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Pain Care Fast Facts: 5-Minute Clinical Inservice

Urine Drug Testing (UDT) 2nd Ed, 5/10

Urine drug testing is a non-invasive method of detecting drug substances within several days after use. In contrast, **Serum** drug testing is limited to detecting drugs for only several hours after use, is invasive and more expensive than urine testing. Urine drug testing may be used prior to initiation of new therapy, prior to changes in treatment or randomly as part of a drug use agreement. Drug testing should corroborate the medication history. It may be used as a means to document adherence to therapy regimens, reinforce behavioral change, and is the first step in identifying undisclosed medications. Accurate interpretation of UDT requires taking a detailed history of the medications a patient uses, including over-the-counter or herbal preparations, a well as time of last use. Urine drug testing is performed as a **qualitative** immunoassay by fluorescence polarization or as a **quantitative** analysis with gas chromatography and mass spectrometry (GC/MS). The quantitative method is more expensive but can be considerably more precise. The drug screens named below are panels available specifically through UW Hospital and Clinics.

Drug screen, Urine Stat (*turnaround time 1 hour***)** is a rapid, qualitative immunoassay which identifies the presence of commonly used drugs and their metabolites (Table 1). Results are reported as "not detected" or "presumptive positive." The term "presumptive positive" indicates the presence of a drug type but does not identify individual drugs within a class. Results are ambiguous in terms of drug concentration and cross-reactivity with other compounds. Of note, concentrations produced by therapeutic doses of medications are often below detection cut-off values and there is no reliable correlation between urine concentration and drug doses used. Unexpected or questionable results should be further investigated with quantitative GC/MS.

Drug Screen, Urine Comprehensive (*turnaround time 3-5 days*) identifies over 100 drug substances and drug metabolites. The specific agent and concentration are reported. Many commonly used drugs have poor chromatographic properties and may not be detected by GC/MS (Table 4). Other tests are available to quantify them such as high performance liquid chromatography (HPLC). Separate tests for LSD, cannabinoids, and ethanol are also available.

Table 1. Qualitative Immunoassay Urine Drug Screen

Drug Agent	Detection Cut-off (ng/ml)	Detectibility (days)
amphetamines/ methamphetamines	300	≤5
barbiturates	200	1-3
benzodiazepines	100	1-3
cocaine metabolites	300	2-3
opiates	300	1-2
phencylidine (PCP)	25	≤30

Table 2. Qualitative Immunoassay Urine Drug Screen

Positive results	*Not reliably identified*	
Natural Opioid	**Semisynthetic**	**Synthetic**
codeine	Hydrocodone	meperidine
morphine	Oxycodone	fentanyl
heroin	Hydromorphone	propoxyphene
	Oxymorphone	methadone
	Buprenorphine	

Table 3. Compounds which may cause false positive results in Qualitative Immunoassay

opiates:	poppy seeds (large amounts)
phencylidine (PCP):	Dextromethorphan
amphetamines:	Phentermine, pseudoephedrine, ephedrine, selegiline, Vicks® inhaler (desoxyephedrine)

Table 4. Drugs <u>not</u> identified with the Comprehensive Drug Screen that instead require <u>separate quantitative testing</u>

alprazolam	Fentanyl	Methadone	Oxycodone
buprenorphine	Hydrocodone	Morphine	Propoxyphene
codeine	Hydromorphone	Oxazepam	Triazolam

Tips for ordering and interpreting urine drug screen tests

- Qualitative UDT can be used to detect the inappropriate presence or absence of a drug class.
- Qualitative UDT for opiates is very sensitive for detecting morphine and codeine, but does not distinguish which is present. UDT is less sensitive for semisynthetic/synthetic opioids (Table 2). Quantitative GC/MS is required for specific drug detection.
- Consult the laboratory regarding any unexpected results. False negatives and positives can and do occur (Table 3). In certain cases, small amounts of opioid metabolites may appear (hydrocodone from codeine, hydromorphone from hydrocodone, oxymorphone from oxycodone) and should not be interpreted as evidence of the use of nonprescribed agents.
- Variability in immunoassay also applies to benzodiazepines, and certain benzodiazepines such as clonazepam are not detected.
- Use the results to strengthen the healthcare professional-patient relationship and to support positive behavior change.

Selected References

1. Michna E. et al. Urine toxicology screening among chronic pain patients on opioid therapy; frequency and predictability of abnormal findings. Clin J Pain 2007;23:173-179.
2. Heit HA. Gourlay DL. Urine drug testing in pain medicine. Journal of Pain and Symptom Management. 2004; 27:260-267.
3. Gourlay DL, Heit HA. Urine drug testing in clinical practice. Available at: http://www.familydocs.org/assets/Professional_Development/CME/UDT.pdf. Accessed 3/29/2007.
4. Drug Screen, Urine Stat. Lab Test Directory. Available on UConnect. Accessed 3/29/2007.