes for example), as well as other interfering substances in the urine specimen that may cause erroneous results.
- B. Adulterated urine specimens may provide erroneous results. If adulteration of the specimen is suspected, request another specimen. See appendix D.
- C. A **positive** result does not indicate the level of intoxication, administration route, or concentration in urine.
- D. A **negative** result does not necessarily indicate a drug-free urine. Negative results can be obtained when the drug is present, but below the cut-off level of the test.
- E. This test does not distinguish between drugs of abuse and certain medications.
- F. Refer to Appendix B for information on cross-reactivity for each assay.

Specimen Requirements

- A. DrugSmart cup collection:
 - 1. If confirmatory testing is necessary please collect the sample into a sterile cup instead. See part B.
 - 2. The urine specimen must be collected in a labeled test cup with a minimum volume of 30mL. Urine can be collected at any time of day for testing.
- B. Sterile cup collection:
 - 1. The urine specimen must be collected in a labeled sterile collection cup with a minimum volume of 30mL. Urine can be collected at any time of day for testing. Urine specimens exhibiting visible precipitates should be allowed to settle prior to testing.
 - 2. Confirmatory screening requires 2–6 mL depending on the test. See reporting and interpretation of results section for greater detail. No other specimen types are acceptable (i.e. serum or non-human urine).
 - 3. If testing cannot be performed immediately the sample may be refrigerated at 2-8°C for a maximum of 48 hours. Refrigerated specimens must be at room temperature prior to testing. If visible precipitates are present, the urine should be allowed to settle prior to testing.

Quality Control

- A. One positive and one negative urine control are assayed once per week or upon opening a new lot of cups.
- B. The negative QC must yield an interpretation of “Negative” on all assays to be valid. The positive QC must yield an interpretation of “Positive” on all assays to be valid.
- C. The two controls are Biochemical Diagnostics Negative Control and Biochemical Diagnostics DET Stat Skreen-H Control. The controls are provided in liquid form. Swirl gently prior to use to ensure homogeneity. Each control bottle is for a single use.
- D. Label two test cups as Neg and Pos. Open one negative and one positive bottle and pour contents into the appropriate cup.
- E. Read test results after 5 minutes.
- F. Record the QC results on the Urine Drug Screen QC log sheet. Out of control values are documented and any corrective action taken is recorded on the log sheet.
- G. Control package inserts and QC log sheets must be kept in the QC file for 2 years.

Test Procedure

- A. Tear open the foil pouch and remove the Test Cup.
- B. Label the Test Cup with two patient identifiers and pour the freshly collected urine into the test cup.
- C. The clinic personnel will start the timer or observe the time on the clock.
- D. The personnel will remove the tear-off label and read the results after five minutes.
- E. At the end of 5 minutes, read each strip result and record the results in EPIC.

In order to prevent any incorrect results, the results should NOT be interpreted after 10 minutes.

Reference Ranges

Negative.

Linearity

- A. Sensitivity

Cut-off concentrations for each drug were set according to Substance Abuse and Mental Health Services Administration (SAMHSA) guidelines. The cut-off value is determined by the mean reaction rate of the Low (middle) Calibrator on each assay, and is reported in absorbance units (mA/min) on the instrument printout. The absorbance cut-off value will change slightly with each calibration. The actual concentration (ng/mL) of the drug is not displayed.

Assay	Cut-Off (ng/mL)
Amphetamines (AMP)	$\geq 1,000$
Benzodiazepine (BZD)	≥ 300
Cocaine (COC)	≥ 300
Methadone (MTD)	≥ 300
Methamphetamine (MET)	$\geq 1,000$
Opiates (OPI)	$\geq 2,000$
Oxycodone (OXY)	≥ 100
Marijuana (THC)	≥ 50

Calculations

None.

Reporting and Interpreting Results

A. Interpretation of Results:

1. **Negative:** Two lines appear. A colored line appears in the Control region (C) and a colored line appears in the Test region (T). A negative test result indicates that the drug is either not present or is present at levels below the cutoff threshold of the test.
***Note:** The shade of the colored lines in the Test region (T) may vary. The result should be considered negative whenever there is even a faint line.
2. **Positive:** Only one line appears. A colored line appears in the Control region (C) and **No** colored line appears in the Test region (T). The positive result means that the drug concentration in the urine sample is greater than the designated cut-off threshold of the test.
3. **Invalid:** No line appears in the Control region (C). Insufficient specimen volume or incorrect procedural techniques are the most likely reasons for Control line failure. Repeat the test with a new cup.

Each strip result is read individually and independent of one another.

B. For any drug that tests positive, the following procedure must be followed if sending the sample for confirmatory analysis:

1. Verify that sufficient urine is available to perform the confirmation. If additional urine is required, ask for it at this time. Label a separate urine cup with the patient information. Transfer the urine specimen into the labeled cup.
2. In the event that two or more drug classes need to be confirmed, determine which class of drugs should be confirmed first in the event that insufficient urine is available to perform confirmation of all drugs.
3. The minimum volume needed to run each confirmation test is listed below. The volumes are per individual test; therefore, if the sample were positive for Cocaine (2 mL) and Opiates (2 mL), a total of 4 mL would be required. Send urine to LCRP.

Amphetamines	2 mL
Cocaine	2 mL
Opiates	2 mL
THC - Cannabinoids	6 mL
Barbiturates	5 mL

Reagents, Controls, and Calibrators

A. DrugSmart Test Cup:

No preparation is required. Packaged in the sealed pouch, the cups are stored at 2°-30°C. The cups are stable through the expiration date printed on the sealed pouch. The cup must remain in the sealed pouch until use. DO NOT FREEZE.

B. Biochemical Diagnostics Quality Controls:

- DET Stat Skreen-H Control
- Negative Control

Controls are prepared from human urine with drugs of abuse added. The controls come in liquid form, no preparation required. Before sampling, gently swirl the vials several times to ensure mixing. Unopened control is stable until label expiration when stored at 2-8°C.

C. No calibration is necessary.

References

- A. DrugSmart Cup package insert
- B. National Institute of Mental Health Website;
<http://www.nimh.nih.gov/publicat/medicate.cfm>
- C. The Clinical Toxicology Laboratory, Contemporary Practice of Poisoning Evaluation; Leslie M. Shaw, Tai C. Kwong, et al.; AACC Press, Washington,DC; 2001.
- D. Clinical Chemistry – Theory, Analysis, Correlation; Lawrence A. Kaplan, Amadeo J. Pesce, Steve Kazmierczak; Mosby, St. Louis, MO; 2003.
- E. Troubleshooting guide-Drugs of abuse handout, March 2007

Appendix A

Assay Principle

Amphetamine/Methamphetamine: Amphetamine is a sympathomimetic amine whose biological effects include potent central nervous system stimulation, appetite reduction, hyperthermia, insomnia and euphoria. The drug is readily absorbed by the gastro intestinal tract and is then either deactivated by the liver into deaminated and hydroxylated metabolites or excreted unchanged in the urine. Pharmaceutical names of amphetamine include Adderall[®] and Dexedrine[®]. Common street names are “speed” and “uppers.” The half-life of the drug is approximately 12 hours. The detection window of amphetamine in urine is 1 to 2 days after use. Methamphetamine is a potent sympathomimetic amine with therapeutic applications. High doses lead to enhanced stimulation of the central nervous system and induce euphoria, alertness, and a sense of increased energy. Other physical responses to methamphetamine use include cardiac dysrhythmias, paranoia and psychotic behaviors virtually indistinguishable from schizophrenia. Methamphetamine has a half-life of about 15 hours. In urine, both methamphetamine and its metabolite amphetamine can be detected up to 3 days after use.

Barbiturates: Barbiturates are a class of central nervous system depressants used medically as sedatives and anticonvulsants. Members of the barbiturate class include phenobarbital, pentobarbital, secobarbital, butalbital and amobarbital. Common physical effects of barbiturate use include impaired motor coordination, anesthesia, sedation, cardiovascular and respiratory depression. The half-lives of barbiturates range from 2 to 40 hours, depending on the duration of use. Short acting barbiturates, such as secobarbital and butalbital, can be detected in urine up to 4 days after use. Long-acting barbiturates, such as phenobarbital, can be detected in urine up to 3 weeks after use.

Benzodiazepines: Benzodiazepines are a class of drugs frequently prescribed for the treatment of anxiety, sleep disorders and some seizure conditions. Members of this drug class include diazepam, chlordiazepoxide, alprazolam and cloazepam. Physical and psychological effects of benzodiazepine use include lethargy, reduced motor coordination and drowsiness. Physical dependence can occur and withdrawal symptoms may appear when the medication is discontinued. The half-lives of benzodiazepines range from 2 to 40 hours, depending on the duration of use. Benzodiazepines may be detected in urine up to 10 days after use.

Cocaine: Derived from the leaves of the coca plant, cocaine is a potent central nervous system stimulant and local anesthetic. Physical and psychological effects of cocaine use include increased heart rate, fever, pupil dilation, diaphoresis, euphoria and increased energy. Biologically, cocaine is rapidly metabolized to benzoylecgonine. The half-life of benzoylecgonine (5 to 8 hours) is much longer than that of the parent compound cocaine (0.5 to 1.5 hours). Benzoylecgonine can be detected in urine up to 3 days after cocaine use.

Opiates: Opiates, including heroin, morphine, and codeine, are derived from the opium poppy. Medicinally, opiates are used for pain management and cough reduction. Heroin is an illicit analog of morphine that breaks down in the body to 6-acetylmorphine, morphine and morphine glucuronide. The biological half-lives of opiates range from 3-4 hours. In urine, opiates are detectable up to 3 days after use. Morphine is the metabolite of both heroin and codeine; morphine (or morphine glucuronide) in urine could indicate morphine, heroin and/or codeine use.

THC: Tetrahydrocannabinol (THC) is considered the most psychoactive of the more than 400 chemicals found in the marijuana plant (*Cannabis sativa*). Physical and psychological effects of marijuana use include elevated mood, increased appetite, increased cardiac output, apathy and altered perception. The ability of the drug to enhance the appetite has made marijuana attractive for use with AIDS and cancer patients suffering from nausea and vomiting. THC is extensively metabolized to 11-nor-⁹-THC-9-COOH which has a half-life of 24 hours. Urine detection limits vary widely depending on the frequency of drug use. In chronic users, THC-COOH can remain detectable in the urine for up to 28 days.

Methadone: Methadone is a narcotic analgesic prescribed for the management of moderate to severe pain and for the treatment of opiate dependence. The pharmacology of Oral Methadone is very different from IV Methadone. Oral Methadone is partially stored in the liver for later use. IV Methadone acts more like heroin. In most states you must go to a pain clinic or a Methadone maintenance clinic to be prescribed Methadone. Methadone is a long acting pain reliever producing effects that last from 12 to 48 hours. Ideally, Methadone frees the client from the pressures of obtaining illegal heroin, from the dangers of injection, and from the emotional roller coaster that most opiates produce. Methadone, if taken for long periods and at large doses, can lead to a very long withdrawal period. The withdrawals from Methadone are more prolonged and troublesome than those provoked by heroin cessation, yet the substitution and phase removal of Methadone is an acceptable method of detoxification for patients and therapists.

Oxycocone: Oxycodone is a semi-synthetic opioid with a structural similarity to codeine. The drug is manufactured by modifying thebain, an alkaloid found in the opium poppy. It provides relief by acting on opioid receptors in the spinal cord, brain, and possibly directly in the affected tissues. Oxycodone is prescribed for the relief of moderate to high pain under the well-known pharmaceutical trade names of OxyContin, Tylox, Percodan, and Percocet. The window of detection for oxycodone in the urine is expected to be similar to that of other opioids.

Appendix B

Cross Reactivity

Cross-reactivity of structurally similar substances is a problem associated with immunoassay methodologies, resulting in false positive or negative results. Screening technologies are predominantly immunoassay techniques which may prove high sensitivity but are of limited specificity. Manufacturers will test for common potential interfering substances and list these on the package insert, however it is not possible to test every compound. Also some compounds ingested in therapeutic dosage may not cross-react, however when abused in “mega” doses may significantly influence urine immunoassay results.

Listed below are potential reactants and cross-reactants with **most** immunoassay methodologies

Acetaminophen (see also Paracetamol)	Aceta, Acephen, Apacet, Dapacen, FEVERALL, Tylenol, Excedrin (combination), Panadol, Tempra	Non-reactive
Acetaminophen with Codeine (see also Paracetamol with codeine)	Tylenol 3, Tylenol with codeine	Positive for Opiates (OPI) Potential cross reactants: Dihydrocodeine
6-Acetylmorphine		Positive for Opiates (OPI)
Acetone		Non- reactive
Allobarbitol		Positive for Barbiturates (BAR)
Alphenol	No known trade names	Positive for Barbiturates (BAR)
Alprazolam	Xanax	Positive for Benzodiazepines (BZO) Potential cross reactants: Oxaprozin (Daypro), Sertraline
Amobarbital	Amytal, Tuinal	Positive for Barbiturates (BAR)
Amphetamine/ Methamphetamine	AMP: Adderall, Dexedrine, Benzedrine M/AMP: Desoxyn, Didrex Eldepryl	Positive for Amphetamines/ Methamphetamines Potential cross reactants: Ephedrine, Pseudoephedrine, Phenylpropanolamine, Phentermine, Phenmetrazine, Ranitidine
Ampicillin	Penbritin, Polycillin, Principen	Non-reactive
Aprobarbital		Positive for Barbiturates (BAR)
Aspirin	Bayer Aspirin, Excedrin, ASA, Angettes, Asasantin, Caprin	Non-reactive
Barbital		Positive for Barbiturates (BAR)

Benzodiazepines	See individual Benzodiazepines listed	Potential cross reactants: Oxaprozin (Daypro), Sertraline
Bromazepam	Lexotan	Positive for Benzodiazepines (BZO) Potential cross reactants: Oxaprozin (Daypro), Sertraline
Brompheniramine	Dimetapp, Dimotapp, Dimotane	Non-reactive
Butabarbital	Butisol, Soneryl	Positive for Barbiturates (BAR)
Butalbital	Fioricet, Fiorinal	Positive for Barbiturates (BAR)
Butethal		Positive for Barbiturates (BAR)
Chlorazepate	Tranxene	Positive for Benzodiazepines (BZO)
Chlordiazepoxide	Librium	Positive for Benzodiazepines (BZO) Potential cross reactants: Oxaprozin (Daypro), Sertraline
Clobazam	Frisium	Positive for Benzodiazepines (BZO) Potential cross reactants: Oxaprozin (Daypro), Sertraline
Clonazepam	Clonopin, Klonopin, Rivotril	Positive for Benzodiazepines (BZO) Potential cross reactants: Oxaprozin (Daypro), Sertraline
Codeine Phosphate	Codafen Continus, Codeine Linctus, Pediatric BP, Galcodine, Kapake, Migraleve, Solpadol, Tylex	Positive for Opiates (OPI) Potential cross reactants: Dihydrocodeine
Co-Fluampicil	Magnapen	Non-reactive
Delorazepam	Briantum	Positive for Benzodiazepines (BZO)
Dexamphetamine Sulfate	Adderall, Adderall XR, Dexedrine	Positive for Amphetamine (AMP)
Diazepam	Diazemuls, Stesolid, Valclair, Valium	Positive for Benzodiazepines (BZO) Potential cross reactants: Oxaprozin (Daypro), Sertraline
Dihydrocodeine	DHC Continus, Paramol, Remedeine, Remedeine Forte	Positive for Opiates (OPI/MOR)
Doxylamine	Nyquil	Positive for Methadone (MTD)
Ecgonine		Positive for Cocaine (COC)
Ecgonine Methyl Ester		Positive for Cocaine (COC)
Efavirenz		Positive for Cannabinoids (THC) [Urinary metabolite only].
Estazolam	ProSom	Positive for Benzodiazepines (BZO) Potential cross reactants: Oxaprozin (Daypro), Sertraline
Ethylmorphine		Positive for Opiates (OPI) Potential cross reactants: Dihydrocodeine
Flunitrazepam	Rohypnol	Positive for Benzodiazepines (BZO) Potential cross reactants: Oxaprozin (Daypro), Sertraline
Hydrocodone	Lorcet, Loratab, Vicodin,	Positive for Opiates (OPI) and Oxycodone (OXY)
Hydormorphone	Dilaudid, Hydrostat	Positive for Opiates (OPI) and Oxycodone (OXY)
Ibuprofen	Brufen, Codafen, fenbid, Ibugel,	Non-reactive

	Ibuspray, Motrin, Proflex	
Koalin and Morphine mixture	Diocalm, Entersan, Opazimes	Positive for Opiates (OPI)
Ketoprofen	Orudis, Oruvail, Powergel	Non-reactive
Lorazepam	Ativan	Positive for Benzodiazepines (BZO) Potential cross reactants: Oxaprozin (Daypro), Sertraline
Lormetazepam	Noctamide	Positive for Benzodiazepines (BZO) Potential cross reactants: Oxaprozin (Daypro), Sertraline
Medazepam	Anxitol, Lerisum, Medacepan, Nobritol, Nobrium	Positive for Benzodiazepines (BZO)
p- Methoxyamphetamine (PMA)		Positive for Methamphetamine (M-AMP) Potential cross reactants: Ephedrine, Pseudoephedrine, Phenylpropanolamine, Phenetermine, Ranitidine
Methadone, Hydrochloride	Dolophine, Methadose, Phisetone	Positive for Methadone (MTD)
d-Methamphetamine HCL	Desoxyn, Methedrine, Methamprex	Positive for Methamphetamine (M-AMP) Potential cross reactants: Ephedrine, Pseudoephedrine, Phenylpropanolamine, Phenetermine, Ranitidine
l-Methamphetamine HCL	Vick's Inhaler	Positive for Methamphetamine (M-AMP) Potential cross reactants: Ephedrine, Pseudoephedrine, Phenylpropanolamine, Phenetermine, Ranitidine
Methylenedioxyamphetamine (MDA)	Eve (slang), Love Drug (slang)	Positive for Amphetamine (AMP) Potential cross reactants: Ephedrine, Pseudoephedrine, Phenylpropanolamine, Phentermine, Phenmetrazine, Ranitidine
Methylenedioxymethamphetamine (MDMA)	Ecstasy (slang), XTC (slang), Adam (slang), E (slang)	Positive for Methamphetamine (M-AMP) and Ecstasy (MDMA) Potential cross reactants: Ephedrine, Pseudoephedrine, Phenylpropanolamine, Phentermine, Phenmetrazine, Ranitidine
Morphine	Astramorph, Cyclimorph, Duramorph, Morcap, Morphine Sulfate, MS Contin, Oramorph, Roxanol, Severedol	Positive for Opiates (OPI, MOR/MOP) Potential cross reactants: Dihydrocodeine
Naproxen	Aleve, Condrotec, Napratec, Naprosen, Naprosyn, Nycopren, Synflex	Non-reactive
Nicotine	Nicoderm, Nicorette, Nicotinell, Nicotrol, Niquitin	Non-reactive
Nitrazepam	Mogadon, Somnite	Positive for Benzodiazepines (BZO) Potential cross reactants: Oxaprozin (Daypro), Sertraline
Nordiazepam		Positive for Benzodiazepines (BZO) Potential cross reactants: Oxaprozin (Daypro), Sertraline

Oxazepam	Serax, Ox-pam	Positive for Benzodiazepines (BZO) Potential cross reactants: Oxaprozin (Daypro), Sertraline
Oxymorphone		Positive for Oxycodone (OXY)
Penicillin	Combicillin, Mefoxin	Non-reactive
Pentobarbital	Nembutal	Positive for Barbiturates (BAR)
Phenobarbitone (see also Phenobarbital)	Luminal	Positive for Barbiturates (BAR)
Phenytoin	Dilantin, Epanutin, Epitard	Possible positive for Barbiturates (BAR). Urinary metabolite only.
Phenobarbital	Donnatal	Positive for Barbiturates (BAR)
Pholcodine	Galenphol, Strong BP, Pavacol-D, Thebacon	Positive for Opiates (OPI)
Procaine	Novocain	Non-reactive
Prazepam	Centrax, Demetrin	Positive for Benzodiazepines (BZO)
Pseudoephedrine	Afrinol, Sudafed, Tylenol Cold (combination)	Potential Positive for Amphetamine (AMP) and Methamphetamine (M-AMP)*
Quinidine		Non- reactive
Ranitidine	Pylorid, Zantac	Potential Positive for Methamphetamine (M-AMP). Urinary metabolite only.
Secobarbital	Seconal	Positive for Barbiturates (BAR)
Sertaline	Zoloft	Potential positive for Benzodiazepines(BZO).
Temazepam	Restoril	Positive for Benzodiazepines(BZO) Potential cross reactants: Oxaprozin (Daypro), Sertaline
Theophylline		Non- reactive
Triazolam	Halcion	Positive for Benzodiazepines (BZO) Potential cross reactants: Oxaprozin (Daypro), Sertraline
Tyramine		Non- reactive
(1R,2S)-(-)-N-Methyl-Ephedrine		Non- reactive

Appendix C

Duration of drug detectability in urine after use

*

Drug	Duration
Amphetamines,	48 hours
Benzodiazepines	Highly variable
Cocaine	24-72 hours
Heroin/ Opiate, Oxycodone	24 hours
Marijuana THC - Cannabinoids	3-30 days
Methamphetamine	1-2 days

Appendix D

ADULTERATION TESTING/ SPECIMEN VALIDITY TESTING

Adulteration is the tampering of a urine specimen with the intention of altering the test results. The use of adulterants can cause false negative results in drug tests by either interfering with the screening test or destroying the drugs present in the urine. Diluting, flushing or adding adulterants to the sample after collection are ways that users of illicit drugs have attempted to defeat drug tests and invalidate the testing procedures. Diluting samples or adding household chemical such as detergents, bleach and soaps are some of the creative ploys that abusers have used to mask positive samples. Specimen tampering is very common in the United States and is expected to continue to grow in other areas of the world that use drug tests. There are many different types of adulterants; some are made to affect the test, others are made to affect the drug.

CREATININE (DILUTION):

Dilution is the most common type of adulteration. Dilution can be either “*in vivo*” (consuming excessive quantities of fluids in an attempt to dilute the urine) or “*in vitro*” (introducing liquid into a specimen that has already been collected). The intention of dilution is to make the concentration of drug in the urine lower than the detection limit (cutoff) of the test. Creatinine testing in conjunction with specific gravity testing is a good indication of dilution of the urine sample. The absence of Creatinine (<5 mg/dl) is indicative of a specimen not consistent with human urine.

SPECIFIC GRAVITY: (Less than 1.005):

Specific gravity tests for sample dilution. Values outside the normal range may be the result of specimen dilution or adulteration.

pH: (Less than 5.0 or greater than 8.0):

pH tests for the presence of acidic or alkaline adulterants in urine. Values outside the normal range may indicate that the specimen has been altered or spiked with acidic or alkaline compounds.

NITRITE: (Urinary tract infection):

Nitrite is a compound that is introduced into a urine specimen after collection. Nitrite works by oxidizing the major cannabinoid (THC-COOH) metabolite and making it undetectable. While this mechanism does work, the time needed for the reaction to occur is usually several hours. This means that after collection of the urine the rapid test maybe positive and when the sample is tested at the laboratory the nitrate will have modified the THC metabolite making it undetectable. Some commonly used commercial adulterants that contain nitrates are “Klear, Whizzes, Mary Jane 13”. Nitrites are sometimes found in people with urinary tract or bacterial infections.

GLUTARALDEHYDE:

Glutaraldehyde is an older adulterant that is introduced into the urine specimen after collection. It is not believed to affect the performance of lateral flow tests. Glutaraldehyde denatures the enzyme used in EMIT-like autoanalyzer reagents. Adulterants such as UrinAid and Clear Choice contain glutaraldehyde. Glutaraldehyde is not normally found in urine. However certain metabolic abnormalities such as ketoacidosis (fasting, uncontrolled diabetes, high-protein diets) may interfere with the test results.

OXIDANTS/PYRIDINIUM CHLOROCHROMATE (PCC):

Like nitrite, oxidants and PCC are introduced into a specimen after collection and are primarily meant to alter the structure of THC-COOH. Some commonly used oxidants are bleach, hydrogen peroxide and Urine Luck. Normal human urine should not contain oxidants or PCC. The presence of high levels of antioxidants in the specimen, such as ascorbic acid, may result in false negative results.

