

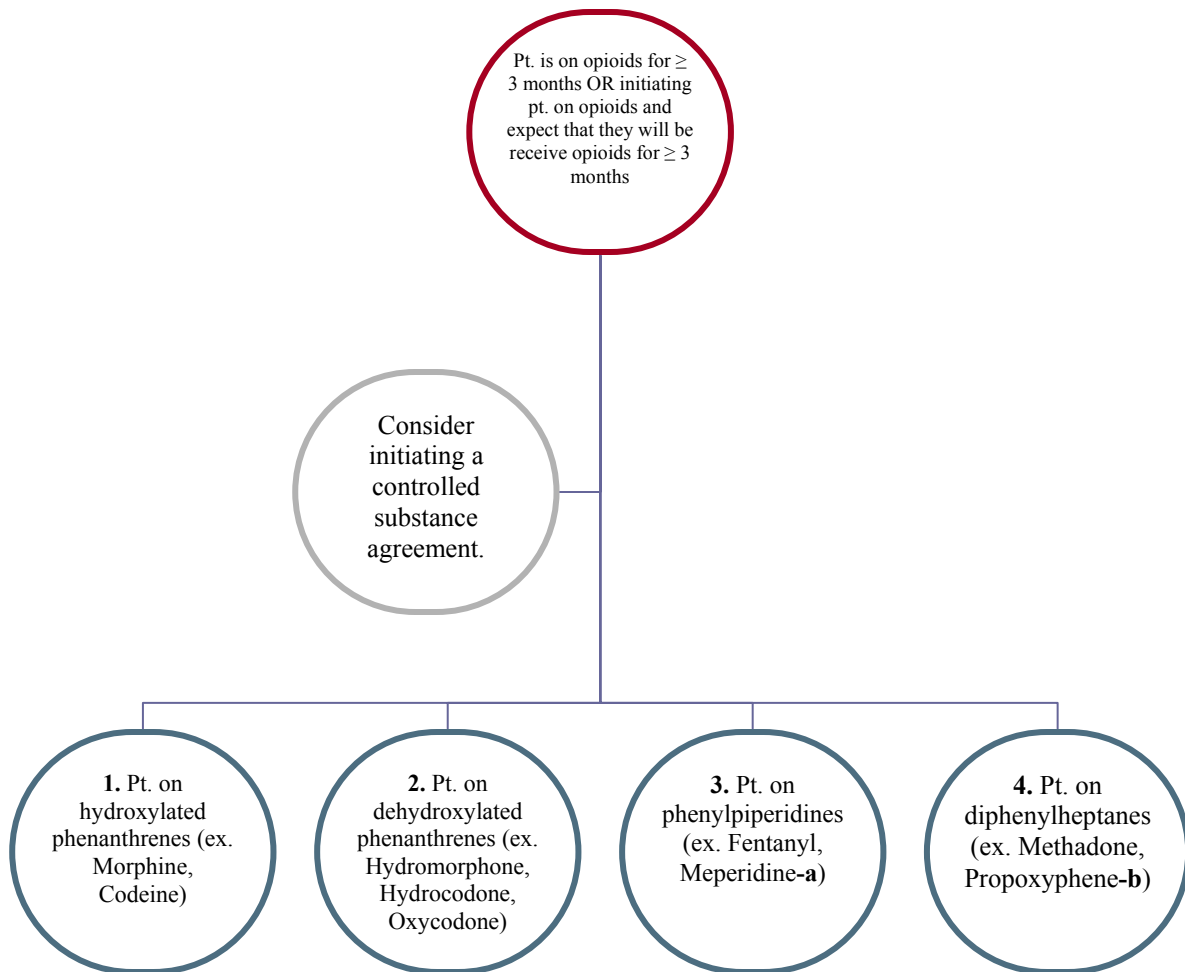
# Suggested Urine Drug Screen (UDS) Algorithm

Developed for the Stratton VA Medical Center and affiliated Community Based Outpatient Clinics (CBOCs) in the region encompassing Albany NY

Data collected, collated, and organized by Riham Ywakim, Pharm.D. Candidate.  
Revised, reviewed, and reformatted by Dr. Jeffrey Fudin, August 2008

**Figure 1: Overall Narcotic Drug Classifications**

Refer to Figure 7 for a complete list of each chemical classification.



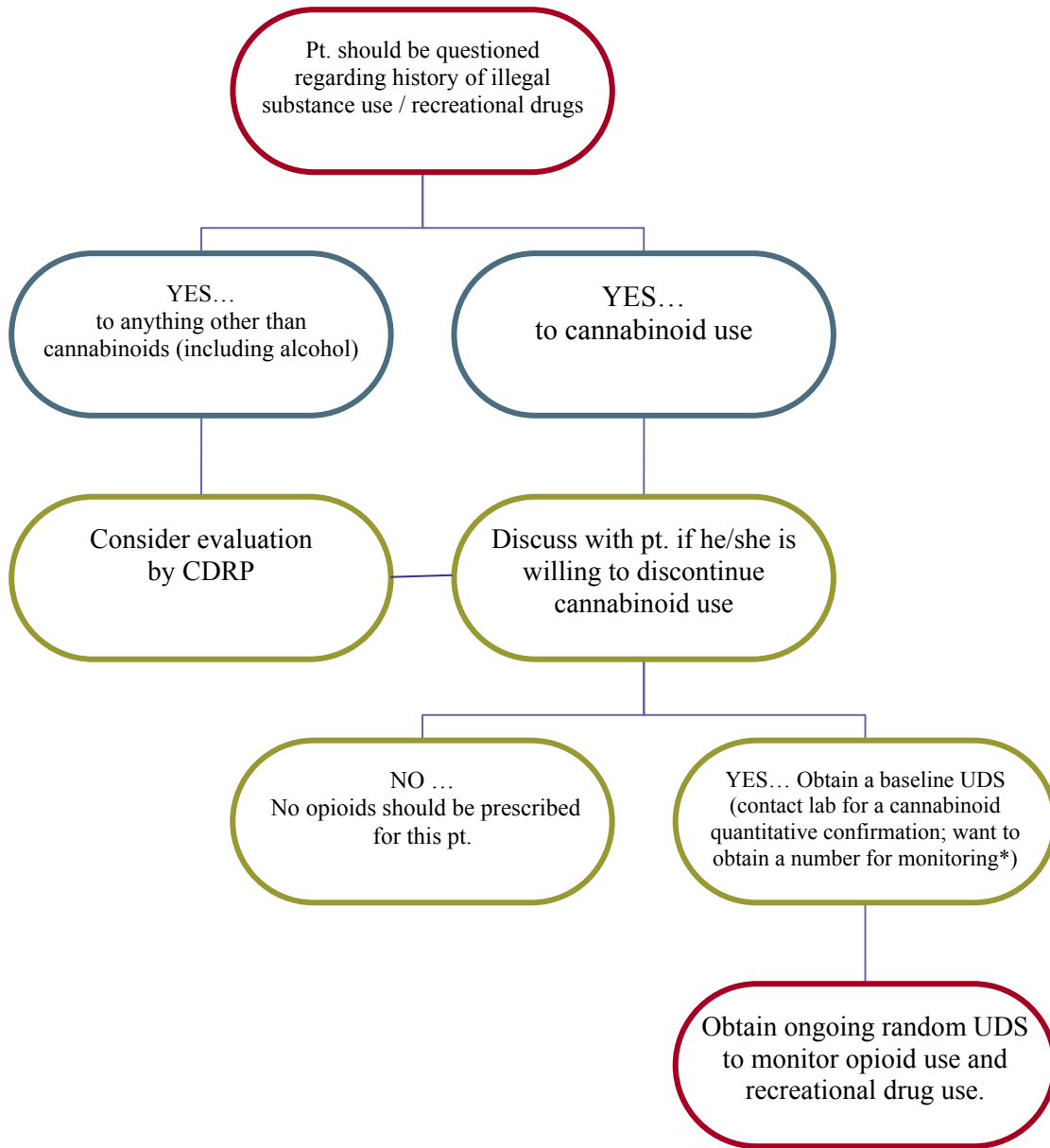
- a. Meperidine should not be used chronically for pain when considering toxicity.<sup>1a</sup>
- b. Propoxyphene is a non-formulary drug with marginal analgesic properties and significant toxicity especially in the presence of alcohol use.<sup>2a</sup>

UDS are intended to **screen** for patients who may be diverting, supplementing or abusing prescribed drugs or other illicit substances.  
**They are not intended to predict or determine the patient's dose vs. compliance.**

1a. Raymo LL, Camejo M, Fudin J. Eradicating analgesic use of meperidine in a hospital. AJHP. 2007;1150-1153.

2a. Jonasson Ulf, Jonasson B, Saldeen T. Correlation between prescription of various dextropropoxyphene preparations and their involvement in fatal poisonings. Forensic Science International. 1999. 103;125-132.

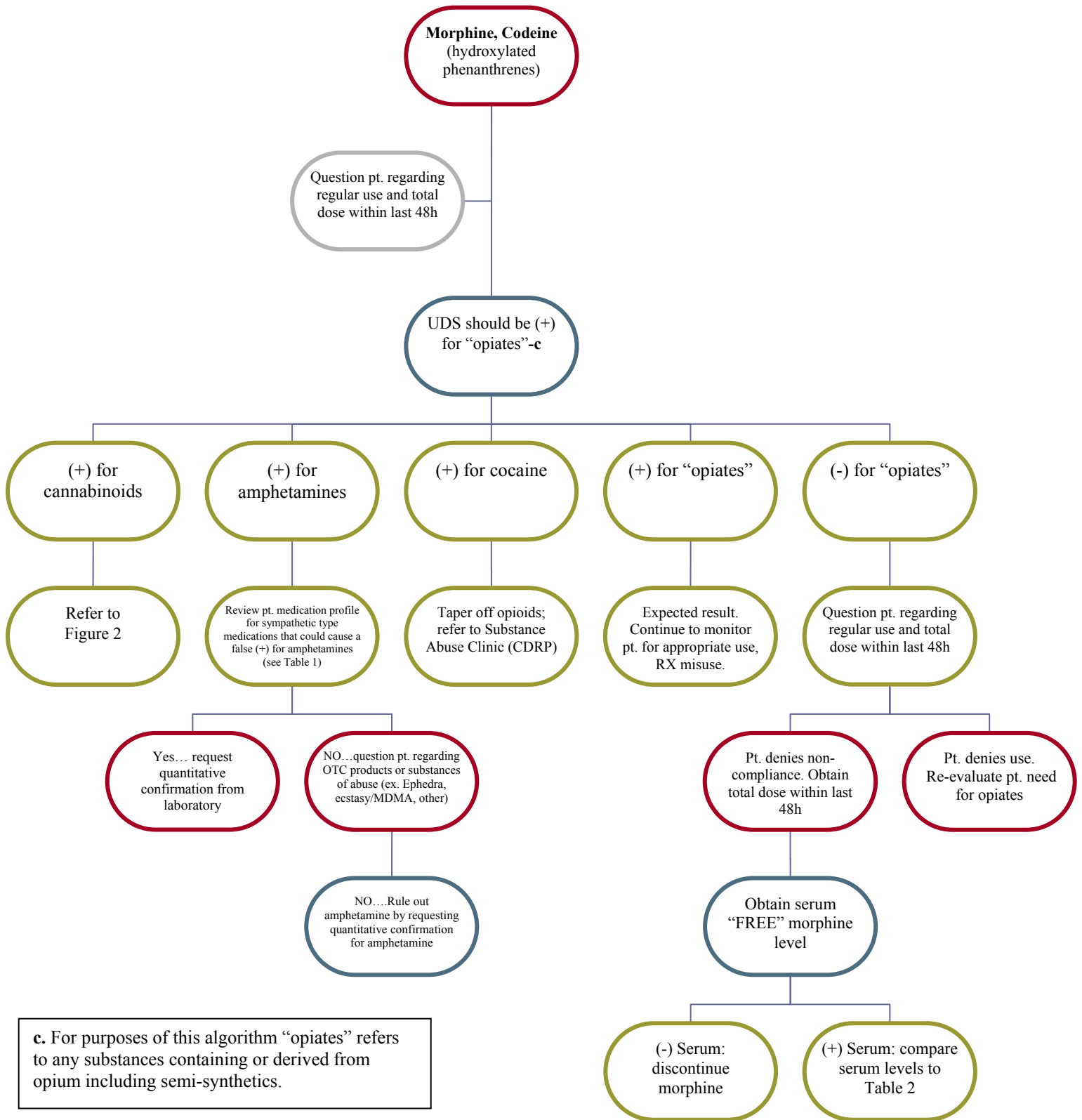
**Figure 2:** Is your patient a candidate for narcotic drug prescriptions?



\* In most cases, expect that there should be no cannabinoids present in the urine by day 21.

## Monitoring Urine Drug Screens

**Figure 3: Monitoring UDS for Morphine/Codeine**



**c.** For purposes of this algorithm “opiates” refers to any substances containing or derived from opium including semi-synthetics.

**Table 1:**

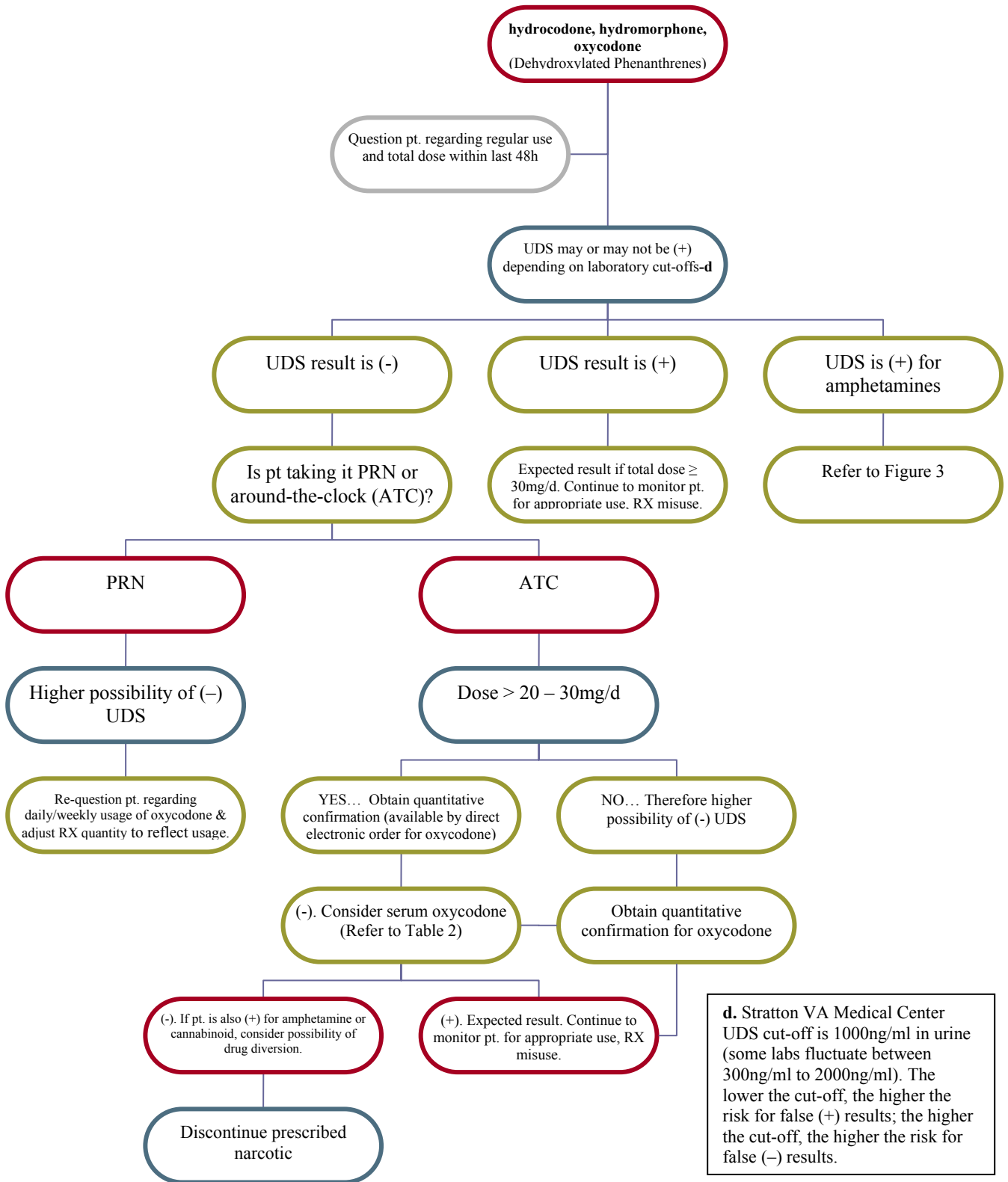
Examples of Drugs that may Cause False Positives for Amphetamines  
(Note: This table is not all inclusive.)

Any drug with a catecholamine nucleus:

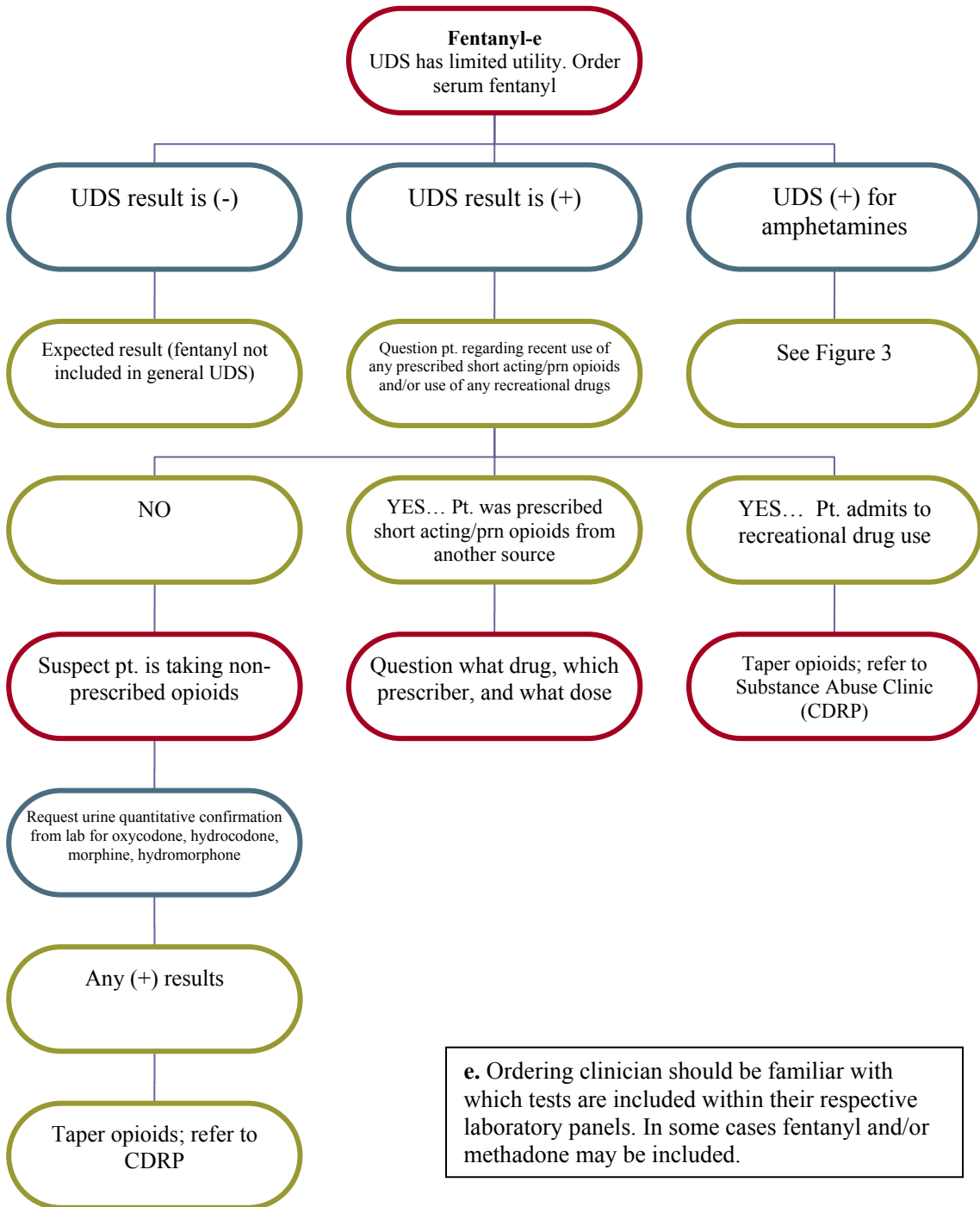
- Beta-blockers (including propranolol, atenolol, timolol ophthalmic)
- B-agonists
- Dopamine congeners (ex. levadopa, carbidopa, bupropion)
- Alpha –agonist catecholamines (chronic use of eye drops (Visine), nasal decongestants)
- Pseudoephedrine, phenylephrine, ephedra
- Afrin
- Adrenergic ophthalmic (ex. dipivefrin, timolol, levobunolol)

**NOTE:** Methylphenidate will NOT show (+) for amphetamines

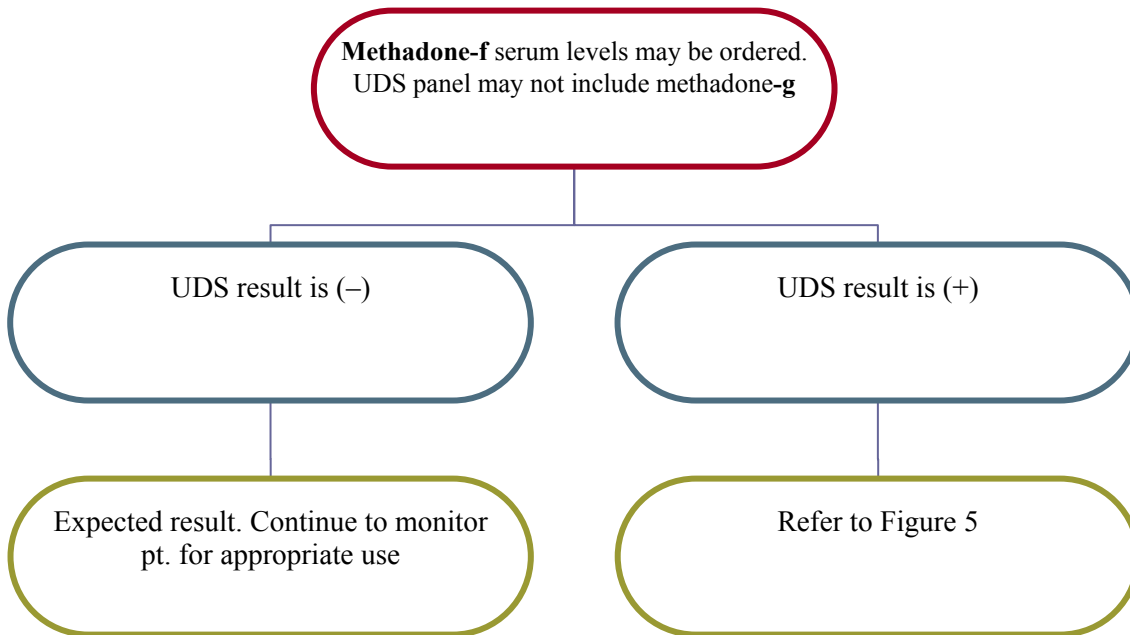
**Figure 4: Monitoring UDS for Oxycodone/Hydrocodone/Hydromorphone**



**Figure 5: Monitoring UDS for Fentanyl**



**Figure 6: Monitoring UDS for Methadone**



**f.** Methadone is CYP 3A4 substrate and is therefore prone to many drug interactions. Refer to Table 3 for a partial list of CYP 3A4 inhibitors and inducers which have the potential to interact with methadone

**g.** Stratton VA Medical Center UDS panel does not include methadone. Pain UDS panel does include methadone. Methadone UDS may be ordered as a single test. In some cases fentanyl and/or methadone may be included in the UDS panel (outside of Stratton VA). If pt. on  $\geq 20\text{mg/d}$  of methadone, urine should remain (+) for 3 days.

**Disclaimer: These flow charts are not comprehensive, are not all inclusive, and may not include every possible permutation presented by the patient. These flow charts are intended as a simple guide and ordering clinician MUST know which drugs are included in the urine drug screen panel.**

**References:**

1. Chronic Pain Treatment Guidelines. URL available online at: <[http://www.painmed.org/pdf/medical\\_treatment\\_utilization\\_schedule\\_guidelines.pdf](http://www.painmed.org/pdf/medical_treatment_utilization_schedule_guidelines.pdf)> August 2007 (P: 35-41).
2. Florate Jr, Orlando G. Urinary Drug Testing In Pain Management. Practical Pain Management. PPM Communications, Inc., Glen Mills, PA. April 2005 (P: 38-42).
3. PainEDU.org. Screener and Opioid Assessment for Patients with Pain (SOAPP)®Version 1.0. ©2008 Inflexxion, Inc. URL available online at: [http://painedu.org/soapp/SOAPP\\_24.pdf](http://painedu.org/soapp/SOAPP_24.pdf).
4. Probes, Laerence M. Opioid Blood Levels in Chronic Management. Practical Pain Management. PPM Communications, Inc., Glen Mills, PA. April 2005 (P: 12-18).
5. Veterans Health Administration, Department of Defense. VA/DoD Clinical Practice Guideline for the Management of Opioid Therapy for Chronic Pain. Washington (DC): Veterans Health Administration, Department of Defense; March 2003.
6. Virami, Adil; Mailis, Angela; Shapiro, Lori E; Shear, Neil H. Drug Interactions in Human Neuropathic Pain Pharmacology. © 1997 International Association for the Study of Pain. Pain 73 (1997) 3-13.

Courtesy of Jeffrey Fudin, Rph, BS, PharmD, DAAPM (CPS at Stratton VA Medical Center & Adjunct Associate Professor, Albany College of Pharmacy. And Riham Ywakim, PharmD Candidate, Albany College of Pharmacy. Data created and updated August 2008.

**Table 2**

**Opioid Pharmacokinetics and Expected Metabolites (Updated 06-2008)**

Data updated and revised by Antonio Rivera, Pharm.D. / Reviewed & Reformatted by Jeffrey Fudin, R.Ph., BS, Pharm.D., DAAPM

DRUG	Half-Life (Hrs <sup>a</sup> )	Time to Steady State (Hrs <sup>a</sup> )	Metabolites	Time to Peak Conc. (Hrs <sup>a</sup> )	Serum Predictability	Sample Time After Dose (Hrs <sup>a</sup> )	24 Hour Dose vs. Expected Serum Conc. (ng/mL)
OXYCODONE 1,3,24,28,27	IR=3.2 CR=4.5-8	IR = 17.5 CR = 24-38	Noroxycodone, Oxymorphone, Oxycodol, Oxymorhol, Noroxycodol	IR = 1.6 CR = 2.1-3.2	Y	IR = 1.4 +/-0.7 CR = 3.2 +/-2.2	IR 20mg = 16.6 +/-4.4 CR 20mg = 15.1 +/-4.7
MORPHINE 4,5,6,24,28,28,24	2-4	24	Morphine-3-glucuronide, Morphine-6-glucuronide, Normorphine, Codeine, 7,8-dihydromorphinone	IR = 1 CR = 2-3	Y	IR = 1.0 CR = 4.4	IR 40mg = 11.1 +/-8.4 CR 100mg = 36.9 +/-15.5
TRANSDERMAL FENTANYL 7,8,9,24	18-25	72	Norfentanyl, 4-N-(N-propionylanilino) piperidine, 4-N-(N-hydroxypropionylanilino) piperidine, 1-(2-phenethyl)-4-N-(N-hydroxypropionylanilino) piperidine	24-72	Y	25mcg/hr=38.1hrs 50mcg/hr=34.8hrs 75mcg/hr= 33.5hrs 100mcg/hr=36.8hrs	(800mcg = 0.6 +/-0.3) (1200mcg = 1.4 +/- 0.5) (1800mcg = 1.7 +/- 0.7) (2400mcg = 2.5 +/- 1.2) [XXXXmcg <sup>b</sup> ]
HYDROMORPHONE 10,11,12,24,28,24	2.5	12.5	Hydromorphone-3-glucuronide, Hydromorphone-3-glucoside, Dihydroisomorphine-6-glucuronide, Dihydroisomorphine-6-glucoside, Dihydroisomorphine, Dihydromorphine <sup>c</sup>	48-60 min.	Y	IR = 1.47	IR 48 mg = 19.7 +/- 4.04
CODEINE 13,14,24	2.5-3.5	12.5-17.5	Morphine, Norcodeine, Normorphine, Hydrocodone, Codeine 6-glucuronide	1-2	Y	IR = 1.1	IR 180mg = 222.9 +/- 48.9
HYDROCODONE 15,16,17,24,31	3.8-4.5	19-22.5	Hydromorphone, Norcodeine, 6-beta-hydrocodol, 6-alpha-hydrocodol, 6-beta-hydromorphol, 6-alpha-hydromorphol, norhydrocodone	1.3	?	N/A	N/A
METHADONE 18,19,22,24,32	24	~5 days	EDDP (2-ethyl-1,5-dimethyl-3,3-diphenylpyrrolinium), EMDP (2-ethyl-5-methyl-3,3-diphenylpyrroline)	2-4	Y	SS blood draw @ 24 hr post-dose, before subsequent dose, & after initial dose.	Linear drug levels increase 280ng/mL for every 1mg/kg consumed
HEROIN 21,22,23,24	~3 min. 1.7-6.3 min	~15 min.	6-acetylmorphine, Morphine, Morphine-3-glucuronide, Normorphine, 6-acetylmorphine 3-glucuronide, Normorphine glucuronide	10 minutes for I.M. dose <sup>d</sup>	Y	112mcg/min continuous infusion = 5min <sup>e</sup>	Heroin level = 57 ng/mL <sup>f</sup> 6-acetylmorphine level=15ng/mL <sup>f</sup>
LEVORPHANOL <sup>26</sup>	One dose 11-16hr Chronic dosing up to 30 hrs	72hrs	3-glucuronide	approximately 1	?		
PROPOXYPHENE <sup>28</sup>	3-12hs		Dextropropoxyphene, nordextropropoxyphene,	2-3			
Meperidine <sup>26,27</sup>	~3.6hr	3-6 days	Nomeperidine, meperidinic acid, nomeperidinic acid	1-1.5	?		
Oxymorphone <sup>29</sup> -IR, ER	IR = 7.2 - 8.4hr ER 9.4 - 11.3	IR = 3-4 days ER = 3 days	Oxymorphone-3-glucuronide, 6-OH-oxymorphone,	IR = 30mins ER = 3 hrs	IR=? ER=Y		IR ER = linear kinetics have been demonstrated in a dose proportional relationship

IR = Immediate Release Products, CR = Continuous Release products, SS = Steady State  
A-Hours, unless otherwise indicated  
B-Can detect heroin and 6-acetyl morphine within 10-15 minutes of parenteral administration  
C-Administered IV in a single patient over 180 minutes  
D-Cumulative amount of fentanyl release from patch dose in 24 hours.  
E-hydromorphone is 7,8-dihydromorphinone: Please note that morphine metabolism to hydromorphone has been confirmed in 8 mammals other than humans.  
There is only data that correlates the conversion of morphine to hydromorphone in humans.<sup>29</sup>

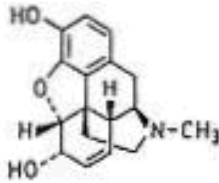
Courtesy of Jeffrey Fudin, RPh, BS, PharmD, DAAPM and Antonio Rivera, Pharm.D.

References for Table 2 immediately above and a larger printer friendly version are available online at [http://www.paindr.com/2008-06-02\\_Opioid\\_Metabolite\\_Chart\\_format.pdf](http://www.paindr.com/2008-06-02_Opioid_Metabolite_Chart_format.pdf)

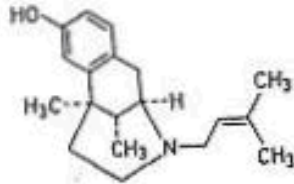
Figure 7

**Chemical Classes of Opioids**

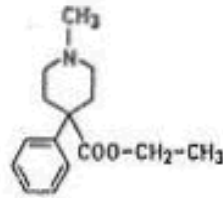
PHENANTHRENES



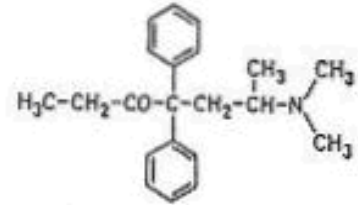
BENZOMORPHANS



PHENYLPIPERIDINES



DIPHENYLHEPTANES



**Rx  
EXAMPLES:**

MORPHINE  
morphine  
codeine  
hydrocodone\*  
hydromorphone\*  
levorphanol\*  
oxycodone\*  
oxymorphone\*  
buprenorphine\*  
nalbuphine  
butorphanol\*  
naloxone\*  
heroin (diacetyl-morphine)

PENTAZOCINE  
pentazocine  
diphenoxylate  
loperamide

MEPERIDINE  
meperidine  
fentanyl  
sufentanil  
alfentanil  
remifentanil

METHADONE  
methadone  
propoxyphene

**X-SENSITIVITY:**

PROBABLE

POSSIBLE

LOW RISK

LOW RISK

\*These agents lack the 6-OH group of morphine, possibly decreasing cross-sensitivity within the phenanthrene group.

Courtesy of Dr. Jeffrey Fudin (FudinJ@gmail.com)  
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**References:**

Fudin J, Levasseur DJ, Passik SD, Kirsh KL, Coleman J. Chronic pain management with opioids in patients with past or current substance abuse problems. *Journal of Pharmacy Practice*. 2003, 16;4:291-308

Reisine T, Pasternak G. Opioid analgesics and antagonists. In Hardman JG, Limbird LE, Molinoff PB, Ruddon RW, Gilman AG, eds. *Goodman and Gilman's The Pharmacological Basis of Therapeutics*. 9<sup>th</sup> ed. New York, NY: McGraw-Hill Companies; 1996:521-555.

Willette RE. Analgesic Agents. In: Wilson and Grisvold's *Textbook of Organic Medicinal Chemistry*. Ninth Edition, Editors: Delgado JN, Remers WA. JB Lippincott Company, Philadelphia, PA. 1991:629-654.

**Table 3:**

**CYP 3A4 Inhibitors and Inducers with the potential to interact with methadone**  
**This table is not all inclusive. Refer questions to a registered pharmacist.**

<b>Inhibitors</b>	<b>Inducers</b>
<i><b>Antidepressants</b></i>	Carbamazepine
Nefazadone	Dexamethasone
Fluvoxamine	Phenobarbital
Fluoxetine	Phenytoin
Sertraline	Rifampin
Paroxetine	
Venlafaxine	
<i><b>Azole Antifungals</b></i>	
Ketoconazole	
Itraconazole	
Fluconazole	
<i><b>Macrolide Antibiotics</b></i>	
Clarithromycin	
Erythromycin	
<i><b>Protease Inhibitors</b></i>	
Ritonavir	
Saquinavir	
Indinavir	
Nelfinavir	
<i><b>Others</b></i>	
Cimetidine	
Diltiazem	

Virami, Adil; Mailis, Angela; Shapiro, Lori E; Shear, Neil H. Drug Interactions in Human Neuropathic Pain Pharmacology. © 1997 International Association for the Study of Pain. Pain 73 (1997) 3-13.

**NOTE:** Inhibitors will decrease metabolism of substrates and generally lead to increased drug effect. Inducers will increase metabolism of substrates and generally lead to decreased drug effect. Some cytochrome P450 drug interactions have more or less therapeutic significance. Refer questions to a registered pharmacist.

**This form is a validated tool for assessing risk prior to placing patients on opioid therapy. For more information on this form, short versions of SOAAP, and other validated tools, see references on last page below.**

## SOAPP® Version 1.0

Name: \_\_\_\_\_ Date: \_\_\_\_\_

*The following are some questions given to all patients at the Pain Management Center who are on or being considered for opioids for their pain. Please answer each question as honestly as possible. This information is for our records and will remain confidential. Your answers alone will not determine your treatment. Thank you.*

Please answer the questions below using the following scale:

**0 = Never, 1 = Seldom, 2 = Sometimes, 3 = Often, 4 = Very Often**

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 1. How often do you feel that your pain is “out of control?”  | 0 | 1 | 2 | 3 | 4 |
| 2. How often do you have mood swings?   | 0 | 1 | 2 | 3 | 4 |
| 3. How often do you do things that you later regret?  | 0 | 1 | 2 | 3 | 4 |
| 4. How often has your family been supportive and encouraging?   | 0 | 1 | 2 | 3 | 4 |
| 5. How often have others told you that you have a bad temper?   | 0 | 1 | 2 | 3 | 4 |
| 6. Compared with other people, how often have you been in a car accident?   | 0 | 1 | 2 | 3 | 4 |
| 7. How often do you smoke a cigarette within an hour after you wake up?   | 0 | 1 | 2 | 3 | 4 |
| 8. How often have you felt a need for higher doses of medication to treat your pain?                                    | 0 | 1 | 2 | 3 | 4 |
| 9. How often do you take more medication than you are supposed to?  | 0 | 1 | 2 | 3 | 4 |
| 10. How often have any of your family members, including parents and grandparents, had a problem with alcohol or drugs? | 0 | 1 | 2 | 3 | 4 |
| 11. How often have any of your close friends had a problem with alcohol or drugs?                                       | 0 | 1 | 2 | 3 | 4 |

- |   |           |
|---|-----------|
| 12. How often have others suggested that you have a drug or alcohol problem?                              | 0 1 2 3 4 |
| 13. How often have you attended an AA or NA meeting?  | 0 1 2 3 4 |
| 14. How often have you had a problem getting along with the doctors who prescribed your medicines?        | 0 1 2 3 4 |
| 15. How often have you taken medication other than the way that it was prescribed?                        | 0 1 2 3 4 |
| 16. How often have you been seen by a psychiatrist or a mental health counselor?                          | 0 1 2 3 4 |
| 17. How often have you been treated for an alcohol or drug problem?                                       | 0 1 2 3 4 |
| 18. How often have your medications been lost or stolen?  | 0 1 2 3 4 |
| 19. How often have others expressed concern over your use of medication?                                  | 0 1 2 3 4 |
| 20. How often have you felt a craving for medication?   | 0 1 2 3 4 |
| 21. How often has more than one doctor prescribed pain medication for you at the same time?               | 0 1 2 3 4 |
| 22. How often have you been asked to give a urine screen for substance abuse?                             | 0 1 2 3 4 |
| 23. How often have you used illegal drugs (for example, marijuana, cocaine, etc.) in the past five years? | 0 1 2 3 4 |
| 24. How often, in your lifetime, have you had legal problems or been arrested?                            | 0 1 2 3 4 |

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