

## Signs to watch for before and during drug tests

- Diluted urine (watered down) given for urine sample
- Presence of over the counter medication in person's system e.g. Tylenol
- Person claims of poppy seed consumption prior to test
- Large consumptions of cranberry juice prior to test
- Neon yellow urine from B complex vitamin given for urine sample
- Altoid breath or Listerine breath prior to saliva test
- Excuses to prolong testing and/or defensive behavior when asked

## Types of Tests

### Urine Drug Testing

#### Urine Tests

- **Are the least expensive of the test methods (~\$7-\$50 for home version).**
- **Are considered an intrusive method of testing.**
- **Can be done at home (for example by parents) though require lab verification for accurate results.**
- **Detect use primarily within the past week (longer with regular use).**
- **Can be affected by abstaining from use for a period of time before the test.**
- **Are often temperature tested to insure sample integrity.**

The following is a summary of the analytical methods used by laboratories to detect the presence of drugs or their metabolites in urine.

#### Immunoassays

These tests are most commonly used to screen samples. In the event that drugs or their metabolites are detected, then the sample is normally tested again using an even more sensitive test such as Gas Chromatography and Mass Spectrometry. Immunoassays work on the principle of antigen-antibody interaction. Antibodies are chosen which will bind selectively to drugs or their metabolites. The binding is then detected using either enzymes, radioisotopes or fluorescent compounds.

**EMIT** (Enzyme Multiplied Immunoassay Technique) is manufactured by Syva Laboratories. It uses an enzyme as the detection mechanism. It is the cheapest, simplest to perform and the most widely used of the immunoassays. Unfortunately, it is also the easiest to fail and more worryingly, the least accurate: giving a 4-34% false positive rate.

**RIA** (Radio Immunoassay) is manufactured by Roche Diagnostics. It is similar to EMIT but uses a radioactive isotope such as iodine instead of an enzyme. However, because it involves using radioactive substances, it is less popular than EMIT. This is a highly sensitive form of testing mainly used by the military.

**FPI** (Fluorescence Polarization Immunoassay) is manufactured by Abbott Laboratories. Fluorescent compounds mark the selective binding of antibodies to drugs and their metabolites. It is highly sensitive and highly specific.

### Thin Layer Chromatography

This procedure involves the addition of a solvent to the sample causing the drugs and their metabolites to travel up a porous strip leaving colour spots behind. As each different substance travels a specific distance, the strip can then be compared with known standards. This test gives no quantitative information, it merely indicates the presence of drugs or their metabolites. Furthermore, it relies on the subjective judgment of a technician and requires considerable skill and training. It is not widely used.

### Gas Chromatography and Mass Spectrometry

These are the most precise tests for identifying and quantifying drugs or their metabolites in the urine. They are usually used as a confirmation test following a positive result on an Immunoassay. It involves a two step process, whereby Gas Chromatography separates the sample into its constituent parts and Mass Spectrometry identifies the exact molecular structure of the compounds. The combination of Gas Chromatography and Mass Spectrometry is considered to be the definitive method of establishing the presence of drugs or their metabolites in the urine. However, the equipment necessary to perform it is extremely expensive and this is reflected in the price for testing each sample. Occasionally problems do arise with poor calibration of the equipment.

## Hair Tests

- **Are currently several times more expensive than urine tests (~\$100-\$150).**
- **Are considered a relatively unintrusive method of drug testing.**
- **Detect substance use over a longer period (see [detection period](#)).**
- **Do not usually detect use within the past week.**
- **Require a sample of hair about the diameter of a pencil and 1.5 inches long. They cannot be done with a single hair.**
- **Test positive a little more than twice as often as a urine test. In a recent study, out of 1823 paired hair and urine samples, 57 urine samples tested positive for drugs of abuse; while 124 hair samples from the same group tested positive.**
- **Are not significantly affected by brief periods of abstinence from drugs.**
- **Can sometimes be used to determine when use occurred and if it has been discontinued. Drugs, such as opiates (codeine, morphine, heroin) lay down on the hair shaft very tightly and are shown not to migrate along the shaft, thus, if a long segment of hair is available one can draw some "relative" conclusions about when the use occurred. However cocaine, although very easy to detect, is able to migrate along the shaft; making it very difficult to determine when the drug was used and for how long.**
- **Claims to be able to reliably differentiate between opiate and poppy seed use.**

- We've heard that many hair tests now check for more than the NIDA 5, and include at least Cannabis, Ecstasy/MDMA, Cocaine, Opiates, Methamphetamine, Amphetamine, Phencyclidine (PCP), Benzodiazepines, & Barbiturates (2001).

### Sweat (Patch) Tests

- Are considered a relatively intrusive method of drug testing because they require the wearing of a patch for an extended period of time.
- Are still relatively uncommon.
- Are controversial in terms of accuracy. There is some reason to believe that surface contamination (such as cannabis smoke) can cause a false reading.
- Can detect use, which would not trigger other tests. Because of the short detection period for many drugs in urine, single use of many drugs longer than a week prior to using the patch will not cause a positive urine test. Because the skin patches are gathering sweat over an extended period of time, it is possible that any use during that time will produce a positive result.

### Saliva Tests

- Are a little more expensive than urine testing, but less than hair or blood. (~\$15-\$75).
- Are considered a relatively unintrusive method of drug testing.
- Are becoming more common.
- Are easy to administer but require lab processing to ensure accuracy.
- Detect use primarily within the past few days.
- Can detect more recent use than other testing methods.
- Have no nationally accepted standards or cutoff concentrations for detection, making results greatly dependent on the specific product purchased. This could also make results less-reliable and/or acceptable for legal cases.
- More reliable for detection of Methamphetamine and Opiates, less reliable for THC or Cannabinoids (2004).

### Blood Tests

- Are the most expensive method of testing.
- Are considered the most intrusive method of testing.
- Are the most accurate method of testing.
- Are the least common method of testing (most likely due to cost).

SUBSTANCE	BLOOD	SALIVA	SWEAT	URINE	HAIR
Alcohol	12 hours	4-6 hours	2-3 days prior and duration of wear	10-12 hours traditional/3-5 days via ethyl Gluconoride metabolite	Years
Amphetamine	12 hours	3 days	2-3 days prior and duration of wear	1-4 days	up to 90 days
Barbiturates	1-2 days	2-3 days	2-3 days prior and duration of wear	1-21 days	Up to 90 days
Benzodiazepines	6-48 hours	3-7 days	2-3 days prior and duration of wear	1-42 days	Up to 90 days
Cannabis (single use)	2-3 days	8-24 hrs	2-3 days prior and duration of wear	2-3 days	up to 90 days
Cannabis (habitual use)	2 weeks	8-24 hrs	2-3 days prior and duration of wear	up to 12 wks	up to 90 days
Cocaine	24 hours	1 -3 days	2-3 days prior and duration of wear	2-5 days	up to 90 days
Codeine/Morphine	6-12 hours	12-36 hrs	2-3 days prior and duration of wear	2-4 days	up to 90 days
Cotinine (Nicotine)	2-4 days	Unknown	2-3 days prior and duration of wear	2-4 days	Up to 90 days
Ecstasy		2-3 days	2-3 days prior and duration of wear	1-3 days	Up to 90 days
Heroin	6 hours	Unknown	2-3 days prior and duration of wear	2-4 days	up to 90 days
LSD	0-3 hours	1-4 days	2-3 days prior and duration of wear	2-24 hours	Up to 3 days
Methadone	24 hours	3-5 days	2-3 days prior and duration of wear	3 days	Up to 30 days

<b>Methamphetamine</b>	<b>1-3 days</b>	<b>2-3 days</b>	<b>2-3 days prior and duration of wear</b>	<b>2-5 days</b>	<b>up to 90 days</b>
<b>Opiates</b>	<b>6 hours</b>	<b>2-3 days</b>	<b>2-3 days prior and duration of wear</b>	<b>24-48 hours</b>	<b>Up to 90 days</b>
<b>PCP</b>	<b>1-3 days</b>	<b>3 days</b>	<b>2-3 days prior and duration of wear</b>	<b>3-30 days depending on frequency of use</b>	<b>up to 90 days</b>
<b>Phenobarbital</b>	<b>4-7 days</b>	<b>10-20 days</b>	<b>2-3 days prior and duration of wear</b>	<b>7-14 days</b>	<b>Up to 90 days</b>

## Pros and Cons of Drug Testing Methods

There is no perfect drug testing method. Each method has some advantages and disadvantages. What makes a drug testing method good or not so good is more related to the needs of the person.

### Urine Drug Testing

**Pros:** Urine drug test kits are available as on-site tests, or laboratory analysis. Referred to as "the gold standard", urinalysis is the most common test type and used by federally mandated drug testing programs.

**Cons:** The main disadvantages of urine-based drug test kits is are (1.) the ease at which they can be "cheated" via sample adulteration or substitution, unless specimen collection is directly observed, (2.) inability to detect current / on-the-job drug abuse, (3.) the need for bathroom facilities, and (4.) with respect to SAMHSA-5, or NIDA-5, the inability to test for drugs used in current society.

### Saliva Drug Testing

**Pros:** Saliva (Oral) drug test kits are very donor friendly, non-invasive and easy to collect the specimen. There is no need for a bathroom to administer the tests. Saliva drug testing is great at detecting very recent drug use. Also these drug tests are harder to adulterate than the urine drug tests since the sample can be obtained under direct supervision. Results can be read in minutes and there is no need for a lab. Depending on the test, up to 8 (5 or 6

at a time) different drugs could be detected. This method is the best method for determining current use and impairment.

Cons: The main disadvantage of saliva based drug testing is lack of awareness in the market, as well as misinformation spread largely by laboratories and TPAs (third party administrators), who stand to lose money as saliva testing continues to replace traditional urine-based techniques.

## **Spray (Sweat) Drug Testing**

Pros: Spray (Sweat) drug test kits are non-invasive and donor friendly. It is very easy to collect the specimen and no bathroom is needed for taking the specimen. The detection window is long and usually can detect drug use up to a couple of weeks. These drug tests are relatively tamper proof since they are hard to manipulate. There is no need for a lab and you can get results in minutes.

Cons: The main disadvantage of spray or sweat based drug testing is the fact that they are open to contamination. Also large variations of sweat production rates of possible donors make some results inconclusive. There is not much variety in these drug tests since they are not as popular as urine or saliva drug testing kits. Their prices tend to be a little higher per test conducted. One main disadvantage of this testing method is the limited number of drugs that can be detected.

## **Hair Drug Testing**

Advantages: Hair Alcohol Testing can provide a much longer window of detection.

Disadvantages: Costs more than urine testing. Cannot be used if a donor has no hair.