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U.S. Department of Justice
Office of Justice Programs
National Institute of Justice

National Institute of Justice / Research in Brief

May 1990

Urine Testing of Detained Juveniles To Identify High-Risk Youth

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Research in the last 10 years has revealed strong associations between illicit drug use and crime.[1] Offenders who frequently use illicit drugs tend to have higher crime rates. By identifying drug-abusing criminals and instituting effective interventions, the criminal justice system may be able substantially to reduce drug abuse and crime.[2]

Research has also shown, however, that both self-reports and official criminal justice records provide poor measures of drug use among offenders.[3] Urine tests are therefore being increasingly adopted by the criminal justice system for identification and monitoring of drug-abusing offenders.[4]

However, almost all available research by the criminal justice system on drug use and drug testing has focused on adults. Although surveys of juveniles have found drug-crime relationships similar to those found in adults,[5] little is known about the correlates of drug use among youths held in juvenile detention centers.

From the Director

New NIJ research on juvenile drug use, backed up by objective testing, reveals that we have a window of opportunity during early adolescence to help delinquent youth get off drugs.

This *Research in Brief* reports on the findings of an extensive 3-year study of almost 400 detained juveniles and the role of drug use in the events that brought them into contact with the justice system.

As these findings show, the older the juveniles the more into drugs they get. By the time they are 16 or 17, drug use has become significantly higher, a pattern that shows up also in the juvenile arrestees tested under NIJ's Drug Use Forecasting (DUF) program.

We know from a number of studies that adult offenders who use drugs are among the most active criminals, and that they report they began using drugs as youngsters. The evidence from this study by Dr. Richard Dembo and his associates bears this out: 51 percent of the youths who tested positive for cocaine were rearrested or referred to juvenile authorities one or more times for a property misdemeanor. This compared to 33 percent for those who tested negative for the drug. Those who were cocaine positive apparently were also highly involved in drug distribution, reporting almost four times as many drug sale crimes as those who tested negative.

These findings underscore the urgent need to intervene early to help delinquent youth involved in drug use. By applying education and treatment resources to 13- and 14-year-olds, we may be able to forestall the progression to more serious drug use and criminality.

We know that the hardened drug-using criminal is difficult to treat. Several NIJ studies suggest that treatment seems to work best for offenders who were not heavily involved in crime before their addiction. Other research suggests that treatment with surveillance and testing works better than treatment alone.

As this research emphasizes, the justice system has an opportunity to be an agency for change for youngsters who have by law come under its control. Drug testing can be used diagnostically to identify high-risk youth before they become established in the cycle of illicit drug use and crime. Testing also is a valuable tool for assuring that they remain in treatment and remain drug free so they can truly change destructive behavior patterns.

Properly applied, drug treatment for high-risk youths offers hope of rescuing these youngsters from a life of crime and protecting those who might otherwise have been victimized by drug-using offenders. Early intervention also may help society avoid paying more later in terms of more expensive incarceration of those offenders in adult institutions.

NIJ is pleased to have collaborated with our sister agency, the Office of Juvenile Justice and Delinquency Prevention, in supporting this research.

James K. Stewart
Director
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Study methods

The Hillsborough Regional Detention Center is a State-operated facility in Tampa, Florida, for holding youths up to age 19 who are awaiting court processing and a smaller number who are placed in detention following a court appearance. Average length of stay is 2 weeks.

Initial interviews were conducted with 399 youths (table 2 shows sample characteristics) during a 5-month period beginning December 1986. To be eligible for this study, youths had to be Florida residents who had not been transferred from another secure facility (the overwhelming majority were). All eligible females and a random sample of half the males were invited to participate and to supply a urine specimen.

All research information was confidential and protected from subpoena. Each youth was offered $10 for the 75-minute interview and for providing a urine specimen. Ninety-eight percent agreed to participate.

Followup interviews were sought 10 to 15 months later with those youths who still lived in Florida and did not have an outstanding arrest warrant. (This represented 86 percent of the original group.) New urine specimens were sought from those who were interviewed in the community or who had reentered the detention center on a new charge or court order.

Reinterviewed youths received $25 for a second interview and specimen. Of the 343 targeted youths, 89 percent were reinterviewed. Of these, however, 94 had previously been admitted to a jail or other secure institution (including hospitals) and were not asked for a second urine specimen. (In one case, the interviewer failed to bring a specimen cup to the interview.) Of the 210 asked to provide a specimen, 201 (96 percent) did so.

Findings from the study have been reported in 15 papers in the last 2 years. (See list at end of this document following list of other references.)

Such knowledge can be useful in light of findings from the National Institute of Justice Drug Use Forecasting (DUF) program that suggests that many adult arrestees began using illicit drugs, typically marijuana, in their teens. By identifying drug users among detained youngsters, it may be possible to deter them from continued drug abuse and progression to addictive drugs such as heroin or cocaine.

This *Research in Brief* summarizes the findings of an extensive, 3-year research project about the role of drug use in the lives of juvenile detainees and the potential benefits of urine tests for identifying those youngsters at high risk for future criminal behavior. A total of 399 youths entering a State-operated regional detention center in Tampa, Florida, agreed to undergo urine tests and confidential interviews regarding drug use. A subsample of these youngsters was selected for followup 10 to 15 months later; 89 percent of these youths were successfully interviewed. The research gathered information about their drug use, crime patterns, and psychological and behavioral adjustment.

Major findings

Among 399 male and female youths aged 10 to 18 who entered the detention center, mainly on delinquency charges, 41 percent tested positive for one drug, primarily marijuana (37 percent) or cocaine (10 percent). Seven percent tested positive for two or more drugs. The enzyme multiplied immunoassay technique (EMIT™) test, a fast, automated urinalysis procedure, screened the subjects' urines for seven other drugs, but the rate of positive test results did not exceed 1 percent for any other drugs.[6] Table 1 presents the test results.

As table 1 shows, marijuana use is present in the youngest age group and increases with age. Cocaine use, on the other hand, is nonexistent in the younger age group but begins to show up in the older teens. This indicates an opportunity for early intervention to forestall more serious drug use patterns.

For the 201 youths who gave samples at both the initial and followup tests, the percentage positive for cocaine more than doubled over the 15-month followup period (9 percent in initial tests, 19 percent on followup). Positive findings for marijuana remained essentially stable (34 percent initial, 37 percent at followup). (Positives in table 1, however,

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The research reported was supported by grant number 86–IJ–CX–0050 from the National Institute of Justice and grant number 87–JN–CX–0008 from the Office of Juvenile Justice and Delinquency Prevention.

Table 1

Urine test results at initial interview (n=399)

Positive for:	
Marijuana	37%
Cocaine	10
Benzodiazepines (Valium)	<1
Opiates	<1
Any of above	41%
Two or more of above	7

Positive for any drug, marijuana, and cocaine, by age

Age	10–12	13	14	15	16	17+
(n)	(21)	(23)	(54)	(87)	(117)	(97)
Positive for						
Any drug	24%	39%	28%	44%	44%	46%
Marijuana	24	39	24	40	39	41
Cocaine	0	4	4	6	14	15

are percentages of the original 399 youths: 10 for cocaine, 37 for marijuana.)

In the 18 months after the initial interview, 44 percent of the total group had at least one referral or arrest for a property felony, 35 percent for a property misdemeanor.

The urine test results for cocaine (but not for marijuana) significantly predicted subsequent arrests or referrals for property misdemeanors. Fifty-one percent of those positive for cocaine at the initial interview were arrested or referred to juvenile authorities compared to 33 percent of those who tested negative.

Youths testing positive for a drug at the initial interview were more likely to have received drug treatment during the followup period, but most drug users failed to *receive* any treatment because there were very few treatment program slots for adolescents in the community—particularly in the public sector.

Limitations of followup findings

Since no followup specimens were obtained from youths who had been jailed or otherwise securely confined, findings from the second test may apply primarily to the types of youth who were *less likely* to be incarcerated for long periods.

Comparing the two groups on demographic characteristics and referral history, psychosocial functioning, and alcohol-drug use, persons who were incarcerated at followup were worse on all indicators—they had significantly more prior arrests for property felonies, property misdemeanors, public disorder misdemeanors, and drug felonies.

Drug users tend to be property offenders, and thus those subjects who were not asked for second specimens may consist of more serious drug abusers. Thus the findings may underestimate the true level of drug use among detainees over time and the relationship of drug use to criminality.

Demographic characteristics of the original sample, their referral histories, and the primary reasons they were sent to the detention center are shown in table 2. Almost three-quarters were boys, and median age was between 15 and 16 years. The most frequent current offense was a property felony charge (28 percent) followed by a warrant for failure to appear for another offense. Two-thirds had a prior admission to detention. Court records showed 90 percent had been referred to juvenile court at least once before on a delinquency charge and 47 percent on a status offense.

These youths were victims as well as perpetrators. Forty-seven percent had suffered sexual, physical, or emotional abuse or neglect. Only 7 percent were charged with a drug offense.

Comparing urine tests with self-reports

Urine test results and self-reports for both marijuana and cocaine appear in table 3 for the 201 youths for whom both initial interview and followup test data were available. (The shaded numbers show the time periods for which the urine tests are sensitive—a month for marijuana and 2 to 3 days for cocaine.)

At both the initial interview and at followup, only about a quarter of the youths who tested positive for cocaine reported using it in the prior 2 to 3 days, and 5 percent or fewer of the youths who tested negative reported recent cocaine use. Eighty percent of those who tested positive for marijuana reported using the drug in the past month (the period measured by the urine test). Thirty percent who tested negative reported having used it in the past month. Black youths underreported their cocaine use (compared with test results) substantially more than whites.

At both time periods estimates based on self-reports were higher for marijuana than for cocaine, as shown by table 4. These findings may be explained by the fact that cocaine use is less socially acceptable than marijuana use. Clearly, without the urine tests, recent cocaine use would have been greatly underdetected—by half at the initial interview and two-thirds at the followup.

One limitation of urine tests is that they can only detect recent drug use. Hence, they were not able to detect use in many youths who had reported using the drug at an earlier period. Of those who tested negative for marijuana at first interview, 58 percent reported they had used it one or more times earlier (table 3). Similar results were found in the followup, and similar results were found for cocaine (although at the lower level shown in table 3).

Table 2
Sample characteristics (n=399)

Male	72%
Ethnicity:[a]	
Anglo	51%
Black	42
Hispanic	6
Other	1
	100%
Age	
10–12	5%
13	6
14	14
15	22
16	29
17	23
18	1
	100%
Most serious current referral charge	
Property felony	28%
Warrant—failure to appear	16
Court order	15
Violent felony	9
Property misdemeanor	8
Public disorder—misdemeanor	6
Drug felony	5
Resisting arrest	5
Violent misdemeanor	2
Drug misdemeanor	2
Status offense	2
Violation of community control	2
	100%
1 + prior referral for—	
Delinquency	90%
Status offense	47
Combined	92
Victimization[b]	47%
Youths indicating this is their first juvenile detention	33%

[a] Based on official record information and interview responses. Youths who said they were from Spanish-American families were classified as Hispanic.

[b] Victim of sexual abuse, physical abuse, emotional abuse, or neglect.

These interviews, it must be emphasized, were conducted under confidential research conditions. In the potentially more threatening criminal justice setting, a youth might be even less likely to report recent illicit drug use. The Nation's first juvenile pretrial testing program, in Washington, D.C., reported that fewer than one-third of the youths who tested positive for drugs admitted to recent drug use.[7]

Test results at the initial interview compared with those at the followup are shown in table 5. Youths who tested positive at the initial interview were also likely to test positive at followup. Two-thirds of the youths who tested positive for marijuana initially tested positive for marijuana again at the followup.

Forty-four percent of cocaine positives tested positive again; 17 percent of the persons testing positive for cocaine at the followup had originally tested negative, suggesting a trend toward greater cocaine use in this population.

Subsequent arrests

Table 6 shows the distribution of offenses charged to the youths in the 18-month period following their initial interviews. Forty-four percent had at least one referral for a property felony and 35 percent for a property misdemeanor offense during the 18-month period. The researchers found that neither self-reported use of alcohol nor the lifetime frequency of reported marijuana or cocaine use significantly predicted subsequent referrals or arrests for property misdemeanors.

Urine tests, however, particularly if positive for cocaine use, *were* a significant predictor of property misdemeanor crimes—even after statistically controlling for the youths' age, gender, race, and socioeconomic status, referral history prior to the initial interview, mental health problems, self-reported history of alcohol, marijuana/hashish, or cocaine use, and either self-reported or official history of physical abuse or sexual victimization.

Table 7 shows that 51 percent of those testing positive for cocaine at the initial interview had referrals/arrests for property misdemeanors in the next 18 months, compared with only 33 percent of those who initially tested cocaine negative. The youths who tested positive for cocaine apparently were also highly involved in drug distribution, reporting almost four times as many drug sale crimes as those who tested negative. This finding is similar to those reported for adult drug users.[8]

Self-reported delinquencies

Arrest data may have limited use as indicators of criminal involvement.[9] Self-report studies find that less than 1 percent of crimes result in arrest.[10] While self-reports cannot be accepted uncritically, reports of drug users have been found generally valid if obtained in confidential, nonthreatening research circumstances.[11]

For this analysis, both self-report and urine test results were combined to measure marijuana use. Male youths who were more greatly involved with marijuana at first interview reported significantly more participation in general theft (auto theft, other property theft, breaking into a building or vehicle, and joyriding) and drug sales (marijuana/hashish or cocaine/crack and other hard drugs) in the previous year.

Similarly, the greater the youths' involvement with marijuana during the followup period, the greater their reported participation in theft offenses during that period. Similar findings applied to the females in the study.[12]

Drug or alcohol treatment

Even though urine test results were not routinely turned over to detention center

Table 3
Urinalysis and self-reports of drug use, at initial and followup interviews
(n=201 male and female juveniles tested both times)

	Initial interview				Followup interview			
	Marijuana		Cocaine		Marijuana		Cocaine	
	D+	D–	D+	D–	D+	D–	D+	D–
Self-report	(n=69)	(n=132)	(n=18)	(n=183)	(n=74)	(n=127)	(n=39)	(n=162)
Used 3 days prior to interview	29%	5%	**22%**	**3%**[a]	32%	2%	**26%**	**2%**[a]
Used in past month	**81**	**31**[a]	56	17	**80**	**29**[a]	46	12
Ever used[b]	93	58	78	30	92	42	59	22

[a] Shaded figures show self-reported use that corresponds with period to which urine test is sensitive.

[b] In followup interview, measures use since initial interview.

Table 4
Estimated recent drug use from self-reports and urine tests

	Self-report	Urine only	Combined only
Initial interview:			
Marijuana	48%	34%	55%
Cocaine	4	9	11
Followup interview:			
Marijuana	48%	37%	55%
Cocaine	6	19	21

Table 5
Urinalysis reports at initial interview and followup
(n=201)

Positive for:	Initial	Followup
Marijuana	34%	37%
Cocaine	9	19
Opiates	< 1	1
Any of the above	39	50
2+ drugs	4	8

Table 6

Referrals or arrests by category during 18-month followup period

n=398[a]

Violent felonies 22%	**Property felonies** 44%	**Drug felonies** 13%
Murder, manslaughter, attempted murder or manslaughter, sexual battery, other felonious sex offenses, armed robbery, other robbery, aggravated assault or battery	Arson, burglary (breaking and entering), auto theft, grand larceny (excluding auto), receiving stolen goods	Felony violation of drug laws (excluding marijuana), felony marijuana offense
Violent misdemeanors 21%	**Property misdemeanors** 35%	**Drug misdemeanors** 5%
Assault and/or battery (not aggravated)	Petty larceny (excluding retail), retail theft (shoplifting), receiving stolen property (<$100), criminal mischief (vandalism)	Misdemeanor violation of drug laws (excluding marijuana), misdemeanor marijuana offense
Public disorder misdemeanors 13%		
Disorderly conduct (trespassing, loitering, prowling)		

[a] One youth who died after the initial interview is excluded. Percentages total to more than 100% because some had more than one arrest or referral

Table 7

Relationship of cocaine test results at initial interview to property crimes in the 18-month followup period and drug sales in year prior to initial interview

	Test result at initial interview	
Referral/arrest information Had 1+ referrals/arrests for:	**Negative for cocaine (359)**	**Positive for cocaine (39)**
Property misdemeanor	33%	51%*
Property felony	43	56
Self-reported mean number of drug sale offenses committed in year prior to initial interview	28.6	108.4**

* $p < .05$

** $p < .01$

staff (except with the youth's permission), the researchers suspected that those who tested positive at initial interview would be more likely to have been subsequently referred to treatment. This was the case, although few youths (23 percent) actually received treatment (table 8). Drug-positive youths were also more likely to have received *some* treatment, but most received none.

There were few publicly funded treatment slots in Tampa for juveniles. Many youths reported poignant experiences, saying they were attending treatment on an outpatient basis and were abruptly terminated when their money ran out. Others were terminated from programs because of rule violations and returned to the streets to resume heavy drug use and delinquency.

Policy implications

Severe drug abuse problems exist among juvenile detainees in Tampa as well as in other large cities across the country. Juvenile arrestees tested by the Drug Use Forecasting (DUF) program of the National Institute of Justice in San Diego, Phoenix, and Washington, D.C., also revealed considerable recent drug use.[13] While marijuana was the drug most frequently detected in this study, an increase in cocaine use was found in the 15-month period after the initial detention.

Only 7 percent of the youths entered the detention center on drug-charge referrals, but tests showed 37 percent had recently used marijuana and 10 percent cocaine. Thus the results provide some evidence that urine tests may be useful for identifying drug use in juvenile detainees. Furthermore, youths who tested positive for cocaine had more referrals/arrests for property crimes and more involvement in drug dealing. (However, the project's analyses of "risk" reveal group—not individual—characteristics. These findings are useful in understanding how drug use relates *generally* to delinquency, but individuals within a group differ.)

The fact that many youngsters did report their recent marijuana use might lead one to conclude that urine tests were not needed to detect use of that drug. However, the research interviews were conducted under confidential and nonadversarial conditions; screening personnel in more routine criminal justice situations would not likely obtain such a high degree of self-disclosure.

Moreover, few youths who used cocaine admitted to it in interviews. Thus the evidence suggests that juvenile detainees (like adult detainees) tended to underreport recent illicit drug use.[14] The finding that youths testing positive for cocaine have higher subsequent arrest rates for property crimes suggests that urine tests may significantly aid in predicting youth criminality as such tests do for adult offenders. Some jurisdictions (Phoenix, Washington, D.C.) already use urine tests to identify juvenile drug users and refer them to treatment.

Earlier project work found that youths who test positive for marijuana had more nondrug felony referrals (mostly burglary, auto theft, or grand larceny) than those who tested negative on this drug.[15] Examination of subsequent arrests, however, did not reveal that youths who were marijuana-positive at initial interview had higher rearrest rates than the marijuana-negative youths, even

though the positives reported greater participation in theft and drug sales.

The higher rate of criminality among marijuana users raises a key policy issue: Because marijuana is a gateway drug to the use of other illicit drugs,[16] early intervention with marijuana-using juvenile detainees may be effective in preventing many of these high-risk youths from proceeding to the use of cocaine and injectable drugs.

The project results also show the depth of emotional and behavioral problems in these juveniles. Many had been victims of child abuse and neglect. Effective treatment will have to be comprehensive, addressing a variety of mental health needs in addition to focusing on drug abuse.

As with adults, reducing drug dependence among seriously troubled youths often requires repeated interventions reinforced by improvements in social, educational, and vocational skills.[17] The chronic nature of the difficulties faced by many youths needs to be recognized and addressed. Additional research will be needed to determine how the criminal justice system can best intervene and monitor these youths.

Time running out

The findings of this research underscore the need for identifying and treating drug-abusing juvenile detainees, who will be much more difficult to treat as they grow older. The number of youths in the project sample who tested positive for cocaine doubled in 15 months.

Time is running out for these youths. By 30 months after their initial interviews, 37 percent of those studied had been admitted to the Florida Department of Corrections system.

Table 8

Were drug-positive youths likely to seek treatment? (n=201)

	Urine test results at initial interview	
Treatment	**Drug neg. (123)**	**Drug pos. (78)**
Youth reported having prior drug or alcohol treatment	6%	28%***
Record indicates youth referred by detention staff for drug/alcohol evaluation at initial interview	11%	28%**
Youth reported receiving treatment after initial interview	8%	23%**

** $p < .01$

*** $p < .001$

Notes

1. Ball et al. 1981, 1983; Chaiken and Chaiken 1982; Wish and Johnson 1986.

2. Stewart 1988, Wish et al. 1988.

3. Toborg 1984, Wish et al. 1980, Wish 1987.

4. Wish and Gropper 1990.

5. Elliott, Ageton, Huizinga, Knowles, and Canter 1983.

6. Tests were conducted for alcohol, amphetamines, barbiturates, benzodiazepines, methaqualone, opiates, cocaine, phencyclidine (PCP), and cannabinoids. Alcohol tests used the GC/MS (gas chromatography–mass spectrophotometry) procedure; other drugs, the EMIT method with all positives confirmed by GC/MS. Confirmation of THC (tetrahydrocannabidiol, active constituent of marijuana products) was sought only on an initial EMIT finding of 50 nanograms (ng) or greater concentration of THC per milliliter of urine (mL). All EMIT positives for cocaine and opiates were confirmed by GC/MS. The threshold for an alcohol positive was 10 ng/mL; for THC, 20 ng/mL; for PCP, 75 ng/mL: and for the other six drugs, 300 ng/mL.

In February 1987 the project initiated split-urine testing of a systematic sample of 25 of the 200 specimens subsequently provided by initially interviewed youths. The specimens went to the project's regular testing service, SmithKline Bio-Science Laboratories, and to the New York State Division of Substance Abuse Services (DSAS) testing laboratories. Twenty-four of the 25 test results (96 percent) were consistent between the two. In one instance, DSAS found traces of cannabinoids where SmithKline did not; this result was scored as a negative.

A systematic sample of 10 specimens provided at the time of followup interviews underwent split testing by the same two labs and proved 100 percent consistent.

7. Boyer and McCauley 1988.

8. Johnson et al. 1985, Collins et al. 1985.

9. David Nurco's work stimulated the development of this section.

10. Collins et al. 1982, Ball et al. 1981, Inciardi and Pottieger 1986, McGlothlin et al. 1978.

11. Ball 1967, Stephens 1972, Inciardi 1986.

12. Dembo, Williams, Wothke, Schmeidler, Getreu, Berry, Wish, and Christensen 1989a.

13. Boyer and McCauley 1988, Pennell 1988, Maricopa County 1988.

14. Pennell 1988.

15. Dembo, Washburn, Wish, Schmeidler, Getreu, Berry, Williams, and Blount, 1987.

16. Single, Kandel, and Faust 1974.

17. Dembo, Williams, Schneidler, Getreu, Berry, Genung, Wish, and LaVoie, 1988b.

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NCJ 119965

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