

## As easy as breath alcohol: identifying drugs through presumptive testing

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Drug abuse is commonplace, as are its dangerous effects. Today, many simple presumptive tests exist to detect drugs and identify problem users.

If only everything were as easy and unambiguous as testing for alcohol! The blood alcohol limits, such as those for drivers, are set down in law, and breath alcohol tests are easy to perform using a portable breathalyser, which produces reliable results on the spot. Both the method for proving fitness to drive and its results are widely recognised. Yet alongside the prevalent and socially accepted consumption of alcohol, we are now dealing with a substantial increase in the use of illegal drugs.

This development is led by cannabis – after alcohol the most popular intoxicant worldwide – as well as opiates (such as heroin), cocaine, amphetamines and methamphetamines, the so-called designer drugs like ecstasy, speed and crystal meth.

GLOBAL CONSUMPTION OF ILLEGAL DRUGS	
Drug	Consumption*
Cannabis	2,5 – 5,0
Opiates and opioids (e.g. heroin)	0,3 – 0,8
Cocaine	0,3 – 0,4
Amphetamine and similar drugs	0,3 – 1,2
Methamphetamine (e.g. ecstasy)	0,2 – 0,4
other drugs	3,4 – 6,6

\* Minimum and maximum estimates of the population in percentage terms

Source: UNDOC 2012; 1.) Central question: How high is the amount of people between 15 and 64 years who have used the drug in the last 12 months?

Unlike alcohol, it is not possible to detect the consumption of these illegal drugs with a simple breath test. They are usually identified using elaborate blood analysis. Taking blood, however, is often too time-consuming for spontaneous spot checks, such as on the roads, at the workplace, at customs or in prison. Presumptive tests are required, which provide reliable on-the-spot testing results quickly and without the need for trained medical staff. Drug testing kits that function with the ease and speed of alcohol breath tests will make the work of police and company safety officers significantly easier.

So what are suitable testing methods for detecting illegal drugs in the body spontaneously and yet reliably? Here is a comparison.

#### Hair and nails: only permit detection of general consumption

Drug substances and their metabolites are encapsulated and stored in hair and nails. If a test subject supplies a hair sample for testing, then depending on the hair length (rule of thumb: about 1 cm/month), it is possible to detect drug consumption in the corresponding period. Hair is an easy and non-invasive way to obtain samples to send to the laboratory. The examination there requires trained, but not necessarily medical, staff.

However, an analysis of the keratinous hair and nails only yields reliable information about the subject's drug history and habits. It does not provide insight into any acute drug intake. This means that no conclusions can be drawn about actual impairment at the time of testing. Hair and nails are therefore not suitable for a spontaneous presumptive test.

### Urine: detection possible only when influence not acute

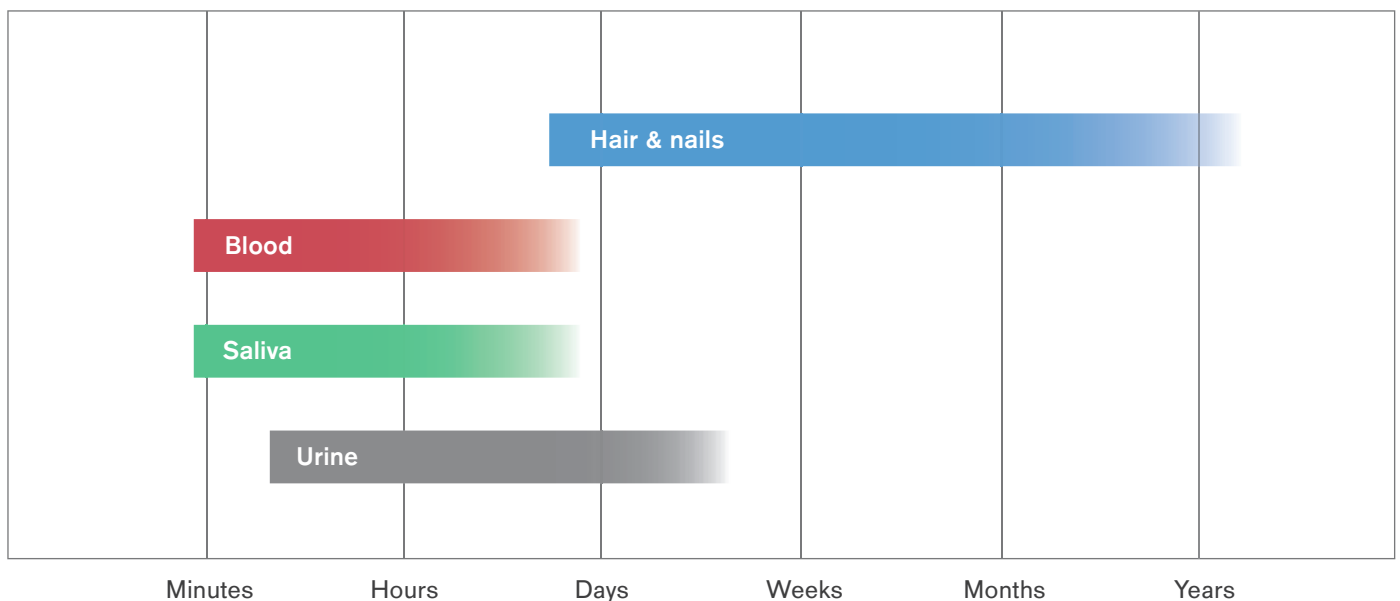
Screening for addictive substances in urine is the most widespread method used for testing. All drug substances and their metabolites can be detected in urine for several days up to a week, depending on the type of substance absorbed, dose, form of consumption (smoked, sniffed, injected) and how often it was taken. In special cases (chronic cannabis or benzodiazepine abuse), the substances may remain detectable in urine for several weeks after abstaining.

For this reason, urine is not well suited to detecting an acute impairment, as it does not contain measurable concentrations of foreign substances or their metabolites immediately or shortly after taking drugs. Conversely, a positive urine test does not necessarily indicate recent consumption. In addition, taking a urine sample requires a suitable premises, as well as the fact it must be taken under observation to prevent manipulation. Such premises are generally unavailable during spontaneous inspections, such as in traffic situations, which would infringe the subject's privacy when taking a sample under observation.

### Blood: May only be taken by trained staff

Blood is excellently suited for detecting drugs as it absorbs the narcotics quickly, i.e. almost as soon as consumption begins, and transports them into all tissues, including receptors and organs, which then remove them from the organism. The subject cannot manipulate the blood, and so a detection of alcohol or illegal drugs (cocaine, THC, etc.) indicates influence at the time of testing. However, taking and analysing blood is impractical for basic on-the-spot drug tests, as it requires specialised personnel, laboratory equipment and usually also a court order.

In Germany, for example, only blood meets the legal requirements for specimens under Sec. 24(a)(2) of the Road Traffic Act (driving a vehicle in traffic under the influence of an intoxicating substance). A laboratory analysis of blood is generally considered a legally admissible method of confirming or refuting a positive presumptive test for court purposes. However, the act of taking blood is extremely invasive and may only be performed by staff with medical training. Therefore, it is not suitable for on-the-spot testing.



Analytical detection timeframe for different test materials Source: Caplan, Y.H., Goldberger, B.A. (2001): Alternative specimens for workplace drug testing. *J Anal Toxicol.* 2001 Jul-Aug;25(5):396-9.

### Saliva: fast and reliable

Testing saliva specimens for drug substances is a real alternative. A specimen can be obtained without invasive procedure to test for acute impairment of the person, particularly at work and in traffic checks. Like blood, saliva can yield reliable information regarding the acute influence of drugs on a test subject.

The saliva test does not require medical staff, and unlike the urine sample, obtaining it does not infringe on a person's privacy. Saliva can be taken on the spot – easily, quickly and reliably – under constant supervision, hygienically and without any need for special facilities. The time and staff costs involved are much lower than for urine tests, and it is almost impossible to manipulate the specimens. Lastly, so far, test subjects have generally been more willing to provide a saliva specimen than a urine sample.

### Perfectly suited for presumptive tests

Saliva is the clear winner in the comparison of analysis methods used in presumptive drug tests. Saliva specimens are taken easily, quickly and without medical staff. They protect the test subject's privacy and so are very popular. And – most importantly for those who perform the tests – they yield reliable results.

Current devices for a saliva test return results that coincide with blood analyses with up to 95% accuracy. Devices that are capable of detecting with precision up to eight different substance classes simultaneously, including the drugs used most frequently, such as cannabis, amphetamines, methamphetamines, opiates, cocaine and methadone. Devices that even indicate the difficult to detect cannabis component THC at a miniscule 5 nanograms per millilitre of saliva – just 3 minutes after taking the sample. Devices that are hygienic, as they prevent any contact with the specimen. That can be used on the go and as a permanent installation. That work on the spot in all (weather) conditions, because their temperature can be adjusted to guarantee the measurement temperature required for precise results at all times and in all places. Devices that also provide clear readouts in the dark due to appropriate lighting. That provide reliable data management, transmission and documentation. That ultimately store all measurement results for later reference.

Presumptive tests for illegal drugs can now be performed with a saliva sample as easily as breath alcohol tests. This enables spontaneous checks anytime and anywhere at low cost. Leading to increased safety.



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