



Drugs of Abuse

Urine Drugs of Abuse Testing

URINE DRUG SCREENS MAY BE PERFORMED FOR A NUMBER OF REASONS.

These can include employment related tests, testing for patients taking part in drug treatment programs, court ordered tests and medical related conditions.

Testing can be performed via two pathways. For routine clinical testing, urine samples are collected as for other routine clinical tests.

For medico-legal samples, the specimens can be processed according to Australian Standard 4308 which has strict requirements for collection, transport and testing. This is a more expensive exercise.

Following is a listing and description of the drugs that may be screened for.

Amphetamine Like Compounds

Amphetamine and methamphetamine are stimulants. They increase alertness, reduce hunger and induce a feeling of well-being. They have been used to suppress appetite and to reduce fatigue.

'Ice' is a smokable form of methamphetamine.

Ecstasy and other 'designer' hallucinogenic amphetamines are chemically related to amphetamines.

Non-prescription drugs that may interact with screening tests and produce false positive tests include ephedrine, pseudoephedrine (Sudafed), phenylpropanolamine, Propylhexedrine, phentermine and some theophylline containing medications.

Benzodiazepines

Benzodiazepines are sedative-hypnotic drugs that are structurally similar and include widely used drugs such as diazepam (Valium) and oxazepam. The different diazepines are absorbed at different rates and the timing of their psychoactive effects varies with the absorption rate.

They are usually taken orally and are metabolised in the liver. Some benzodiazepine metabolites are pharmacologically active. Benzodiazepines potentiate the effect of other central nervous system depressants, such as alcohol.

The detection period for benzodiazepines is up to 30 days with chronic use.

Barbituates

Barbiturates are a class of central nervous system depressants. They are usually taken orally. They are classified as very short acting (15min) to long acting (a day or more). An example of a long-acting barbiturate is phenobarbital. Barbiturates are an uncommon drug of abuse in Australia.

The detection period for the short-acting barbiturates is between 2-4 days and the long acting barbiturates can be detected up to 30 days.

Cocaine

Cocaine is rapidly absorbed, especially when smoked. While all forms are potentially addictive 'Crack' is especially likely to lead to dependence because of its more rapid heightened effect on the user. Cocaine is almost completely metabolised in the liver, with only about 1% excreted unchanged in the urine. Most cocaine is eliminated as benzoylecgonine, the major metabolite.

Cocaine metabolites may be detected in urine for up to two days after cocaine is used.

Cannabinoids

Marijuana is a mixture of dried leaves and flowering tops of the plant *cannabis sativa*. The agents that produce the hallucinogenic and other biological effects of marijuana are called cannabinoids. The cannabinoid d9-tetrahydrocannabinol (d9-THC) is the principal psychoactive ingredient in marijuana. This compound is quickly and rapidly absorbed by inhalation or from the gastrointestinal tract and is almost completely metabolised by liver enzymes.

Peak plasma levels of d9-THC occur within 10min of inhalation and approximately one hour after ingestion. Concentrations depend on the total amount absorbed, frequency of abuse, rate of release from fatty tissue, and time of sample collection with respect to use. In chronic users, THC accumulates in fatty tissue faster than it can be eliminated. This accumulation leads to longer detection times in urine for chronic users which can extend to 6-12 weeks.

Methadone (EDDP)

Methadone is a synthetic narcotic/analgesic drug that is administered orally or intravenously. Medically assisted withdrawal from opioids is often accomplished using Methadone. It is frequently used in maintenance programs as a substitute for heroin and other abused opioids while allowing the subject to successfully participate in drug rehabilitation. Methadone is metabolised in the liver, with 2-ethylidine-1, 5-dimethyl-3, 3-diphenylpyrrolidine (EDDP) being the primary metabolite.

Detection of EDDP in the urine rather than methadone has two advantages. Patients who spike their urine with methadone to cover diversion of methadone will report negative for EDDP. Secondly renal clearance of EDDP is not affected by urinary pH, as is methadone, which eliminates the possibility of false positives or negatives.

Opiates

Opiates are a class of compounds that includes morphine, codeine and heroin. Morphine and codeine are naturally occurring alkaloids that are found in opium. Opium is a substance exuded from the un-ripe seedpod of the opium poppy (*Papaver somniferum*).

Heroin is a semi-synthetic derivative of morphine.

Morphine is a potent analgesic. Codeine is used in analgesic preparations and as a cough suppressant. Heroin is an even more potent analgesic and drug of abuse that may be snorted, smoked or dissolved and injected subcutaneously or intravenously. All of these classes of opiates are absorbed rapidly.

Heroin is converted almost immediately to morphine via monoacetylmorphine. Both are excreted in urine. Codeine is excreted in urine as the free form, norcodeine and as morphine. The various metabolites are detectable for 2-4 days usually apart from monoacetyl morphine which is detectable for 12-14hrs only.

The presence of opiates in the urine may indicate the use of heroin, morphine and/or codeine. A GC-MS Assay is required to determine which opiates are present.

The finding of the heroin metabolite monoacetyl morphine is required to prove heroin use.

Confirmatory Testing

Gas Chromatography-Mass Spectrometry (GC-MS) is a more sophisticated and costly technique which can determine which specific drug is causing a positive response in a screening test result. For example, it is possible with this technique to determine if a positive opiate response is due to the presence of heroin, morphine or the over the counter analgesic Codeine. This is also of particular importance with positive screening tests for amphetamine like substances that may be caused by illegal substances including amphetamine, metamphetamine, ecstasy or the legal drug pseudoephedrine.

SPECIMEN REQUIREMENTS

Test Name: Urine Drugs of Abuse

Sample Type:
Yellow-top Urine Container

Sample Transport: Refrigerate

If you have any questions or require further information, please contact our Customer Service Centre.

1300 453 688

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