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Primary Care Providers' Experiences with Urine Toxicology Tests to Manage Prescription Opioid Misuse and Substance Use Among Chronic Non-Cancer Pain Patients in Safety Net Healthcare Settings

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Abstract

Background—Guideline recommendations to reduce prescription opioid misuse among patients with chronic non-cancer pain include the routine use of urine toxicology tests for high-risk patients. Yet little is known about how the implementation of urine toxicology tests among patients with co-occurring chronic non-cancer pain and substance use impacts primary care providers' management of misuse. In this paper, we present clinicians' perspectives on the benefits and challenges of implementing urine toxicology tests in the monitoring of opioid misuse and substance use in safety net healthcare settings.

Methods—We interviewed 23 primary care providers from six safety net healthcare settings whose patients had a diagnosis of co-occurring chronic non-cancer pain and substance use. We transcribed, coded, and analyzed interviews using grounded theory methodology.

Results—The benefits of implementing urine toxicology tests for primary care providers included less reliance on intuition to assess for misuse and the ability to identify unknown opioid misuse and/or substance use. The challenges of implementing urine toxicology tests included insufficient education and training about how to interpret and implement tests, and a lack of clarity on how and when to act on tests that indicated misuse and/or substance use.

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AUTHOR CONTRIBUTIONS

K.K., M.K., and C.M. developed the original project proposal and obtained funding. R.C., J.C., K.Z., and K.K. were responsible for research conception and design, collection of data, analysis, and interpretation of results. R.C. wrote the manuscript, and all authors contributed to editing and revision.

Conclusions—These data suggest that primary care clinicians' lack of education and training to interpret and implement urine toxicology tests may impact their management of patient opioid misuse and/or substance use. Clinicians may benefit from additional education and training about the clinical implementation and use of urine toxicology tests. Additional research is needed on how primary care providers implementation and use of urine toxicology tests impacts chronic non-cancer pain management in primary care and safety net healthcare settings among patients with co-occurring chronic non-cancer pain and substance use.

Keywords

urine toxicology screen; chronic pain; opioids

INTRODUCTION

In 2013, 15 million people in the United States aged 12 or older misused prescription opioids.[1] Opioid analgesic misuse is defined as the use of an opioid in a manner other than how it is prescribed.[2–4] This definition includes a range of behaviors including: diverting prescription opioids for non-medical use, forging prescriptions,[5–7] or altering the route of administration into an illicit marketplace for various purposes (e.g., to treat pain, enhance pleasure, moderate the effects of other substances, provide income, exchange for goods and/or services).[8–10]

The rise in both prescription opioid use and misuse in the last decade[11–14] concerns clinicians because it has been associated with overdose and subsequent harms to patients and communities.[15] To address these concerns, the American Pain Society and the American Academy of Pain Medicine (APS-AAPM) published a guideline for the use of chronic opioid therapy with specific recommendations for patients with co-occurring chronic non-cancer pain and substance use.[16] For these high-risk patients, the APS-AAPM strongly recommends that clinicians conduct periodic urine toxicology tests to confirm adherence to chronic opioid therapy and to identify illicit substance use. Urine toxicology tests help identify opioid misuse and substance use by detecting the presence of substances, unprescribed medications, and/or diversion through the absence of a prescribed opioid.

While urine toxicology tests are widely used by clinicians for its specificity, sensitivity, ease of administration, and cost,[17] a limited amount of evidence exists on the effectiveness of tests to improve patient outcomes.[16,18–20] Prior studies found that pain specialists and clinicians feel inadequately trained and lack confidence with the implementation of urine toxicology tests.[21,22] Little is known about how the implementation of urine toxicology tests among patients with co-occurring chronic non-cancer pain and substance use impacts clinicians' management of opioid misuse and substance use. In this qualitative study, we present clinicians' perspectives on the benefits and challenges of urine toxicology tests when utilized in patients with co-occurring chronic non-cancer pain and substance use who are cared for in safety net healthcare settings (i.e., settings that primarily serve uninsured, Medicaid-insured, and other vulnerable populations).[23]

METHODS

Participation and Recruitment

Primary care providers in this study practiced in six different safety net healthcare clinics across four counties in the San Francisco Bay Area. We chose these settings because 1) these clinics were initiating the routine use of urine toxicology tests in order to help clinicians evaluate and risk stratify patients, monitor compliance, and discontinue or taper opioid therapy consistent with statewide revisions of opioid prescribing guidelines, and 2) the majority of patients with chronic non-cancer pain are treated in primary care settings[13] where one in four patients suffer from persistent pain that interferes with daily activities.[27] While individual study clinics varied in the type and degree of implementation strategies to increase opioid prescription safety and decrease misuse, all study clinics had recently increased routine and standardized use of urine toxicology tests. These changes occurred at an individual clinical level and were not a direct result of statewide revisions of opioid prescribing guidelines.

We defined a primary care provider (clinician) as a physician, nurse practitioner, or physician assistant who provided longitudinal primary care to patients. To be eligible for this study, clinicians had to report to having patients on their panel that had both chronic non-cancer pain diagnoses and a past or current substance use disorder. Researchers (K.K., J.C., R.C., K.Z.) visited the selected settings, explained the study to the staff, and passed around a sign-up sheet for clinicians to leave their contact information if interested in participation. We then contacted these clinicians by phone and email and, after meeting the study eligibility requirements and giving written consent to the study procedures, clinicians participated in semi-structured, audio-recorded interviews. We informed participants of the study privacy protocol, which included storing data on secured servers and in locked cabinets. This recruitment technique ensured a small sample size enriched of participants with various levels of experience and perspectives on managing misuse among patients with chronic non-cancer pain and a history of substance use in safety net health settings, for which there is a dearth of contextual data.

In addition to recruiting clinicians, we identified and interviewed key informants who were selected based on their involvement in the development of pain management policies and the provision of services related to chronic non-cancer pain management. Participants received a $50 gift card to an online retailer for their participation.

Interviews

Interviews occurred between October 2013 and March 2014, and were 60 to 120 minutes in duration. These semi-structured, audio-recorded interviews took place in a private location separate from the clinic space of the participants' choosing (e.g., clinicians' office, coffee shop). We (K.K., J.C., R.C., K.Z.) followed-up on questions that framed the interview guide with open-ended inquiries of topics introduced by the participant. Interview questions addressed clinicians' perspectives on the use and implementation of clinic policies to monitor opioid misuse. We also asked clinicians to reflect on examples of clinical strategies for managing chronic non-cancer pain among patients who also use substances. This non-

directive, open-ended approach of the interview encouraged participants to elaborate beyond the scope of the interview guide. The Institutional Review Board at University of California, San Francisco approved the study.

Data Analysis

An external transcriber transcribed interviews verbatim from audio-recorded materials. Based on grounded theory methodology,[28,29] we reviewed the transcripts and wrote summaries of each transcript that enabled the categorization, or coding, of the data into emerging subject areas. First, we independently coded a sample of one to two clinicians' transcripts from which, after successive iterations, we generated an initial set of inductive codes. Then, we applied these initial codes (e.g., "clinic pain policies," "misuse") to new transcripts.

We developed the coding scheme through an iterative process. We initially derived deductive codes from the topic areas of the interview guide (e.g. "perceptions of diversion and misuse," "clinic pain policies," "opioids as commodities," "quality and types of resources available to the clinic/clinician for pain management"). We developed emergent inductive codes by assessing the frequency of broad themes during interviews, including themes not specified in the original interview guide (e.g., "clinical uncertainties," "clinician expectations"). We supplemented preliminary deductive codes with a set of inductive codes that emerged from a coding analysis of the data.

We reviewed the codes and themes as they were generated, considered alternatives, and made appropriate revisions before arriving at a set of 40 thematic codes. Transcripts and codes were then uploaded and reanalyzed using a computer-assisted qualitative data analysis software program (ATLAS.ti) to facilitate consistent application of the themes. This analysis is part of a larger qualitative study to examine the factors impacting clinicians' and patients' chronic non-cancer pain management practices in clinical settings and patients' home communities. Data related to urine toxicology tests emerged during the clinician interviews. Clinicians' issues surrounding urine toxicology tests was most frequently mentioned in data coded for "misuse," "clinic pain policy," "policing pain," and "risk and safety." We did not use a code specific only to urine toxicology tests when coding the data because we were examining all clinic pain policies, not only urine toxicology test policies. For this analysis, we used ATLAS.ti queries for "misuse," "clinic pain policies," "policing pain," and "risk and safety."

RESULTS

We interviewed 23 primary care providers, of whom 18 were physicians, 4 nurse practitioners, and 1 physician assistant; 16 were women. Clinicians worked in various settings: 9 worked in hospital-based clinics; 9 in primary care clinics funded by the county, and 5 in federally qualified health centers. In addition, we identified and interviewed five key informants; one, whose account we include below, is a toxicologist.

Clinicians reported using urine toxicology tests to varying degrees both before and after the implementation of clinic-wide policies on the routine use of tests with all patients on chronic

opioid therapy. In the interviews, clinicians used various terms to refer to urine toxicology tests, including “utox,” “urine tox,” “urine examinations,” “tox screen,” and “urine.”

We report data from 24 interviews, including 23 clinicians and 1 toxicologist. Clinicians reported two benefits from the routine implementation of urine toxicology tests that included less reliance on intuition to assess for misuse and the ability to identify opioid misuse and/or substance use that was previously unknown to them. The challenges of implementing urine toxicology tests included insufficient education and training about how to interpret and implement test findings, and a lack of clarity on how and when to act on tests that indicated misuse and/or substance use.

Benefits of Urine Toxicology Tests: Decreased Reliance on Intuition to Assess for Misuse

Prior to the implementation of routine urine toxicology tests, clinicians described assessing for misuse with tests but in a selective and inconsistent manner.

> We’ve got all of these urine examinations that we can now do [with the new clinic policies] to make sure there’s nothing else in the urine, and [to] make sure the person’s not diverting [opioids]…When I first started practicing, I’d be writing [opioid prescriptions] and not really doing much initial assessment—just using my intuition as I went along and [assessing] how well [patients] were doing.

Clinicians described the increased implementation of urine toxicology tests with patients on chronic opioid therapy as a helpful tool to assess for misuse, whereas before they relied on their intuition of patients as a form of assessment.

Many clinicians reported the drawbacks of using intuition or “clinical judgment” to determine which patients were at higher risk for misuse and warranted the routine use of urine toxicology tests.

> [Before the new clinic policies,] I was using clinical judgment to decide [if patients had misused because]; it’s really hard to talk about. The game changer was that one lady [an older woman with chronic non-cancer pain on chronic opioid therapy who also had unprescribed methadone in her urine toxicology test], that one experience where I was like…“That’s not why I got into medicine, I really have to bring the hammer down, I have to behave differently [when prescribing opioids].” What changed for me after that was everybody who I was prescribing opiates to was getting the utox more frequently.

Clinicians reported that they found it challenging to talk about misuse because they worried about wrongly accusing patients based on a biased and incorrect judgment. However, clinicians were concerned that their intuition would overlook patients who did misuse. In the above example, the clinician perceived that she had incorrectly judged, based on the patient’s age and gender, that the patient was unlikely to misuse. According to the clinician, the patient’s urine toxicology test revealed an error in judgment. The routine use of urine toxicology tests allowed for a more comprehensive assessment of misuse that could be framed around clinic policies rather than a decision based on patients’ individual characteristics.

Many clinicians suspected their patients of misuse but had not confronted or tested them with a urine toxicology test because their suspicion was based on potentially biased judgments.

> [I]f you're a 91-year-old on morphine, go ahead and give a urine. There's very little harm in doing it and we can say [to patients], "This is not that I'm mistrusting you, it's just the system, it's the protocol"…There was a lot of implicit knowledge of diversion without [clinicians] acting on it.

Clinicians described the routine use of urine toxicology tests as an equalizing tool, applied to all patients on chronic opioid therapy regardless of their age, gender, or behavior.

Clinicians felt that relying on "implicit knowledge" to approach patients about misuse could lead to conflicts or distrust. Some clinicians felt that the universal application of urine toxicology tests helped clinicians approach their patients about misuse.

> [With the new policies on urine toxicology tests,] I can't give them [patients] the benefit of the doubt [regarding their misuse], that's just clinic policy now. In a way, that makes it easier for the provider, and in cases where I wanted to stop the pain medications, it's been very easy to hide behind [clinic policies] and I've very much welcomed that.

Prior to the routine use of urine toxicology tests, clinicians worried about talking to their patients about misuse. The implementation of urine toxicology tests helped some clinicians avoid conflict with their patients by using the tests to talk to patients about their misuse. The increased use of urine toxicology tests on all patients on chronic opioid therapy shifted the assessment of misuse from being based on clinicians' intuition to one consistent with the revised state guidelines.

Benefits of Urine Toxicology Tests: Detection of Opioid Misuse and Substance Use

Clinicians' reported that urine toxicology tests aided them to identify patients whose opioid misuse and/or substance use was not known to them.

> [P]atients that we've known for years, we're constantly finding out [that they misuse]. We trust them over time and I took care of a couple people's patients when they were gone on holiday. I did their urine test on them and they hadn't had [a urine toxicology test] maybe for a year or two, and all of the sudden you realize that they actually haven't been taking [the prescribed opioid that] you're giving them, they're just diverting it for money.

Urine toxicology tests provided this clinician with objective information about misuse, which the clinician interpreted as the diversion of opioids into illicit markets for profit.[a] Many clinicians reported that the tests confirmed their suspicions of misuse; in other cases, clinicians identified unsuspected cases of misuse.

[a]A single urine toxicology test does not definitively prove the diversion of opioids for profit. There are other potential explanations for the absence of an opioid (i.e., patient is not taking an opioid as prescribed and is exhausting an opioid supply or forgetting to take an opioid prior to a clinic visit).

Another clinician described the benefits of implementing urine toxicology tests in a situation where the clinician used a test to confirm his suspicions of misuse when other data was not available.

> [My patient] has had a long history of, “Oh, honey, I just lost the prescription,” or “Oh, honey,” this, or “Oh, honey,” that, and it’s Tylenol 4 and it’s a lot of it and she’s got back pain issues but won’t do any other modalities. Early refills, a salicylate [compound found in aspirin] overdose, a delta [the active component of marijuana], altered mental status in the ER with methadone on board. Finally, and I hate this language but, I “caught her” with methadone in her urine, and I don’t prescribe her methadone…To me right now she’s a moot point, she’s done in terms of pain medication from me.

Other clinicians described the value of routine urine toxicology tests in that it could provide them with more information about their patients’ current medical treatments and conditions.

> You’ll find out someone’s on methadone maintenance and it’s like, “Oh, look, you have methadone in your urine.” And [the patient’s] like, “By the way, I go to the [Methadone] Clinic, I’ve gone there for the last three years and never told you.”… Or [you’ll] be like, “Oh, you have benzo [benzodiazepine] in your urine.” “By the way I go to another psychiatrist,” and I didn’t know that they were going.

Urine toxicology tests alerted the clinician about their patients’ use of opioids with other substances, such as benzodiazepines and methadone, that the clinician did not know about.

Challenges of Urine Toxicology Tests: Lack of Education and Training to Interpret and Implement Urine Toxicology Tests

The main challenge that clinicians identified with the increased use of urine toxicology tests was related to its clinical implementation in safety net healthcare settings where sufficient staff and resources are limited.

> No one had thought through [with the new policy on urine toxicology tests]: “How is this going to be implemented?...How often are patients being utoxed?” They left it up to the providers and in a [safety net health] clinic like ours…there’s no glue that really holds the clinic together, having random people do it is a disaster.”

The issue for this clinician was how to implement urine toxicology tests as a routine clinical procedure. While tests became more frequent with the new clinic guidelines, many clinics did not have sufficient staff or resources to systematically address how often clinicians should test, which substances to test for, and how to implement standardized urine toxicology tests.

Clinicians who described using urine toxicology tests routinely to monitor misuse had difficulty interpreting results due to insufficient education and training.

> There is a lot of room for interpretation [of urine toxicology tests] that I’m finding within our clinic staff, and that’s something that has been difficult to systematize. I have one provider who in a hot minute is ready to say, “Got’cha…” It’s like she gets a little glee out of [revoking prescription opioids from patients], which is a

> little bothersome…Frankly, I hate interpreting that thing [urine toxicology tests]. It is really ugly and it's a pain…I've had so many calls to [the toxicology laboratory] where it's been, "Have I nailed this person or not?" and…it feels like, "I don't have the confidence in that big of a clinical decision, I want to make the call to [the lab]."

Some clinicians felt that urine toxicology tests provided a clear indication of opioid misuse and unsafe substance use that obligated them to discontinue chronic opioid therapy. However, other clinicians were less certain about what tests revealed. Despite the increased utilization of urine toxicology tests on a clinic-wide level, some clinicians felt that the interpretation of tests was left to individual clinicians to manage.

A toxicologist, who analyzes over a thousand urine toxicology tests per month, expressed concern about clinicians' lack of education to interpret tests.

> [Clinicians] may take a medication away from a patient that they shouldn't have taken it away [from]. They might think that their patients are not taking what they're supposed to be taking, or selling, or they may suspect something that's not really true…It's not that straightforward and these are really great doctors. You just wonder how many of them think they're interpreting [tests] the right way. It's not something you get [training on] necessarily, that you've had a course in or that you spend a lot of time trying to understand. Even [with my laboratory staff]…I [have to] teach it to them and they can't answer the questions they should [be able to].

The toxicologist echoes clinicians' own concerns about misinterpreting urine toxicology tests.

Challenges of Urine Toxicology Tests: Lack of Clarity on How and When to Act on Urine Toxicology Test Results

Clinicians often felt that the clinic guidelines for urine toxicology tests conflicted with their own decisions about best practices for patients' pain management. Some clinicians relied on the tests to monitor patients' illicit substance use while other clinicians did not believe that the discontinuation of chronic opioid therapy should be based on test results.

> There have been many times when I felt like [discontinuing chronic opioid therapy because of a cocaine positive urine toxicology test is] not probably the right thing to do, or I wouldn't do it in this way [as mandated in the clinic policy], and I felt pressure to do it in the same way that the clinical policy states…

This quotation demonstrates the challenges of patient care in the context of heightened standardized implementation of urine toxicology tests to assess for opioid misuse and illicit substance use. Some clinicians described uncertainty in relying on tests to define what should be considered unsafe substance use and when to discontinue chronic opioid therapy.

Clinicians saw urine toxicology tests as limited in scope and lacking context because it did not provide them with a definite course of action. Many clinicians described variable responses as how to proceed with chronic opioid therapy when tests revealed negative for prescribed opioids in a patient's urine.

> [I told a patient,] “I don’t believe you’re taking these [opioid] medications because it would show up in your urine. So what’s going on?” and I would sit down and talk with them…It turns into a struggle, [a] tug-of-war. And I do not like using the words “liar,” and I never do with a patient, but there’s just times where in the back of your mind you’re just thinking, “He’s not using the drugs [prescribed opioids]. What’s going on and why is he asking me for another refill?” It doesn’t make sense. So I’ll have a long, hard discussion and it may vary as to whether I give them another course of drugs [opioids] or not.

The clinician did not feel urine toxicology tests provided irrefutable evidence as to whether or not the patient had misused, or a clear guideline as to whether or not the clinician should continue the patient’s chronic opioid therapy. Despite the standardized, increased use of urine toxicology tests, clinicians described significant variability in how to interpret and act on tests with individual patients.

DISCUSSION

Our findings show that clinicians benefited from the implementation of routine urine toxicology tests with patients on chronic opioid therapy. We found that clinicians benefited from the standardized management of misuse with more routinized urine toxicology tests to identify patients whose substance use and misuse of opioids was previously unknown to them. Yet without sufficient training, education, and time to administer, interpret, and implement tests, our research demonstrates that clinicians were unclear about how and when to act on tests that indicated possible misuse and/or a substance use problem.

Our findings suggest that the clinic-wide implementation of routine urine toxicology tests helped reduce clinicians’ uncertainty about which patients to test by adopting a universal standard toward patient care. Previous findings suggest that clinicians make judgments about substance use based on anecdote, intuition, and individual experience.[22] This research found that clinicians were not accurate at predicting who among their patients was likely to misuse or use illicit substances, and these incorrect judgments were often influenced by perceptions of patients’ race and ethnicity.[2,30,31] Our findings suggest that without standardization in the implementation of urine toxicology tests for all patients on chronic opioid therapy, clinicians may unknowingly rely on implicit biases based on stereotypes to assess whom to select for tests.[32,33] Without proper guidance on whom to select for urine toxicology tests, clinicians may rely on their own implicit biases of patients to determine opioid misuse and/or substance use.[2,30]

While the increased use of urine toxicology tests provided clinicians with the possibility of reducing bias in the selection of patients for tests, uncertainty remained about how to interpret and act on tests, particularly when results demonstrated illicit substance use. While current guidelines[16, 22] and state medical board policies[24] recommend the routine use of urine toxicology tests to detect opioid and substance use disorders,[34] they do not address how to monitor high-risk patients through the interpretation of urine toxicology tests. Despite the standardization of tests, some clinicians preferred more individualized care when managing patients with co-occurring chronic non-cancer pain and substance use. Clinicians

felt tension between clinic policies and their decisions on substance use because some clinicians did not feel that urine toxicology tests provided them with a clear indication of unsafe substance use that obligated them to discontinue chronic opioid therapy. Our results are consistent with prior studies that identified uncertainty about which substances to test for, how often to test, and how to act on test results.[22,35] Additional studies are needed to guide decisions about the use and interpretation of urine toxicology tests in high-risk patients with co-occurring chronic non-cancer pain and substance use.

Our findings suggest that clinicians' adherence to the clinical guidelines on the routine use of urine toxicology tests varied due to administrative challenges. These challenges included the lack of urine toxicology education and training, insufficient staff and resources to administer tests, and limited time to interpret and act on tests. Previous research found that clinicians' reliance on urine toxicology tests without an understanding of opioid metabolism, individual cutoffs for tests, and the likelihood of false positives or false negatives can lead to misinterpretation of urine toxicology tests.[36,37] Our findings support these studies and illustrate that opioid misuse cannot be diagnosed from urine toxicology test results alone. Our findings are consistent with studies that found low adherence rates for urine toxicology tests among clinicians who cared for patients at increased risk of misuse[20,38–40] and in safety net health settings.[41]

One notable finding in our study was clinicians' use of language surrounding urine toxicology tests. Some clinicians described urine toxicology tests as confirming their suspicions of patients' opioid misuse and/or substance use (e.g., "I 'caught her' with methadone in her urine;" "Got'cha;" "I do not like using the words 'liar,' but"). In such cases, clinicians framed urine toxicology tests as a tool that promoted punishment and distrust of patients that may negatively impact care and prevent the identification of patients who misuse to receive substance use treatment. Inappropriate language has a legacy in clinical research,[42] policy, and practice that can situate the problems of prescribing opioids on "risky patients" rather than on "risky opioids."[43,44] Educational initiatives and further research are needed that explore how specific language used in discussions about opioid misuse and urine toxicology tests can shape clinical interactions between clinicians and patients.[45–47]

Several limitations warrant consideration. First, qualitative research methods preclude the establishment of cause and effect, but help to identify contextual factors that contribute to the use and interpretation of urine toxicology tests. Second, because these clinicians practiced in safety net healthcare settings, our findings may not generalize to other clinical settings. The study sample was not randomly selected and may not be representative of all clinicians or toxicologists. Despite these limitations, our methodology was well suited for the study because of the dearth of contextual data about clinicians' experiences using urine toxicology tests in safety net healthcare settings and among patients with co-occurring chronic non-cancer pain and substance use about whom such qualitative information has not previously been systematically collected or analyzed.[16]

Our findings support several recommendations. First, the need for ongoing education and training of clinicians about the use and interpretation of urine toxicology tests.[48,49] Second,

clinicians should recognize the limits of urine toxicology tests to assess for and impact the rates of opioid misuse and substance use.[50] Our findings support the need for actionable test strategies and policies through consistent clinical practices, standardized roles and responsibilities for staff using tests, and institutionalized urine toxicology education and training.[48] While urine toxicology tests have perceived benefits for the management of opioid misuse and substance use, it is not a magic bullet. Urine toxicology tests are widely recommended, yet a limited amount of data suggests that these tests are effective at managing misuse and substance use among patients with co-occurring chronic non-cancer pain and substance use.[20,51]

In safety net healthcare settings where patients have higher rates of chronic non-cancer pain and are more likely to be prescribed opioids than privately insured individuals,[4] it is important that the interpretation of urine toxicology test results not be left to clinicians' individual interpretations alone.[52] Safety-net led initiatives aimed at changing urine toxicology test implementation, such as ensuring consistent clinical practices and offering ongoing educational programs and resources, have shown success in the development of consistent clinical approaches to pain management.[53] Even with future revisions of expert guidelines and state recommendations for the increased use of urine toxicology testing, it is critical that the implementation of urine toxicology tests ensure best practices to reach all staff and patients involved in using them.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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