



Drug Testing in Clinical Settings

Robert L. DuPont, M.D.

Abstract

Drug testing, the pinnacle of modern biotechnology, has evolved beyond urine testing to include testing in hair, saliva, and sweat and has moved out of the laboratory to include on-site testing with results available in a few minutes. Alcohol and drug abusers characteristically lie about their substance use to anyone who might want them to stop their use. Drug testing is now highly reliable in detecting the recent use of specific drugs as well as alcohol, thereby greatly enhancing substance abuse treatment and prevention. Drug testing is also useful in schools and in family-based efforts to prevent drug use. The biology of substance abuse as well as the technology of testing needs to be understood by anyone seeking to use testing to detect the recent use of addicting substances.

Keywords

Drug Testing, Detection of Drug Use, Addiction, Substance Abuse, Drug Testing in Drug Treatment, Criminal Justice Drug Testing, Toxicology of Drugs of Abuse

I. Introduction: Background

Drugs of abuse are chemicals that hijack the brain's reward system to produce far more powerful feelings than are produced by the natural rewards of food and sex.⁽¹⁾ Humans in their relentless exploration of their environments have discovered, and more recently invented, a relatively small number of chemicals that overwhelm the brain's reward system. Drug abusers, regardless of the drug they choose or the way they get the drugs into their bodies, seek the effects of these chemicals on their brains. Since the drugs are carried to the users' brains in their blood, the drugs are found in all parts of users' bodies and in all body fluids including urine, saliva and sweat. Drugs are quickly metabolized in the liver and the blood so that even when the drugs themselves are at very low levels their metabolites can sometimes be detected.⁽²⁾ ⁽³⁾ Drugs can also be detected in hair, producing a veritable tape recording of drug use in the prior ninety days or even longer.

The same high level of biotechnology is used to detect drugs and their metabolites regardless of the matrix that is tested. This means that the same high level of reliability is achieved whether the drug test involves blood, urine, oral fluid (saliva), hair or sweat. The choice of what to test involves consideration of cost, ease of access and the desired detection window. By far the most common drug testing matrix is urine where the drugs and their metabolites are found in relatively high concentration and where the drug tests can be done without expensive extraction.

Drug testing needs to get beyond the urine cup. There are important advantages to other matrices in many cases. Generally, urine identifies drug use in the few hours to 3 days before the test. Oral fluids have a shorter detection window – generally from a few hours to 1 or 2 days. While hair tests cannot detect drug use within the week prior to sample collection, a standard inch and a half sample detects drug use in the prior 90 days. Sweat testing involves wearing a patch similar to the patch worn when stopping smoking. Sweat patch testing identifies drug use while the patch is worn, usually for 1 to 3 weeks. Urine is particularly appropriate for frequently repeated random testing (for example in treatment and the criminal justice system).

Hair testing is particularly valuable for scheduled tests, such as pre-employment drug testing, when a detection window beyond 3 days is desirable and when cheating is a risk. Sweat patch testing is especially valuable immediately following treatment or in initial return to work settings. Oral fluid testing is especially valuable in many

settings where urine is used because it is easier to collect and resistant to cheating. Roadside testing is an excellent application of oral fluid testing.

Urine is the matrix most subject to cheating, a serious problem that is virtually non-existent with the other matrices. Drug tests can be done at a laboratory or at the site of collection using on-site drug test kits. Laboratory testing can be used to test for a wider range of drugs than the other matrices, but results are not available from the laboratory for 1-3 days after the sample was collected. On-site testing gives results within a few minutes of sample collection. On-site test kits are available for urine and oral fluid testing but not for hair or sweat testing, both of which are available only through large laboratories. A more expensive confirming test is possible with either laboratory or on-site drug testing but is seldom needed in clinical settings where testing is frequently repeated and where the consequences of a positive test result are seldom severe. Most positive drug test results lead to immediate admission of use by the donor. This is the best confirmation.

Whatever the setting in which drug testing occurs, success is enhanced by using smarter drug testing including testing that rotates the matrix and the drug panel to reduce cheating and to extend the preventive power of the drug tests. This strategy is described in a related article.(4)

Drug abusers deny recent drug use to anyone who may want to separate them from their drugs. Drug tests overcome denial and dishonesty. They are essential to detecting recent drug use in any setting where no-use is the standard. Without drug tests it is difficult, and often impossible, to identify recent drug use. In this article we look at drug tests in three settings – treatment, the criminal justice system and the family. Other articles in this series explore drug testing technology and testing in the workplace and schools.

Drug tests do not identify impairment or addiction. Drug testing does identify the recent use of specific drugs. Drug tests are limited and can only identify the specific drugs in their panels; they do not identify “drug use” generally, so when using a drug test it is essential to know what drugs were in the panel that was used. Use of drugs outside that panel will not be identified, not matter how much of them were used, how recently they were used or how impairing that use was. Many drug test panels are limited to the SAMHSA-5 drug panel used in federally mandated testing: marijuana, cocaine, morphine/codeine, amphetamine/ methamphetamine, and PCP. There are many more drugs that are commonly used including Ecstasy, LSD, and a wide range of prescription drugs including Valium, Xanax, Oxycontin and Vicodin. If abuse of these drugs is suspected, it is essential to include them on the panel of the drug test that is selected. Although alcohol is most often detected in breath tests, alcohol can also be detected in urine, blood and oral fluids but not in hair or sweat patches. Because alcohol is rapidly metabolized, these tests are seldom positive more than a few hours after drinking stops. Nicotine’s metabolite cotinine is detected in urine.

Most illegal drug users, even very severe and chronic users, have been off alcohol and drugs many times – sometimes involuntarily. Their central problem is not stopping, it is staying stopped. Put in other words, the clinical challenge for drug abusers is relapse. Since relapse is a long-term, often lifelong, risk of addicted people, the major challenge of helping these people maintain recovery is to prevent relapse. Drug testing plays a central role in reducing relapse as it does in drug abuse prevention in schools, workplaces and in many other settings.

II. Clinical Contexts for Drug Testing

Drug testing is useful in any setting in which drug use is a problem.(5) (6) (7) Common settings for drug use include:

1. Substance Abuse Treatment. One of the most important contexts in which drug testing is substance abuse treatment where testing is generally inefficiently used. The standard for clinical drug testing is set by the nation’s Physician Health Programs (PHPs) which monitor addicted physicians for 5 years or longer. These programs typically use random drug testing so that on each workday participating physicians call a phone number to see if they need to go in for testing that day. In the first national study of PHPs, 79 percent of the physicians did not have a single

positive test for either alcohol or drugs, and of those who had a positive test, two thirds never had a second positive test. Treatment programs should adopt similar strategies to insure careful long-term monitoring which produces outstanding long-term outcomes.(8) Drug testing is not drug abuse treatment, but drug testing makes drug treatment far more successful because it identifies drug use, thereby permitting swift and certain, but not necessarily severe, interventions to stop alcohol and other drug use and to promote long-term recovery.

2. Criminal Justice System. About 5 million Americans are being supervised on parole or probation. As many as 80% of these convicted offenders have substance abuse problems including alcohol and other drugs of abuse. This is one of the heaviest drug using and most problem-generating segments of the population of about 20 million American illegal drug users. New data on frequent random drug testing linked to immediate consequences, as is also true for the PHPs, has been shown to greatly enhance outcomes for offenders in the community. Prolonged random testing with a zero tolerance for continued substance use not only produces dramatic reductions in alcohol and other drug use but it also produces sharp drops in criminal recidivism and incarceration.(9) (10)

3. Family. While the community at large, schools and pediatricians are important when it comes to drug abuse prevention, the family is ground zero for the prevention of substance abuse. The family is also a primary location for relapse prevention after substance abuse treatment which rarely lasts more than a year. Families can improve their success in both prevention and recovery by implementing family-based drug testing – especially for high risk family members. This often means drug testing teenagers and other family who have had problems with alcohol or other drugs of abuse. Families need help selecting drug tests and knowing how to handle positive tests results when they occur. A related article details a strategy for family drug testing.(11)

Families generally do not have access to laboratory-based drug testing unless they use their physician or a teenager's pediatrician, or a drug treatment program. However, families have access to drug tests though the Internet and through commercial outlets including most drug stores and many other retail stores. The drug test kits come with instructions for their use as well as phone numbers where questions can be answered. The range of drugs tested for with these kits is often very small, so it may be useful to work with a laboratory or a physician to have access to a wider range of drug tests.

When to Test, What to Test for and How to Select a Test Matrix

In each of the three settings described here, it is usually desirable to start with urine testing for a relatively inexpensive panel of 5 to 10 drugs. These tests are accessible through most clinical laboratories for organizations such as treatment and criminal justice programs. There are many advantages to expanding the testing to include more drugs both on a rotating basis and when there are concerns about a specific individual's use of specific drugs that are outside this basic test panel. There are also advantages to using matrices beyond urine, especially hair and

oral fluids in a rotating basis and in special situations including when cheating is suspected since these alternative matrices are resistant to cheating.

When confronted with a result that is difficult to interpret and when the donor of the tested sample convincingly disputes a positive result, it may be desirable to contact the testing laboratory or when using test kits for on-site testing, the manufacturer of the kits that are used. They have toxicologists available who can interpret the specific result. As an alternative, it is possible to contact a certified Medical Review Officer (MRO) – a physician who is trained to interpret drug test results. To find an MRO, please visit the following: American Association of Medical Review Officers (AAMRO) www.aamro.com; Division of Workplace Programs (SAMHSA) <http://dwp.samhsa.gov/DrugTesting/>; or Medical Review Officer Certification Council (MROCC) www.mrocc.com. For more information about drug testing visit the Drug and Alcohol Testing Industry Association (DATIA) web site (www.datia.org).

Summary

Drug testing is the pinnacle of modern biotechnology. Drug testing technology is continuing to improve and to become both more effective and less expensive. Drug tests identify recent drug use by detecting drugs and their metabolites in urine, oral fluids, hair and sweat. Drug testing detects only the drugs on the specific panels selected for each test.

The use of drug tests to detect recent drug use is valuable in many clinical settings including substance abuse treatment, the criminal justice system and in the family. By detecting recent drug use, drug testing plays a central role in prevention, treatment and long-term relapse prevention.

Author Information

Robert L. DuPont, M.D.

President, Institute for Behavior and Health

For more than 30 years, Robert L. DuPont, M.D. has been a leader in drug abuse prevention and treatment. Among his many contributions to the field is his leadership as the first Director of the National Institute on Drug Abuse (1973-1978) and as the second White House Drug Chief (1973-1978). From 1968 to 1970 he was Director of Community services for the District of Columbia Department of Corrections, heading parole and half-way house services. From 1970 to 1973, he served as administrator of the District of Columbia Narcotics Treatment Administration (NTA), the city-wide drug abuse treatment program that was the model for the federal government's massive commitment to drug abuse treatment in the early 1970s. Following this distinguished public career, in 1978 Dr. DuPont became the founding president of the Institute for Behavior and Health, Inc.

Dr. DuPont has written for publication more than three hundred professional articles and fifteen books and monographs on a variety of health-related subjects. His books include *Getting Tough on Gateway Drugs: A Guide for the Family*, *A Bridge to Recovery: An Introduction to Twelve-Step Programs* and *The Selfish Brain: Learning from Addiction*. In 2005, Hazelden, the nation's leading publisher of books on addiction and recovery, published three books on drug testing by Dr. DuPont: *Drug Testing in Drug Abuse Treatment*, *Drug Testing in Schools*, and *Drug Testing in the Criminal Justice System*.

Throughout his decades of work in addiction prevention, Dr. DuPont has served in many capacities. His activities in the American Society of Addiction Medicine (ASAM) include chairing the forensic science committee and he is a Life Fellow. He is also a Life Fellow of the American Psychiatric Association (APA) and was chairman of the Drug Dependence Section of the World Psychiatric Association (WPA) from 1974 to 1979. In 1989 he became a founding member of the Medical Review Officer Committee of ASAM.

A graduate of Emory University, Dr. DuPont received an M.D. degree in 1963 from the Harvard Medical School. He completed his psychiatric training at Harvard and the National Institutes of Health in Bethesda, Maryland. Dr. DuPont

maintains an active practice of psychiatry specializing in addiction and the anxiety disorders and has been Clinical Professor of Psychiatry at the Georgetown University School of Medicine since 1980. He is vice president of Bensing, DuPont and Associates (BDA), a leading national consulting firm dealing with substance abuse, founded in 1982 by Dr. DuPont and Peter Bensing, former Director of the Drug Enforcement Administration.

Dr. DuPont's signature role throughout his career has been to focus on the public health goal of reducing the use of illegal drugs.

Conflict of Interest Statement

The author declares that he has no competing interests or conflicts of interest, and that this article was not paid for, inspired, reviewed or edited by a commercial sponsor.

References

1. Volkow ND & Li TK. Drug addiction: The neurobiology of behavior gone awry. In R. K. Ries, D. Fiellin, S. C. Miller & R. Saitz (Eds.) *Principles of Addiction Medicine* (4th ed., pp. 3-12). Chevy Chase, MD: American Society of Addiction Medicine, 2009.
2. DuPont, R. L. & Selavka, C. M. (In Press). Testing to identify recent drug use. In M. Galanter & H. D. Kleber (Eds.) *Psychotherapy for the Treatment of Substance Abuse*. The American Psychiatric Press.
3. DuPont, R. L., Goldberger, B. A. & Gold, M. S. (2009). Clinical and legal considerations in drug testing. In R. K. Ries, D. Fiellin, S. C. Miller & R. Saitz (Eds.) *Principles of Addiction Medicine* (4th ed., pp. 1499-1507). Chevy Chase, MD: American Society of Addiction Medicine.
4. DuPont, R. L. & Graves, H. (2005). *Smarter student drug testing*. Rockville, MD: Institute for Behavior and Health, Inc. (www.ibhinc.org)
5. DuPont R. L., Newel, R. & Brethen, P. (2005). *Drug testing in drug abuse treatment*. Center City, MN: Hazelden.
6. DuPont, R. L. & Brady L. A. (2005). *Drug testing in schools: Guidelines for effective use*. Center City, MN: Hazelden.
7. DuPont, R. L., Mieczkowski, T. & Newel, R. (2005). *Drug testing in the criminal justice system*. Center City, MN: Hazelden.
8. DuPont R. L., McLellan A. T., White W. L., Merlo L., and Gold M. S. (2009). Setting the standard for recovery: Physicians Health Programs evaluation review. *Journal for Substance Abuse Treatment*, **36**(2), 159-171.
9. Hawken, A. & Kleiman, M. (2008, July). Research brief: Evaluation of HOPE Probation. Retrieved December 1, 2009 from http://www.pewtrusts.org/uploadedFiles/HOPE_Research_Brief.pdf.
10. Long, L. (2009). The 24/7 Sobriety project. *The Public Lawyer* (17), 2: 2-5.
11. DuPont, R. L. & Bucher, R. H. (2005). *Guide to responsible family drug and alcohol testing*. Rockville, MD: Institute for Behavior and Health, Inc. (www.ibhinc.org)

©

Copyright
2006 -
2009 The
Journal of
Global
Drug Policy
and
Practice

[Privacy Policy](#)

[Terms of Use](#)

[Contact Us](#)