

Newsletter

DRUG TESTING

Compiled by: **Lancet Laboratories South Africa**

This guide serves to inform you of the different types of Drug tests available, what type of test to choose, and under which circumstances. Drugs can be divided into legally prescribed drugs like: Benzodiazepines (E.g. Valium), Opiates and other Analgesics, and Illicit drugs like: Amphetamines, Cocaine and Marijuana. Prescription drugs are often abused and can also be obtained illicitly. Individuals who are abusing drugs display clinical signs that are associated with the drug of abuse.

LABORATORY TESTING

The laboratory is asked to test patient samples for drugs when drug abuse is suspected. There are **2 general test** categories available: Screening tests and Confirmation tests.

- The screening test is to separate patients that are negative from those that are not.
- The samples that test not negative (i.e. positive) with the screening test, should be subjected to a confirmation test.
- The confirmation test will identify the specific drug present, or if the confirmation test is negative classify the screening test result as a false-positive screening test.
- Immunoassays are also available as a test performed by large automated analysers in the laboratory. The sample is placed in a tube/container and sent to the laboratory for testing.
- These tests are done for specific drug classes; these have to be specified on the request form. If more than 1 drug class is needed, for example cannabis and opiates, it has to be specified.
- This type of testing is quick; the tests pick up the drugs easily and are easy to perform. The result is reported as negative below a certain cut-off. This cut-off is often determined by the manufacturer, or a legal cut-off can be used.
- These tests are also prone to cross-reactions, as seen with Codeine and morphine (both give positive opiate screening results).
- Another example is Valium and Dormicum, both are benzodiazepines, but they don't give the same screening result. Valium will give a higher result than a similar amount of Dormicum. Stocrin, an anti-retroviral agent, can give a false-positive cannabis result with certain test systems.
- Above the cut-off the result is reported as a numerical value. In urine samples, although the concentration of the drug is obtained, the result gives no indication of the physical state of the urine sample donor at the time of collection.
- As with near patient testing, laboratory testing is also inexpensive, however there are limitations to both types of screening tests. The limitations of all immunoassays, near patient and laboratory automated, include: only drug classes are tested for (e.g. opiates), NOT the specific drug (e.g. codeine vs. morphine – the one a common pain killer, the other a highly controlled drug used for specific reasons).

Antibodies present in the sample may also react with the testing system, giving false-positive as well as false-negative results.



NEAR PATIENT TESTING

Typically a testing strip is used, or a cup/ device where the test strip forms part of the device.

- These devices can be quite sophisticated and can even test the temperature of the Urine sample, as well as for the presence of adulterants.
- An adulterant is something the donor uses, either by adding it to the urine or consuming it themselves, to alter the outcome of the test.
- These devices can also test for a number of drugs at the same time.
- Testing the temperature of the urine sample and for the presence of adulterants is done to ensure that the sample has not been tampered with.
- Drug tests are often used in workplace drug testing, where the requirement is that the test only turns positive once a minimum amount of drug has been detected, in other words at a given cut-off. to the laboratory for confirmation testing.

WHY DO DRUG TESTING ?

The reason can be medical or legal. Medical testing is done when a person is taken to a medical facility because of acute illness, and on examination, is suspected to be under the influence of a drug. Testing can help to make a diagnosis and guide the immediate treatment It is considered can also be done in known drug abusers to ensure they are not using drugs.

- Drug testing can also be done in known Drug Abusers to ensure they are not using Drugs.
- These tests are done without legal implications; the result does not have to stand up in a court of law. In legal cases, testing is done after an accident or a crime.



CONFIRMATION TEST

This category of testing is performed once a non-negative (i.e. positive) result has been obtained on a screening test. It is performed in the laboratory, on highly specialised instruments

It is more expensive than a screening test, and it takes longer to obtain a result. The results are given as an amount, or concentration of drug in the sample. In urine samples this concentration does not provide information about how much of the drug was taken, when the drug was taken, or how affected the person. These tests can distinguish between different drugs within a drug class. For example: if a positive opiate result was obtained on a screening test, the specific opiate will be identified with the confirmation test, either *codeine, morphine or heroin*.

It can also be part of a workplace drug screening programme. In these situations the legal validity of the sample becomes paramount. This does not form part of this discussion.





WHICH SAMPLE? URINE, BLOOD OR HAIR ?

Sample type depends on the type of testing that is required; urine is the sample of choice for the average clinical testing.

The way in which drugs are eliminated from the body also means it is possible to detect these agents for a longer period of time in a urine sample. However, these samples can be tampered with and this is why most laboratories do some tests to exclude tampering or adulteration.

SWEAT

Sweat testing is being used to assess long term abstinence from drugs. Once again, testing laboratories that can process sweat samples are also not readily available.

BLOOD SAMPLE

Blood is the sample of choice if you want to measure the drug concentration present at the time of taking the sample. It is used to monitor therapeutic drugs, like the anti-convulsants, because of the irregular use of illicit drugs and the fact that they get eliminated from the blood relatively quickly, it is not the sample of choice to test for suspected illicit drug abuse.

SALIVA SAMPLE

Saliva is another attractive sample type, as it is not invasive to take the sample and drug levels are comparable to blood levels. As with hair samples, it may also not be admissible in court and requires specialised instruments to measure it. Testing laboratories that can process saliva samples are not readily available.

HAIR SAMPLE

Hair is a very attractive sample type. It is easy to obtain and it can't be tampered with. Hair also gives a longer timeline to assess drug exposure. There are however problems with using hair for drug testing; it requires specialized instruments and personnel to analyze it. It is uncertain if it is admissible in court as evidence. Testing laboratories that can process hair samples are not readily available.



HOW LONG ARE DRUGS DETECTABLE IN YOUR SYSTEM?

The time period drugs are detectable is affected by the amount of drug used, the use of other concomitant drugs, how often the drug is used, and the metabolism of the individual.

Drug	Street Name	Window of detection
Cocaine	Coke, Crack, Snow	2-3 days max 22 days
Methamphetamines	Crank, Crystal Meth, Speed, Ice, Tik	60 hours max 6 days
Cannabis	Grass, Herb, Pot, Weed	1-4 days (occasional) 12 days (moderate) 22 days (chronic use)
Amphetamine	Crosses, Hearts	1-3 days max 9 days
Opiates	Dover's Powder, Paregoric	10 hours - 6 days max 10 days
Oxycodone (naloxone, hydrocodone, hydromorphone, oxymorphone)	Oxy	1-2 days
Propoxyphene	Darvon, Pinks, Footballs	6 hours 2 days
Benzodiazepines	Tranks, Xanax	3-7 days 4-6 weeks (chronic)
Barbiturates	Barbs	2 days (short acting) 2-3 weeks (long acting)
Ecstasy (MDMA)	E, XTC, Love drug, Hug drug, Lover's Speed	1-3 days

SPECIAL SITUATIONS

Drugs are often used in the perpetration of crimes; in particular drug-assisted sexual assault.

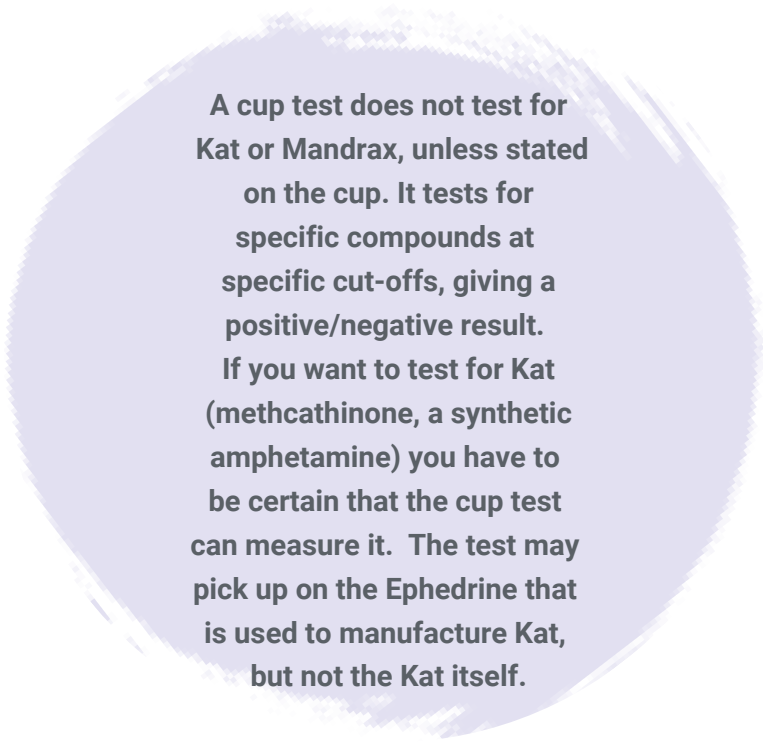
- Common drugs used include a benzodiazepine, like Rohypnol (Roofies), and Gamma Hydroxy Butyrate (GHB). These drugs cause retrograde amnesia, leaving the victims with no memory of the event.

These victims may never have been exposed to these drugs; they have never used or taken drugs before. This would make it the first time the person has been exposed to this drug. Being a single dose it is eliminated quickly, within hours, making the window for detecting them in the system very short. By the time the victim realises that something has happened, days may have passed and no drugs would be found in blood or urine.

Nyaope (whoonga, wunga) is a street name for local street drugs; the content will vary between different areas and between different suppliers. It is a mixture of drugs and may contain varying amounts of cannabis, methamphetamines and/or heroin, as well as any other bulking agents such as baking powder, rat poison or icing sugar. There are claims that it may contain anti-retrovirals as well.

Bath Salts is an American term used for designer drugs, it contains synthetic forms of the naturally-occurring cathinones found in the khat plant (*Catha edulis*), for example methcathinone (Kat or Cat).

The manufacture of this drug is possibly slightly more sophisticated than Nyaope, but can also contain mixtures of drugs and different drugs according to the supplier.



A cup test does not test for Kat or Mandrax, unless stated on the cup. It tests for specific compounds at specific cut-offs, giving a positive/negative result. If you want to test for Kat (methcathinone, a synthetic amphetamine) you have to be certain that the cup test can measure it. The test may pick up on the Ephedrine that is used to manufacture Kat, but not the Kat itself.

CONCLUSION

When subjecting someone to a drug test, there has to be a clear indication in mind. If not, the result will not give the required information, leading to disappointment and frustration. There is no quick test that detects all possible drugs, especially if the person took the drugs a few days ago. A negative test does not say that the person does not use drugs. A negative test result may mean that there just wasn't enough of the drug to give a positive result. A positive test requires the person to have taken the drug that is being tested for, in a sufficient quantity to give a positive result well within the detection window (before the drug is eliminated completely from the body).



You should know why you are doing the test, what drug you are testing for, and if you want a positive/negative result only or a specific drug concentration. The testing of powders and tablets are generally not performed by routine laboratories, but by forensic laboratories either in the State or by University laboratories. If there is any doubt seek the advice of a qualified health professional.