


Physician Renewal of Chronically Prescribed Controlled Substances Based on Urine Drug Test Results

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Abstract

Objective: The effect of specific urine drug testing (UDT) results on physician prescribing habits has not been well described. The primary objective was to report renewal rates of chronically prescribed controlled substances based on types of inconsistent UDT results. **Methods:** We conducted a retrospective chart review over a 5-month period comparing prescription renewals rates for patients with consistent versus inconsistent UDTs. Inconsistent UDTs were defined by prescribed drug not detected or the presence of heroin, cocaine, nonprescribed opioids, nonprescribed benzodiazepines, or marijuana. **Results:** Of the 474 UDTs reviewed, 214 (45.1%) were inconsistent. The most common findings among inconsistent UDTs, including overlapping results, were prescribed drug not detected (26.8%) and the presence of marijuana (20.7%), nonprescribed opioids (9.9%), and nonprescribed benzodiazepines (6.1%). In contrast, cocaine (5.5%) and heroin (0.4%) were less likely to be found on UDTs for this population. The relative risk (RR) of prescription renewal was 0.64 (95% CI 0.57-0.71) for inconsistent UDTs versus consistent UDTs. Within the inconsistent UDTs, the renewal rates when marijuana (79.6%) or nonprescribed opioids or benzodiazepines (63.6%) were present were much higher than when heroin or cocaine were present (0.0%; $P < .001$). Patients whose prescribed controlled substance was not detected had a 55.8% renewal rate. **Conclusions:** Prescription renewal rates were high when patient UDTs contained nonprescribed marijuana, opioids, and benzodiazepines, or when the prescribed drug was not detected. Prescription renewal rates were low when illicit drugs, such as heroin and cocaine, were detected.

Keywords

opioid, urine toxicology, substance abuse, opioid prescribing, opioid contract

Introduction

Recent trends for opioid overdoses,¹ illicit drug use,² and the diversion of prescription opioids³ have led to protocols that attempt to address these problems. Because self-reported drug use has been shown to be unreliable in patients who are chronically prescribed controlled substances,⁴ agreements outlining expectations of patients on opioid therapy are commonly used by providers.⁵

Urine drug testing (UDT) as a part of an overall adherence monitoring program, has been shown to significantly reduce illicit drug use.⁶ A small number of studies^{7,8} indicate that physicians are continuing to renew controlled substances despite aberrant drug-related behaviors, though they do not delineate renewal rates based on particular results.

This study reports the effect of abnormal UDT results on controlled substance prescription renewal rates by physicians

at a single internal medicine practice associated with a tertiary care teaching hospital located in Albany, New York.

Objectives

The primary objective was to report prescription renewal rates of chronically prescribed controlled substances based on different subcategories of inconsistent UDT results, including prescribed drug not detected (PDND) and the detection of heroin, cocaine, nonprescribed opioids, nonprescribed benzodiazepines, or marijuana. A secondary

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objective was to report the percentage of physician prescription renewal rates for patients in whom marijuana was the only illicit substance detected.

We hypothesized that the majority (defined as greater than 50%) of inconsistent UDT results would not be renewed by physicians, but that the majority (greater than 50%) of UDTs with only marijuana detected would be renewed.

Methods

This was a retrospective cohort study in which a waiver of informed consent was issued by the local institutional review board. In November 2015, a midsize (7 attending physicians) internal medicine practice, associated with Albany Medical Center in Albany, New York, implemented a controlled substance agreement that required UDTs for all patients being prescribed controlled substances. The mean age of attendings was 53 years and 3 (42.3%) were female and none had any specialized training in prescribing opioids. The controlled substance agreement, signed by both patient and provider, stipulated that future inconsistent UDT results could lead to a discontinuation of the prescribed controlled substance.

All patients already on long-term controlled substance therapy were required to give a urine sample during their first clinic visit after the institution of the controlled substance agreement. Patients who refused to be tested were not prescribed controlled substances. Only the first urine sample was examined for this study. UDT was performed using light chromatography–mass spectrometry (LC-MS/MS) analysis, which is widely considered the gold standard.⁹ Validity markers, such as urine creatinine, nitrites, pH, and specific gravity, were monitored for falsification of UDT results. UDT results were interpreted by an outside lab with knowledge of the type of controlled substance the patient was reported to be on. Physicians were notified of inconsistent UDT results through the electronic medical record. Physicians used a combination of letter, phone call, and in-person visits to notify patients of UDT results.

Patient charts containing prescription orders were reviewed by the primary author to determine if the prescription for the controlled substance was renewed after the UDT results were returned. Any discrepancies in the UDT interpretation that were documented in the chart were accounted for. To ensure interrater reliability, a second study author independently abstracted approximately 15% of the sample with 100% agreement (kappa of 1). The data were abstracted from the electronic health record onto a data collection instrument.

Inclusion criteria included all patients on controlled substances from November 2015 to April 2016. Exclusion criteria included age less than 18 years, patients prescribed controlled substances for short term (defined here as not renewed more than once) or as needed (ie, “prn”) use, and

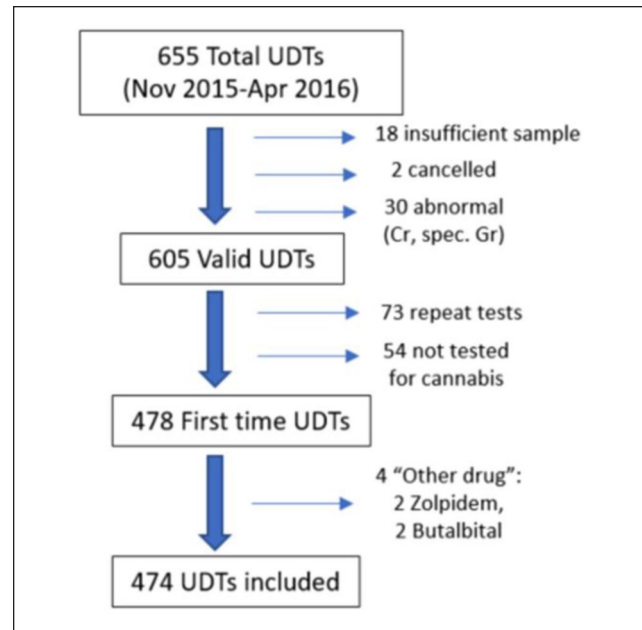


Figure 1. Sample selection for urine drug testings (UDTs) included in study.

patients whose UDT was not screened for marijuana at the discretion of the treating provider.

In total, 655 UDTs were collected at this practice between November 2015 and April 2016. 18 were rejected due to insufficient urine sample, 2 were cancelled by the provider, and 30 were deemed abnormal. Since this study only examined the first UDT, 73 specimens that were randomly obtained during additional clinic visits were removed from the analysis. A total of 54 specimens were excluded due to physician decision to not test for the presence of marijuana. An additional 4 UDTs were excluded from the analysis because they were inconsistent due to the presence of less commonly prescribed substances, namely zolpidem ($n = 2$) and butalbital ($n = 2$). This left a total of 474 UDTs (Figure 1).

UDTs were dichotomized into consistent and inconsistent groups. A UDT was considered consistent if the prescribed medication was found in the urine and no other nonprescribed controlled substance or illicit drug was found. UDTs could be inconsistent due to any of the following: prescribed drug not detected (PDND), or presence of any of the following: heroin, cocaine, nonprescribed opioids, nonprescribed benzodiazepines, or marijuana (Figure 2).

We analyzed inconsistent UDTs in both mutually exclusive categories and mutually nonexclusive categories. Mutually exclusive categories included the following: (a) PDND and no other drugs detected, (b) PDND but heroin or cocaine (or both) detected, (c) PDND but an opioid or benzodiazepine (or both) detected, (d) PDND and marijuana only detected, (e) prescribed drug detected and heroin or cocaine detected, (f) prescribed drug detected and nonprescribed

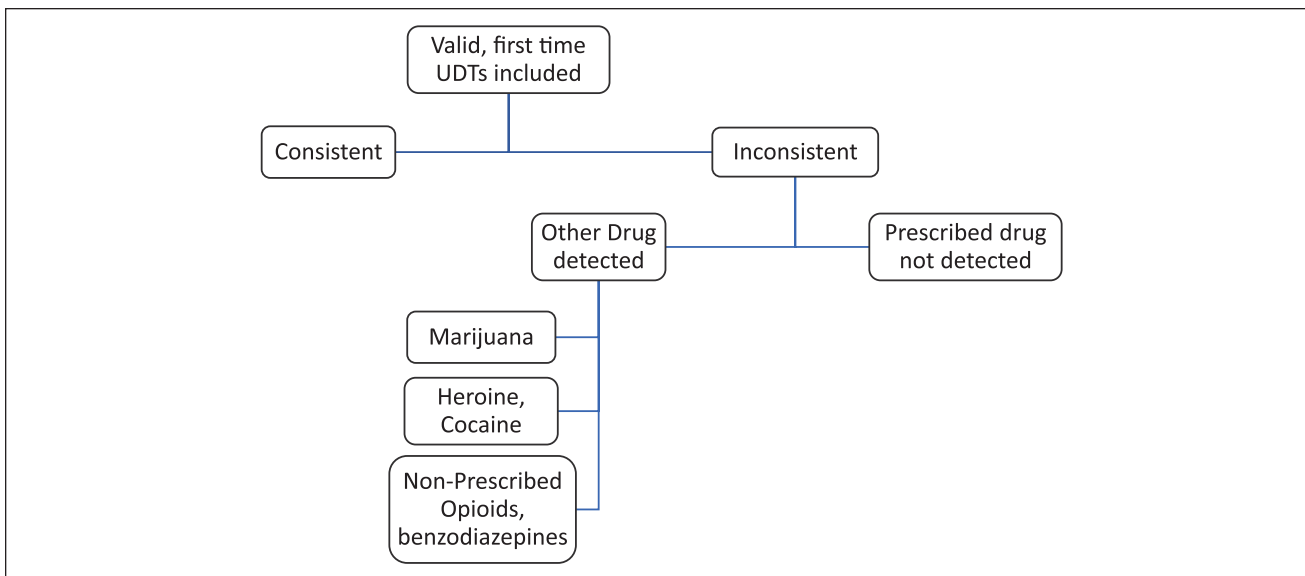


Figure 2. Organization of urine drug testing (UDT) results based on type of inconsistency.

Table 1. Sample Characteristics of Patients with Valid, First-Time Urine Drug Testings (UDTs).

Variable	Consistent (N = 260)	Inconsistent (N = 214)	Difference (95% CI)
Renewal rate	251 (96.5%)	132 (61.7%)	34.8% (28.4%-41.2%)
Age (years), mean ± SD	60.8 ± 14.3	53.6 ± 13.6	7.4 (4.9-9.9)
Female	164 (63.1%)	111 (51.9%)	11.2% (2.3%-20.1%)

opioid or benzodiazepine detected, and (g) prescribed drug detected and marijuana only detected.

Basic nonidentifying demographic data, such as age and gender, were collected. Descriptive statistics were calculated for all variables and compared among patients with consistent and inconsistent UDT results. *T* tests and chi-square or Fisher’s exact test were used to assess differences between means and dichotomous variables, respectively. Incident risk ratios (RRs) comparing the renewal rates among the consistent and inconsistent test result categories were estimated using modified Poisson regression with robust error variance. Statistical software STATA 14.0 was used for all analyses.

Results

Basic demographic data for the study population are shown in Table 1. The consistent UDT group was older ($P < .001$) and composed of more women ($P < .05$) than the inconsistent UDT group. There was no association between either patient age or gender with differences in prescription renewal rates. Only 54.9% of the sample population had a consistent UDT and their prescription renewal rate (96.5%) was much higher compared with those with an inconsistent UDT

Table 2. Types of Inconsistent Urine Drug Testing (UDT; Nonmutually Exclusive Categories^a).

Variable	Frequency (%)
Total inconsistent UDTs	214
Prescribed drug not detected	127 (26.8)
Marijuana	98 (20.7)
Nonprescribed opioids	47 (9.9)
Nonprescribed benzodiazepines	29 (6.1)
Cocaine	26 (5.5)
Heroin	2 (0.4)

^aBecause of overlapping results (presence of more than one type of inconsistency on a single UDT), totals do not equal 100%.

(61.7%), for a difference of 34.8% (95% CI 28.4%-41.2%; $P < .001$). Inconsistent UDTs were thus 0.64 times (95% CI 0.57-0.71) as likely to be renewed as consistent UDTs.

Table 2 describes the total number of times an inconsistent finding was noted on an UDT in this population, including nonmutually exclusive overlapping results. PDND was found on 127 (26.8%) of the UDTs, followed closely by marijuana in 98 (20.7%). In contrast, heroin (n = 2) and cocaine (n = 26) were much less likely to be found in this population.

Table 3. Renewal Rates for Consistent Urine Drug Testings (UDTs) Versus Subcategories of Inconsistent UDTs.

UDT Test Results	n	Renewal Rate, n (%)	Risk Ratio (95% CI)
A. Consistent UDT	260	251 (96.5)	1.00 (Reference)
B. Prescribed drug not detected (PDND) only—no other drugs	52	29 (55.8)	0.58 (0.39-0.85)
C. PDND + heroin or cocaine	17	2 (11.8)	0.12 (0.03-0.49)
D. PDND + opioids, benzodiazepines (but no heroin or cocaine)	24	18 (75.0)	0.78 (0.48-1.25)
E. PDND + only marijuana	34	27 (79.4)	0.82 (0.55-1.22)
F. Heroin or cocaine in addition to prescribed drug	10	0 (0.0)	0.0 (0.0-0.0)
G. Benzodiazepines or opioids in addition to prescribed drug (but no heroin or cocaine)	33	21 (63.6)	0.66 (0.42-1.03)
H. Only marijuana in addition to the prescribed drug	44	35 (79.6)	0.82 (0.58-1.17)

Table 3 illustrates a similar concept for mutually exclusive subgroups and shows the risk ratios and renewal rates. The consistent UDT group was used as the reference for each of the subcategories of inconsistent UDTs. The most common type of inconsistent UDT found was PDND and no other drugs detected, which occurred in 52 patients, followed by marijuana in addition to prescribed drug detected, which occurred in 44 patients. The least common types of UDT were those in which heroin or cocaine was detected, both with PDND (n = 17) and with the prescribed drug detected (n = 10).

For UDTs in which the inconsistency detected was an illicit drug, marijuana had the highest renewal rate regardless of whether the prescribed drug was detected (79.6% renewal rate) or not detected (79.4% renewal rate). The RR of UDTs with marijuana was 0.82 though this difference was not significant.

UDTs with nonprescribed opioids and/or benzodiazepines also had relatively high absolute renewal rates of 75.0% in the absence of the prescribed drug versus 63.6% in the presence of the prescribed drug. Conversely, UDTs with heroin and/or cocaine were much less likely to be renewed—0.0% if in the presence of the prescribed drug, and 11.8% if combined with PDND. UDTs with only PDND were renewed 55.8% of the time, and when compared with consistent UDTs were 0.58 times (95% CI: 0.39 to 0.85) as likely to be renewed.

Discussion

Inconsistent UDTs comprised almost half (45.1%) of the UDT results at this practice. Absence of prescribed drug (PDND) and presence of marijuana were the 2 most common types of inconsistencies found in this population. These results were similar to those found in previous studies.^{10,11}

The corresponding renewal rates for inconsistent UDTs was higher than we hypothesized, with 61.7% of inconsistent UDT patients continuing to receive their controlled medication prescriptions despite their noncompliance with

the signed controlled substance agreement. However, our findings are in accordance with previous studies showing that most patients continued to receive prescribed opioid medications despite the presence of multiple aberrant drug behaviors.^{7,8}

The relatively low renewal rate (RR = 0.58) for PDND-only UDTs is not unexpected. If a drug should have been detected in a patient's urine but was not, then physicians would be inclined to no longer continue to renew the prescription.

This study was unique in that it identified differences in renewal rates for prescriptions based on different subtypes of inconsistent UDTs. Marijuana detected in the presence of prescribed drug had the highest renewal rates (79.6%), followed by marijuana detected in the absence of prescribed drug (79.4%), followed by nonprescribed opioid/benzodiazepine detected in absence of prescribed drug (75.0%). When compared with renewal rates in consistent UDTs the differences were not significant. UDTs that detected heroin and/or cocaine were not renewed by physicians in this practice.

There are few studies examining the relationship between specific UDT results and physician prescribing practices. Physicians may be more lenient with renewing prescriptions depending on type of inconsistency. This supposition is supported by a study that showed that physicians were less likely to refer patients to substance use disorder treatment for those who tested positive for cannabis compared to those who tested positive for other illicit drugs.¹¹ This may reflect a more lenient attitude toward marijuana, given recent changes in its legal status in several states.¹²

In New York State, marijuana was decriminalized in June 2019, meaning that the possession of up to 2 ounces is treated as a violation instead of a crime. Our study suggested a leniency toward the use of marijuana, as its presence on UDTs did not deter physicians from renewing prescriptions for controlled substances and many UDT specimens were not tested for marijuana (and excluded from this study), though our study was conducted prior to this change in legal status.

Physicians must weigh whether discontinuing the medication will cause the patient to leave the physician's practice, risk unmonitored use of other drugs, and/or remain undertreated for valid pain. Recommendations for how physicians should respond to aberrant UDT results include utilizing open-ended questions to engage patients in conversations, avoiding immediate dismissal without plan for follow up, and providing resources for counseling and addiction management.^{13,14}

This study had several limitations. First, this was a mid-size practice, so the results may not be representative of regional or larger populations. Second, only first-time UDTs were used shortly after a policy change was instituted in this practice. Third, we had relatively low power to detect differences among certain drugs, such as heroin versus cocaine, and it is possible that the cutoffs used by the manufacturers of the equipment was too high leading to false negative test results. Fourth, long term outcomes of patients (eg, patients discharged from the practice) were not assessed. Finally, exact reasons for why providers continued to renew or not renew based on specific results were not fully assessed.

Conclusions

Different types of inconsistent UDT results had varying effects on controlled substance prescription renewal rates by physicians in this internal medicine practice. Prescription renewal rates were relatively high when patients had UDTs containing non-prescribed marijuana, opioids, and benzodiazepines, or when the prescribed drug was not detected. Prescription renewal rates were low when UDTs contained illicit drugs.


Declaration of Conflicting Interests

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