Drug Testing Methods

Drug testing methods, other than urinalysis, include blood and hair. Table 2 provides a comparison of these three most commonly used specimens. Blood and hair tend not to be routinely used for testing for illicit drugs because of high costs, underdeveloped technology, and/or greater intrusiveness. When comparing blood and urine, the detection times in urine are significantly greater than the detection times in blood because most drugs are rapidly eliminated from blood both by the body's metabolic system and by excretion into urine (Council on Scientific Affairs 1987). As the bladder is emptied only a few times during the day, the urine becomes a reservoir of drugs and metabolites.

In recent time, there has been considerable interest in hair testing, which may provide accurate information concerning past use but cannot address the issue of drug use at the time of collection. Essentially, hair records what drugs were in the blood when the hair was made into a hair follicle (DuPont and Baumgartner 1995). Importantly, hair does not deteriorate or lose the drugs trapped in it, as does blood or urine.[1] However, some research shows that passive ingestion can result in a false positive from a hair sample.[2]

Table 2: Comparison of Commonly Used Specimens for Drug Analysis

Specimen	Ease of Collection	Stability of Drugs	Average Window of Exposure	Sample Preparation Before Analysis	Possible Adulteration
Blood	Most Invasive	Variable	Recent	Minimal	No
Urine[a]	Moderate	Stable	1–3 days	Minimal	Yes
Hair[b]	Less Invasive	Stable	7–90 days	Significant	No

[a] The window of exposure is up to 30 days for cannabis, and two weeks for benzodiazepines.
[b] The window of exposure can be up to a year; it depends on how often you get your hair cut.
Adapted from Ostrea 1999, Table 3; Dupont and Baumgartner 1995, Table 1.

[1] Neither urinalysis nor hair testing are reliable methods for detecting alcohol use (DuPont and Baumgartner 1995).
[2] It also appears that African Americans are 30 to 50 times more likely to return a positive from a hair test than whites or Asians. As a result they are more susceptible to passive ingestion (Reed 1999).

Hair grows at about half an inch per month and usually a one-and-half-inch sample is required to detect drug use in the previous 90 days (DuPont and Baumgartner 1995). For a sufficient sample, it usually takes 6 days of growth.[3] Urine, on the other hand, cleans out the blood and, as a result, it contains a record of what a person has been ingesting in the recent past. Thus, urine tests can usually detect use in the previous 1 to 3 days, but not longer term use. From a policy perspective, DUMA is currently most interested in determining recent drug use amongst detainees and urinalysis is the methodology employed for the pilot study.

DUMA collects self-reports from a structured interview as well as specimens for urinalysis testing. Essentially, urinalysis measures the amount of a drug that is present in the urine. Self-report data is widely used by researchers and a considerable amount of work has validated its use in a variety of settings for a range of behaviours including drug use (Harrison 1995). As self-report data is the main method of obtaining basic empirical data on the human condition, researchers are heavily reliant on this methodology, so its validity and reliability are crucial issues. Some studies (Harrison 1995) have shown that the validity of self-report drug use data can be affected by:

- How recently the drug was used.

- Whether the questions are asked by an interviewer or self-completed by the person.

- Whether the drug is stigmatised in the general community.

However, there is general consensus amongst those who work with self-report data that it is reliable and valid in most settings, despite general scepticism amongst the lay public and policy makers. Within criminology, self-reported delinquency has been found to have both concurrent and predictive validity with official records (Farrington et al. 1996). When the interviews take place within a formal criminal justice environment, such as a watchhouse, there may be more basis to scepticism about the validity of self-report data, especially for self-reported recent drug use.[4] As the interviews with detainees take place within a potentially threatening environment to the individual, the perceived threat of sanctions and the

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[3]   Mieczkowski and Newel (1993) reported that 17 per cent of their male sample were unable to provide hair samples because the hair was too short. Feucht, Stephens and Walker (1994) also pointed out the difficulties of obtaining hair samples where subjects have relatively short hair.

[4]   Bigger (1979, p. 25) cites a number of research studies that have documented that "the reliability of addicts' responses varies, and for numerous reasons users do not always tell the truth".

face-to-face interview situation may reduce respondents' willingness to self-report recent drug use; this is despite the assurances of confidentiality.

For obvious reasons, law enforcement officials are particularly sceptical about self-report data from offenders. Confirmation by some independent mechanism—in this case urinalysis—is clearly an advantage. Analysis of data collected from the US-ADAM program indicates under-reporting ranges from 11 to 60 per cent; willingness to report varies accordingly by drug, age, and perceived legal consequences (Wish and Gropper 1990). Feucht et al.'s (1994, p. 112) study of juvenile detainees concluded that "self-reports of drug use by juvenile detainees obtained in the context of a detention facility appear hopelessly unreliable". Harrison (1995) argues that the narrow window of detection for urinalysis can account for some of this discrepancy, along with recall errors, problems in the question wording and instructions, and failure to recognise or identify a drug. But even after taking these factors into consideration, Harrison was not able to fully account for the discrepancy between self-report and urinalysis data.

A study of 303 detainees (see Table 3) found that considerably fewer people self-reported drug use than tested positive using urine, while hair testing detected drug use amongst an even larger proportion of the sample (DuPont and Baumgartner 1995). However, this study was conducted in the United States, where sentencing penalties for revealing illicit drug use are far greater than Australia. In Australia, detainees may be more willing to self-report recent drug use. The data suggest that those with a serious dependency problem are more likely to test positive to both the urine and the hair test. Given that hair testing is more effective in detecting long term drug users, the DUMA results will clearly underestimate the extent of regular drug use amongst detainees (see Mieczkowksi and Newel 1993). The exception is marijuana, where each method is "approximately equally effective in identifying marijuana use" (DuPont and Baumgartner 1995, p. 74, Mieczkowksi and Newel 1993).

Table 3: Comparison of Positive Outcomes: Self-reports, Urinalysis and Hair Analysis

Drug	Self-reported Drug Use (Percentages)		Positive Results (Percentages)	
	In Prior 48 Hours	In Prior 30 Days	Urine	Hair
Cocaine	8.3	11.2	20.4	46.5
Opiates	0	1.0	1.7	8.9

Source: DuPont and Baumgartner 1995, Table 4.

In theory, there are other sources of information, such as the arrestee's official criminal justice records, that could be used to infer prior drug use history. Wish and Gropper (1990) have shown that United States arrest records fail to provide the necessary information. In terms of personal information recorded about the offender's drug use, the official files are rarely systematically kept or, if kept, are not verified by independent sources. Analysis of arrests for sale or possession of a drug is not an accurate measure of drug use prevalence; reliance on these data would grossly underestimate the number of users within the criminal justice population. It is unlikely that the Australian situation is any different. Further, criminal history data based on official arrest records will grossly underestimate the extent of drug use. Two primary reasons for this are that arrest data generally underestimates criminal activity (Coleman and Moynihan 1996) and drug arrests, in particular, are notoriously unreliable as they simply reflect policing practices (Chilvers 1998). One of the goals of DUMA is to determine whether urinalysis testing provides more reliable data on recent drug use than the traditional self-report methodology and the official record.