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Psychiatry residents and fellows' confidence and knowledge in interpreting urine drug testing results related to opioids

Joji Suzuki, MD^{1,2}, Stephanie Garayalde, MD², Martekuo Dodoo, MS³, and Claudia Rodriguez, MD^{1,2}

¹Brigham and Women's Hospital, Boston, MA

²Harvard Medical School, Boston, MA

³Psychiatry Residency Program, University of Florida, Gainesville, FL

⁴Eastern Virginia Medical School, Norfolk, VA

Abstract

Background—Prior studies have suggested that physicians and residents may not have sufficient knowledge to appropriately interpret urine drug tests (UDT) in patients who are prescribed opioids or using illicit substances. Therefore, the aim of this study was to survey psychiatry residents and fellows about their confidence and knowledge in interpreting UDT in patients with chronic pain or receiving office-based opioid treatment.

Methods—All psychiatry residency and fellowship program directors in the New England states were approached to recruit their trainees to participate in an anonymous on-line survey including a 7-item knowledge test.

Results—A total of 93 residents and fellows completed the survey. Only a minority (24.7%) reported any prior training in UDT interpretation. A majority (62.6%) felt confident about interpreting UDT. The mean total score for the knowledge test was 3.5 (SD 1.1, range 1-6). There were no significant differences in total score by confidence in UDT interpretation (3.7 vs 3.4, $T=-1.17$, NS), nor by prior training in UDT interpretation (3.8 vs 3.5, $T=-1.22$, NS).

Conclusions—Psychiatry residents and fellows infrequently receive training in UDT interpretation, score poorly on the knowledge test, and their confidence in UDT interpretation does not reflect their knowledge. Future research should evaluate educational interventions that improve UDT interpretation among psychiatry residents and fellows.

Keywords

Urine drug testing; opioids; chronic pain; opioid use disorder; chronic pain

Corresponding author: Joji Suzuki MD, Department of Psychiatry, Brigham and Women's Hospital, 60 Fenwood Road, Boston, MA 02115. Tel: 617-732-5752. jsuzuki2@bwh.harvard.edu.

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The routine use of urine toxicology to monitor treatment progress is recommended for patients prescribed opioids for chronic pain, as well as for patients with opioid use disorder in office-based opioid treatment with buprenorphine^{1,2}. Psychiatrists are increasingly caring for patients with chronic pain and opioid use disorder given the frequent co-occurrence of psychiatric illnesses³. However, prior studies have suggested that physicians and residents may not have sufficient knowledge to appropriately interpret urine drug testing (UDT) in patients who are prescribed opioids or using illicit substances⁴⁻⁷. Given that UDTs are commonly used in clinical practice for psychiatrists, it is critically important that psychiatrists are able to utilize this tool effectively. Erroneously interpreting results may lead to an incorrect understanding of the patients' progress in treatment.

However, no prior study has specifically sought to identify whether psychiatrists or psychiatry residents might also not have sufficient knowledge to interpret UDT related to opioids appropriately. Therefore, the aim of this present study was to survey psychiatry residents and fellows about their confidence and knowledge in UDT interpretation related to opioids in patients with chronic pain on or receiving office-based opioid treatment.

Methods

Recruitment

The [name deleted to maintain the integrity of the review process] approved the study. The study population included psychiatry residents and fellows in training programs in the New England states (Connecticut, Maine, Massachusetts, New Hampshire, Vermont, and Rhode Island). All 17 accredited psychiatry residency programs, as well as 33 fellowship programs in New England, were identified from the ACGME website to extract contact information for each program. Between October of 2015 and January of 2016, residency and fellowship training directors were contacted via email to seek their assistance in forwarding the recruitment email to residents or fellows in their programs. Up to two more reminder emails were sent at least one month apart to training directors. The recruitment email contained a brief description of the study and a link to the on-line survey.

Data collection

Potential participants received a recruitment email that contained a link to the online survey, created through www.surveymonkey.com. The survey asked about demographics (age, gender, ethnicity, racial background), training background (PGY year, fellowship training, receipt of any training in UDT interpretation), and the degree to which they agreed with the statement "I feel confident in my ability to interpret results of urine drug tests" using a 5-point scale ("strongly agree", "agree", "neutral", "disagree", and "strongly disagree"). Knowledge of opioid UDT interpretation was assessed using seven questions developed by a board-certified pain management specialist and a board-certified clinical chemist and toxicologist⁴. The questions concerned administration of prescription opioids, heroin, passive inhalation of marijuana, and ingestion of poppy seeds (see Table 1). A modification was made to an answer choice on question 3 to reflect new data suggesting that hydromorphone is a metabolite of morphine (and heroin) through a minor pathway⁸. The survey was structured so that all responses remained anonymous. Respondents were offered

a chance to win a \$100 gift card from Amazon.com, as part of a reward system administered through the online survey program.

Data analysis

A maximum of 675 responses was expected if all training directors forwarded the recruitment email to all the residents and fellows. The rate of participation was calculated. Descriptive statistics were used to summarize respondent demographics and survey responses. Frequency of correct response to each knowledge question, mean total score, and range were calculated. Confidence in UDT interpretation was collapsed to either “Yes” (“strongly agree” or “agree”) or “No” (“Neutral”, “disagree”, or “Strongly disagree”). Total knowledge scores among those who were and were not confident with UDT interpretation were compared using t-tests. In addition, total knowledge score among those who did and did not receive training in UDT interpretation were compared using t-tests.

Results

Results are summarized in Table 2. A total of 93 residents and fellows responded to the survey, for a response rate of 13.8% (93/675). However, because we are unable to ascertain how many residents actually received the recruitment letter from their training directors, the actual response rate is likely to be higher. Respondents were on average 30.7 years old (SD 4.3, range 20-55), 48.0% male, 9.9% Hispanic, and 83.5% white. The majority (83.9%) of respondents were residents in their PGY1 through PGY4 years. A total of 24.7% endorsed prior training in UDT interpretation. Overall, 12.1% strongly agreed, 50.5% agreed, 25.3% felt neutral, 8.8% disagreed, and 3.3% strongly disagreed with the statement “I feel confident in my ability to interpret results of urine drug tests”. The mean total score for the knowledge test was 3.5 (SD 1.1, range 1-6). Just under half (49.1%) answered at least half of the questions correctly, but none answered all seven questions correctly.

There were no significant differences in total score by confidence in UDT interpretation (3.7 vs 3.4, $T=-1.17$, NS), nor by prior training in UDT interpretation (3.8 vs 3.5, $T=-1.22$, NS). In addition, level of training of the respondent was not associated with total scores.

Discussion

Results from this study indicated that the majority of psychiatry residents and fellows reported feeling confident in opioid UDT interpretation, even though the majority reported no prior training in UDT interpretation. The results from the knowledge test indicated a low level of knowledge—residents and fellows answered about half of the questions correctly on average, and no one answering all questions correctly. Given the low rate of prior training in UDT interpretation, the test results are not surprising. Additionally, the lack of any relationship between confidence in UDT interpretation and total knowledge scores suggests that the trainees’ self-assessment of their knowledge was inaccurate. Taken together, these results suggest that psychiatry residents and fellows infrequently receive training in UDT interpretation, have a low level of knowledge regarding interpretation of opioid UDT, and their confidence does not accurately reflect their actual knowledge.

Prior studies with both residents and practicing physicians have yielded similar results. In the original study by Reisfield and colleagues that administered the 7-question knowledge test, 114 physicians attending an opioid medication conference completed the test⁴. The mean total score was 2.8, 30% answered more than half correctly, and no one answered all questions correctly. The authors do not report the respondents' specialty, but indicate that 19% were board certified in pain management, and that 6% were board certified in either addiction medicine or addiction psychiatry. In their second study, 60 family medicine physicians attending a review course completed the test⁵. In this sample, the mean score was 2.4, only 20% answered more than half of the questions correctly, and none of the respondents answered more than 5 questions correctly. In the study by Starrels et al. using the same knowledge test with 99 internal medicine residents, the mean total score was 3.0, 27% answered at least half correctly, and no one answered all questions correctly⁶. The majority (55%) of residents in this study were confident in their ability to interpret urine toxicology results, but the total scores on the knowledge test did not differ between residents who were and were not confident. The authors speculated that the discrepancy between confidence and knowledge may exist due to the seemingly straightforward interpretation of immunoassay screens, that confirmatory tests are not commonly used to identify specific opioids, and deficiencies that exist in training in substance use disorders and pain management in medical school and residency programs.

The reasons for the need to accurately interpret UDT are numerous. Without understanding the limitations of UDTs, decisions may be inadvertently made that are harmful to the patient and the therapeutic relationship. For example, a false negative result of an opiate immunoassay may be erroneously interpreted to mean the patient who is prescribed oxycodone is diverting their medications, even though oxycodone is unlikely to cause a positive on immunoassay screening. The patient may be falsely accused of diversion, which may lead to consequences such as inappropriate discontinuation of opioid treatment. Another example is a positive result for opiates caused by the consumption of poppy seeds. In this scenario, a patient may be falsely accused of using illicit opioids. This has potential consequences for a patient with an opioid use disorder in treatment with buprenorphine. Given the greater scrutiny being placed on ensuring safer treatment of chronic pain, as well as the need to increase access to office-based opioid treatment, there is a concurrent need to ensure clinicians can accurately interpret UDTs. As such, it is important to ensure that all psychiatry residents and fellows are adequately trained in UDT interpretation in order to avoid such misinterpretations.

There are numerous limitations to this study. The response rate was low, and only residents and fellows in New England were recruited, limiting the ability to generalize the findings. Those residents and fellows who were more knowledgeable in UDT interpretation, or have an interest in pain or substance use disorders, may have been more likely to respond to the survey, artificially increasing the knowledge scores. While the test used in this study has been reported in several other publications, a 7-item test may not be comprehensive enough to truly assess one's knowledge in UDT interpretation. Finally, the knowledge test may not adequately reflect the participants' ability to make clinical decisions in actual patients under supervision.

Psychiatry residents and fellows infrequently receive training in UDT interpretation, demonstrate poor knowledge of UDT interpretation, and their confidence does not reflect their actual knowledge. Residency and fellowship programs should consider implementing formal UDT interpretation training given the potential for poor clinical outcomes if UDTs are misinterpreted. Future studies are needed evaluate the efficacy of educational interventions in improving UDT interpretation.

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Table 1

Urine drug test questionnaire, knowledge questions

Question	Answer choices (correct responses are bolded)
1) In a patient prescribed Tylenol #3 (codeine and acetaminophen), one would reasonably expect which of the following to be detected in the urine?	<ul style="list-style-type: none"> a. Codeine b. Dihydrocodeine c. Morphine d. All of the above e. a and c only
2) In a patient prescribed MS Contin (morphine), one would reasonably expect which of the following to be detected in the urine?	<ul style="list-style-type: none"> a. Codeine b. Dihydrocodeine c. Morphine d. All of the above e. a and c only
3) In a patient using heroin, one would be likely to detect which of the following in the urine?	<ul style="list-style-type: none"> a. Heroin b. Oxycodone* c. Morphine d. All of the above e. a and c only
4) A patient on OxyContin (oxycodone) therapy is administered a random urine drug test. He notifies you that he ate a large lemon poppy seed muffin for breakfast. What substances might reasonably be detected in the urine?	<ul style="list-style-type: none"> a. oxycodone b. codeine c. Morphine d. All of the above e. a and c only
5) A patient on chronic opioid therapy tests positive for cannabis on a random urine drug screen. She explains that her husband sometimes smokes pot in their bedroom. Is this a plausible explanation for the test findings?	<ul style="list-style-type: none"> a. Yes b. No
6) Which of the following are plausible explanations for a negative urine opiate drug screen in a patient on chronic opioid therapy?	<ul style="list-style-type: none"> a. Patient ran out of opioid early and has not used any in a few days b. Patient is a "fast metabolizer" c. Drug screen does not detect that particular opioid d. a, b, and c e. a and c only
7) A patient on chronic Dilaudid (hydromorphone) therapy tests negative for opioids on a urine drug screen. The patient claims to be using medicine as prescribed. The appropriate next step would be to:	<ul style="list-style-type: none"> a. Subject the urine to a different type of test b. Readminister a urine drug screen at the next visit c. Taper and discontinue opioid therapy d. Refer the patient to a detoxification/rehabilitation program e. Notify law enforcement

* Answer choice from original test was changed from hydromorphone to oxycodone, because hydromorphone is now a recognized metabolite of morphine and heroin [8].

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Table 2

Summary of demographic data, training history, and knowledge test results

	Total (n=93)
Age	30.7 (SD 4.3, range 20-55)
Gender	M: 45 (48.0%)
Ethnicity	Hispanic: 9 (9.9%)
Racial background	White: 76 (83.5%) Black: 0 Asian: 7 (7.7%) Other: 8 (8.8%)
Year of training	PGY1: 16 (17.4%) PGY2: 19 (20.7%) PGY3: 25 (27.2%) PGY4: 18 (19.6%) Psychosomatics fellow: 3 (3.3%) Addiction fellow: 4 (4.3%) Forensics fellow: 1 (1.1%) Child/Adolescent fellow: 5 (5.4%) Geriatrics fellow: 1 (1.1%)
Training in UDT interpretation	Yes: 23 (24.7%)
Confidence in UDT interpretation	Strongly agree: 11 (12.1%) Agree: 46 (50.5%) Neutral: 23 (25.3%) Disagree: 8 (8.8%) Strongly disagree: 3 (3.3%)
Knowledge test results	Correct (%)
Q1 correct	26 (32.1%)
Q2 correct	71 (88.8%)
Q3 correct	21 (25.9%)
Q4 correct	9 (11.3%)
Q5 correct	69 (85.2%)
Q6 correct	19 (23.5%)
Q7 correct	73 (90.1%)
Total score	3.5 (SD 1.1, range 1-6)