The Case of Angry Adam: How to correctly interpret a urine drug screen result

June 2018 VIP Chat

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Noon-12:30 MST

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Vulnerable Veteran – Innovative PACT (VIP) & VIP Chats

- **VIP Goal:**
  - The VISN 19 VIP (Vulnerable Veteran – Innovative PACT) Initiative's over-arching goal is to **improve the health of veterans who are particularly vulnerable due to medical disease and/or their social determinants in primary care environments**
  - Veterans served by this Initiative include those with unhealthy alcohol and drug use, co-occurring pain and/or addiction disorders, social determinants of health including homelessness, and those who frequently use health care services
- **VIP "Chat" Goal:**

  To provide education, mentorship, and foster a learning collaborative to improve the knowledge and skills of health care providers in VISN 19
- The chats are generally scheduled for the **4th Wednesday of each month**
- All health care providers are welcome to join! – ***FUN***!
- Please note this presentation is ***recorded and archived***
  - VIP sharepoint site (VA only): www.tinyurl.com/vip-initiative

Disclosures and Acknowledgements

- I have no personal fiduciary conflicts of interest
- I work full time for the Salt Lake City VA Health Care System and the University of Utah
- The views expressed in this presentation are solely my own and do not necessarily reflect the position or policy of the Department of Veterans Affairs or the United States government or any other university or organization

- The VIP Initiative and these “chats” are sponsored by VA’s Veteran Integrated Service Network 19 (VISN 19) and the VA Salt Lake City Health Care System

AGENDA

- Introduction and Case (10 minutes)
- “Bite Sized Teach” (BST or “Beast Mode”) (15 minutes)
- Discussion (5 minutes)
  - Extended discussion (optional) (30 minutes)

youtu.be/dJ_8QmHlNPw.medicine.emory.edu/education/academy-of-medical-educators/bst-mode.html

TODAY's GOALs

- Understand the role of urine drug screens in the monitoring of patients on opioids
- Understand the role of urine drug screens for patient on opioid agonist treatment
- Correctly interpret a variety of urine drug screen results

CASE 1: Adam's Chief Complaint

- Adam is a 49 year old male Veteran who presents to your primary care clinic
- He has been your patient for 10 years
- He recently was diagnosed with stage 4 colon cancer
- He has been placed on opioids for pain s/p a colon resection
- Otherwise, he is healthy except he has had a "cold" recently
- He admits to having a lot of stress and has been hanging out with his college "hippy buddies" recently. "My wife doesn't like them"
- You have called him in to discuss his urine toxicology report

CASE 1: Adam's history

- **Past Medical History:**
  - Nicotine use disorder – he smokes ½ pack per day
- **Social history:**
  - Was in the Navy
  - Divorced and remarried
  - Works in healthcare
- **Family history:**
  - Mother and Father are alive and well
  - Three children – no diseases

CASE 1: Adam's Medications/Studies

- **Allergies:**
  - None
- **Medications:**
  - Oxycodone 5mg po q6 hours prn
- **Labs/Studies:**
  - Urine drug screen:
    - Morphine **negative**
    - Cocaine **negative**
    - Amphetamine's **positive**
    - 6-AM **negative**
    - Marijuana **negative**

CASE 1 : Adam’s conundrums

- Interpret the lab result.

- What would you say to Adam?
- What actions would you take?

TODAY's GOALs

- **Understand the role of urine drug screens in the monitoring of patients on opioids**
- Understand the role of urine drug screens for patient on opioid agonist treatment
- Correctly interpret a variety of urine drug screen results

General Goals of Drug Testing

- Important and routine component of treatment for all patients on on opioids.
- Testing is not meant to "catch" the patient
- A positive (or negative result) should be interpreted cautiously
- A positive test result should not simply lead to discharge from treatment, but an opportunity for reviewing the current plan

- Basically, drug testing procedures and follow up should be similar to other tests we routinely do
  - Are we punitive when someone's glucose is high?
  - Are we punitive when someone's cholesterol is high?

General Goals of Drug Testing

- Think of Urine Drug Screen results as a test on the PROVIDER's treatment quality
  - Do you need to change care?
  - Do you need to intensify care?

- Think of Urine Drug Screens as akin to HBa1c results
  - Monitoring TREATMENT over time….

Drug Testing in the Office

- Ideally laboratory testing could be:
  - Random
  - Observed
  - Convenient for the patient
  - High quality
  - Able to offer timely result

Screening and Confirmatory Tests

SCREENING TESTS

- Relatively rapid
- Inexpensive
- Usually immunoassay
- Performed in lab or point-of-care testing (POCT)
- Results are PRESUMPTIVE until confirmed by a more definitive test
- Good for initial check (negative)

CONFIRMATORY TESTS

- Usually time consuming
- Expensive
- Usually chromatography and spectrometry
- Likely performed in certified lab
- More PRECISE and more SPECIFIC
- Results considered definitive
- Not needed all the time…

What IS in a typical *screening* test

- Opiates (detects morphine, codeine, and metabolites)
- Benzodiazepine
- Cannabinoids
- Amphetamines
- Cocaine metabolite (benzoylecgonine)

What is NOT in a typical *screening* test

- Buprenorphine (and nor-buprenorphine)
- Fentanyl
- Oxycodone
- Methadone
- Benzodiazepines
- Alcohol metabolite (ethyl glucuronide or ethyl sulfite)

Sample Authenticity

- Urine samples can be altered
  - Adding a substance so that it appears to have been ingested (adulterant)
  - Diluting with water to decrease chances of detecting that are substances present
  - Providing a sample produced earlier or by another person

How to beat a drug test – A future VIP Chat!

Sample Authenticity

- Some of these can be detected by examining physical characteristics of the urine
  - Temperature
  - Specific Gravity
  - Creatinine

Characteristic	Normal Range
Temperature*	90-100 F
pH	4.5 to 8
Creatinine	> 20 mg/dL
Specific gravity	> 1.002 to 1.030

* within 4 minutes of collection

Duration often results in urine drug tests

Substance	Duration
Alcohol Ethyl glucuronide	7-12 hours 2-5 days
Amphetamine	2 days
Benzodiazepines (short-acting, e.g. lorazepam) Benzodiazepines (long-acting, e.g. diazepam)	3 days 30 days
Buprenorphine	4-10 days
Cocaine	2-4 days
Ethyl glucuronide	2-6 days
Heroin or morphine	1-3 days
Marijuana (single use) Marijuana (chronic use)	3 days 30+ days
Opioids	2-4 days

Moeller et al., Mayo Clinic Proc. 2017

Poppy Seeds and Opioids

- Poppy seeds can contain ***codeine*** and ***morphine*** in amounts detectable on UDT after ingestion, including after eating poppy-seeded baked goods such as bagels or pastries
- Because morphine and codeine are actually present in the seeds:
  - positive results due to poppy seeds are chemically indistinguishable from those due to use of opiates, even with confirmatory testing
- Patients being tested for opioids should be advised to avoid poppy seeds and foods containing them
  - abstinence from poppy seed-containing foods may be included as part of a treatment agreement in order to allow informative testing for opioid use
- Concentrations of codeine and morphine > 2000 ng/ml are generally considered to suggest opioid use rather than poppy seed ingestion
  - Therefore consider confirmatory/quantification testing

Moeller et al., Mayo Clinic Proc. 2017

Opioid metabolism

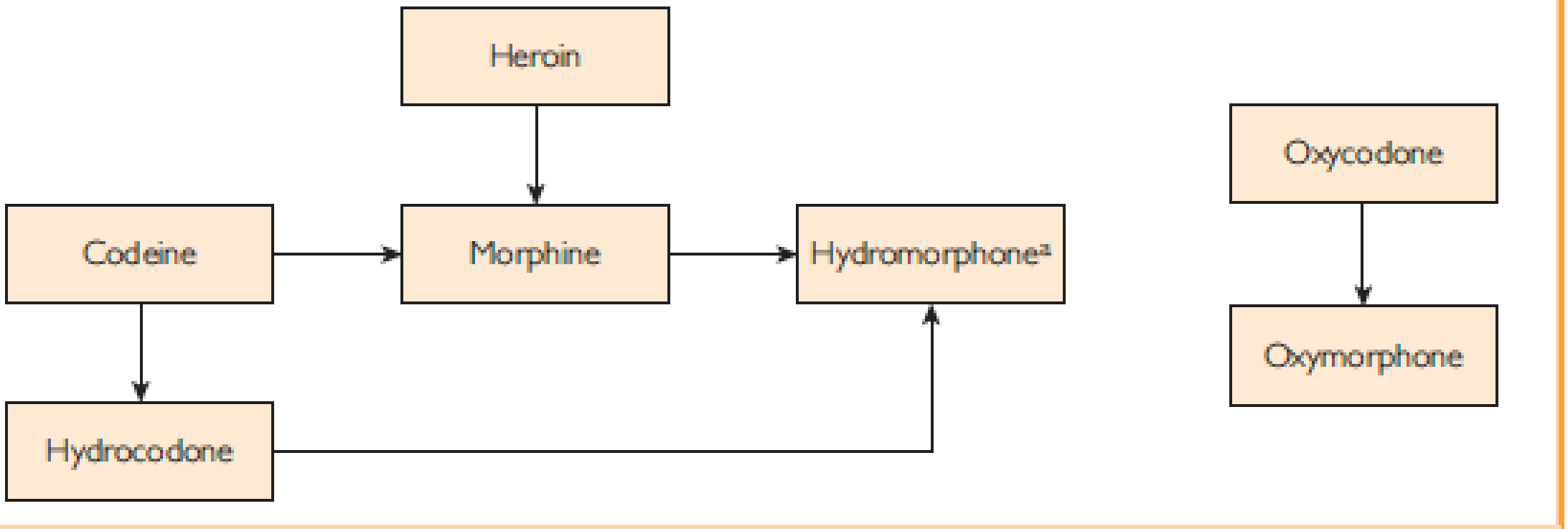


FIGURE 1. Metabolism of opioids.[136,141] [a]Morphine is metabolized to hydromorphone in very small amounts.

Moeller et al., Mayo Clinic Proc. 2017

Benzodiazepine metabolism

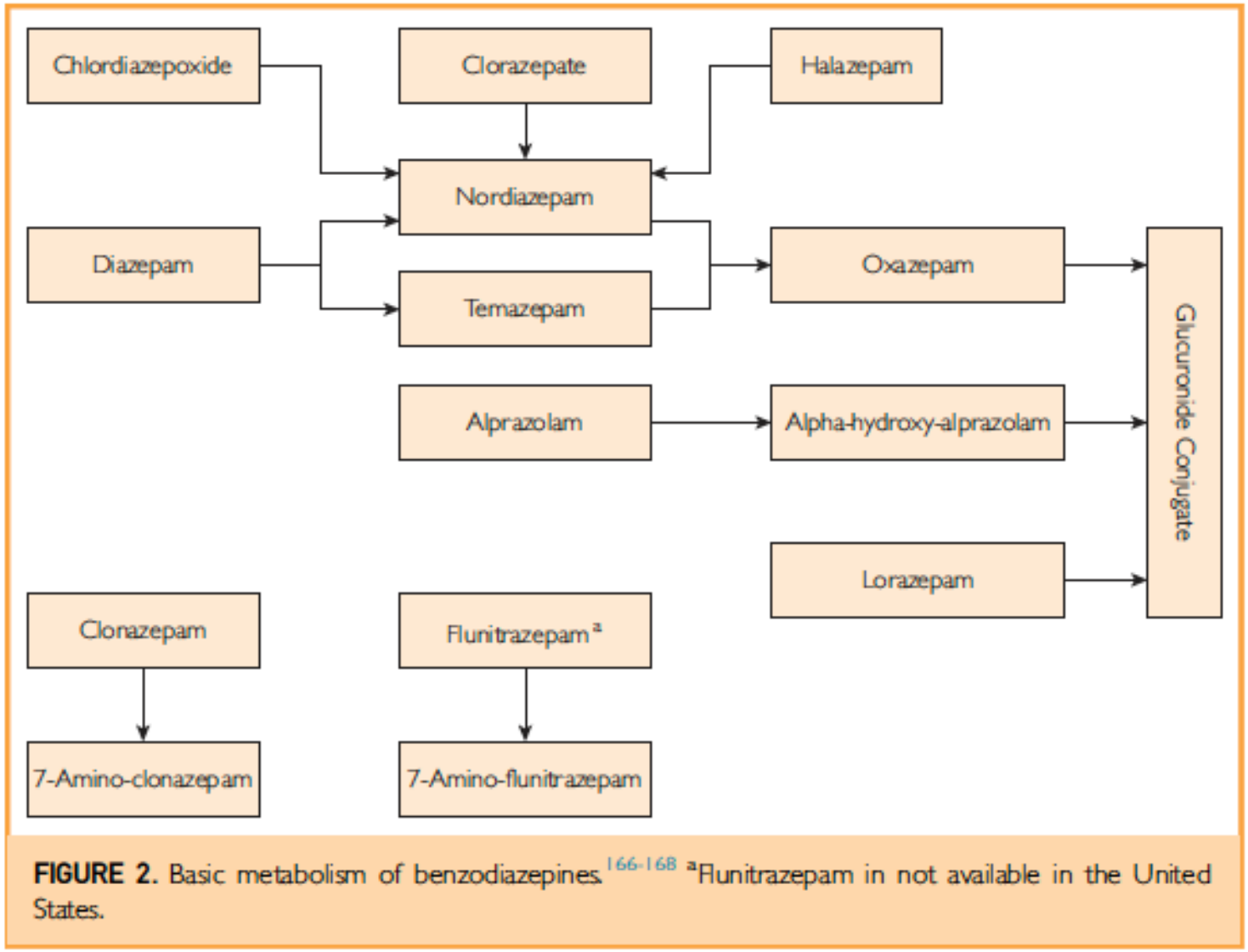


FIGURE 2. Basic metabolism of benzodiazepines.[166-168] [a]Flunitrazepam in not available in the United States.

Moeller et al., Mayo Clinic Proc. 2017

CASE 1: Adam's conundrums???

- **Interpret the lab result**
- **What would you say to Adam?**
- **What actions would you take?**

RECALL:

On oxycodone

UDS results:

Morphine	**negative**
Cocaine	**negative**
Amphetamine's	**positive**
6-AM	**negative**
Marijuana	**negative**

What about Amphetamine result?

- False “positive”!

Screening test	Reported causes of false positives (*not* comprehensive)
Amphetamines	amantadine aripiprazole bupropion *l*-methamphetamine (present in some nasal sprays) phenylephrine pseudoephedrine
Benzodiazepines	sertraline
Cannabinoids	NSAIDs proton pump inhibitors
Fentanyl	trazodone
Methadone	diphenhydramine doxylamine
Opiates	dextromethorphan

Moeller et al., Mayo Clinic Proc. 2017

CASE 2: Angry Adam's Chief Complaint

- Adam is a 49 year old male Veteran who presents to your primary care clinic
- He has been your patient for 10 years
- He is on buprenorphine/naloxone for opioid use disorder
- You have called him in to discuss his urine toxicology report

CASE 2: Angry Adam's history

- **Past Medical History:**
  - Opioid Use Disorder (OUD)
  - Nicotine use disorder – he smokes ½ pack per day
- **Social history:**
  - Was in the Navy
  - Divorced and remarried
  - Works in telecommunication
- **Family history:**
  - He is adopted
  - Three children – no diseases

CASE 2: Angry Adam's Medications/ Studies

- **Allergies:**
  - None
- **Medications:**
  - Buprenorphine/naloxone 8/2mg qd
- **Labs/Studies:**
  - Urine drug screen:
    - Morphine — negative
    - Cocaine — negative
    - Amphetamine — negative
    - 6-AM — **positive**
    - Marijuana — negative
    - Buprenorphine — **positive**
    - Nor-buprenorphine — **negative**

CASE 1 : Angry Adam’s conundrums

- Interpret the lab result.

- What would you say to Adam?
- What actions would you take?

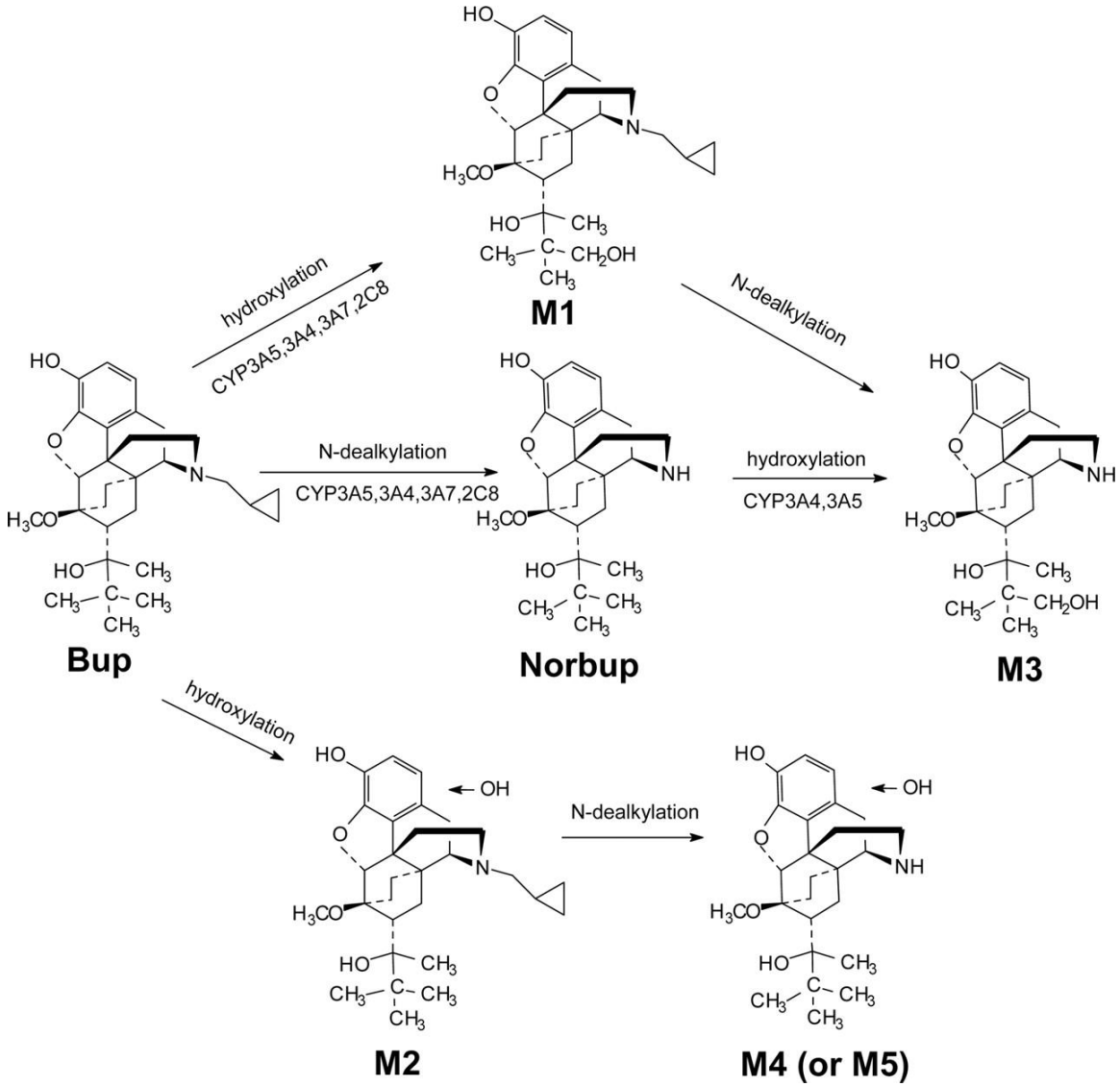
Drug Testing in the Office for Medication Treatment

- Laboratory testing for evidence of substance use has several roles in treatment for opioid use disorder
  - Initial assessment
  - Treatment planning
  - Screening to identify non-prescribed substances/medications
  - Monitoring adherence to pharmacotherapy
  - Evaluating efficacy of treatment and assist in treatment planning

Testing for Buprenorphine

- Testing for buprenorphine can be useful to monitor adherence and detect possible diversion
- Buprenorphine is **not** detected by screening tests for opiates
- Confirmatory testing will distinguish buprenorphine and its metabolite norbuprenorphine
- Individuals vary in the ratio of buprenorphine to norbuprenorphine due to individual metabolism and co-administered inducers or inhibitors of CYP3A4
  - buprenorphine with little or no metabolite (i.e. a ratio of norbuprenorphine:buprenorphine: < 0.02) suggests that a sample was tampered by adding buprenorphine directly to the urine

Testing for Buprenorphine



Nor-Buprenorphine is an active metabolite

So what if the test result is wrong? Talk to your team!

- Develop policies ahead of time of specific consequences of positive tests specified by presence or absence of prescribed medications
- Incorporate policy into the signed treatment agreement
- Consider additional steps
  - Review medication dose – may need to increase dose
  - Intensity of treatment
    - More frequent visits
    - observed dosing
    - additional evidence-based counseling
    - addressing co-occurring disorders
  - Frequency of testing can be increased
- Discuss with multi-disciplinary treatment team in clinic

So what if the test result is wrong? Talk to patient!

- Discuss rationale for testing
  - Means of supporting recovery, not for punitive purpose
- Review test?
  - Results, pH, urine concentration
- Review medication list?
  - Consider possibility of false-positive
  - Consider discussing with an expert (pathologist, pharmacist, chemist)
- Confirmatory testing?
- Review Goals of Care
  - Discuss changes in treatment plan
  - Review consequences of continued use of illicit/non-prescribed substances

Frequency of Testing in MAT Controversial

- No strict, established guidelines or specific evidence to guide frequency
- Frequency of UDT depends on several factors:
  - Stage of Treatment
    - Monthly testing has been suggested as a minimum during ongoing addictions treatment
    - More frequent testing may be more appropriate early in treatment or if there is concern for diversion or recurrence of substance use
  - Stability of Patient
  - Half-life of drugs being tested
  - Treatment setting
    - Office based
    - Opioid Treatment Programs: Federal law mandates a minimum of ***eight*** drug tests per year
- Random testing, rather than at appointments or other pre-scheduled times, is recommended in order to obtain a representative sample

CASE 1 : Angry Adam's conundrums

- **Interpret the lab result.**
- **What would you say to Adam?**
- **What actions would you take?**

RECALL:

Patient on buprenorphine

Urine drug screen:

Morphine	**negative**
Cocaine	**negative**
Amphetamine	**negative**
6-AM	**positive**
Marijuana	**negative**
Buprenorphine	**positive**
Nor-buprenorphine	**negative**

DISCUSSION

Next VIP CHAT!

Wednesday, July 25, 2018 Noon-12:30 PM **(ALWAYS 4th Wednesday of the month)**

The case of Remy the Remote Veteran – How do to Home Induction of Buprenorphine