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Subject:	URINE DRUG SCREENS				
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URINE DRUG SCREENS

Urine specimens will be screened for drugs of abuse by either on site drug testing devices or instrument based tests. Qualitative immunoassays are performed for the following drugs or drug groups in urine (this is the recommended test to be ordered on patients suspected of drug overdose or where use of drugs is of concern for medical treatment). If drugs other than those listed are suspected, they should be ordered specifically, e.g. acetaminophen, dilantin, etc.:

DRUGS	CUT OFF CONCENTRATION
Amphetamines	1000 ng/mL
Barbiturates	200
Benzodiazepines	200
Cannabinoids	50
Cocaine	300
Methadone	300
Opiates	300
Oxycodone	300
PCP (phencyclidine)	25
Propoxyphene	300
Tricyclic Antidepressants	300

The "Drug Screen" is reported as "POS" or "NEG" for the above drugs (classes). 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) is the preferred confirmatory method. Clinical consideration and professional judgment should be applied to any drug of abuse test result, particularly when preliminary positive results are used. Positive results for the drugs - Amphetamines, barbiturates, benzodiazepines, Cannabinoids, cocaine, opiates, oxycodone, propoxyphene and PCP will be confirmed by GC/MS. Results of confirmation tests will be reported within 48-72 hours (Mon-Fri). If ordered as routine, the "Drug Screen" has a 24 hour turnaround time (M-F).

Amphetamine Assay:

The Amphetamine Assay has been specifically designed to detect amphetamine and methamphetamine, the amphetamines which are commonly abused and excreted in the urine. The assay will also detect certain other phenylethylamines at higher detectability limits. Over-the-counter cold medications containing ephedrine, pseudoephedrine, or phenylpropanolamine (e.g. Contac, Sudafed) may cause a presumptive positive response.

Amphetamines are central nervous system stimulants that produce wakefulness, alertness, increased energy, reduced hunger, and an overall feeling of well being. The term "amphetamine" includes many drugs, but d-amphetamine, d-methamphetamine (the N-methyl derivative of amphetamine), and d-amphetamine are the most common Amphetamines can be taken orally, intravenously, by smoking, or by snorting.

Amphetamines are readily absorbed from the gastrointestinal tract and are then either deactivated by the liver or excreted unchanged in the urine. The relative importance of these elimination modes depends on urinary pH. Amphetamine is metabolized to deaminated (hippuric and benzoic acids) and hydroxylated metabolites. Methamphetamine is partially metabolized to amphetamine, its major active metabolite. Amphetamine and methamphetamine appear in the urine within three hours after administration, and can be detected by the EMIT assay for up to 96 hours after the last dose.

Barbiturate Assay:

The Barbiturate Assay has been designed to detect those barbiturates that are commonly abused and excreted in the urine. These include secobarbital, phenobarbital, butalbital, butabarbital, pentobarbital, and amobarbital. The assay will also detect other barbiturates at equivalent or higher detection limits.

Barbiturates are classified as central nervous system depressants and are primarily used as sedative-hypnotics, anticonvulsants, treatment for migraine headaches and reduction of cerebral edema secondary to head injury. They are rapidly absorbed following oral administration and are 30-40% bound to plasma proteins. Barbiturates are classified based on their duration of action, which is largely dependent on their individual lipid solubility. The ultrashort-acting barbiturates include thiopental, thiamylal and methhexital. Short-acting include pentobarbital and secobarbital; intermediate-acting are amobarbital, butalbital and butabarbital. Phenobarbital, primarily used for seizure disorders is classified as long-acting. The ratio of unchanged drug to metabolites varies depending upon duration of action. Short-acting barbiturates will primarily appear in urine as metabolites, while longer-acting barbiturates will appear unchanged.

Benzodiazepine Metabolite Assay:

The Benzodiazepine Assay has been designed to detect a class of drugs rather than a specific drug. It detects the use of diazepam (Valium), chlordiazepoxide (Librium), oxazepam (Serax) and alprazolam (xanax).

Benzodiazepines are sedative-hypnotic drugs that are structurally similar. The different benzodiazepines are absorbed at different rates, and the timing of their psychoactive effects varies with the absorption rate. Benzodiazepines are usually taken orally and are metabolized in the liver. Some benzodiazepine metabolites are pharmacologically active. Benzodiazepines potentiate the effect of other central nervous system depressants, such as ethyl alcohol.

Cannabinoid Assay:

The Cannabinoid Assay is intended for the qualitative determination of cannabinoids (THC) in human urine. The Cannabinoid Assay is designed to detect 11-nor-delta 9-THC-9-carboxylic acid, the major urinary metabolite of delta 9 - THC. It also detects other delta 9 - THC metabolites.

Marijuana is a mixture of dried leaves and flowering tops of the plant Cannabis Sativa L. The substance delta 9 - tetrahydrocannabinol (delta 9 - THC) is the principal psychoactive ingredient in marijuana. The compound delta 9 - THC, quickly and effectively absorbed by inhalation or from the gastrointestinal tract is almost completely metabolized. Excretion of urinary metabolites begins within hours after exposure to cannabinoids. In the first 72 hours after ingestion, 30-35% of the metabolites are excreted in the feces and 10-15% in the urine. Thus, only 50% of the initial dose is usually eliminated after 72 hours. In chronic users, THC may accumulate in fatty tissue faster than it can be excreted. This leads to longer detection times in urine for chronic users than for occasional users.

Cocaine Metabolite Assay:

The Cocaine Metabolite Assay has been designed to detect benzoylecgonine, the major metabolite of cocaine. Cocaine is a central nervous system stimulant that is extracted from the coca plant. As a drug of abuse, it is self-administered is a variety of ways, including inhalation and intravenous injections. Cocaine base can be smoked in a form that is commonly known as "crack". Cocaine is rapidly absorbed, especially when smoked. While all forms are potentially addicting, "crack" is especially likely to lead to dependence because of it's more rapid and heightened effect on the abuser.

Excretion rate patterns vary with the mode of administration and from individual to individual. Cocaine is almost completely metabolized, primarily in the liver, with only about one percent excreted in the urine unchanged. Most cocaine is eliminated as benzoylecgonine, the major metabolite of cocaine. Cocaine is also excreted is relatively lesser amounts as ecgonine methyl ester and ecgonine. Benzoylecgonine can be detected in urine within four hours after cocaine inhalation and remain detectable in urine for about 72 hours.

Methadone Assay:

The Methadone Assay is intended for the qualitative determination of methadone in human urine. Methadone is a synthetic narcotic/analgesic drug that is administered orally or intravenously. Medically assisted withdrawal from opioids is usually accomplished using methadone. Methadone is frequently used in maintenance programs as a substitute for heroin or other abused opioids while allowing the subject to successfully participate in drug rehabilitation. Patients are able to function well on methadone and perform complex tasks competently.

Methadone is metabolized in the liver. The kidneys become a major route of methadone excretion at doses exceeding 50 mg/dl. Urine levels in methadone maintenance patient's range from 1 to 5 μg/ml 24 hours after a methadone dose.

Opiate Assay:

The DRI® Opiate Assay is intended for the qualitative determination of opiates in human urine. The Assay was designed to detect a class of drugs rather than a specific drug. This assay detects morphine, morphine glucuronide (the major metabolites of heroin), and codeine. Morphine glucuronide is the major urinary metabolite and accounts for approximately 80% of the total morphine excreted. The assay detects synthetic opiates related to morphine, such as codeine, hydrocodone (vicodin) and hydromorphine (Dilaudid). It does not detect oxycodone or methadone.

The opiates are typically used in pain management or as antitussives. Morphine, codeine, hydrocodone and hydromorphone are legitimate drugs but are subject to abuse. Heroin, a Schedule I drug, may be snorted, smoked, or dissolved and injected subcutaneously or intravenously.

Opiates are absorbed rapidly. Heroin is converted almost immediately to morphine, which is excreted in urine both unchanged and as a glucuronidated metabolite. Excretion takes place over a period of 1-3 days. Morphine is excreted in the urine as a glucuronide conjugate and there also may be small amounts of hydromorphone present. Codeine is excreted in urine as a glucuronidated conjugate, and as morphine. Hydrocodone is excreted in the urine in both the parent form and as its primary metabolite, hydromorphone. Hydromorphone is the primary drug exceted with use Dilaudid. Depending on the drug and dose, opiates can be detected in urine from 1-3 days after use.

Oxycodone Assay:

The Oxycodone Assay provides a simple and rapid analytical screening procedure for the qualitatively detection of oxycodone and oxymorphone in human urine.

Oxycodone is a semi-synthetic opioid prescribed for pain management in patients with moderate to severe pain. It is similar to codeine and morphine in its analgesic properties but it is more potent than morphine and has higher dependence potential. The drug oxycodone is supplied as OxyContin® (Oxycodone HCl) or in combination with aspirin (Percodan®) or acetaminophen (Percocet®). Drug abusers crush the pills into powder for faster effect which may result in a potentially fatal outcome. The primary metabolite, oxymorphone, is a potent narcotic analgesic. From 33-61% of a single dose of oxycodone is excreted in urine within 24

hours as unconjugated oxycodone (13-19%), conjugated oxycodone (7-29%), and conjugated oxymorphone (13-14%).

Propoxyphene Assay:

The Propoxyphene Assay is intended for qualitative determination of propoxyphene in human urine.

Propoxyphene (Darvon), a narcotic analgesic, is one of the most commonly prescribed drugs in the United States for the treatment of mild to moderate pain. It is also dispensed in a common formulation with other analgesics such as aspirin and acetaminophen. Propoxyphene is a mildly effective narcotic analgesic used to treat mild-to-moderate pain. Propoxyphene is structurally related to methadone and produces central nervous system effects similar to those of morphine-like opioids. When given orally, it is one-half to two-thirds as potent as codeine and has a similar incidence of side effects including nausea, anorexia, constipation, abdominal pain, and drowsiness. A synergistic effect is produced when propoxyphene is given in combination with aspirin.

When propoxyphene is ingested, it is rapidly metabolized and excreted into urine as norpropoxyphene with only about 20% reaching systemic circulation as unchanged drug. Propoxyphene may be toxic and even fatal at levels which exceed the recommended therapeutic dosages, particularly because they are metabolized quickly, primarily to norpropoxyphene. In addition to respiratory depression, toxic doses may produce convulsions, delusions, hallucinations, confusion, cardiotoxicity, and pulmonary edema.

Tricyclic Antidepressants:

The Assay for tricyclic antidepressants is designed as a rapid qualitative test to detect the presence of tricyclic antidepressants such as amitriptyline, imipramine and desimpramine and their metabolites. The assay was designed to detect a class of drugs rather than a specific drug. High therapeutic concentrations, (i.e.; 200-300 ng/ml) and toxic levels of chlorpromazine may give a positive result in this assay.