

Matrix Cup

Plus Optional Adulterant Strip(s)

FOR THE QUALITATIVE ASSESSMENT OF DRUGS AND/OR THEIR METABOLITES IN HUMAN URINE

and

URINE ALCOHOL (Optional)

FOR THE SEMI-QUANTITATIVE ASSESSMENT OF ETHYL ALCOHOL IN HUMAN URINE

Plus

URINE CHECK (Optional)

FOR THE VALIDATION OF URINE SPECIMEN EXAMINED

For in vitro Diagnostic and Forensic Use



Optional: Alcohol & Adulteration

REF.	<p>Urine Alcohol Strip can be optionally integrated into this Matrix Cup</p> <p>Urine check adulteration strip can also be optionally integrated into Drugs Of Matrix Cup with custom parameters. pH and/or creatinine are the optional standard parameters whereas five other parameters are offered as options for custom made test devices. The currently available Adulteration parameters offered by Matrix Diagnostics Ltd. are Creatinine (C), pH (P), Specific Gravity (G), Nitrite (N), Glutaraldehyde (U), Bleach(B), and Pyridinium Chlorochromate (P).</p>
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MES	Mescaline	300	ng/ml of Mescaline
MPD	Methylphenidate	150	ng/ml of Methylphenidate
MQL	Methaqualone	300	ng/ml of Methaqualone
MTD	Methadone	300	ng/ml of methadone
OPI *	Opiate*	300	ng/ml of morphine
OPI II*	Opiate II*	2000	ng/ml of morphine
OXY	Oxycodone	1000	ng/ml of oxycodone
PCP	Phencyclidine	25	ng/ml of phencyclidine
PGB	Pregabalin	500	ng/ml of Pregabalin
PGB	Pregabalin	1000	ng/ml of Pregabalin
PPX	Propoxyphene	300	ng/ml of Norpropoxyphene
TAP	Tapentadol	500	ng/ml of Tapentadol
THC	Cannabinoid	50	ng/ml of 11-nor-Δ9-THC-9-COOH
TPM	Tropicamide	350	ng/ml of Tropicamide
TML	Tramadol	100	ng/ml of Tramadol
TML	Tramadol	200	ng/ml of Tramadol
TCA	Tricyclic antidepressant	1000	ng/ml of Nortriptyline
TZD	Trazodone	200	ng/ml of Trazodone
TLD	Tilidine	300	ng/ml of Tilidine
ZAL	Zaleplon	100	ng/ml of Zaleplon
ZOL	Zolpidem Phenyl-4-carboxylic acid	50	ng/ml of Zolpidem Phenyl-4-carboxylic acid
ZOP	Zopicone	50	ng/ml of Zopicone
6-MAM	6-Acetylmorphine	10	ng/ml of 6-Acetylmorphine
7-ACL	7-Aminoclonazepam	300	ng/ml of 7-Aminoclonazepam
APVP	α -Pyrrolidinovaleperophenone	500	ng/ml of α -Pyrrolidinovaleperophenone
GHB	Gamma-Hydroxybutyric Acid	10	µ g/ml of Gamma-Hydroxybutyric Acid
ALC	Alcohol	40	mg/dl (0.04% BAC) of Alcohol
Oxidants/ Specific Gravity / pH/Nitrite / Glutaraldehyde/Creatinine			

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 judgement should be applied to any drug of abuse test result, particularly when preliminary positive results are indicated. The optional built-in Adulteration Test is for validation of urine specimen's integrity and must not be used for In Vitro diagnostic use.

*** SAMHSA recommends a cut-off concentration of 2000 ng/ml for Opiates Test, a cut-off concentration of 1000 ng/ml for Amphetamine Test, a cut-off concentration of 10 ng/ml for Buprenorphine Test, a cut-off concentration of 100 ng/ml for EDDP Test, a cut-off concentration of 1000 ng/ml for Methamphetamine Test.**

SUMMARY AND EXPLANATION

Drugs of Abuse

ACE Acetaminophen (paracetamol) is a popular alternative to aspirin due to its lower potential for undesirable side effects, exhibiting analgesic and antipyretic effect without anti-inflammatory properties. Acetaminophen is available in pure form as numerous tradename preparations for oral use, in amounts of 350-500 mg in normal-release or 650 mg in sustained release formulations. Its is also found combined in over 200 preparations with other drugs such as codeine, hydrocodone and propoxyphene. In therapeutic usage the drug is excreted largely in the urine as various conjugates: 45-55% as a glucuronide conjugate, 20-30% as a sulfate, and 15-55% as cysteine and mercapturic acid conjugates. Approximately 2% of each doses is excreted unchanged in the urine. Following overdose, saturation of conjugation pathways occurs and glutathione stores become depleted, resulting in the formation of a highly reactive acetaminophen metabolite. The amount of unchanged acetaminophen excreted in urine after overdose may increase to as much as 10-14% of each dose.

ALP Benzodiazepines are medications that are frequently prescribed for the symptomatic treatment of anxiety and sleep disorders. They produce their effects via specific receptors involving a neurochemical called gamma aminobutyric acid (GABA). Because they are safer and more effective, Benzodiazepines have replaced Barbiturates in the treatment of both anxiety and insomnia. Benzodiazepines are also used as sedatives before some surgical and medical procedures, and for the treatment of seizure disorders and alcohol withdrawal.Risk of physical dependence increases if Benzodiazepines are taken regularly (e.g., daily) for more than a few months, especially at higher than normal doses. Stopping abruptly can bring on such symptoms as trouble sleeping, gastrointestinal upset, feeling unwell, loss of appetite, sweating, trembling, weakness, anxiety and changes in perception. Only trace amounts (less than 1% of most Benzodiazepines are excreted unaltered in the urine; most of the concentration for the Benzodiazepines in the urine is 3-7 days.Alprazolam may be quantified in blood or plasma to confirm a diagnosis of poisoning in hospitalized patients, provide evidence in an impaired driving arrest, or to assist in a medicolegal death investigation. Blood or plasma alprazolam concentrations are usually in a range of 10–100 µg/L in persons receiving the drug therapeutically, 100–300 µg/L in those arrested for impaired driving, and 300–2000 µg/L in victims of acute overdose

AMP are a class of potent sympathomimetic agents with therapeutic applications. The most common amphetamines are d-amphetamine and dl-amphetamine. Amphetamines are central nervous stimulants that cause the neurotransmitters epinephrine, norepinephrine and dopamine to be released into the brain and body giving users feelings of euphoria, alertness, and increased energy. Chronic abuse of amphetamine leads to tolerance and drug reinforcement effect. Cardiovascular responses to amphetamine include i ncreased 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

BAR 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

BZO are a class of widely prescribed central nervous system depressants which have anxiolytic, hypnotic, anticonvulsant and muscle relaxant effects. Chronic abuse can result in addiction and tardive dyskinesia. 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.

BUP A derivative of thebaine, is an opioid that has been marketed in the United States as the Schedule V parenteral analgesic Buprenex. In 2003, based on a reevaluation of available evidence regarding the potential for abuse, addiction, and side effect, DEA reclassified buprenorphine from a Schedule V to a Schedule III narcotic. Buprenorphine resembles morphine structurally but has a longer duration of action than morphine and can be administered 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 of 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 may 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.

CAT Cathine, also known as d-norpseudoephedrine and (+)-norpseudoephedrine, is a psychoactive drug of the phenethylamine and amphetamine chemical classes which acts as a stimulant. Along with cathinone, it is found naturally in Catha edulis (khat), and contributes to its overall effects. It has approximately 10–14% of the potency of amphetamine. The World Anti-Doping Agency's list of prohibited substances (used for the Olympic Games among other athletic events) bars cathine in concentrations of over 5 micrograms per milliliter in urine.Cathine is a Schedule III drug under the Convention on Psychotropic Substances.

CAF Caffeine is a central nervous system (CNS) stimulant of the methylxanthine class. It is the world's most widely consumed psychoactive drug. It is found in the seeds, nuts, or leaves of a number of plants native to South America and East Asia and confers on them several survival

and reproductive benefits. Caffeine can produce a mild form of drug dependence-associated with withdrawal symptoms such as sleepiness, headache, and irritability – when an individual stops using caffeine after repeated daily intake. After intravenous administration of caffeine the urine level of the drug is approximately the same in each of the first 4 hourly specimens. Blood samples taken 10 and 70 minutes after injection of the drug were analyzed and showed 0.29 and 0.28mg. per 100 cc. respectively. There are to be contrasted with the 1st hour urine which contained 0.73mg.per 100 cc., essentially 3 times that in the blood. After oral administration of caffeine to the horse the concentration of caffeine in the urine rose progressively during the first 3 hours, remained relatively constant through the 8th hours. At 48 hours, a urine specimen contained approximately 0.17mg. per 100 cc. of caffeine. In addition, flu-like symptoms, nausea/vomiting, and muscle pain/stiffness were judged likely to represent valid symptom categories. In experimental studies, the incidence of headache was 50% and the incidence of clinically significant distress or functional impairment was 13%. Typically, onset of symptoms occurred 12–24 h after abstinence, with peak intensity at 20–51 h, and for a duration of 2–9 days. 1% to 3% of caffeine is excreted unchanged in the urine. The rate of caffeine metabolism is variable, with a half-life of 4 to 6h.

CFYL Carfentanyl is an analog of the synthetic opioid analgesic fentanyl. It is 10,000 times more potent than morphine, making it among the most potent commercially used opioids. Carfentanil was first synthesized in 1974. It is marketed under the trade name Wildnil as a general anaesthetic agent for large animals. Side effects of carfentanil are similar to those of fentanyl, which include itching, nausea and respiratory depression, which can be life-threatening. Carfentanil is classified as Schedule II under the Controlled Substances Act in the United States with a DEAACSCN of 9743.

CLON is a chlorinated derivative of nitrazepam having anticonvulsant, muscle relaxant and very potent anxiolytic properties. It is marketed as the prescription drug under the names of Klonopin, Ravotril, Tivotril or Rivatril. Clonazepam has an unusually long half-life of 18-50 hours in human body, making it generally considered to be among long-acting benzodiazepines. Clonazepam has a fast onset of action and high effectiveness rate and low toxicity in overdose, but have drawbacks due to adverse reactions including paradoxical effects, drowsiness, and cognitive impairment. Cognitive impairment can persist for at least 6 months after withdrawal of clonazepam. Clonazepam is largely bound to plasma proteins. Clonazepam is rapidly and completely absorbed after oral administration. Maximum plasma concentration of clonazepam are reached within 1 to 4 hours after oral administration. Clonazepam is highly metabolized with less than 2% unchanged in urine. The metabolites include 7-aminoclonazepam, 7-acetaminoclonazepam and 3-hydroxy clonazepam.

COC 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, intranasal or oral administration and excreted in the urine primarily as benzoylcegonine in a short period. Benzoylcegonine 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.

COT is an alkaloid found in tobacco and is also a major metabolite of nicotine. Cotinine is used as a biomarker for exposure to tobacco smoke and has also been sold as an anti-depressant under the brand name of Scotine. Cotinine has an in vivo half-life of approximately 20 hours, and is typically detectable for several days after the use of tobacco. The level of cotinine is proportionate to the amount of exposure to tobacco smoke. In urine, values between 11 ng/ml and 30 ng/ml may be associated with light smoking or passive exposure. The cotinine levels in active smokers typically reach 500 ng/ml or more.

DIA Benzodiazepines are medications that are frequently prescribed for the symptomatic treatment of anxiety and sleep disorders. They produce their effects via specific receptors involving a neurochemical called gamma aminobutyric acid (GABA). Because they are safer and more effective, Benzodiazepines have replaced Barbiturates in the treatment of both anxiety and insomnia. Benzodiazepines are also used as sedatives before some surgical and medical procedures, and for the treatment of seizure disorders and alcohol withdrawal.Risk of physical dependence increases if Benzodiazepines are taken regularly (e.g., daily) for more than a few months, especially at higher than normal doses. Stopping abruptly can bring on such symptoms as trouble sleeping, gastrointestinal upset, feeling unwell, loss of appetite, sweating, trembling, weakness, anxiety and changes in perception. Only trace amounts (less than 1% of most Benzodiazepines are excreted unaltered in the urine; most of the concentration in urine is conjugated drug. The detection period for the Benzodiazepines in the urine is 3-7 days.

EDDP 2-Ethylidene-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 readily achieved in methadone maintenance screening, than in urine drug testing. The detection of EDDP in urine is more readily achieved in urine drug testing than in urine drug testing. The tampering of specimens by spiking the urine with methadone can be prevented. Secondly, the 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.

ETG Ethyl glucuronide (EtG) is a minor non-oxidative metabolite of ethyl alcohol formed by the in vivo conjugation of ethanol with glucuronic acid with UDP glucuronosyl transferase.ETG is a product of metabolic process about of Ingested alcohol (ethanol) rapidly metabolized in the body, which is excreted in the blood, hair and urine. By using The ETG Rapid Test Device (Urine), can detect ETG in urine, confirming the consumption of alcohol. The ETG metabolite remains in the body longer and therefore has a more useful window of detection of 8 to 80 hours. ETG testing is an excellent option for zero-tolerance alcohol consumption or rehabilitation programs.

Fentanyl is a synthetic opioid. It has the brand names of Sublimaze, Actiq, Durogesic, Fentora and others. Fentanyl is approximately 100 times more potent than morphine, with 100 micrograms of fentanyl approximately equivalent to 10 mg of morphine or 75 mg of meperidine in analgesic activity. Fentanyl is a potent narcotic analgesic with rapid onset and short duration of action. Historically, it has been used to treat chronic breakthrough pain and is commonly used pre-procedures. Illicit use of pharmaceutical fentanyl first appeared in the mid-1970s. Because the effects of fentanyl last for only a very short time, it is even more addictive than heroin. The regular uses may become addicted very quickly. Fentanyl is much more potent than heroin, and tends to produce significantly worse respiratory depression, making it somewhat more dangerous than heroin to users. The overdose of fentanyl has caused death. In the United States, fentanyl is classified as a Schedule II controlled substance.

GAB Gabapentin (GAB) marketed under the brand name Neurontin among others, is a medication used to treat epilepsy,neuropathic pain, hot flashes, and restless leg syndrome. In epilepsy it may be used for those with partial seizures. It is recommended as one of a number of first line medications for the treatment of neuropathic pain idiopathic neuropathy, post-herpetic neuralgia, and central neuropathic pain. The mechanism of the anticonvulsant action of gabapentin has not been fully described. Several possible mechanisms for pain improvement have been discussed. Though similar in structure to the endogenous neurotransmitter GABA, gabapentin has not been shown to bind to GABA receptors at concentrations at or below 1 mM. Gabapentin modulates the action of glutamate decarboxylase (GAD) and branched chain aminotransferase (BCAT), two enzymes involved in GABA biosynthesis. In human and rat studies, gabapentin was found to increase GABA biosynthesis, and to increase non-synaptic GABA neurotransmission in vitro.Common side effects include sleepiness and dizziness. Serious side effects may include an increased risk of suicide, aggressive behaviour, and drug reaction with eosinophilia and systemic symptoms. It is unclear if it is safe duringpregnancy or breastfeeding. Lower doses should be used in people with kidney problems. Gabapentin affects the inhibitory neurotransmitter γ-aminobutyric acid (GABA).

HMO The hydromorphone (HMO) is a derivative of morphine. It can be said that hydromorphone is to morphine as hydrocodone is to codeine and, therefore, a semi-synthetic drug. Hydromorphone is commonly used in the hospital setting, mostly intravenously (IV) because its bioavailability orally, rectally, and intranasally is very low. But a positive test result does not automatically mean that an abuse of drugs has been taken place since also some fully legally taken medicaments do contain opiates (e.g. codeine) .

KET is a derivative of phencyclidine. It is used medically as a veterinary and human anesthetic. Certain doses of ketamine can cause dream-like states and hallucinations. In high doses, ketamine can cause delirium, amnesia, impaired motor function, high blood pressure, depression, and potentially fatal respiratory problems. Ketamine is metabolized in the liver and excreted through the kidney. The half-life of ketamine in the body is around three hours.

KRAMITragina speciosa is a tropical evergreen tree in thecoffee family native to Southeast Asia. M. speciosa isindigenous to Thailand, Indon esia, Malaysia, Vietnam, Papua New Guinea, and Brunei, where it has been used in traditional medicine since at least thethirteenth century. Kratom has opioid-like properties and some stimulant effects.Mitragyna is classified as a kappa-opioid receptor agonist and is roughly 13 times more potent than morphine. Mitragyna is thought to be responsible for the opioid-like effectsKratom, due to its opioid-like action, has been used for treatment of pain and opioid withdrawal. Animal studies suggest that the primary mitragyninepharmacologic action occurs at the mu and delta-opioid receptors, as well as serotonergic and noradrenergic pathways in the spinal cord. Stimulation at post-synaptic alpha-2 adrenergic receptors, and receptor blocking at 5-hydroxytryptamine 2A may also occur. The 7-hydroxymitragynine may have a higher affinity for the opioid receptors. Partial agonist activity may be involved.

K2 is a psychoactive herbal and chemical product that, when consumed, mimics the effects of cannabis. It is best known by the brand name K2 and Spice, both of which have largely become genericized trademarks used for refer to any synthetic cannabis product. The studies suggest that synthetic cannabinoid intoxication is associated with acute psychosis, worsening of previously stable psychotic disorders, and also may have the ability to trigger a chronic (long-term) psychotic disorder among vulnerable individuals such as those with a family history of mental illness. A large and diverse variety of synthetic cannabinoids, most often cannabicyclohexanol, JWH-018, JWH-073, or HU-210 are used. As of March 1, 2011, five cannabinoids, JWH-018, JWH-073, CP-47, JWH-200 and cannabicyclohexanol are illegal in US because these substances have the potential to be extremely harmful and, therefore, pose an imminent hazard to the public safety.

K2-AB AB-PINACA is a synthetic cannabinoid usually sold as a herbal smoking mixture designed to mimic THC, the active chemical of cannabis. Synthetic cannabinoids are classed as 'New Psychoactive Substances' (NPS) which are unregulated substances that have become newly available on the market as an alternative to illegal drugs. As a reaction to prohibition, synthetic cannabinoid producers change the compounds found in designer drugs and create new generations of synthetic drugs, such as AB-PINACA. As a result, accidental overdose and severe psychiatric complications may be more likely to occur because the type and amount of active compound may vary considerably from batch to batch. Other effects may include agitation, rapid heart rate, confusion, dizziness and nausea.

K4 Synthetic Cannabinoids are chemical compounds that mimic the effects of THC, the main active ingredient of cannabis. They bind to the cannabinoid receptors in the brain and were developed to treat pain. The two most common synthetic cannabinoids were JWH-018 and JWH-073. New versions of these include AM1248, AB48, UR144 and XLR11. UR144 is the new generation of synthetic cannabinoids and is chemically different to the first generation. New generations of synthetic cannabinoids are continuously emerging to replace the synthetic cannabinoids that have been made illegal. The naphthene ring in JWH-018 is substituted with a tetramethylcyclopropyl group to form UR144.

LSD Lysergic acid diethylamide, abbreviated LSD or LSD-25, also known as lysergide and colloquially as acid, is a semisynthetic psychedelic drug of the ergoline family, well known for its psychological effects which can include altered thinking processes, closed and open eye visuals, synaesthesia, an altered sense of time and spiritual experiences, as well as for its key role in 1960s counterculture. It is used mainly as an entheogen, recreational drug, and as an agent in psychedelic therapy. LSD is non-addictive, is not known to cause brain damage,

and has extremely low toxicity relative to dose, although in rare cases adverse psychiatric reactions such as anxiety or delusions are possible.

MCAAT Methcathinone, is a monamide alkaloid and psychoactive stimulant, a substituted cathinone. Methcathinone is a highly addictive drug, primarily psychologically addicting and most of the signs of addiction to the drug are emotional or psychological. It has been popularized and continues to be sold under misleading names such as "bath salts", "plant fertilizers" or "research chemicals", but it is actually a powerful psycho-stimulant used as a recreational drug. Effects of this drug typically last from 4 to 6 hours. It is used as a recreational drug due to its potent stimulant and euphoric effects and is considered to be addictive, with both physical and psychological withdrawal occurring if its use is discontinued after prolonged or high-dosage administration. It is usually snorted, but can be smoked, injected, or taken orally. Methcathinone is listed as a Schedule I controlled substance by the Convention on Psychotropic Substances and the United States' Controlled Substances Act, and as such it is not considered to be safe or effective in the treatment, diagnosis, prevention, or cure of any disease, and has no approved medical use. Methcathinone has very strong affinities for the dopamine transporter and the norepinephrine (noradrenaline) transporter. Its affinity for the serotonin transporter is less than that of methamphetamine.

MDA MDA (3,4-methylenedioxyamphetamine),also known as tenamphetamine (INN), is a psychedelic and entactogenic drug of the phenethylamine and amphetamine chemical classes. It is mainly used as a recreational drug, an entheogen, and atool in use to supplement various types of practices for transcendence, including in meditation, psychonautics, and as an agent in psychedelic psychotherapy. It was first synthesized by G. Mannish and W. Jacobson in 1910. There are about 20 different synthetic routes described in the literature for its preparation.

MDMA Methylenedioxyamphetamine (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 Methylenedioxymethamphetamine in urine exceeds 500ng/ml.

MDPV Methylenedioxypropylvalerone (MDPV) is a psychoactive drug with stimulant properties which acts as a norepinephrine-dopamine reuptake inhibitor. The primary psychological effects have a duration of roughly 3 to 4 hours, with after effects such as tachycardia, hypertension, and mild stimulation lasting from 6 to 8 hours.

MDPHP MDPHP is a psychoactive drug with stimulant properties which acts as a norepinephrine-dopamine reuptake inhibitor. The primary psychological effects have a duration of roughly 3 to 4 hours, with after effects such as tachycardia, hypertension, and mild stimulation lasting from 6 to 8 hours. The second largest group of new drugs monitored by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) are synthetic cathinones. Substances that are immediately replaced by the law are immediately tested by new uncontrolled derivatives that cause constant and dynamic changes on the drug market. The MDPHP is a recent synthetic cathinones that have appeared on the "legal highs" market

MET is the most popular synthetic 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 oxidized 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.

MEP Mephedrone, also known as 4-methylmethcathinone (4-MMC) or 4-methylcathedrone is a synthetic stimulant drug of the amphetamine and cathinone classes. Slang names include drone, M-CAT, White Magic and meow meow. It is chemically similar to the cathinone compounds found in the khat plant of eastern Africa. Mephedrone comes in the form of tablets or a powder, which users can swallow, snort or inject, producing similar effects to MDMA, amphetamines and cocaine. In addition to its stimulant effects, Mephedrone produces side effects, of which teeth grinding are the most common. A number of metabolites are possible, however the n-demethyl metabolite of Mephedrone will be 4-Methylcathinone. This metabolite appears to be nearly inactive as a Monoamine Oxidase Inhibitor .On further metabolism of this metabolite one of the possible metabolites is 4-Methylnorephedrine, caused by the reduction of the Keto.A dose of 150mg-250mg is the average, giving a duration of around 2 hours,the duration will lengthen in larger 250mg+ dosages .

MES Mescaline or 3,4,5-trimethoxyphenethylamine is a naturally occurring psychedelic alkaloid of the phenethylamineclass, known for its hallucinogenic effects similar to those of LSD and psilocybin. It shares strong structural similarities with the catecholamine dopamine.It occurs naturally in the peyote cactus (Lophophora williamsii), the San Pedro cactus (Echinopsis pachanoi) and in the Peruvian torch (Echinopsis peruviana), and as well in a number of other members of the Cactaceae plant family. It is also found in small amounts in certain members of the Fabaceae (bean) family, including Acacia berlandieri. Tolerance builds with repeated usage, lasting for a few days. Mescaline causes cross-tolerance with other serotonergic psychedelics such as LSD andpsilocybin. About half the initial dosage is excreted after 6 hours, but some studies suggest that it is not metabolized at all before excretion. Mescaline appears to not be subject to metabolism by CYP2D6and between 20% and 50% of mescaline is excreted in the urine unchanged, and the rest being excreted as the carboxylic acid form of mescaline, a likely result of MAO degradation.

MPD is most commonly known by the Novartis trademark name Ritalin, which is an instant-release racemic mixture. There are also a variety of formulations and generic brand names exist. Methylphenidate is a psychostimulant drug for the treatment of attention-deficit hyperactivity disorder, Postural Orthostatic Tachycardia Syndrome, and narcolepsy. It may also be prescribed for off-label use in treatment-resistant cases of lethargy, depression, neutral insult, obesity, and rarely other psychiatric disorders such as Obsessive-Compulsive Disorder. Methylphenidate like other stimulants increases dopamine levels. The abuse potential is increased when methylphenidate is crushed and snored or when it is injected producing effects almost identical to cocaine. Cocaine-like effects can also occur with very large doses taken orally. Methylphenidate has a high potential for drug dependence and additive abuse due to its similar pharmacologically to cocaine and amphetamines. Internationally, methylphenidate is a Schedule II drug under the Convention on Psychotropic Substances. In the United States, methylphenidate is classified as a Schedule II controlled substance, the designation used for substances that have a recognized medical value but present a high likelihood for abuse because of their addictive potential.

MQL Methaqualone is classified as a sedative/hypnotic. It was originally synthesized in India to combat malaria but found to be ineffective. Methaqualone did prove effective as a sedative and was developed in the hopes of avoiding some of the adverse effects of the barbiturates, particularly their high capacity for addiction. Unfortunately, methaqualone was found to be just as addictive. Physiologically, methaqualone is cumulative,and tolerance occurs rapidly in some individuals. In addition, it is extensively metabolized,at least 12 hydroxylated metabolites having been identified in the urine. The major metabolites are methaqualone-N-oxide, conjugate 4'-hydroxy-methaqualone,conjugated 2-hydroxymethaqualone.About 0.2% of methaqualone is excreted unchanged within 24 hours;40-50% of the methaqualone is excreted as metabolites within 72 hours,mostly as the glucuronide conjugates. The half-life for methaqualone averages 33 to 36 hours.It can be detected up to four days after administration.Side effects from chronic use of methaqualone are loss of motor coordination,walking into walls,ataxia,slurred speech,drowsiness and nystagmus.Severe acute overdose tends to produce muscle spasms, abnormally rapid reflexes,extreme muscle tension and restlessness.

MTD 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 high 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.

OPI 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 opiates doses.

OXY is known as Oxycotin, Roxicodone and is an ingredient of Percodan, Percocet, Roxicet and Tylox. Oxycodone is a semi-synthetic opiate derived from opium. Like other opiates, oxycodone is characterized by its analgesic properties. The low tendency for users to form a physical dependency during extended tolerance development, 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.

PCP commonly known as PCP, is a hallucinogen 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-destructive. At high doses, from 100 to 500 mg/ml, PCP can cause convulsions, hypertension, prolonged coma, absent peripheral sensation, and even death. PCP is metabolized via hydroxylation, oxidation, and conjugation with glucuronic acid in the liver. About 10% of the does is excreted in urine as unchanged drug. For chronic users, PCP can be detected in the urine for 7 to 8 days after drug administration.

PGB Pregabalin is a medication primarily used for epilepsy, neuropathic pain, and fibromyalgia. Its use for epilepsy is as an add-on

	Paramethoxymethamphetamine (PMA)	>100,000	
	Tyramine	>100,000	
AMP	D-Amphetamine	1,000	
	l-Amphetamine	>100,000	
	d-methamphetamine	>100,000	
	l-methamphetamine	>100,000	
	3,4-Methylenedioxyamphetamine	1,250	
	3,4-Methylenedioxy-methamphetamine	>100,000	
	3,4-Methylenedioxyethylamphetamine	>100,000	
	Paramethoxyamphetamine	625	
	Phentermine	1250	
	Tyramine	>100,000	
BAR	Secobarbital	300	
	Allobarbitol	1250	
	Alphenal	625	
	Amobarbital	625	
	Aprobarbital	188	
	Butabarbitol	94	
	Butalbital	2500	
	Butethal	200	
	Cyclopentobarbital	400	
	Pentobarbital	1,000	
Phenobarbital	300		
BUP	Buprenorphine	10	
	Buprenorphine-3-β-D-Glucuronide	10	
	Norbuprenorphine	50	
	Norbuprenorphine-3-β-D-Glucuronide	100	
Benzoxiazepines	Oxazepam	300	
	Alprazolam	125	
	Bromazepam	625	
	Chlordiazepoxide	2500	
	Clobazam	63	
	Clonazepam	2500	
	Clorazepate	3330	
	Desalkylurazepam	250	
	Diazepam	250	
	Estazolam	5000	
	Fentanyl	>100,000	
	Flunitrazepam	375	
	Flurazepam	>100,000	
	Lorazepam	1250	
	Lormetazepam	1250	
	Medazepam	>100,000	
	Midazolam	>100,000	
	Nitrazepam	25000	
	Norchlordiazepoxide	250	
	Nordiazepam	500	
	Prazepam	>100,000	
	Temazepam	63	
	Triazolam	5000	
	CAT	(+)-Norpseudoephedrine HCl (Cathine)	100
		(+)-3,4-Methylenedioxyamphetamine (MDA)	80
d/l-Amphetamine		80	
p-Hydroxyamphetamine		80	
Tryptamine		10000	
Methoxyphenamine		10000	
Caffeine		8,000	
CAF	Theophylline	100,000	
	Carfentanyl	500	
CFYL	Fentanyl	100	
	Clonazepam	150	
CLON	Alprazolam	250	
	Bromazepam	625	
	Chlordiazepoxide	2,500	
	Clobazam	63	
	Oxazepam	30	
	Clorazepate	3,330	
	Delorazepam	2,500	
	Desalkylurazepam	250	
	Diazepam	250	
	Estazolam	5,000	
	Flunitrazepam	375	
	Lorazepam	1,250	
	Lormetazepam	1,250	
	Midazolam	100,000	
	Nitrazepam	25,000	
	Norchlordiazepoxide	250	
	Nordiazepam	500	

Sulindac		100,000
	Temazepam	125
	Triazolam	5,000
	Benzoylcegonine	300
COC	Cocaine	1,000
	Ecgonine	100,000
	Ecgonine Methyl Ester	>100,000
	Benzoylcegonine	150
COC 150	Cocaine HCl	500
	Cocacethylene	7500
	Ecgonine	15000
	Norcocaine	50000
	(-)-Cotinine	200
	(-)-Nicotine	6250
	Diazepam	100
	Oxazepam	450
	Bromazepam	1000
	Chlordiazepoxide	1500
COT	Clobazam	150
	Clonazepam	6000
	Clorazepate dipotassium	300
	Desalkylflurazepam	2000
	Alprazolam	400
	Estazolam	200
	Flunitrazepam	>50,000
	Flurazepam	750
	(±) Lorazepam	10,000
	Midazolam	1000
	Nitrazepam	1500
	Nordiazepam	300
	Temazepam	75
	EDDP	100
	Meperidine	>100,000
	Methadone	>100,000
	Norfentanyl	>100,000
Phencyclidine	>100,000	
Promazine	50000	
Promethazine	25000	
Prothipendyl	50,000	
Prozine	12500	
ETG	Ethyl Glucuronide	500
	Ethanol	>100,000
	D-Glucuronic Acid	>100,000
	Morphine-3-b-D-glucuronide	>100,000
ETG II*	Ethyl Glucuronide	1000
	Fentanyl and Fentanyl metabolites	10
FYL	Fentanyl	100
	Norfentanyl	>10,000
	Gabapentin	2000
GAB	Pregabalin	>100000
	Hydromorphone	250
HMO	Acetylcodeine	4000
	Buprenorphine	>10,000
	Codeine	3000
	Diacetyl Morphin	3000
	Dihydrocodeine	4000
	Ethylmorphine	4000
	Hydrocodone	300
	Morphine	2500
	6-Monoacetylmorphine	3000
	Morphine-3-glucuronid	2500
	Nalorphine	12500
	Thebaine	>20000
	Methadone	>100000
	Oxazepam	>100000
	Oxycodone	100000
	EDDP	>100000
	KET	Ketamine
Norketamine		1,000
Dextromethorphan		500
7-hydroxymitragynine		500
KRA	Mitragynine	6000
	JWH-018-5-Pentanoic acid	50
K2	JWH-073-4-Butanoic acid	50
	AB- PINACA	25
K2-AB	AB-PINACA 5-Pentanoic	25
	AB-PINACA 5-hydroxypentyl	25
	AB- FUBINACA	40
	AB-PINACA 4-hydroxypentyl	>10,000

UR-144 5-Pentanoic		5,000
	UR-144	>10,000
	UR-144 5-hydroxypentyl	>10,000
	UR-144 4-hydroxypentyl	>10,000
	APINACA	>10,000
	APINACA 5-hydroxypentyl	>10,000
	ADB-PINACA N-(5-hydroxypentyl)	50
	ADB-PINACA Pentanoic Acid	25
	5-fluoro AB-PINACA N-(4-hydroxypentyl)	50
	UR-144 5-Pentanoic acid metabolite	25
	UR-144 4-hydroxypentyl	50
	UR-144 5-hydroxypentyl	50
	UR-144	>10,000
	XLR-11	>10,000
	AB- PINACA	>10,000
	AB-PINACA 5-Pentanoic	>10,000
	AB-PINACA 5-hydroxypentyl	>10,000
AB- FUBINACA	>10,000	
AB-PINACA 4-hydroxypentyl	>10,000	
APINACA	>10,000	
APINACA 5-hydroxypentyl	>10,000	
ADB-PINACA N-(5-hydroxypentyl)	>10,000	
ADB-PINACA Pentanoic Acid	>10,000	
5-fluoro AB-PINACA N-(4-hydroxypentyl)	>10,000	
LSD	Lysergic acid diethylamide	20
	Methcathinone	500
MCAT	4-MMC (Mephedrone)	520
	3-MMC (3-methylmethcathinone)	500
	4-MEC (4-methylethcathinone)	550
	Cathinone	>100,000
	MDPV	>10,000
	MDA	3,4-Methylenedioxyamphetamine (MDA)
MDMA	l-Amphetamine	50,000
	d-Amphetamine	500
	Phentermine	1,250
	Paramethoxyamphetamine (PMA)	625
	Tyramine	100,000
	3,4-Methylenedioxy-methamphetamine	500
	d-Amphetamine	>100,000
l-Amphetamine	>100,000	
d-methamphetamine	>100,000	
l-methamphetamine	>100,000	
MDPV	3,4-Methylenedioxyamphetamine	2,500
	3,4-Methylenedioxyethylamphetamine	156
	Paramethoxyamphetamine	50,000
	Paramethoxymethamphetamine	>100,000
	MDPV	500
MDPHP	MDPHP	500
	MDPV	500
MET	α -PVP	10000
	d-Methamphetamine	1,000
	Chloroquine	25,000
	Fenfluramine	12,500
	l-Methamphetamine	1,000
	Mephentermine hemisulfate salt	31250
	3,4-Methylenedioxyethylamphetamine	50000
	3,4-Methylenedioxy-methamphetamine	313
	Paramethoxymethamphetamine	625
	(-)-Ephedrine	4000
MET 500	D(+)-Methamphetamine	500
	(+/-)-3,4-Methylenedioxy-n-ethylamphetamine(MDEA)	5000
	D/L-Methamphetamine	500
MEP	p-Hydroxymethamphetamine	5000
	Mephedrone	500
	Methcathinone	500
MES	Mescaline	300
MPD	Methylphenidate	150
	Ritalinic acid	5000
MQL	Methaqualone	300
	Amitriptyline	50,000
	Carbamazepine	20,000
	Nortriptyline	50,000
	Phenytol	40,000
Methadone	Theophylline	40,000
	Methadone	300
	(-)-alpha-methadol	2,000
Opiate	Morphine	300
	Acetylcodeine	150

Buprenorphine		>10000
	Codeine	250
	Diacetyl Morphin	250
	Dihydrocodeine	586
	Ethylmorphine	200
	Hydrocodone	12500
	Hydromorphone	12500
	6-Monoacetylmorphine	250
	Morphine-3-glucuronid	2500
	Nalorphine	25000
Opiate II	Thebaine	25000
	Morphine	2,000
	Acetylcodeine	1,563
	Buprenorphine	25,000
	Codeine	2000
	Diacetylmorphine (Heroin)	5,000
	Dihydrocodeine	1,563
	Ethylmorphine	250
	Hydromorphone	25,000
	Hydrocodone	50,000
OXY100	Merperidine	>100,000
	6-Monoacetylmorphine (6-MAM)	4,000
	Morphine-3-β-d-glucuronide	12,500
	Nalorphine Hydrochloride	>100,000
	Oxycodone	>100,000
	Oxymorphone	>100,000
	Rifampicine	>100,000
	Thebaine	50,000
	Oxycodone	100
	Hydrocodone	6250
Hydromorphone	50000	
PCP	Naloxone	50000
	Oxymorphone	250
	Phencyclidine	25
	Hydrocodone	>100,000
PGB	Hydromorphone	>100,000
	4-hydroxyphencyclidine	75
PGB 1000	Pregabalin	500
	Gabapentin	>20,000
PPX	D-Propoxyphene	300
	D-Norpropoxyphene	5000
TAP	Tapentadol	500
	N-Desmethyltapentadol	10000
	Tapentadol-O-sulfate	1000
	Tapentadol-β-D-glucuronide	1000
	Tapentadol-β-D-glucuronide	1000
THC	11-nor-Δ9-THC-9-COOH	50
	11-nor-Δ8-THC-9-COOH	50
	11-hydroxy-Δ9-Tetrahydrocannabinol	50
	Δ 8-Tetrahydrocannabinol	15000
	Δ 9-Tetrahydrocannabinol	15000
	Cannabinol	20000
	Cannabidiol	>100,000
TPM	Tropicamide	350
	Cis-Tramadol	200
TML	N-Desmethyl-cis tramadol	500
	O-Desmethyl-cis tramadol	20,000
	Netrexone	10,000
	Tetrahydrozoline	10,000
	Dihydrocodeine	50,000
	Tramadol	100
TML 100	(+/-)Chlorpheniramine	50,000
	Dimenhydrinate	50,000
	Diphenhydramine	50,000
	Phencyclidine	50,000
	(+)-Chlorpheniramine	>100,000
	Nortriptyline HCl	1000
	Amitriptyline	150
	Clomipramine	>100000
	Cyclobenzaprine	12500
	Desipramine	188
TCA	Doxepin	2000
	Imipramine	2500
	Maprotiline	750
	Nordoxepin	500
	Opipramol	1563
	Promazine	1000
	Promethazine	6250

	Prothipendyl	25000
	Protryptiline	6250
	Prozine	1250
	Trimipramine	>100,000
TZD	Trazodone	200
TLD	Tilidin	50
ZAL	Zaleplon	200
ZOL	Zolpidem Phenyl-4-carboxylic	50
	Zolpidem	>10,000
ZOP	N-Desmethylzopiclone	50
	Zopiclone-N-oxide	50
	Zopiclone	300
6-MAM	6-Monoacetylmorphine	10
	Acetylcodeine	>10,000
	Buprenorphine	>10,000
	Codeine	>10,000
	Diacetylmorphine	1000
	Dihydrocodeine	>10,000
	Ethylmorphine	>10,000
	Hydrocodone	>10,000
	Hydromorphone	5000
	Morphine	10000
	Morphine-3-glucuronide	>10,000
	Nalorphine	5000
	Thebaine	>20,000
7-ACL	7-amine-clonazepam	300
	Oxazepam	>10,000
	Alprazolam	>10,000
	Bromazepam	>10,000
	Chlordiazepoxide	>10,000
	Clobazam	>10,000
	Clonazepam	10,000
	Clorazepate dipotassium	>10,000
	Desalkylflurazepam	>10,000
	Diazepam	>10,000
	Estazolam	>10,000
	Flunitrazepam	>50,000
	(±) Lorazepam	10,000
	Midazolam	>100,000
	Nitrazepam	>10,000
	Norchlordiazepoxide	>100,000
	Nordiazepam	>100,000
	Temazepam	>10,000
APVP	APVP	500
	MDPV	40
	PVP	>100,000

1. Interference testing

The performance of the DOA/Alcohol Panel Test Device 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 the DOA/Alcohol Panel Test Device at the concentrations listed below.

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 the DOA/Alcohol Panel Test Device which produced positive results when tested at levels equal or greater than the concentrations listed below:

The following compounds show no cross-reactivity at concentrations up to 100 ug/mL unless specified in the table above.

REFERENCES

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- Steven B. Karch, Drugs of abuse hand book, CRC Press, 1st, Ed. (1998)
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