

## Drug Test Testing and Different Kinds of Drug Testing

Khasim Yasin\*

Department of Pharmacology and Toxicology, Jamia Hamdard University, New Delhi, India

### Commentary

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\***For Correspondence** : Khasim  
Yasin, Department of  
Pharmacology and Toxicology,  
Jamia Hamdard University, New  
Delhi, India;  
**Email:** ykhasim@gmail.com

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### DESCRIPTION

A drug test is a technical analysis of a biological specimen, for example urine, hair, blood, breath, sweat, or oral fluid/saliva to determine the presence or absence of specified parent drugs or their metabolites. The detection windows depend upon multiple factors: Drug class, amount and frequency of use, metabolic rate, body mass, age, overall health, and urine pH. For ease of use, the detection times of metabolites have been incorporated into each parent drug. For example, heroin and cocaine can only be detected for a few hours after use, but their metabolites can be detected for several days in urine. The chart depicts the longer detection times of the metabolites.

Oral fluid or saliva testing results for the most part mimic that of blood. The only exceptions are THC (Tetra Hydro Cannabinol) and benzodiazepines. Oral fluid will likely detect THC from ingestion up to a maximum period of 6 hours–12 hours. This continues to cause difficulty in oral fluid detection of THC and benzodiazepines. Breath air for the most part mimics blood tests as well. Due to the very low levels of substances in the breath air, liquid chromatography mass spectrometry has to be used to analyze the sample according to a recent publication wherein 12 analytes were investigated.

Urine analysis is primarily used because of its low cost. Urine drug testing is one of the most common testing methods used. The enzyme multiplied immune test is the most frequently used urinalysis. Complaints have been made about the relatively high rates of false positives using this test. Urine drug tests screen the urine for the presence of a parent drug or its metabolites. The level of drug or its metabolites is not predictive of when the drug was taken or how much the patient used. Urine drug testing is an immunoassay based on the principle of competitive binding. Drugs which may be present in the urine specimen compete against their respective drug conjugate for binding sites on their specific antibody. During testing, a urine specimen migrates upward by capillary action. A drug, if present in the urine specimen below its cut off concentration, will not saturate the binding sites of its specific antibody. The antibody will then react with the drug protein conjugate and a visible colored line will show up in the test line region of the specific drug strip.

Breath test is a widespread method for quickly determining alcohol intoxication. A breath test measures the alcohol concentration in the body by a deep lung breath. There are different instruments used for measuring the alcohol content of an individual through their breath. Breathalyzer is a widely known instrument which was developed in 1954 and contained chemicals unlike other breath testing instruments. More modernly used instruments are the infrared light absorption devices and fuel cell detectors, these two testers are microprocessor controlled.

In contrast to other drugs consumed, alcohol is deposited directly in the hair. For this reason the investigation procedure looks for direct products of ethanol metabolism. The main part of alcohol is oxidized in the human body. This means it is released as water and carbon dioxide. One part of the alcohol reacts with fatty acids to produce esters. The sum of the concentrations of four of these Fatty Acid Ethyl Esters (FAEEs: Ethyl myristate, ethyl palmitate, ethyl oleate and ethyl stearate) are used as indicators of the alcohol consumption. The amounts found in hair are measured in nanograms (one nanogram equals only one billionth of a gram), however with the benefit of modern technology, it is possible to detect such small amounts. In the detection of ethyl glucuronide, or EtG, testing can detect amounts in picograms (one picogram equals 0.001 nanograms)

Drug testing a blood sample measures whether or not a drug or a metabolite is in the body at a particular time. These types of tests are considered to be the most accurate way of telling if a person is intoxicated. Blood drug tests are not used very often because they need specialized equipment and medically trained administrators. Depending on how much marijuana was consumed, it can usually be detected in blood tests within six hours of consumption. After six hours has passed, the concentration of marijuana in the blood decreases significantly. It generally disappears completely within 30 days.

Spray (sweat) drug test kits are non-invasive. It is a simple process to collect the required specimen, no bathroom is needed, no laboratory is required for analysis, and the tests themselves are difficult to manipulate and relatively tamper-resistant. The detection window is long and can detect recent drug use within several hours.

There are also some disadvantages to spray or sweat testing. There is not much variety in these drug tests, only a limited number of drugs can be detected, prices tend to be higher, and inconclusive results can be produced by variations in sweat production rates in donors. They also have a relatively long specimen collection period and are more vulnerable to contamination than other common forms of testing.