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Urine Drug Testing

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Director, Pharmacological Treatment of Disease

Tuesday, September 14, 2021

7-8:30 pm ET



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Outline

- 1) Importance of being able to interpret UDT
- 2) Types of test – screen vs confirmatory
- 3) How to interpret tests





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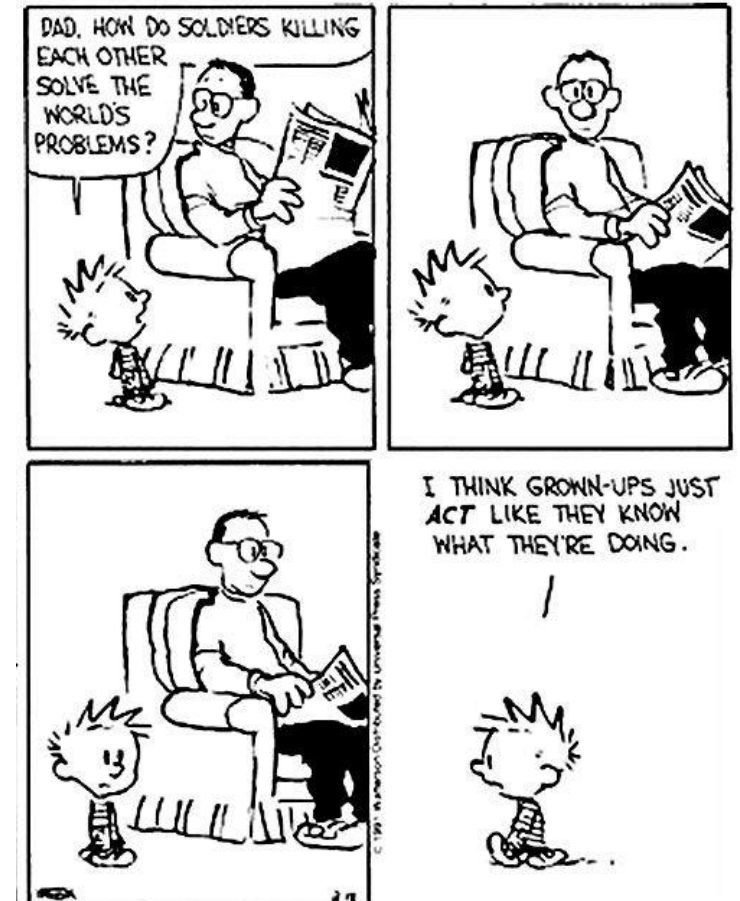
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We Don't Know What We Don't Know

Few studies looking at physician knowledge of UDT, but the data that is available is not very encouraging

UDT is widespread in American society

A large number of Americans 12 and older reported illicit drug use in the past month.





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Methods of drug testing are varied, but urine drug screens are the most widely utilized.

Screening

- Enzyme Multiplied Immunoassay Technique
- Enzyme-linked Immunosorbent Assay (ELISA)
- Fluorescence Polarization Immunoassay

Confirmatory

- Gas Chromatography/Mass Spectrometry (GC-MS)
- Liquid Chromatography/Tandem Mass Spectrometry (LC-MS/MS)





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DRUGS OF ABUSE SCN...	
Amphetamine	Negative
Barbiturates	Negative
Benzodiazepines	Positive !
COCAINE METABOLITES	Negative
Methadone	Negative
Opiates	Positive !
Oxycodone	Negative
PCP	Negative
THC	Negative
Tricyclics	Negative
DOACOM Comments	...

- Most commercial tests are calibrated with morphine
- Fentanyl and methadone have distinct chemical structures
- And is your test positive because of heroin?

Derivation	Opioid
From opium	Codeine, morphine, opium, thebaine
Semisynthetic	Buprenorphine, dihydrocodeine, heroin, hydrocodone, hydromorphone, levorphanol, oxycodone, oxymorphone
Synthetic	Fentanyl, meperidine, methadone, tramadol




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Urine Integrity

- Appearance
- Urine Temperature
- pH
- Specific Gravity
- Creatine
- Factors to consider: medications, diet, hydration status




✓ BAT[†]

SYNTHETIC URINE

DETOXIFYING AGENT


SYNTHETIC URINE



QUICK FIX PLUS 3 OUNCE

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ADD TO CART



HAND WARMERS (5 PACK)

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ADD TO CART

Source: quickfixsynthetic.com

Commercial Adulterant	Chemical Ingredient
Instant Clean ADD-it-ive [®] (T) ⁵²	Glutaraldehyde
Klear [®] (LS, T) ^{52,54,59}	Potassium Nitrite
Stealth [®] (T) ^{52,54}	Mixture of hydrogen peroxide & peroxidase
Urin Aid [®] (T) ⁵²	Glutaraldehyde
Urine Luck [®] (LS, T) ^{52,54,60}	Pyridinium chlorochromate (PCC)
Whizzies [®] (T) ⁵²	Potassium Nitrite

Source: PMID: 21507878

Abbreviations: CR, case report; LS, laboratory study; T, tertiary source.



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Adulterant

- Chlorine bleach (LS, T)^{4,52,53}
- Caustic household cleaners (Drano®)(LS, T)^{4,52,53}
- Glutaraldehyde (T)⁵²
- Goldenseal tea (LS, T)^{4,52,53}
- Hydrogen peroxide; hydrogenc peroxidase (LS)⁵⁵
- Lemon juice (LS)⁵³
- Liquid hand soap (T)^{4,52}
- Nitrites⁶⁶
- Papain (meat tenderizer) (LS)⁶⁶
- Pyridinum chlorochromate (PCC)⁵⁸
- Salt (sodium chloride) (LS, T)^{4,52,55}
- Vinegar (T)^{4,52}
- Visine eye drops (LS, T)^{4,52,53,56,57}

False-Negative Drug Immunoassays

- Amphetamine, barbiturates, cannabinoids, cocaine, opiates
- Amphetamine, barbiturates, benzodiazepines, cannabinoids, cocaine, opiates
- Cocaine
- Cannabinoids
- Cannabinoids
- Cannabinoids
- Barbiturates, benzodiazepines, cannabinoids
- Cannabinoids
- Benzodiazepines, cannabinoids
- Amphetamine, barbiturates, benzodiazepines, cannabinoids, cocaine, opiates
- Amphetamine, barbiturates, benzodiazepines, cannabinoids, cocaine, opiates
- Cannabinoids
- Benzodiazepines, cannabinoids



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Substance	Detection Time in Urine ⁵	Substances Causing False-Positive Results (Generic/Brand Name)	Substances Causing False-Negative Results
Methadone	3-14 days	Chlorpromazine (LS) ⁶⁴ Clomipramine (LS) ⁶⁴ Diphenhydramine/Benadryl [®] (CR) ³⁹ Doxylamine (CR, LS) ⁴⁰ Quetiapine/Seroquel [®] (CR) ⁶⁷ Thioridazine (LS) ⁶⁴ Verapamil/Calan [®] , Verelan [®] (LS) ⁴¹ Ciprofloxacin/Cipro [®] (LS) ⁴⁴ Clinafloxacin (LS) ⁴⁴ Doxylamine (CR, LS) ⁴⁰ Enoxacin (LS) ⁴⁴ Fluoroquinolones (CR, LS, T) ^{5,42-44,63,68} Gatifloxacin/Tequin [®] (CR, LS) ^{44,63} Levofloxacin/Levaquin [®] (LS) ⁴⁴ Lomefloxacin/Maxaquin [®] (LS) ⁴⁴ Moxifloxacin/Avelox [®] (LS) ⁴⁴ Norfloxacin/Noroxin [®] (LS) ⁴⁴ Ofloxacin/Floxin [®] (LS) ^{42-44,63} Pefloxacin/Cipro [®] (LS) ⁴⁴ Perazine (CR) ²⁴ Poppy seeds (foods) (CR, LS, T) ^{4,5,45-48} Quinine (T) ⁵ Ranitidine/Zantac [®] (LS) ⁴⁹ Rifampin/Rifadin [®] (CR, LS, T) ^{5,50,51,68,70} Sparfloxacin (LS) ⁴⁴ Tolmetin/Tolectin [®] (T) ¹⁸	Salicylates(T) ^{7,8,17}
Opioids	2-3 days, up to 6 days for sustained-release formulations, up to 1 week for prolonged and heavy use		



Source: PMID: 21507878

Abbreviations: CR, case report; LS, laboratory study; T, tertiary source; GC, gas chromatography.



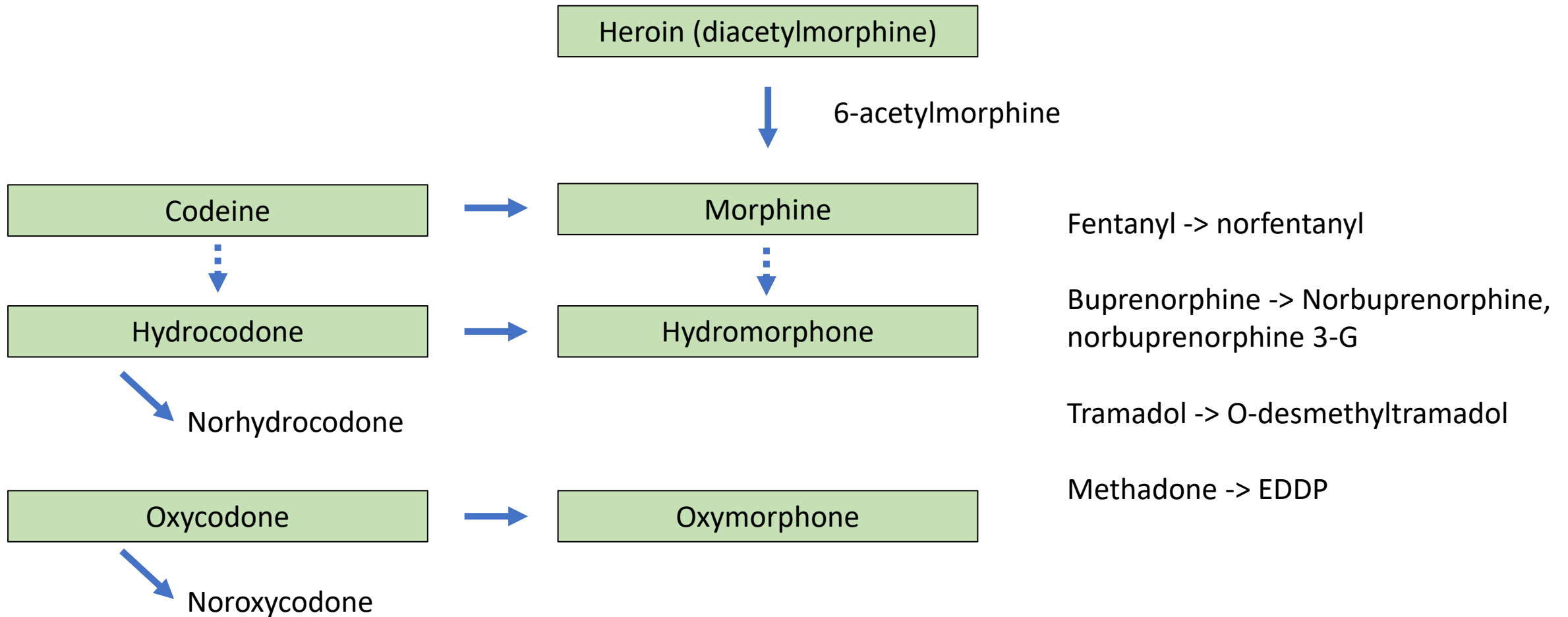
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Prescribed Drug 1		Hydrocodone
Prescribed Drug 2		SEE BELOW
Comment: Hydromorphone		
Creatinine	>=20.0 mg/dL	190.4
pH	4.5 - 9.0	5.8
Oxidant	<200 mcg/mL	NEGATIVE
Amphetamines, Screen	<500 ng/mL	NEGATIVE
medMATCH Amphetamines, Scn		CONSISTENT
Barbiturates	<300 ng/mL	NEGATIVE
medMATCH Barbiturates		CONSISTENT
Benzodiazepines	<100 ng/mL	POSITIVE !
Cocaine Metabolite	<150 ng/mL	NEGATIVE
medMATCH Cocaine Metab		CONSISTENT
Methadone, Screen	<100 ng/mL	NEGATIVE
medMATCH Methadone, Scn		CONSISTENT
Opiates	<100 ng/mL	POSITIVE !
Codeine	<50 ng/mL	NEGATIVE
medMATCH Codeine		CONSISTENT
Morphine	<50 ng/mL	NEGATIVE
medMATCH Morphine		CONSISTENT
Hydrocodone	<50 ng/mL	55 ^
medMATCH Hydrocodone		CONSISTENT
Hydromorphone	<50 ng/mL	85 ^
medMATCH Hydromorphone		CONSISTENT
Comment: Hydromorphone is a metabolite of hydrocodone as well as a prescribed drug.		
Oxycodone, Screen	<100 ng/mL	POSITIVE !
Oxycodone, Confirm	<50 ng/mL	430 ^
medMATCH Oxycodone, Confirm		INCONSISTENT !
Oxymorphone	<50 ng/mL	510 ^
medMATCH Oxymorphone		INCONSISTENT !

Norhydrocodone	<50 ng/mL	270 ^
Norhydrocodone (medMATCH)		CONSISTENT
Comment: Norhydrocodone is a metabolite of Hydrocodone		
Noroxycodone	<50 ng/mL	2100 ^
Noroxycodone (medMATCH)		INCONSISTENT !
Comment: Noroxycodone is a metabolite of Oxycodone.		

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Concluding Thoughts

- Important to understand science and correlate to available testing at institution
- Do not jump to conclusions with inconsistent results, consult experts
- No consensus guidelines on frequency of testing – but agreed upon that urine drug testing is a component of responsible opioid prescribing



Roll over image to zoom in

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