

Drug Testing: Rationale, Utility and Effectiveness

Ken Pidd

For more information and resources visit the NCETA website: <http://nceta.flinders.edu.au>

National Centre for Education and Training on Addiction (NCETA), Flinders University

Rationale For Drug Testing

The three main reasons for drug testing are to: 1) detect use; 2) deter use; and 3) improve safety. Contexts within which drug testing is implemented vary according to reason for testing.

1. To detect drug use

Contexts:

- Clinical
- Sporting
- Workplace
- Roadside
- Custodial
- Schools
- Welfare recipients

2. To deter drug use

Contexts

- Clinical
- Sporting
- Workplace
- Roadside
- Custodial
- Schools
- Welfare recipients

3. To improve safety

Contexts

- Workplace
- Roadside
- 'Pill' testing (music events etc.)

Utility and effectiveness

The utility and effectiveness of drug testing can be evaluated against the three main reasons for its introduction (i.e., to detect use, to deter use, and to improve safety).

1. Detecting Drug Use

Urinalysis, oral fluid/saliva, and hair testing can only detect past drug use. They cannot indicate intoxication/impairment, the drug dose, or the pattern of use. While most drug test types are reliable indicators of past drug use, their utility and effectiveness varies between test types.

Urinalysis

- Typically detects use that has occurred up to 3 days prior to the test
- The exception is cannabis use, where occasional use can be detected for up to 6 days and more regular use can be detected for up to several weeks
- The main disadvantages of urinalysis are that it may not detect very recent use (past 2-6 hours) and urine specimens can be adulterated or substituted relatively easily.

Oral fluid/saliva testing

- Has a much shorter window of detection compared to urinalysis
- For most drug types it detects use that has occurred in the previous 1-3 days
- Compared to urinalysis, oral fluid/saliva specimens are less easily adulterated or substituted
- The main disadvantage of oral fluid is that pH levels can affect drug concentrations in oral fluid/saliva.

Hair testing

- Can detect use that has occurred up to 6 months prior to the test (depending on individual hair growth rates)
- Cannot detect relatively recent use (past 1-4 weeks)
- Cannot detect single use of drug
- No Australian Standards for hair testing (unlike urinalysis and oral fluid/saliva)
- Prohibitive cost.

Table 1: General detection times¹ for urinalysis, oral fluid/saliva testing and hair follicle testing

Drug Test	Non Detectable Period	Detectable Period	Non Detectable Period
Urinalysis	0 - 4 hrs	4 hrs - 3 days ²	> 3 days ²
Oral fluid/saliva	-	0 - 36 hrs	> 36 hrs
Hair follicle	0 hrs - 4 weeks	2 - 6 months ³	-

¹ For each test type, detection times can vary widely by drug type and/or individual differences

² Urinalysis can detect frequent cannabis use for up to several weeks

³ Can be longer depending on hair growth rate and individual/environmental differences

Table 2: Detection times for the most common drug types by test type

Common Drug Types	Urinalysis 	Oral fluid/saliva 	Hair ¹ 
Meth/Amphetamine	Up to 3 days	Up to 48 hours	Up to 6+ months
Benzodiazepines	Up to 14 days	Up to 36 hours	Up to 6+ months
Occasional cannabis use	Up to 4 days	Up to 24 hours	Up to 6+ months
Frequent cannabis use	Up to 30 days	Up to 48 hours	Up to 6+ months
Cocaine	Up to 3 days	Up to 36 hours	Up to 6+ months
Methadone	Up to 3 days	Up to 36 hours	Up to 6+ months
Opiates (Codeine, Morphine)	Up to 3 days	Up to 48 hours	Up to 6+ months

¹ Varies according to hair type and growth rate and cannot detect single use of a drug.

Sources: Dyer & Wilkinson (2008); Victorian Institute of Forensic Medicine (2017); Verstraete (2004).

2. Deterring drug use

- Evidence of the deterrent effect of drug testing, regardless of the test type used, is limited and inconclusive.
- The few studies that have utilised rigorous methodologies indicate that workplace testing either has no effect, or only a very small deterrent effect.
- Any deterrent effect of drug testing is likely to vary according to the context of testing and penalties that apply for positive test results.
- According to deterrence theory, immediate sanctions for breaches are required for a deterrence effect. Where the sanction is immediate and severe (e.g., immediate loss of licence for a positive roadside test) there may be some deterrent effect.

However, offenders may also succumb to the “gambler’s fallacy” (i.e., believing that they would be very unlikely, or unlucky, to be caught more than once) thereby mitigating any deterrent effect.

- The longer term impact of any sanction also needs to be considered.
- In the case of welfare recipients and workplace testing, sanctions for a positive test may:
 - further stigmatise and marginalise individuals and lead to financial difficulties for the individual and dependent family members
 - and/or hamper entry into treatment.

3. Improving safety

- Evidence for the effectiveness of drug testing to improve safety or reduce risk of harm is limited.
- Few quality evaluations of drug testing programs have been undertaken and evidence indicates that drug testing has little, if any, effect.
- Cost effectiveness studies of workplace and welfare testing have found testing programs have little economic value.
- There is some limited evidence that ‘party pill’ testing at music festivals and other venues may have a positive effect on the health and safety of young people who attend these events.
- Unlike alcohol breath analysis, drug testing detects past use not impairment/intoxication.
- A positive drug test does not necessarily mean that drug use played a causal role.
- Testing programs can have an unexpected negative impact on safety.
 - Rather than reducing or stopping drug use, individuals may change their behaviour to avoid detection.

This can include changing patterns of use, using drugs that have a shorter window of detection (e.g., meth/amphetamine), are less detectable (e.g. ‘synthetic’ drugs) or more easily explained (e.g., pharmaceuticals), or the use of masking agents.

When this occurs, drug testing programs are likely to have counter-productive consequences.

References

Andas, H., Krabseth, H., Enger, A., Marcussen, B., Haneborg, A., Christophersen, A., Vindenes, V., Oiestad, E. (2014) Detection time for THC in oral fluid after frequent cannabis smoking. *Therapeutic Drug Monitoring*, 36, 808-814.

Bloom, R (2012) Just as We Suspected: Florida Saved Nothing by Drug Testing Welfare Applicants. ACLU Blog of Rights 18 April 2012, <https://www.aclu.org/blog/mass-incarceration/just-we-suspected-florida-saved-nothing-drug-testing-welfare-applicants> accessed 4th October 2017

Bosker, W.M. & Heustis, M. A. (2009). Oral fluid testing for drugs of abuse. *Clinical Chemistry*, 55(11), 1920-1931.

Drummer, O. (2006). Drug testing in oral fluid. *Clinical Biochemist Reviews*, 27, 147-159.

Dyer, K.R. & Wilkinson, C. (2008). The detection of illicit drugs in oral fluid: another potential strategy to reduce illicit drug-related harm. *Drug and Alcohol Review*, 27, 99-107.

Klein, A. (2017). Australia plans random drug tests for people receiving welfare, *New Scientist*, August 2017. <https://www.newscientist.com/article/2145603-australia-plans-random-drug-tests-for-people-receiving-welfare/> accessed 3rd October 2017.

Lee, D., Milman, G., Barnes, A.J., Goodwin, R., Hirvonen, J., Huestis, M. (2011). Oral fluid cannabinoids in chronic, daily cannabis smokers during sustained, monitored, abstinence. *Clinical Chemistry*, 57(8), 1127-1136.

Niedlbala, R., Kardos, K., Fritch, D., Kardos, S., Fries, T., Waga, J. (2001). Detection of marijuana use by oral fluid and urine analysis following single-dose administration of smoked oral marijuana. *Journal of Analytical Toxicology*, 25, 289-303.

Pidd, K. & Roche A.M. (2014). How effective is drug testing as a workplace safety strategy? A systematic review of the evidence. *Accident Analysis and Prevention*, 71, 154-165.

Pragst, F. & Balkova, M. (2006). State of the art in hair analysis for detection of drug and alcohol abuse. *Clinica Chimica Acta*, 370, 17-49.

Vandevenne, M., Vandebussche, H., Verstraete, A. (2000). Detection Time of Drugs of Abuse in Urine. *Acta Clinica Belgica*, 55:6, 323-333.

Verstraete, A.G. (2004). Detection Times of drugs of abuse in blood, urine, and oral Fluid. *Therapeutic Drug Monitoring*, 26(2), 200-205

Victorian Institute of Forensic Medicine. Drug testing in hair FAQs. VIFM, Melbourne. Available at: <http://www.vifm.org/wp-content/uploads/2015/06/Drugs-in-Hair-FAQ.pdf>: Accessed Sept 30th 2017.



Australia's National Research Centre
on AOD Workforce Development



Flinders
UNIVERSITY

Contact Us

For more information about NCETA's alcohol and other drug research, visit or contact:



www.nceta.flinders.edu.au



nceta@flinders.edu.au



[@NCETAFlinders](https://twitter.com/NCETAFlinders)



[nceta@facebook](https://www.facebook.com/nceta@facebook)