



Adolescent Drug Testing Policies in Schools

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More than a decade after the US Supreme Court established the legality of school-based drug testing, these programs remain controversial, and the evidence evaluating efficacy and risks is inconclusive. The objective of this technical report is to review the relevant literature that explores the benefits, risks, and costs of these programs.

abstract

INTRODUCTION

Given the prevalence of illicit substance use by adolescents in the United States and the far-reaching medical and psychosocial consequences, there has been intense national debate about appropriate methods to combat this problem. Arguably, the most controversial debate has centered on school-based drug testing of adolescents, sometimes called “suspicionless” or “random” school-based drug testing.

More than 15 years ago, the US Supreme Court established the legality of school-based drug testing for students who participate in sports (*Vernonia School District v Acton* [1995]) and more recently for all students who participate in extracurricular activities (*Earls v Tecumseh School District* [2002]), although the evidence presented in these rulings relied on anecdotal reports and testimonials. Nonetheless, in 2003 the White House Office of National Drug Control Policy publication *What You Need to Know About Drug Testing in Schools*¹ stated that “the expectation that they may be tested for drugs is enough to make some students stop using drugs—and others never to start in the first place.” Despite the national sentiment generally supporting school-based drug testing, the American Academy of Pediatrics (AAP) has been more cautious in its policy recommendations because there has continued to be a paucity of scientific evidence demonstrating implementation efficacy or constructive outcomes of school-based drug testing.

Proponents of random drug testing of adolescents cite potential advantages, including substance use prevention or reduction of drug use consequences, because drug testing would potentially serve as a reason for students to avoid drug use and the negative consequences of having positive drug test results and a means for early identification of and

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intervention with adolescents who use illicit substances. Opponents of random drug testing of adolescents point to potential disadvantages, including deterioration in the youth-school relationship, extracurricular activity participation when linked to testing, and the ability to protect students' private medical information. Another important potential drawback of school-based drug testing is that drug tests not performed or interpreted correctly could result in incorrect conclusions. False-positive results can lead to unfair stigmatization, and false-negative results may elicit false reassurances.

This technical report provides a review of the current evidence on random drug testing in schools.

DRUG TESTING OVERVIEW

Numerous methods are used to test for drugs of abuse, and the technology exists to test diverse samples, including urine, blood, saliva, hair, sweat, and breath. Urine drug testing is considered the gold standard, because it has been well studied and standardized and is inexpensive and minimally invasive. A particular advantage is that substances and certain metabolites can be detected in the urine after the period of acute intoxication has ended. Urine drug testing is the method most frequently used in the school setting but is a deceptively complex medical procedure.

Conducting true gold standard drug testing involves a urine specimen collection protocol that includes directly observed voiding and "chain of custody" specimen collection as well as a 2-step testing procedure that follows federal guidelines² for drug detection and confirmation of results. Workplace drug testing often uses an alternative Federal Transportation Protocol, which does not include observed voiding but does mandate outerwear removal and pocket inspections before the person enters the designated bathroom

collection site.² The bathroom is sparse, with blue-dyed toilet water and no running water to minimize the potential for urine specimen adulteration. Immediately on submission, the urine specimen temperature is measured to verify that it matches body temperature.

The initial step of the 2-step drug testing process is an immunoassay to detect a predetermined set of drugs of abuse or drug metabolites in a single urine sample. The immunoassay is positive if the concentration of a specific drug or metabolite in the sample exceeds a predetermined cutoff value. Immunoassays have good sensitivity but low specificity, because they are susceptible to false-positive results from cross-reactivity. This initial step is an effective screening, but positive test results are not considered definitive.

The second step in gold standard testing is confirmatory testing whenever an immunoassay result is positive. The most commonly used confirmatory test combines gas chromatography and mass spectrometry (GC/MS) for high-specificity analysis that dramatically reduces the incidence of false-positive results and can yield clinically useful quantitative drug concentrations. Unlike immunoassay screening, which detects substances down to a predetermined cutoff value, GC/MS can detect low concentrations. This improves sensitivity, particularly in dilute urine samples.

Most psychoactive substances in urine have a limited window of detection of approximately 72 hours after last substance use, although this window varies by substance. Cocaine metabolites have a short detection window, typically 1 to 2 days. Marijuana detection in urine samples varies from a few days in the case of sporadic smokers to several weeks after the last use by chronic users, because marijuana metabolites are stored in and excreted from adipose tissue.

Most psychoactive substances commonly used by teenagers can be detected in urine. Inhalants, which typically undergo rapid respiratory elimination, are an important exception. The composition of standard urine drug testing panels varies between facilities and regions, and understanding which chemical substances will be detected is also complex. For example, the standard urine test for opiates detects morphine and codeine. Even though synthetic opioids such as oxycodone, methadone, and hydrocodone produce the same physiologic effects *in vivo*, these chemically distinct compounds do not cross-react with opiate panels and therefore are not detected by them. Similarly, methylenedioxymethamphetamine, better known as ecstasy or MDMA, is not detected by routine amphetamine screens. Clinicians who order drug tests must be familiar with the panel they are ordering and, whenever possible, should tailor the testing to specific patient care.

Like any medical laboratory test, drug testing can yield false-positive or false-negative results. In urine drug testing, "clinical" false-positive results (ie, drug detection in the absence of illicit drug use) occur if a screening test cross-reacts with an unrelated substance in the urine. For example, fluoroquinolones have been reported to cross-react with immunoassay opiate screens.^{3,4} Confirmatory tests can also yield a clinical false-positive result when a patient takes a certain prescription medication or ingests a food that metabolizes into a substance included in the drug testing panel. A patient properly taking a prescribed amphetamine for attention-deficit/hyperactivity disorder will test positive for that specific amphetamine, which is a false-positive result for substance abuse. Clinical false-negative results can also easily occur, such as when an adolescent uses psychoactive substances intermittently and the use escapes detection because enough

time has elapsed between use of the substance and testing. Another example occurs when the psychoactive substance used is not part of the standard test panel. This may result in misinterpretation if the clinician interpreting the negative result is unfamiliar with the panel composition and therefore does not realize the result is falsely negative.

UTILITY OF DRUG TESTING

For adolescents previously identified as having substance use disorders, drug testing can be used for therapeutic monitoring and as an adjunct to their ongoing treatment. Currently being studied in adolescent populations, therapeutic monitoring has been used effectively in adult populations and involves random yet frequent drug testing. It is often coupled with contingency management, in which patients are rewarded for each negative drug test result and face predetermined consequences for each positive drug test result.

Drug testing is often proposed as a means for de novo identification of adolescents with substance use disorders. Given the limited window of detection for most substances and the detection limits of any standard panel compared with the range of psychoactive substances available for use, screening any large population, which is the essence of school-based, "suspicionless" drug testing, would be predicted to yield a much lower positive predictive value compared with targeted testing of adolescents under suspicion of recent drug use.

Studying school-based drug testing has proven to be methodologically vexing, and published results have been largely inconclusive. Depending on the program type, results have varied from demonstrating no change^{5,6} to only modest, short-term decreases in the use of drugs detected on the panel chosen by the school among the students who were willing to participate in the research.⁷⁻⁹ No

study has determined the long-term effects of school-based drug testing. Research assessing the relationship between drug testing and student attitudes toward drug use has also been inconclusive, with 2 studies finding that students who participated in drug testing programs were more likely to endorse positive attitudes toward future drug use,^{7,8} although this finding was not replicated in other studies.⁹⁻¹¹

CHALLENGES IN IMPLEMENTING SCHOOL-BASED DRUG TESTING

How Often Should Schools Perform Drug Testing?

Research has not clearly determined what the intended or optimal testing frequency should be for an individual school drug testing program but suggests that testing frequency is directly related to beneficial (ie, a deterrent) effect. Most published studies of therapeutic drug testing recommend weekly or more frequent testing to achieve a deterrent effect. High-frequency testing is costly and inconvenient for most schools and unpopular among students. The beneficial effects of less frequent testing are unknown.¹²⁻¹⁴

How Should Samples Be Collected?

Gold standard drug testing, which involves directly observed voiding and specimen collection, is invasive and considered inappropriate for application to the general population of adolescents in a school setting; however, any school-based drug testing protocol used must safeguard against various means of circumventing test accuracy. Testing for drugs of abuse differs from other forms of laboratory testing because of the incentive and potential for tampering. An adolescent with recent drug use might attempt to evade a positive test by submitting someone else's urine specimen, diluting his or her own urine, or adding an adulterating agent to the sample to interfere with the screening

immunoassay. Drug testing that meets the standards to ensure accuracy poses substantial financial and supervision challenges for schools, but failure to adhere to recognized standards would potentially affect the integrity of the process and reliability of the results.

Which Drug Testing Method and Panel Size Are Most Useful?

Screening immunoassays performed without confirmatory testing will not differentiate between true- and false-positive test results. Even extensive testing panels do not detect all psychoactive substances and can yield negative tests that result in false assurances. The expense of testing increases when a more extensive drug testing panel is used.

What Medical Information Will Be Elicited From the Adolescents Tested?

To interpret drug test results accurately, it is necessary to know an individual's complete medical history, including a summary of baseline medical diagnoses and prescribed medications. Although schools typically can gain access to this information, some adolescents and their parents may have chosen to keep specific medical information private. Confidentiality laws pertaining to health information attempt to safeguard one's ability to maintain privacy. Schools performing drug testing pose a direct conflict between the individual's or family's right to maintain privacy and the school's need for this information. The school must also face the personnel and logistical challenges involved in obtaining and handling health information.

Who Will Interpret the Drug Test Results?

Interpretation of drug test results is complex and should be performed only by specially trained clinicians. Research has shown that even practicing pediatricians can make numerous mistakes in interpreting

drug test results when unfamiliar with the testing.¹⁵

Recruitment of trained clinicians to interpret test results would increase school-based drug testing costs.

Who Will Be Notified of a Positive Test Result, and What Consequences Will the Student Face?

Issues of patient confidentiality apply to the notification of test results, particularly positive results, both before and after they are confirmed. Ideally, a small number of predesignated school officials would be informed about a positive test result and would share the results and plan with the adolescent, parents, and primary care physician, with the adolescent's knowledge and consent. It is important to ensure that drug testing results are not promulgated within the school and that unintended consequences for the adolescent are avoided.

The original intent of school-based drug testing was to identify students with possible substance use to intervene with early treatment. Research studies to date have shown that students often face harsh punitive consequences for positive test results, including suspension and even expulsion, and treatment may not be initiated.¹⁶ School suspension or expulsion has significant academic consequences, and the opportunity to ensure compliance with treatment may be lost. A significant challenge for schools is to establish and follow clear protocols for responding to drug test results in a way that is most beneficial for the student and for the school.

What Is the Cost of Drug Testing, and What Are the Costs of Missed Opportunities?

The cost of drug testing varies depending on the type of testing conducted (immunoassay versus GC/MS) and the number of substances detected. A 2007 report estimated the cost of screening alone to be approximately \$20 per test,

including materials and staff time for administration.¹⁷ Because immunoassay screening is susceptible to high rates of false-positive results, federal guidelines for workplace testing³ require all positive immunologic screening results to be confirmed with a more specific test to avoid false accusations of drug use. Confirmatory testing adds substantial cost, anywhere from \$80 to \$200 per test,¹⁸⁻²⁰ so some school drug testing programs have excluded it. Neither the Student Athlete Testing Using Random Notification trial, which confirmed all positive screening tests, nor the Department of Education report, in which only 45% of positive screening results were confirmed, included a cost analysis. It is not known how many school-based drug testing programs forgo confirmatory testing or whether different testing procedures would yield similar results.

According to a report cosponsored by the American Civil Liberties Union and the Drug Policy Alliance, typical school drug testing programs cost approximately \$24 per test or \$42 per student per year. The reported incidence of positive drug test results is low,^{21,22} making the cost per positive drug test result high—more than \$3000 per positive test result according to 1 report. That report also concluded that for the same cost and in lieu of a drug testing program, a moderately large school could hire a full-time counselor to provide prevention programming to the entire student body and targeted intervention for students with substance use disorders.²² By contrast, a school-based counselor who could provide advice and guidance to low-risk students²³ and counseling to students with substance use–related problems and disorders²⁴ may be a more effective and efficient approach to drug testing. The AAP policy statement “Substance Use Screening, Brief Intervention, and Referral to Treatment for Pediatricians” describes these

interventions in detail.²⁵ No comparison of the effects of these different strategies on reducing and preventing drug use has been conducted and reported to date.

Potential Risks and Unintended Consequences of School-Based Drug Testing

Information gleaned from even a single accurate drug test result, whether positive or negative, is limited. A positive drug test result does not diagnose a substance use disorder or indicate that a specific intervention is needed, and a negative drug test result does not rule out a substance use disorder.

Consequences related to false-positive drug test results (school suspension, exclusion from extracurricular activities, interpersonal relationship stressors with parents, peers, teachers, and school administrators) can have significant effects on a high school student. False-negative drug test results (undetected use) might paradoxically enable drug use and delay detection and treatment if the negative results influence parents or school officials to ignore nonspecific signs and symptoms of an adolescent's drug use.

Breach of confidentiality regarding private health information is also a risk to students participating in school-based drug testing. Although medical record content on medical history and substance use is protected by the federal Health Insurance Portability and Accountability Act and federal confidentiality laws (CFR 42), respectively, no such provisions apply to school records. Students who refuse to release their medical history to school personnel risk being cited for a positive drug test result caused by the appropriate use of a prescribed medication.

For a student with a substance use disorder who cannot or will not stop drug use, drug testing may be

associated with significant and even potentially life-threatening risks. Accidental injury can result from ingesting a substance reputed to “clean” urine or “block” the laboratory screening but that also has toxicity or overdose potential. Several Web sites claim that niacin (vitamin B₃) interferes with drug testing. The Centers for Disease Control and Prevention reported that 11% of patients who contacted a poison control center because of niacin ingestion said that the exposure was a result of attempting to defeat a drug test.²⁶ Many products also touted as “detoxifying” contain diuretics that are meant to dilute the urine sample and drive the concentration of drug metabolites below the detection threshold, but use may also result in dangerous electrolyte imbalances.

Adolescents may attempt to defeat drug testing by switching to a substance that is not detectable by urine testing or not included in the testing panel, and a broad array of available psychoactive substances are not detected by standard drug testing. A student who switches to inhalant use to avoid detection risks permanent brain damage and sudden sniffing death. New herbal and synthetic products with psychoactive properties continuously enter the market, and these products are quickly touted via social media.²⁷ In contrast, developing urine screening tests to detect these products often takes years.

The prevalence and effects of these risks have not been studied in a systematic manner; however, this potential for life-threatening adverse consequences must be considered when assessing the risks and benefits of school-based drug testing programs.

CONCLUSIONS

A decade and a half after the initial Supreme Court decision establishing the right of schools to establish drug

testing programs, there remains a lack of convincing scientific data demonstrating efficacy of this testing. Although school-based drug testing programs can be associated with modest short-term decreases in psychoactive substance use, long-term changes have not been documented. No studies have compared school-based drug testing with other types of adolescent school-based prevention or intervention programs.

The AAP recognizes that alcohol and drug use by students is a serious health risk for the individual and the community and that schools have a significant role in the prevention and reduction of substance use by adolescents. The AAP supports the development and evaluation of school-based prevention and intervention programs, including substance use education, screening and brief intervention, supportive counseling, and referral to specialty care. In 2008, the President’s Council on Bioethics concluded that mandatory newborn screening “can be justified only when there is convincing evidence that the benefits for screening and treatment outweigh the risks and burdens.” Given the modest (and short-term) effect size in reducing substance use, high cost, and significant potential for adverse outcomes, the AAP concludes that research evidence does not support the initiation or expansion of school-based drug testing programs at this time.

The AAP supports targeting available resources toward cost-effective substance use interventions with low potential risk. Schools choosing to engage in drug testing should use positive test results as an indication of the need for immediate assessment and treatment by trained specialists rather than instituting only punitive measures. The AAP supports continued research related to all aspects of substance use and recommends that future research

should compare the cost, safety, and outcomes of school-based drug testing with other types of prevention, screening, and treatment programs for students.

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