Pain Physician 2012; 15:ES119-ES133 • ISSN 2150-1149

Current Opinion

Urine Drug Testing: Current Recommendations and Best Practices

Graves T. Owen, MD[1], Allen W. Burton, MD[2], Cristy M. Schade, MD, PhD[3], and Steve Passik, PhD[4]

From: [1]Texas Pain Rehabilitation Institute, [2]Houston Pain Associates, Houston TX; [3]RSD and Back Pain Center of Dallas, TX; [4]Vanderbilt University Medical Center, Nashville, TN.

Dr. Owen is with the Texas Pain Rehabilitation Institute
Dr. Burton is with Houston Pain Associates, Houston, TX.
Dr. Schade is with RSD and Back Pain Center of Dallas, TX.
Dr. Passik is a Professor of Psychiatry and Anesthesiology at Vanderbilt University Medical Center, Nashville, TN.

Address correspondence:
Allen W. Burton, MD
Houston Pain Associate
7700 Main Street #400
Houston, TX
E-mail: awburtonmd@gmail.com

Disclaimer: There was no external funding in the preparation of this manuscript.
Conflict of interest: None.

Manuscript received: 07/07/2011
Revised manuscript received: 08/28/2011
Accepted for publication: 08/31/2011

Free full manuscript:
www.painphysicianjournal.com

Background: The precise role of urine drug testing (UDT) in the practice of pain medicine is currently being defined. Confusion exists as to best practices, and even to what constitutes standard of care. A member survey by our state pain society revealed variability in practice and a lack of consensus.

Objective: The authors sought to further clarify the importance of routine UDT as an important part of an overall treatment plan that includes chronic opioid prescribing. Further, we wish to clarify best practices based on consensus and data where available.

Methods: A 20-item membership survey was sent to Texas Pain Society members. A group of chronic pain experts from the Texas Pain Society undertook an effort to review the best practices in the literature. The rationale for current UDT practices is clarified, with risk management strategies outlined, and recommendations for UDT outlined in detail. A detailed insight into the limitations of point-of-care (enzyme-linked immunosorbent assay, test cups, test strips) versus the more sensitive and specific laboratory methods is provided.

Limitations: Our membership survey was of a limited sample size in one geographic area in the United States and may not represent national patterns. Finally, there is limited data as to the efficacy of UDT practices in improving compliance and curtailing overall medication misuse.

Conclusions: UDT must be done routinely as part of an overall best practice program in order to prescribe chronic opioid therapy. This program may include risk stratification; baseline and periodic UDT; behavioral monitoring; and prescription monitoring programs as the best available tools to monitor chronic opioid compliance.

Key words: Urine drug screening, urine toxicology screening, urine drug testing, chronic pain, addiction, forensic testing

Pain Physician 2012; 15:ES119-ES133

Texas Pain Society (TPS) members have been querying the TPS Board of Directors (of which 3 of the authors are members) with increasing frequency about urine drug testing (UDT) standard of care questions. Responding to membership concerns, the TPS performed a membership survey which revealed that UDT is well accepted, but its application is widely variable (Appendix 1). The survey was emailed twice to 280 members; 102 replied, a 36% response rate. Thus, this manuscript was born out of membership demand and the TPS's purpose of promoting and maintaining the highest standards of professional practice through

education and research. The authors felt that there would be interest in the general pain community beyond Texas to view the topic of urine drug screening (UDS) through the prism of one state society's reaction to this developing issue. Urine drug screening (UDS) typically refers to the first step of a two-step process involving screening (typically immunoassay) and confirmation (chromatographic and mass spectrometric methods). For the purposes of testing in general, the abbreviation "UDT" (urine drug testing) may be preferable.

A perfect storm has developed involving prescription opioid medications. Throughout the past few decades, awareness of untreated and unrecognized pain has increased, along with subsequent educational efforts enlisting doctors to assess and treat pain more aggressively. The term opioidphobia was coined to describe doctors' reluctance to prescribe opioid medications.

Efforts to treat pain more aggressively started in the 1990s and reached full stride around 2000, when even the U.S. Congress proclaimed the years 2000-2010 the Decade of Pain Control and Research. Both the American Pain Society and the American Academy of Pain Medicine wrote formal position statements endorsing the prescribing and use of chronic opioid therapy (COT) for pain. As a result of these efforts, the prescribing of opioids increased substantially.

The increased availability of opioids appears to have led to unanticipated problems, including an explosion in nontherapeutic opioid use. In fact, a national epidemic in the nontherapeutic use of opioids has emerged in the United States. Deaths from the misuse of prescription opioids currently exceed deaths from heroin overdose. Deaths from prescription opioids account for 18.9% of all drug-related deaths in the United States, compared with 12.6% from heroin (1,4). Clark and colleagues (2) reported a 3-fold increase in opioid abuse in recent years. Two-thirds of abused opioids originate from a valid prescription; one-fifth are obtained from more than one physician. Among patients receiving treatment for opioid dependency, 50-60% obtained the drugs from their physicians (3). One study estimated that the minimum economic burden for prescription opioid abuse in 2005 was $9.5 billion (4). The United States contains 5% of the world's population but consumes 99% of the world's hydrocodone. Similar disproportionate consumption by the United States occurs with other opioids as well (5) (Table 1).

Table 1. Percentage of U.S. consumption of world's opioid production (5) (note: hydrocodone is not available in some countries).

Opioid	Percentage
Hydrocodone	99
Oxycodone	80
Methadone	58
Hydromorphone	54
Fentanyl	49
Meperidine	43

Between 1992 and 2003, although the U.S. population grew only 14%, the number of people who admitted to prescription analgesic abuse increased 94%. About this same time (1992 to 2002), first-time abuses of prescription opioids among 12- to 17-year-olds increased 542% (6).

The prevalence of addiction in the general population is estimated to be 3-16% (7). Although addiction in the pain management setting has been considered uncommon, more recent studies examining UDT suggest that the rate of problematic drug-related behaviors in the chronic pain clinic setting is far higher (8,9,12,18, 35,37-40). Many patients with moderate or severe chronic pain who believe they need ongoing COT are psychologically distressed, with a reported 70% prevalence of psychosocial comorbidities in patients with chronic pain (9). Deyo and Edlund (9,41) found that COT use is increasing more rapidly in patients with mental health and/or substance abuse disorders than in patients without these disorders. This is particularly worrisome because patients with mental health and/or substance abuse disorders are at greatest risk of using controlled substances nontherapeutically.

Pain is a subjective process, and clinicians must rely on subjective reports from patients to make treatment decisions. Addicted individuals, as part of their disease state, will not provide truthful self-reports if the report could result in their not receiving their drug of choice. Significant data have shown that self-reported drug use in the chronic pain population is often unreliable (11). Therefore, clinicians must analyze a combination of subjective input and objective observations to assess their patients. Objective observations include pill counts (admittedly difficult to do), prescription monitoring programs, and monitoring for aberrant behaviors. Aberrant behaviors may include early refill requests (self-escalation), reports of "lost or stolen" medica-

tions, treatment noncompliance, and UDT that does not include the prescribed drug and may include illicit or nonprescribed controlled substances. Monitoring of aberrant behavior alone is inadequate and frequently results in underestimated aberrant drug-taking behavior (11,12,10). A combination of monitoring for aberrant behavior and use of UDT has been recommended as the best available monitoring strategy (11,12).

The differential diagnosis for aberrant drug-taking behaviors includes addiction, pseudoaddiction, chemical coping, organic mental syndrome, personality disorder, self-medicating depression, anxiety, situational stressors, and criminal intent. Aberrant UDT results provide valuable and objective information that may assist the clinician in working through the differential diagnoses. Noncompliance suggests hidden agendas, a lack of insight into treatment goals and proven benefit(s), unrealistic expectations of treatment outcome(s), passive coping mechanisms, chemical coping, addiction, or an amotivational state that inhibits active participation, such as depression (13). Due to the extensive overlap of various psychological comorbidities and chronic pain states, discerning the exact reason for medication noncompliance is often difficult.

Recent studies have revealed that among patients with chronic pain who are receiving COT, the percentage of those with aberrant UDT results is surprisingly common: 9-50% (Table 2). Aberrant UDT results may indicate any of a spectrum of problematic behaviors, from addiction to chemical coping. Irregular drug-taking behavior is both a patient and public safety concern. Random UDT combined with adherence monitoring has been shown to reduce the occurrence of aberrant drug-taking behaviors (14).

The use of scheduled and random UDT has been practiced in pain management for several decades, but the practice of UDT is inconsistent. The purpose of this manuscript is to discuss the medical necessity of UDT and to make suggestions for its clinical use.

Risk Assessment

Although commonly practiced, COT remains a controversial treatment with limited outcome data to support its clinical application (15,16). With the rise of prescription abuse and a limited scientific foundation with which to justify the use of COT, this therapy must be used cautiously. Texas Medical Board (TMB) rule 170.3(a)(1)(B)(v) requires an assessment of a patient's potential for substance abuse. Baseline UDT, combined with a psychological evaluation, perhaps including validated psychometric screening tools, provides a valuable risk-assessment basis with which the clinician can assess the patient's candidacy for COT and comply with the TMB rule.

The following risk factors associated with aberrant drug use have been identified by numerous studies: personal or family history of alcoholism or substance abuse (past or present), nicotine dependency, age < 45 years, depression, impulse control problems (attention deficit disorder, bipolar disease, obsessive-compulsive disorder, schizophrenia, personality disorders), hypervigilant states (posttraumatic stress disorder, preadolescent sexual abuse), somatoform disorder, organic mental syndrome, pain after a motor vehicle accident, and pain involving more than 3 regions of the body (17, 18).

Several screening psychometrics are readily available for stratifying COT risk factors. The Opioid Risk Tool (ORT); Pain Medication Questionnaire (PMQ); Diagnosis, Intractability, Risk, Efficacy Score (DIRE); and the Screener and Opioid Assessment for Patients with Pain-Revised (SOAPP-R) are widely accepted tools for opioid risk assessment. A formal psychological assessment can be used as well. The CAGE questionnaire and other screening tools can assess problematic alcohol use. However, according to Chou (19), the quality of the evidence for risk stratification remains weak. As previously discussed, a risk assessment is required by the TMB before COT can be initiated (20).

Risk assessments typically categorize patients into low-, moderate-, and high-risk groups. Recent data

Table 2. Incidence of aberrant Urine Drug Testing results.

Study	Patients with chronic pain who are taking opioid medications with aberrant UDT results.
Cook RF, 1995 (36)	50%
Fishbain DA, 1999 (37)	46.5%
Hariharin J, 2007 (38)	38%
Ives TJ, 2006 (39)	32%
Berndt S, 1993 (35)	32%
Katz NP, 2003 (12)	29%
Michna E, 2007 (8)	45%
West R, 2010 (40)	9-33%
Manchikanti L, 2006 (18)	16%

suggest that the SOAPP-R is superior to the ORT, PMQ, and DIRE (21,22). Only a psychological assessment provides similar sensitivity and specificity. However, the clinical experience of the mental health provider can affect the reliability of the psychological interview in accurately predicting the patient's actual risk classification (23). In Jones's study (23), the percentage of patients identified in a given risk group who would eventually be discharged for aberrant drug-related behavior are described in Table 3. The best tools (SOAPP-R and psychological interviews) correctly identified 70-77% of the patients who would eventually be discharged. Unfortunately, even the best tools failed to identify 23-30% of patients that would eventually demonstrate aberrant drug-taking behaviors severe enough to result in discharge from the clinic. However, the SOAPP-R and psychological interview were significantly more accurate than the PMQ or ORT. Although the psychological interview and SOAPP-R are helpful tools, they should not be used as an isolated modality.

These tools, when supplemented with depression, anxiety, coping, and personality style psychometrics, may improve the reliability of the risk assessment. Furthermore, behavioral monitoring, baseline and random UDT, good bookkeeping principles to track medication administration, and pill counts may be helpful. Currently, our assessment tools remain limited, but rapid progress is being made. Until better evidence develops, the best risk-assessment tool is the SOAPP-R and/or psychological assessment (provided by an experienced health psychologist). These recommendations will likely evolve quickly as additional data are collected.

Table 3. *Risk rating of discharged patients by each risk measurement tool (23). Each patient admitted to a pain clinic in Knoxville, TN was assessed using each psychometric instrument listed below. The patients were tracked for one year while being treated for pain with opioids. The table below represents the sensitivity of the listed instruments to predict future discharge from the clinic for aberrant drug taking behaviors.*

	Low risk n (%)	High risk n (%)
SOAPP-R	30 (23%)	102 (77%)
Psychologist	40 (30%)	92 (70%)
PMQ	74 (56%)	58 (44%)
ORT	94 (71%)	38 (29%)

Key: SOAPP-R is the Screener and Opioid Assessment for Patients with Pain-Revised.
Psychologist is results from a formal psychological evaluation.
PMQ is the Pain Medication Questionnaire.
ORT is the Opioid Risk Tool.

In terms of a broader construct, before committing to COT, physicians should try a systematic stepwise approach using proven treatments with less risk; specifically, all reasonable nonopioid options combined with education about reasonable treatment expectations should be used first. Informed consent for COT is mandatory and includes discussion of the risks of iatrogenic addiction, adverse effects, limitations of therapeutic efficacy, and an exit strategy from COT if problems or lack of efficacy are seen.

In addition to baseline UDT, prescription monitoring programs, behavioral monitoring, pill counting, good bookkeeping practices, and random UDT provides an objective assessment of patient compliance with controlled substances. Information from family members can provide additional insight into the patient's response to COT.

Application of UDT

UDT should be a component of your informed consent and opioid agreement, and an office policy regarding the use of UDT needs to be in place. A UDT policy and consistency is critically important because clinicians' predictions of UDT results are frequently inaccurate (24).

Although no studies have validated improved outcomes, it is strongly recommended that baseline UDT be conducted before initiating COT. How frequently UDT should be performed should be based on the patient's individual risk assessment. Random UDT is preferred to scheduled UDT because patients receive advanced notice with scheduled tests and can therefore plan procedures to defeat the reliability of the tests (15). Common methods used to defeat the accuracy of urine drug tests include bringing in urine from someone else (urine swapping), diluting urine with water from the sink or toilet bowl, and buying various commercially available products that change the urine's chemical profile (pH, etc.). Therefore, a clinician may want to take some of the following basic precautions when collecting urine samples.

The easiest strategy is to refer the patient to an independent laboratory for urine collection and testing. Typically, patients should not be given their prescription until they return from the laboratory with a note indicating that they provided an adequate urine sample. If the clinician prefers to collect urine samples

in his or her own office, a few simple precautions will be valuable. The sink's water flow should be turned off or disconnected and the toilet should have a coloring agent added to the bowl or tank. Patients should be instructed to disrobe in their examination room and to put on a gown; this reduces their ability to sneak a foreign urine sample into the restroom (urine swapping) and eliminates the need for direct observation of urine donation. Strict chain-of-custody protocols as defined by the Department of Transportation and Mental Health Services Administration have not been applied to UDT by physicians treating chronic pain (11). Patient refusal to submit to UDT should raise concern since this means patients "usually have something to hide" (11).

If a patient cannot provide urine, the clinician can obtain and test a blood sample if the clinician's facility has this capability. The primary difference between blood and urine testing is that a blood sample tells the clinician what a patient has in his system, whereas a urine test tells what was in their system. Before disclosing to a patient that he will need to undergo a urine drug test, it is important to ask (and to record) when prescribed medications were last taken and what additional medications were taken during the past week.

The frequency of random UDT should be based on a risk assessment of the individual patient, and a validated risk-assessment instrument should be used. High-risk patients require more frequent monitoring, whereas low-risk patients do not need to be monitored as frequently; all patients, however, receiving COT should be monitored with UDT. Some existing guidelines recommend that high-risk patients be screened at least 4 times per year, up to every month, office visit, or drug refill, and that low-risk patients be randomly screened once or twice a year; moderate-risk patients should be screened on a schedule somewhere between these extremes (Table 4). High-risk patients with aberrant behaviors require the most intense monitoring. Patients considered at low to moderate risk who subsequently have aberrant UDT results or display aberrant behaviors should be moved into the high-risk category. The Official Disability Guidelines suggest more stringent monitoring (25). The Utah Clinical Guidelines on Prescribing Opioids for Treatment of Pain have similar recommendations (26). After a period of stabilization and the extinguishment of aberrant behavior, a clinician may consider downgrading the patient's risk status after providing adequate documentation. However, all patients receiving COT, not just moderate- or high-risk patients, should undergo UDT (27) (Table 4). Christo and colleagues (28) recently published a comprehensive review of urine drug testing in chronic pain including a treatment algorithm substantially similar to the other guidelines referenced here.

Table 4. *UDT recommendations based on risk stratification. Modified from Official Disability Guidelines for UDT (25) and Sundwall et al (26).*

Risk	Number of Urine Drug Tests per Year
Low	1 or 2
Moderate	3 or 4
High	4 or every month, office visit, or every drug refill

UDT

Elements of UDT may include specific gravity, temperature at the time of sample collection, pH, creatinine concentration, and mass spectroscopic confirmatory testing for the following agents: opioids (fentanyl, oxycodone, oxymorphone, tramadol, methadone, hydrocodone, hydromorphone, morphine, codeine, propoxyphene, meperidine, buprenorphine, tapentadol, 6-mono-acetyl morphine [6-MAM]); benzodiazepines (most benzodiazepine immunoassay screens contain nordiazepam, oxazepam, and temazepam, but do not react reliably to alprazolam, lorazepam, and clonazepam); carisoprodol (and its metabolite meprobamate); barbiturates (immunoassay screens that react to phenobarbital and secobarbital may not react reliably to butalbital); ethanol (ethyl glucuronide); amphetamine; methamphetamine; methylphenidate; cocaine; 3-4 methylenedioxymethamphetamine/MDMA (ecstacy); phencyclidine; and tetrahydrocannabinol (THC). While some have argued that THC should not be tested, studies have shown that THC use correlates with other illicit drug use and opioid misuse (29, 42). Furthermore, marijuana is an illegal substance in Texas. The TMB, in recent public forums, commented that a patient who tests positive for marijuana will be considered a drug abuser and in violation of any controlled substance agreement. The clinician prescribing a controlled substance to a known abuser may have to explain his or her actions to a disciplinary panel (personal communication, Public Q&A forum with the TMB, September 2010). The prescribing clinician should understand his liability risk through such "don't ask-don't tell" behaviors, both through possible litigation and perhaps medical board sanctioning. Failure to screen for THC could raise concerns with the TMB.

It is important that clinicians be familiar with the unique characteristics of their laboratory. Many laboratories do not routinely test for semisynthetic and synthetic opioids such as oxycodone, oxymorphone, or fentanyl. These opioids require a specific request in order to be tested. Similar requests may be necessary for carisoprodol or other drugs of interest as listed above.

Opioid metabolites should also be tested. Reputable laboratories use mass spectroscopy to test for these metabolites, and the purpose of this section is to point out the need for more detailed testing versus the use of "shaker cup" or "dipstick" enzyme immunoassays (EIA). Opioids that undergo CYP450 metabolism show a significant degree of variability in metabolite prevalence patterns. Opioid normetabolites such as norhydrocodone, noroxycodone, norfentanyl, normeperidine, norpropoxyphene, norcodeine, and norbuprenorphine are not always tested by laboratories providing toxicology testing associated with pain management. In addition, normetabolites typically are not reactive on immunoassay screens, and specimens that contain only normetabolite may cause a false-negative result when EIA screening is used as a first-line measure. Therefore, metabolite testing is required.

EIA technology, performed either in the laboratory or at the point of care, relies on competitive binding of an antibody to detect the presence of a particular drug or metabolite in the urine. EIA techniques are convenient because they provide rapid results (less than 5 minutes). A major limitation of EIA testing is that it fails to distinguish drugs of the same class. Therefore, aberrant drug-taking behavior within the same drug class would not be detected. In addition, EIA cross-reactivity across a drug class is limited, especially in the case of opiates, benzodiazepines, and barbiturates. For example, opiate immunoassay screens are typically targeted to codeine and morphine; semisynthetic opiates such as hydrocodone and oxycodone may react only at high concentrations or not at all. As discussed earlier, many opioid metabolites do not react on an immunoassay screen. In cases of limited cross-reactivity, false-negatives may be of concern.

Because EIA techniques may have low sensitivity (many immunoassay screens that were developed for the workplace use high thresholds that are unacceptable for use in the clinical setting) and low specificity, EIA technology is subject to false-negative and false-positive results (30). False-positive results can occur because of enzyme cross-reactivity (Table 5). The frequency of false-negatives resulting from EIA testing limits its usefulness. In addition, hallucinogens, inhalants, and anabolic steroids are difficult to detect using EIA techniques. False-negative tests results can occur as well, as a result of inappropriately high cutoff levels or from swapped or adulterated urine. Urine collected within 4 minutes should have a temperature of 90-100°F and a pH value of 4.5-8.0. A pH value of less than 3.0 or greater than 11.0 is suggestive of adulteration.

Creatinine concentration (CrC) is also helpful in detecting adulterated urine, which can have a CrC value of less than 5. A CrC value of less than 20 indicates a sample that has been diluted by adulteration, by consumption of excessive fluids, or possibly by cachexia or renal dysfunction. The specific gravity should be 1.002-1.030, assuming that excessive fluids have not been consumed. UDT vendors can help the clinician evaluate the sample reliability and testing methodology limitation(s).

Therefore, results from immunoassay testing must be considered preliminary and cannot be considered conclusive until confirmatory testing has been performed (15, 30,). Failure to send EIA urine for confirmatory testing is a poor practice. Pesce (44) reported significant false-negative rates with use of EIA compared with liquid chromatography-mass spectroscopy (LC-MS/MS) testing, primarily due to the high cutoff levels used by EIA . Given the significant technical limitations to EIA testing (point-of-care testing), a clinician should consider whether EIA is of any clinical value except for limited and specific clinical situations requiring real-time data. If EIA is used, great care must be taken in interpreting the results.

The gold standard in the UDT industry is the use of either gas chromatography/mass spectroscopy (GC/MS or GC/MS-MS) or LC/MS-MS to confirm test results. Chromatography uses a carrier medium (gas or liquid) to push the sample over a column. The urine sample's compounds of interest are separated out by the molecular interaction between the chromatographic column and the unique compound polarities. As the individual compounds are separated, they are fed into a mass spectrometer, which functions as the compound detector. The process of mass spectroscopy (MS) involves ionizing the compounds and detecting these fragments by using their mass-to-charge ratio. Thus, MS provides a unique fingerprint that can be used to identify compound(s) against a reference standard with high sensitivity and specificity. MS-MS refers to tandem mass spectroscopy, which provides greater sensitivity and specificity than single-stage MS. However, any form of MS testing is su-

Table 5. *Enzyme immunoassay cross-reactions (some are laboratory- or test-specific). Adapted from Trescot, et al (15) and Moellar (43).*

Drug Class	Cross-reactant
Cannabinoids	dronabinol (Marinol) efavirenz ketoprofen naproxen pantopazole ibuprofen promethazine riboflavin tolmetin
Opioids	diphenhydramine poppy seeds chlorpromazine rifampin dextromethorphan quinine ofloxacin papaverine
Amphetamines	benzphetamine chlorpromazine clobenzorex isometheptene isoxsuprine phentermine phenylpropanolamine promethazine ritodrine thioridazine trazodone trimethobenzamide trimipramine ephedrine methylphenidate pseudoephedrine desipramine bupropion fenfluramine propranolol labetalol mexiletine selegiline tyramine amantadine ranitidine phenylephrine vapor sprays (Vick's)
PCP	doxylamine ibuprofen imipramine ketamine meperidine mesoridazine tramadol chlorpromazine thioridazine dextromethorphan diphenhydramine venlafaxine
Benzodiazepines	flunitrazepam oxaprozin sertraline "some herbal agents"
Ethanol	"asthma inhalers"

perior to EIA testing and provides acceptable accuracy (31). The choice of whether to use GC/MS or LC/MS-MS depends on the compound to be analyzed; highly volatile, nonpolar compounds lend themselves well to analysis by GC/MS, whereas polar compounds may be more readily detected by LC/MS-MS (32). An advantage of LC/MS-MS is that a smaller volume is needed, thus reducing the chance of sample rejection due to inadequate sample quantity ("quantity not sufficient") (33). Mass spectroscopy is reported to be "highly sensitive and specific" (34).

More advanced UDT interpretation is beyond the scope of this manuscript. Most UDT corporations can provide literature to assist in interpreting results. Providers must be familiar with metabolic products from parent drugs so that an innocent individual is not unfairly accused of aberrant drug-taking behavior if an expected metabolite is detected in a sample. Quantitative UDT cannot be used to verify compliance with a prescribed dosage of medication due to variability in volumes of distribution (muscle density) and interindividual and intraindividual variability in drug metabolism (30).

Corrective action

When aberrant behaviors occur or UDT produces unexpected results, corrective action must be taken and may involve any or all of the following: counseling, interval dosing (decreasing the time interval between follow-ups), limiting the overall quantity and doses of opioid analgesics, conducting psychological and/or addictionology evaluations, and/or discontinuing the opioid medication ("first do no harm" principle). The absolutely critical component to a corrective action is providing complete documentation of the plan, as well as additional documentation on subsequent office visits of progress made with use of this plan, ensuring follow-

up on UDT results. The Texas Intractable Pain Treatment Act mandates that a physician not prescribe a controlled substance if the physician knows or should know that the patient is using drugs for a nontherapeutic purpose. This Act does allow for prescribing controlled substances to patients who are chemically dependent as long as they are being treated for their chemical dependency. The TMB's Pain Management Chapter states that patients who are at risk for abuse or addiction require special attention and consultation with someone who is an expert in the treatment of such patients (20). This rule also states that the physician shall document his or her rationale for the treatment plan.

Conclusions

Prescribing COT is a complex undertaking that requires balancing the needs of the chronic pain patient with the risks of COT. Texas currently has several challenging interrelated issues facing clinicians, including poorly treated pain and prescription drug abuse. Throughout the past decade, clinicians have focused on pain treatment but have often overlooked abuse issues. Clinicians are typically poor at assessing aberrant drug-taking behavior without the added objectivity of UDT. The paradigm for assessing such behavior is, by necessity, shifting to a risk-stratification model.

Many physicians work under the "truth bias"; that is, they have no reason to not believe their patients. Numerous peer-reviewed studies have determined that self-reports of illicit and nonprescribed controlled substances from pain patients are unreliable. Unfortunately, because of this truth bias, physicians often fail to consider the addicted or chemical-coping patient's secondary gain, willingness to deceive the well-meaning physician, and motivation to manipulate the physician to obtain the drug of choice—often an opioid. Understanding addictive behavior and assessing the risk factors are an essential part of COT.

Any well-meaning physician willing to prescribe COT will be misled on occasion, but failure to screen for and take corrective action when aberrant behaviors are recognized is a poor practice. Clinicians must be vigilant for deceptive and manipulative behaviors. Currently, risk-assessment tools and psychological evaluations, although helpful in risk stratification, are inadequate when used alone. UDT, endorsed by the Official Disability Guidelines (25), is one of the few objective tools that can assist clinicians in evaluating appropriate and inappropriate drug use. UDT must be used as a risk-assessment and compliance tool. UDT has the additional benefit of detecting aberrant behaviors that are suggestive of nonmedical use of controlled substances. Risk stratification, behavioral monitoring, prescription monitoring programs, and baseline and random UDT are the best currently available tools for monitoring COT compliance. Prescription monitoring programs will improve when data become available online in a more real time fashion—currently not the case in Texas.

Given the epidemic in the nonmedical use of opioids and the resulting morbidity and mortality, the proactive use of UDT for all patients on COT is important. However, it would be abusive to an economically strained health care system to routinely screen every patient at every visit. This manuscript provides a rational risk-stratification approach to UDT. However, some of the opinions expressed herein may change as scientific data accumulate.

References

1. The National Center on Addiction and Substance Abuse at Columbia University: Controlled prescription drug abuse at epidemic level. 2006. Accessed May 13, 2009.
   www.casacolumbia.org/absolutenm/?a=397
2. Clark MR, Stoller KB, Brooner RK. Assessment and management of chronic pain in individuals seeking treatment for opioid dependency disorder. *Can J Psychiatry* 2008; 53:496-508.
3. Substance Abuse and Mental Health Services Administration: US Department of Health and Human Services. National Survey on Drug Use and Health 2007.
4. Birnbaun HG, White AG, Reynolds JL, Greenberg PE, Zhang M, Vallow S, Schein JR, Katz NP. Estimated costs of prescription opioid analgesic abuse in the United States in 2001: A social perspective. *Clin J Pain* 2006; 22:667-676.
5. Report of the International Narcotics Control Board for 2007. United Nations, New York, 2008. 8, 2010.
   www.incb.org/incb/annual-report-2007.html Accessed May
6. The National Center on Addiction and Substance Abuse at Columbia University: Controlled prescription drug abuse at epidemic level. 2006.
   www.casacolumbia.org/absolutenm/?a=397
7. Savage SR. Assessment for addiction in pain-treatment settings. *Clin J Pain* 2002; 18:S28-S38.
8. Michna E, Jamison RN, Pham LD, Ross EL, Janfaza D, Nedeljkovic SS, Narang S, Palombi D, Wasan AD. Urine toxicology screening among chronic pain patients on opioid therapy: Frequency and predictability of abnormal findings. *Clin J Pain* 2007; 23:173-179.
9. Manchikanti L, Damron KA, McManus CD, Barnhill RC. Patterns of illicit drug use and opioid abuse in patients with chronic pain at initial evaluation. A prospective, observational study. *Pain Physician* 2004; 7:431-437.
10. Deyo RA, Mirza SK, Turner JA, Martin BI. Overtreating chronic back pain: Time to back off? *J Am Board Fam Pract* 2009; 22:62-68.
11. Katz N, Fanciullo GJ. Role of urine toxicology testing in the management of chronic opioid therapy. *Clin J Pain* 2002; 18:S76-S82.
12. Katz NP, Sherburne S, Beach M, Rose RJ, Vielguth J, Bradley J, Fanciullo GJ. Behavioral monitoring and urine toxicology testing in patients receiving long-term opioid therapy. *Anesth Analg* 2003; 97:1097-1102.
13. Passik, S. D., Kirsh, K. L., Portenoy, R. K. Pain and addictive disease. In Von Roenn JH, Paice JA, Preodor ME (eds.). *Current Diagnosis & Treatment of Pain.* 1stt ed. Lange Medical Books/McGraw-Hill, New York, NY, 2006, pp78-84.
14. Manchikanti L, Manchukonda R, Pampati V, Damron KS, Brandon DE, Cash KA, McManus CD. Does random urine drug testing reduce illicit drug use in chronic pain patients receiving opioids? *Pain Physician* 2006; 9:123-129.
15. Trescot AM, Helm S, Hansen H, Benyamin R, Glaser SE, Adlaka R, Patel S, Manchikanti L. Opioids in the management of chronic non-cancer pain: An update of the American Society of the Interventional Pain Physicians' (ASIPP) guidelines. *Pain Physician* 2008; 11:S5-S62.
16. Chou R, Fanciullo GJ, Fine PG, Adler JA Ballantyne JC, Davies P, Donovan MI, Fishbain DA, Foley KM, Fudin J, Gilson AM, Kelter A, Mauskop A, O'Connor PG, Passik SD, Pasternak GW, Portenoy RK, Rich BA, Roberts RG, Todd KH, Miaskowski C; American Pain Society-American Academy of Pain Medicine Opioids Guidelines Panel. Clinical guidelines for the use of chronic opioid therapy in chronic noncancer pain. *J Pain* 2009; 10:113-130.
17. Webster LR, Webster RM. Predicting aberrant behaviors in opioid-treated patients: Preliminary validation of the Opioid Risk Tool. *Pain Med* 2005; 6:432-442.
18. Manchikanti L, Cash KA, Damron KS, Manchukonda R, Pampati V, McManus CD. Controlled substance abuse and illicit drug use in chronic pain patients: An evaluation of multiple variables. *Pain Physician* 2006; 9:215-226.
19. Chou R, Fanciullo GJ, Fine PG, Miaskowski C, Passik SD, Portenoy RK. Opioids for chronic noncancer pain: Prediction and identification of aberrant drug-related behaviors- A review of the evidence for an American Pain Society and American Academy of Pain Medicine Clinical Practice Guideline. *J Pain* 2009; 10:131-146.
20. Texas Administrative Code, Title 22, Part 9, Chapter 170. Pain Management.
21. Passik SD, Kirsh KL, Casper D. Addiction-related assessment tools and pain management: Instruments for screening, treatment planning, and monitoring compliance. *Pain Med* 2008; 9:S145-S166.
22. Moore TM, Jones T, Browder JH, Daffron S, Passik SD. A comparison of common screening methods for predicting aberrant drug-related behavior among patients receiving opioids for chronic pain management. *Pain Med* 2009; 10:1426-1433.
23. Jones T, Moore T, Levy J,Browder JH, Daffron S, Passik SD. A comparison of various risk screening methods for patients receiving opioids for chronic pain management. Poster presented at: PainWeek; September 8-11, 2010; Las Vegas, NV.
24. Bronstein, K, Passik S, Munitz L, Leider H. Predicting abnormal urine drug testing in patients on chronic opioid therapy. Poster abstract presented at: Pain Week; September 8 – 11, 2010. Las Vegas, NV.
25. Official Disability Guidelines for UDT. Accessed February 10, 2011. Available under pain section.
    www.odg-twc.com/odgtwc/pain.htm#ProcedureSummary
26. Sundwall DN, Rolfs RT, Johnson E. Utah Clinical Guidelines on Prescribing Opioids for Treatment of Pain. Utah Department of Health 2009. http://www.dopl.utah.gov/licensing/forms/OpioidGuidlines.pdf Accessed November 15, 2010.
27. Cone EJ, Caplan YH. Urine toxicology testing in chronic pain management. *Postgrad Med* 2009; 121:91-102.
28. Christo PJ, Manchikanti L, Ruan X, Bottros M, Hansen H, Solanki DR, Jordan AE, Colson J. Urine drug testing in chronic pain. *Pain Physician* 2011; 14:123-143.
29. Reisfeld GM, Wasan AD, Jamison RN. The prevalence and significance of cannabis use on patients prescribed chronic opioid therapy: A review of the extant literature. *Pain Med* 2009; 10:1434-1441.
30. Nafziger AN, Bertino JS. Utility and application of urine drug testing in chronic pain management with opioids. *Clin J Pain* 2009; 25:73-79.
31. Stout PR, Bynum ND, Mitchell JM, Baylor MR, Ropero-Miller JD. A comparison of the validity of gas chromatography-mass spectroscopy and liquid chroma-

tography- tandem mass spectrometry analysis of urine samples for morphine, codeine, 6-acetylmorphine, and benzoylecgonine. *J Anal Toxicol* 2009; 33:398-408.

32. Sheehan TL. The best MS option: GC-MS and LC-MS. Am Lab 2002; 34(18):40-43.
33. Mikel C, Pesce A, West C. A tale of two drug testing technologies: GC-MS and LC-MS/MS. *Pain Physician* 2010; 13:91-99.
34. Ropero-Miller and Goldberger. *Handbook of Workplace Drug Testing*. 2nd ed. AACC Press, Washington, DC, 2009, pp 61-98.
35. Berndt S, Maier C, Schutz HW. Polymedication and medication compliance in patients with chronic non-malignant pain. *Pain* 1993; 52:331-339.
36. Cook RF, Bernstein AD, Arrington TL. Methods for assessing drug use prevalence in the workplace: a comparison of self-report, urinalysis, and hair analysis. *Int J Addict* 1995; 30:403-426.
37. Fishbain DA, Cutler RB, Rosomoff HL, Rosomoff RS. Validity of self-reported drug use in chronic pain patients. *Clin J Pain* 1999;15:184-191.
38. Hariharan J, Lamb GC, Neuner JM. Long-term opioid contract use for chronic pain management in primary care practice. A five year experience. J Gen Intern Med. 2007;22:485-490.
39. Ives TJ, Chelminski PR, Hammett-Stabler CA, et al. Predictors of opioid misuse in patients with chronic pain: a prospective cohort study. BMC Health Serv Res. 2006;4(6):46.
40. West R, Pesce A, West C, et al. Observations of medication compliance by measurement of urinary drug concentrations in a pain management population. *J Opioid Manag* 2010; 6:253-257.
41. Edlund MJ, Steffick D, Hudson T, Harris KM, Sullivan M. Risk factors for clinically recognized opioid abuse and dependence among veterans using opioids for chronic non-cancer pain. *Pain* 2007; 129:355-362. Epub 2007 Apr 20.
42. Pesce A, West C, Rosenthal M, et al. Marijuana correlates with use of other illicit drugs in a pain patient population. Pain Physician. 2010b;13:283-287.
43. Moeller KE, Lee KC, Kissack JC. Urine drug screening: practical guide for clinicians. *Mayo Clin Proc* 2008; 83:66-76.
44. Pesce A, Rosenthal M, West R, et al. An evaluation of the diagnostic accuracy of liquid chromatography-tandem mass spectroscopy versus immunoassay drug testing in pain patients. *Pain Physician* 2010; 13:273-281.