

UNC SON **ECHO** ABC for MOUD

Addiction and Behavioral Clinic for Medication for Opioid Use Disorder Treatment

URINE DRUG SCREENING: PEARLS AND PITFALLS

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at Chapel Hill
School of Nursing



Disclosures

- I have nothing to disclose.

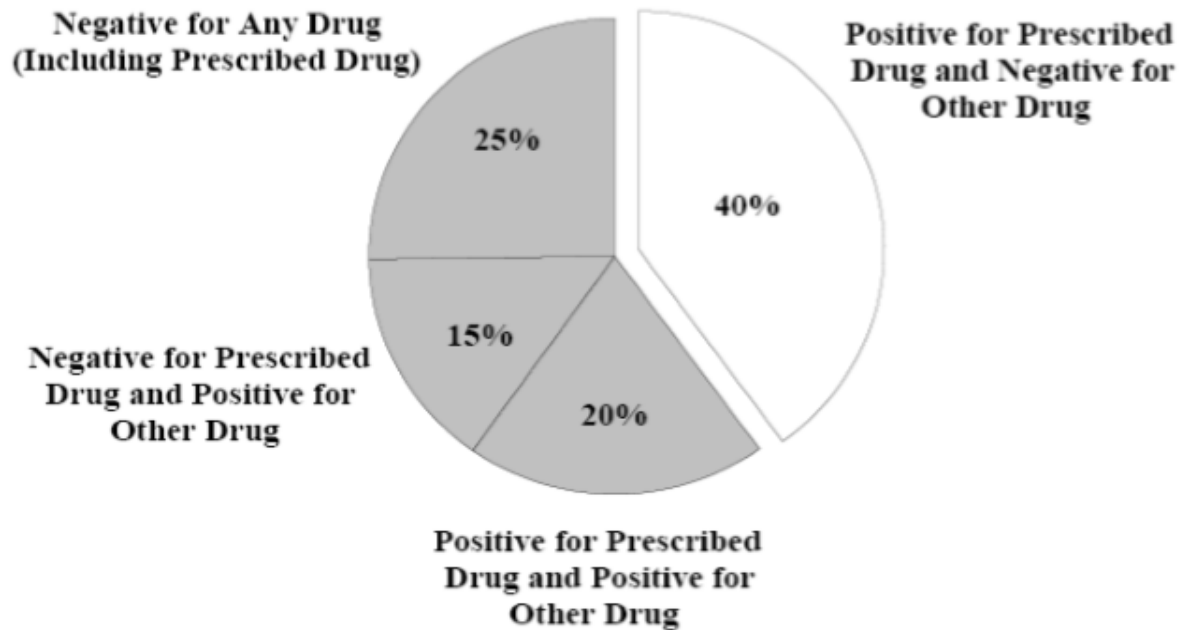


Objectives

- Describe how to utilize drug screening in clinical practice.
- Review cases to highlight pearls and pitfalls of utilizing urine drug screens in primary care settings.
- Discuss strategies to engage patients in difficult conversations around discordant results.

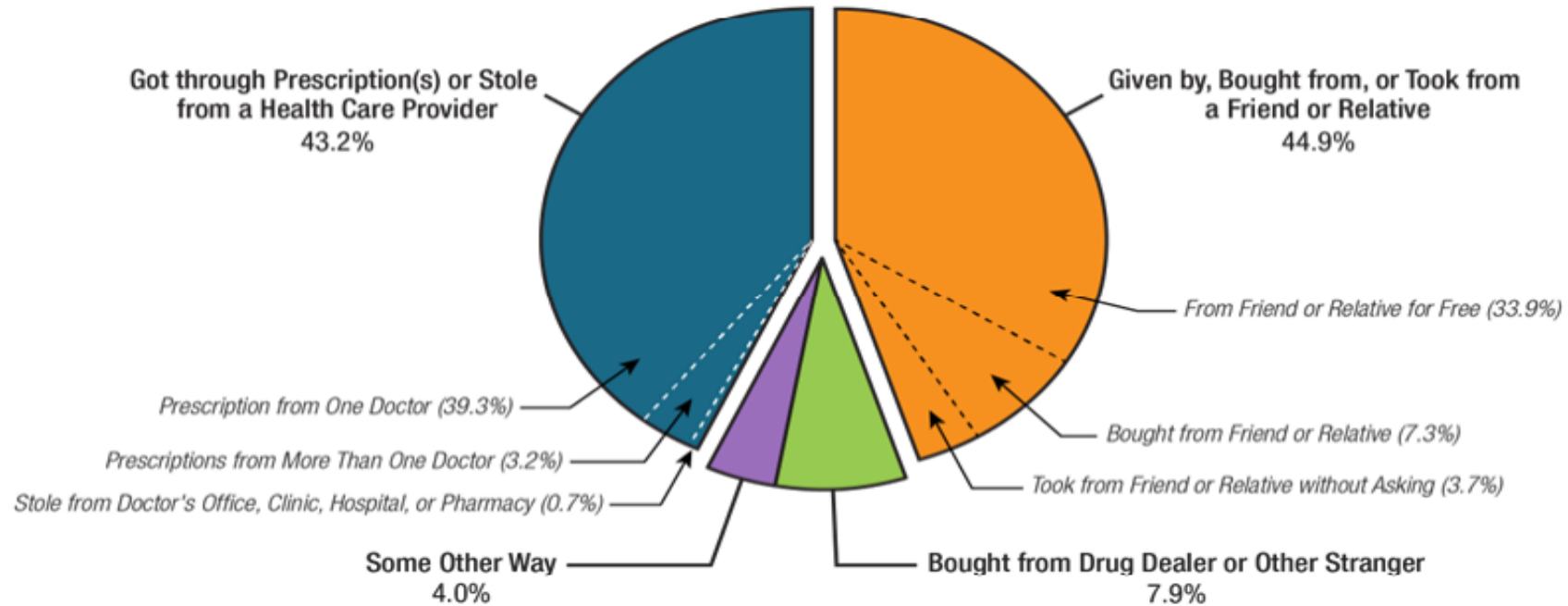
Role for Drug Testing

Figure 4. Percentage of Patients Referred to Quest Diagnostics Laboratories for Drug Testing by Their Physicians Testing Positive and Negative for Drugs Prescribed for Them, 2012.¹⁰²



Center for Substance Abuse Research, 2013

Source Where Pain Relievers Were Obtained for Most Recent Misuse: Among People Aged 12 or Older Who Misused Pain Relievers in the Past Year; 2021



8.7 Million People Aged 12 or Older Who Misused Pain Relievers in the Past Year

Note: Respondents with unknown data for the Source for Most Recent Misuse or who reported Some Other Way but did not specify a valid way were excluded.



What a Drug Test does NOT tell you:

DRUG TESTS CANNOT:

- Prove that a substance *hasn't* been taken
- Identify every substance that may have been taken
- Detect if the patient is intoxicated/impaired
- Rule out or diagnose a Substance Use Disorder!

<https://www.erowid.org/>





What a Drug Test DOES tell you:

Drug tests measure if:

- **Particular drug** is in the patient's sample (urine, blood, saliva, etc)
- Drug is present at a specific **point in time**

Drug Testing in Different Contexts

Drug testing in different contexts

Context



Question

Is the individual violating their parole?
Did the individual drive while intoxicated?

Was the employee intoxicated?
Is the employer financially responsible for the
worker's injury?

Has the patient recently used these *specific* substances
(drugs or medications)?
Which clinical approach is most likely to help the
patient?



Current Issues with UDS...

Research Letter

Urine Drug Screening for Isolated Marijuana Use in Labor and Delivery Units

Alexandra Rubin, MD, Lydia Zhong, BA, Lauren Nacke, LCSW, MSW, Candice Woolfolk, PhD, MPH, Nandini Raghuraman, MD, MSCI, Ebony Carter, MD, MPH, and Jeannie Kelly, MD, MS

Isolated marijuana use is frequently used as an indication for urine drug screening in labor and delivery units. We aimed to identify the results of urine drug screening in a labor and delivery unit for isolated marijuana use. This retrospective cohort study reviewed data from patients

of isolated marijuana use as a criterion for urine drug screening thus appears limited in benefit but rife with inequitable potential to harm.

(Obstet Gynecol 2022;140:607-9)
DOI: 10.1097/AOG.0000000000004930



Title: URINE TOXICOLOGY TESTING for Medical Indications in the Zuckerberg San Francisco General Birth Center and Nursery

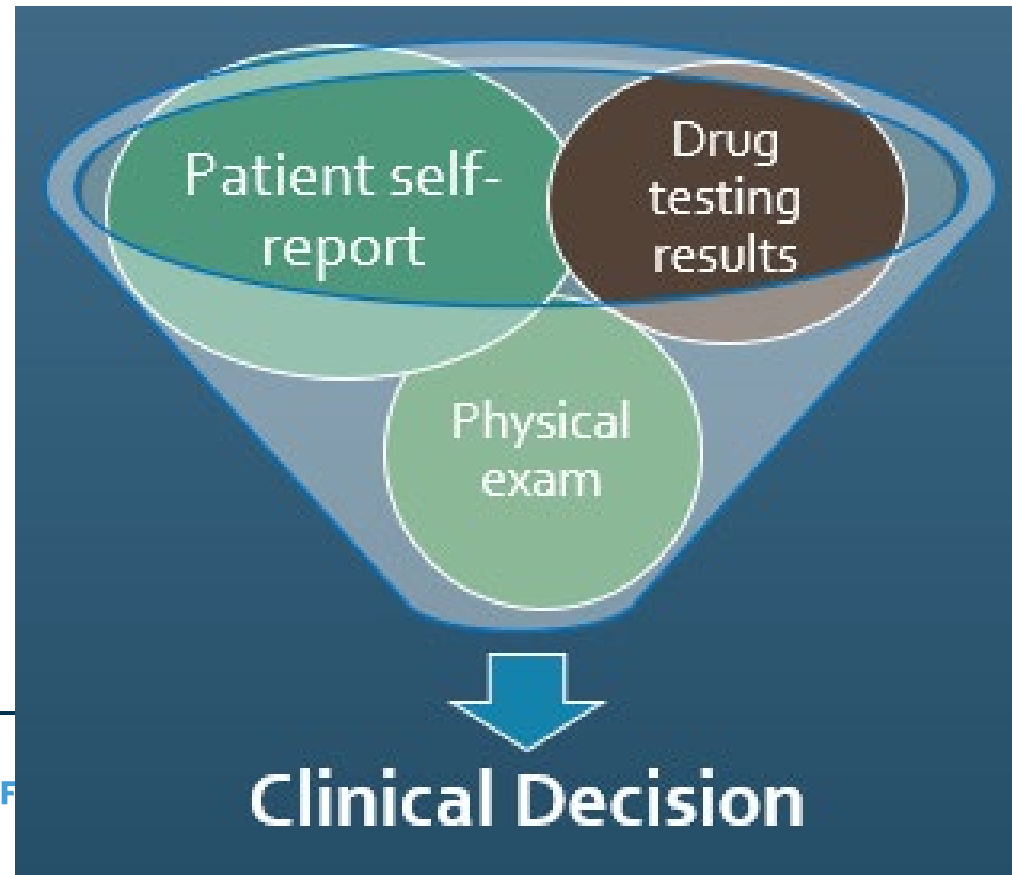
Date(s) revised: 08/10/2021

Purpose of Policy

1. Minimize bias, discrimination, and punitive use of urine toxicology in caring for patients and families.
2. Care for birthing people and infants exposed to substances putting them at high risk for needing specific clinical interventions.
3. This policy is not intended to replace the clinical judgment of a substance use treatment team in using urine drug testing to monitor treatment. It is intended to guide screening outside the context of ongoing treatment.

Clinical Decision Making

- Drug testing results are just ONE component



Window of Detection for Various Sample Types

Exhibit 2-1. Window of Detection for Various Matrices

Matrix	Time*						
Breath	Minutes	Hours					
Blood	Minutes	Hours					
Oral Fluid	Minutes	Hours					
Urine	Hours	Days					
Sweat†	Hours	Days					
Hair‡	Days						
Meconium	Days	Weeks					
	Minutes	Hours	Days	Weeks	Months	Years	

*Very broad estimates that also depend on the substance, the amount and frequency of the substance taken, and other factors previously listed.

†As long as the patch is worn, usually 7 days.

‡7–10 days after use to the time passed to grow the length of hair, but may be limited to 6 months hair growth. However, most laboratories analyze the amount of hair equivalent to 3 months of growth.

Sources: Adapted from Cone (1997); Dasgupta (2008).

Each sample type has its own limitations and benefits; consult with a clinical pathologist or toxicologist to determine the best testing for your needs

Urine Drug Testing

- Easy to collect, but requires a bathroom
- May be observed or unobserved
 - Observed does not necessarily prevent tampering
 - Observed urine collection may be distressing for some patients with a history of trauma (sexual trauma)
 - If using an observer, choose staff member of same gender
- Prone to tampering
 - Dilution
 - Addition of interfering substance
 - Substitution with another person's urine
- Options for testing for sample integrity
 - Temperature
 - pH
 - Specific gravity
- Standardized collection protocol

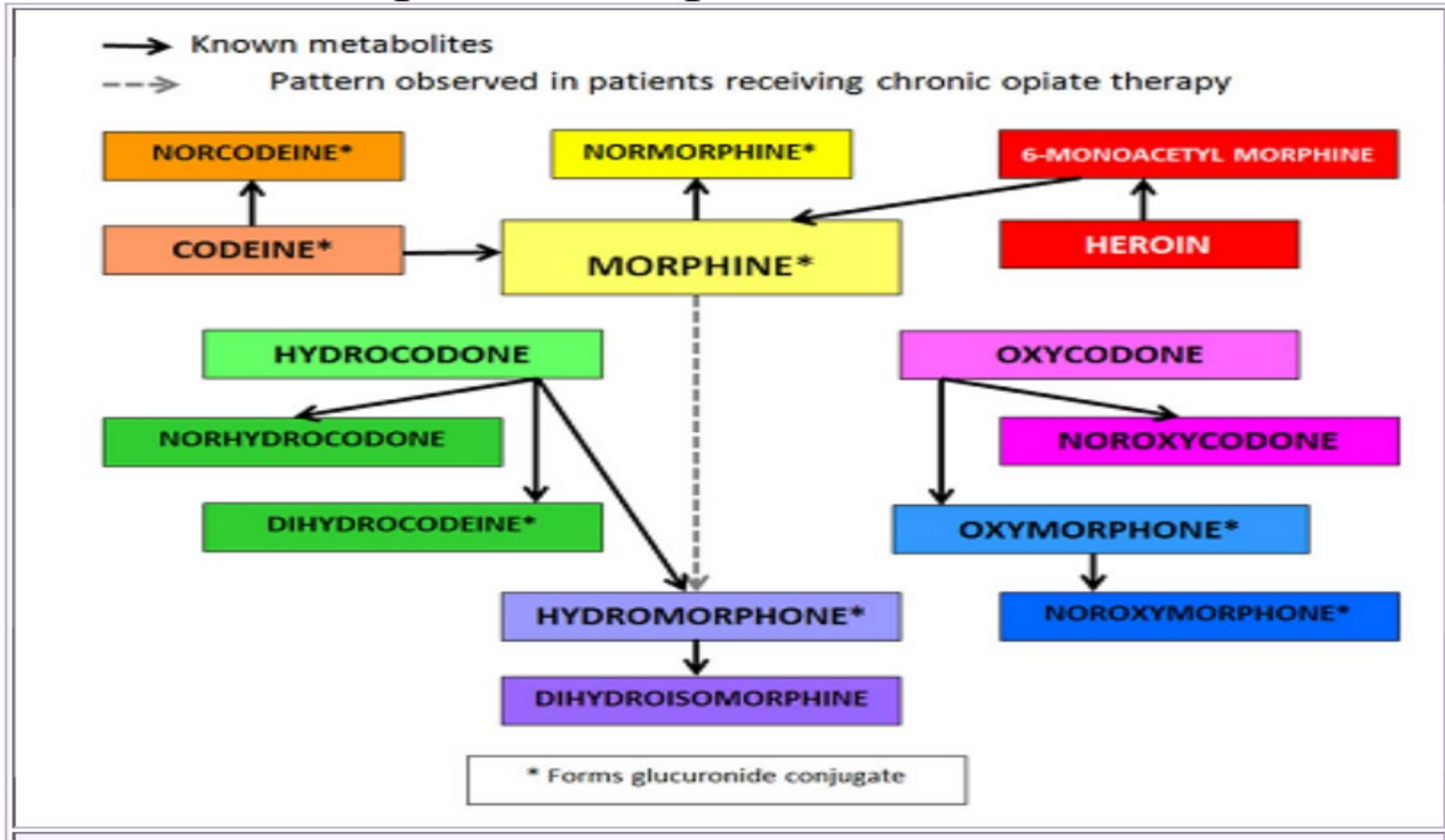


Case #1

- 35 yo F reports taking her oxycodone daily. She presents for a urine drug screen:
- Explanation?
- Opiate (natural) vs. Opioid (synthetic)
 - Morphine, codeine, opium
 - Oxycodone, tramadol, buprenorphine, heroin, fentanyl

Component	Ref Range & Units	3/23/20 1453
<input checked="" type="checkbox"/> Amphetamines Screen, Ur	Not Applicable	<500 ng/mL
<input checked="" type="checkbox"/> Barbiturates Screen, Ur	Not Applicable	<200 ng/mL
<input checked="" type="checkbox"/> Benzodiazepines Screen, Urine	Not Applicable	<200 ng/mL
<input checked="" type="checkbox"/> Cannabinoids Screen, Ur	Not Applicable	<20 ng/mL
<input checked="" type="checkbox"/> Methadone Screen, Urine	Not Applicable	<300 ng/mL
<input checked="" type="checkbox"/> Cocaine(Metab.)Screen, Urine	Not Applicable	<150 ng/mL
<input checked="" type="checkbox"/> Opiates Screen, Ur	Not Applicable	<300 ng/mL

Opioid and Opiate Metabolism



Expected Results on UDS for Opioids

Table. Expected Results on Urine Drug Screening (UDS) for Commonly Encountered Opiates, Semisynthetic Opioids, and Synthetic Opioids^a

Substance	Significant metabolites	Detected by standard UDS?	Specialized UDS available?
Opiates (natural products from the poppy plant, <i>papaver somniferum</i>)			
Morphine	Morphine-3-glucuronide, morphine-6-glucuronide	Yes ^b	NA
Codeine	Codeine-6-glucuronide, morphine, norcodeine, hydrocodone	Yes ^b	NA
Semisynthetic opioids (not naturally occurring but chemically derived from opiates)			
Heroin	6-Monoacetylmorphine, morphine	Yes ^b	NA
Hydrocodone	Norhydrocodone, hydromorphone, dihydrocodeine ^c	Sometimes ^b	Yes ^d
Hydromorphone	Hydromorphone-3-glucuronide	Sometimes ^b	Yes ^d
Oxycodone	Noroxycodone, oxymorphone	No	Yes ^d
Oxymorphone	Oxymorphone-3-glucuronide	No	Yes ^d
Buprenorphine	Norbuprenorphine, buprenorphine-3-glucuronide	No	Yes ^d
Synthetic opioids (synthesized in a laboratory and structurally distinct from opiates)			
Fentanyl	Norfentanyl, despropionylfentanyl	No	Yes ^d
Methadone	2-Ethylidene-1,5-dimethyl-3,3-diphenylpyrrolidine (EDDP)	No	Yes ^d
Tramadol	N-Desmethyltramadol, O-desmethyltramadol	No	Yes ^d
Loperamide	N-Desmethyl-loperamide	No	No ^d
Miscellaneous (opioid natural product not belonging to the above categories)			
Mitragynine (Kratom)	7-Hydroxymitragynine	No	Yes ^d

Weiss ST, Chinn M, Veach L. Reconsidering Reliance on Confirmatory Drug Testing in a Patient With Repeated Positive Urine Drug Screen Results: A Teachable Moment. *JAMA Intern Med.* 2021;181(12):1637-1638.

Case # 2

- 33 yo F presents for care. She has been using a variety of different CBD/THC products and is curious what might show up on a urine drug screen.

Δ -9



Δ -8

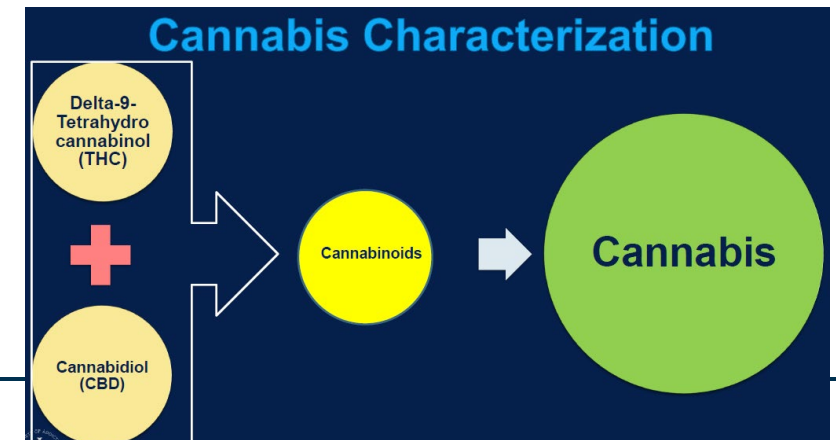


CBD



Cannabinoids

- 113 active cannabinoids in the cannabis plant
- Hemp, Marijuana, Hashish, Hash oil, edibles, synthetic
- 1990s THC potency ~4%-----2018 > 15%.
- People who use MJ < 18 yo, 4-7x more like to develop CUD
- No FDA approved medications
- Some studies suggest cannabis causal factor for Schizophrenia
- FDA approved:
 - Dronabinol (Marinol)
 - Nabilone (Cesamet)
 - Cannabidiol (Epidiolex)



Case #3

- 25 yo M reports taking clonazepam daily
- Reports to clinic for routine monitoring



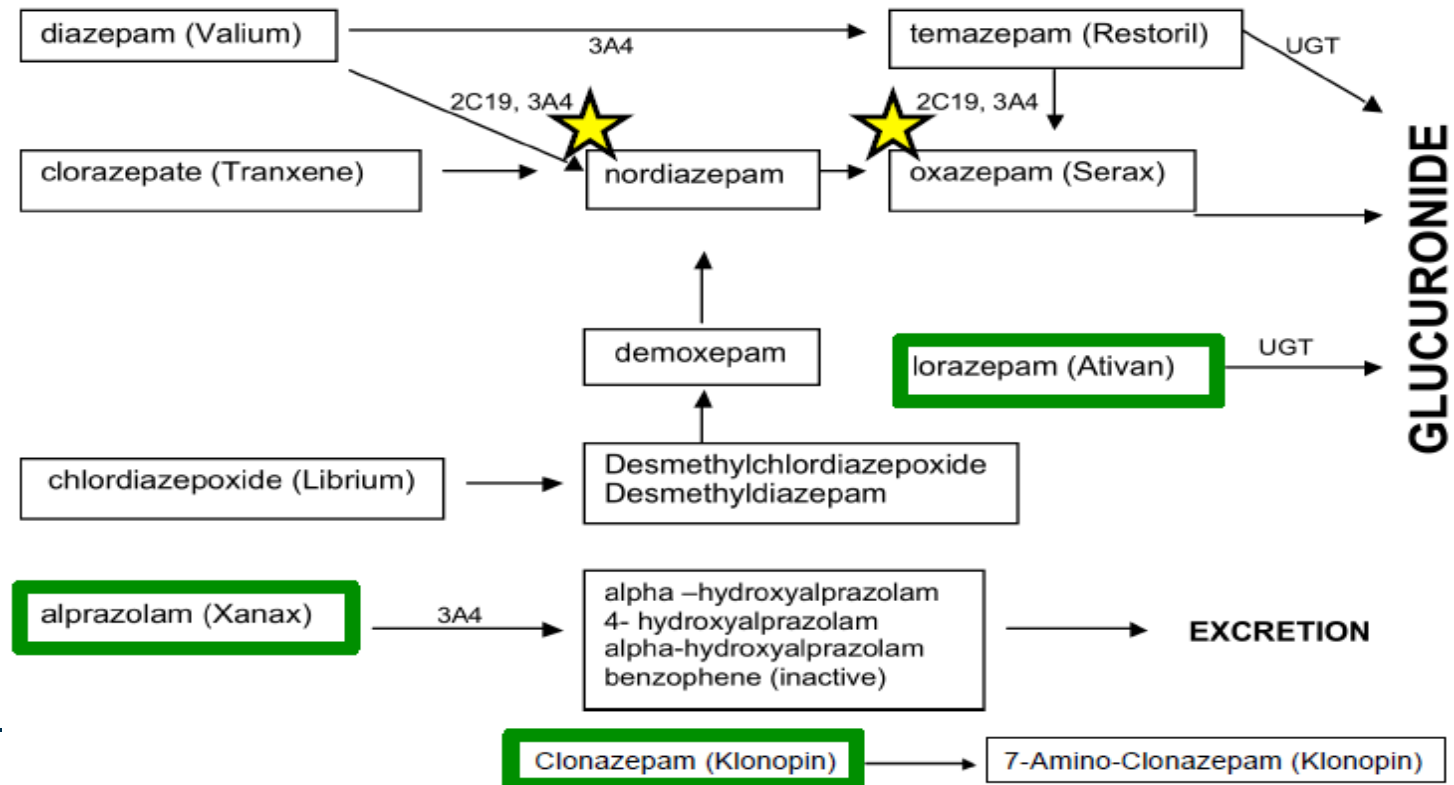
The screenshot shows a digital interface for a drug screen report. At the top, there are three tabs: 'Single', 'Cumulative', and 'Graph'. Below the tabs is a table with three columns: 'Name', 'Value', and 'Reference Range'. The table lists the following substances and their results:

Name	Value	Reference Range
THC	neg	Neg -
COC	neg	Neg -
MORPH	neg	Neg -
AMP	neg	Neg -
METH	neg	Neg -
BAR	neg	Neg -
BENZO	neg	Neg -
ECSTASY	neg	Neg -
MTD	neg	NEG - NEG
OXYCODONE	pos	Neg -
PCP	neg	Neg -

BZD Confirmation

Interpreting Urine Drug Screens

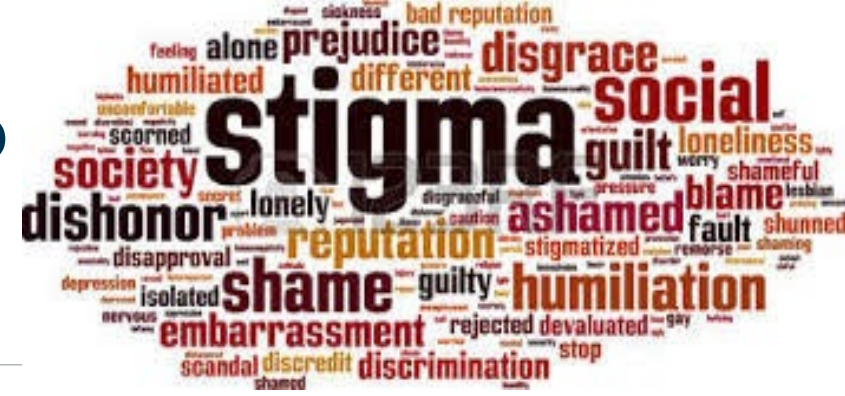
BZD metabolic pathways



Case #4

- 44 yo reports doing well with oxycodone for pain management.
- Presents to clinic, reports UDS will be +oxy.
- UDS = +cocaine
- Next Steps?

How do you respond to results?



- Tests provide information to guide treatment
 - Results are consistent (expected) or inconsistent (unexpected) with the rest of the clinical picture
- Patients may have anxiety about potential test results and may not feel comfortable talking about recent drug use
- Consistent, compassionate, nonjudgmental and health-oriented approach will help to develop therapeutic alliance with the patient over time.

Case #5

- 24 yo here for routine monitoring of ADHD – prescribed stimulant.
- UDS+ morphine, “I’m just taking my Adderall!”
- **True or False:** Poppy seeds can lead to a positive urine drug screen for opiates?
- **Answer: True**
(roll vs. raw poppy seed resulted in urinary morphine concentrations below 2,000 ng/mL)



Case #6

- 25 yo with hx tobacco, cannabis use presents requesting Sudafed (pseudoephedrine) for chronic symptoms of allergic rhinitis.
- You notice they have lost 20 lbs since last visit.
- POC UDS+ amphetamines
- Next Step?

Component	Ref Range & Units	5/13/21 1522
<input checked="" type="checkbox"/> Amphetamine Confirm	Cutoff: 25 ng/mL	4166
<input checked="" type="checkbox"/> Phentermine	Cutoff: 25 ng/mL	Negative
<input checked="" type="checkbox"/> Methamphetamine Confirm, Ur	Cutoff: 25 ng/mL	>60000
<input checked="" type="checkbox"/> Pseudoephedrine	Cutoff: 25 ng/mL	Negative
<input checked="" type="checkbox"/> MDA	Cutoff: 25 ng/mL	Negative
<input checked="" type="checkbox"/> MDMA Confirm	Cutoff: 25 ng/mL	Negative
<input checked="" type="checkbox"/> Amphet Interp, Urine		Positive.

Case #7

- Hx PTSD, MDD, GAD is moving into a recovery house
- Requesting UDS prior to entry into the house
- What might we expect for:
 - **Amphetamines:**
 - bupropion, fluoxetine, propranolol, ranitidine, trazodone
 - **Benzodiazepines:**
 - sertraline
 - **Buprenorphine:**
 - tramadol, fluoxetine, doxepin, haloperidol, sertraline, risperidone
 - **Methadone:**
 - quetiapine, tramadol, diphenhydramine
 - **Phencyclidine:**
 - DXM, diphenhydramine, tramadol, venlafaxine
 - **LSD:**
 - amitriptyline

Case #8

- 42 yo man returns to clinic for follow up
- Reports restlessness, diaphoresis, body aches, insomnia, anxiety
- Has been using a supplement from a local store
- UDS:

▼ TOX, URINE		
Amphetamines, Urine POCT		NEGAT...
Barbiturates, Urine POCT		NEGAT...
Benzodiazepines, Urine POCT		NEGAT...
Buprenorphine, Urine POCT		NEGAT...
Cannabinoids, Urine POCT		PRESU...
Cocaine, Urine POCT		NEGAT...
Methadone, Urine POCT		NEGAT...
Methamphetamine, Urine POCT		NEGAT...
Opiates, Urine POCT		NEGAT...
Oxycodone, Urine POCT		NEGAT...

Case #8: *Mitragyna speciosa* (Kratom)

- Major alkaloid: Mitragynine
 - Low dose -> Stimulant-like effect ($\leq 5g$)
 - Higher doses -> Opioid-like effect ($\sim 15g$)
- Withdrawal – onset 12-18 hrs, several days
 - No controlled trials, similar to other opioids
- Treatment for Kratom Use Disorder
 - Mostly case reports or case series



Kratom (Mitragynine), Screen and Confirmation, Urine

TEST: 791750  CPT: 80307

Test Includes

7-Hydroxymitragynine; mitragynine

Case #9

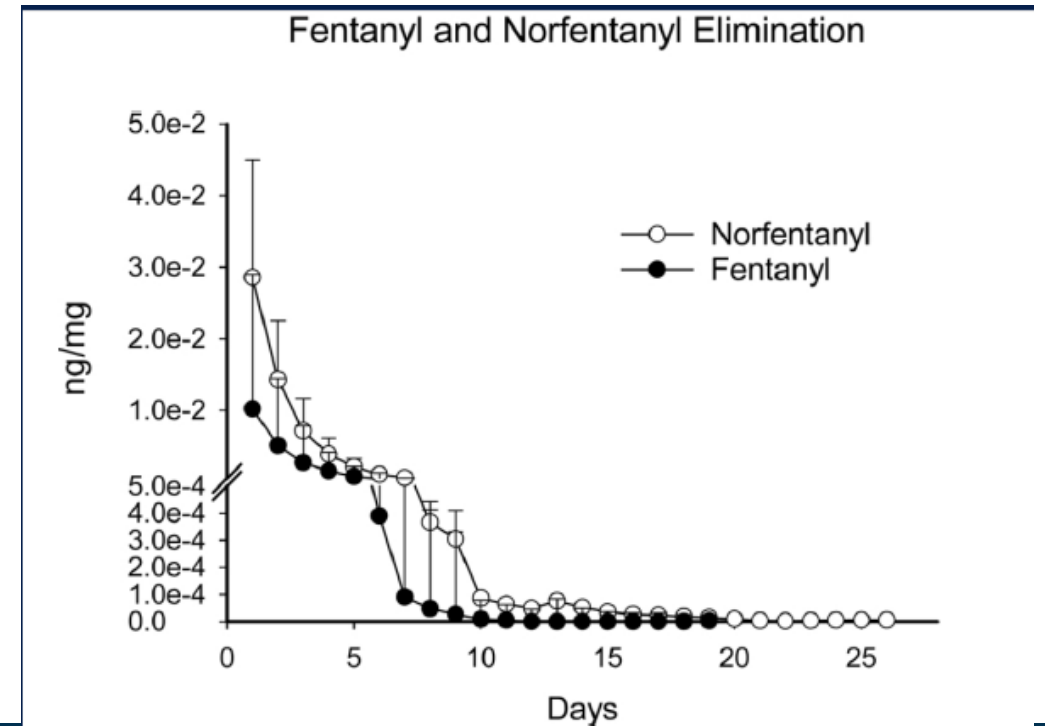
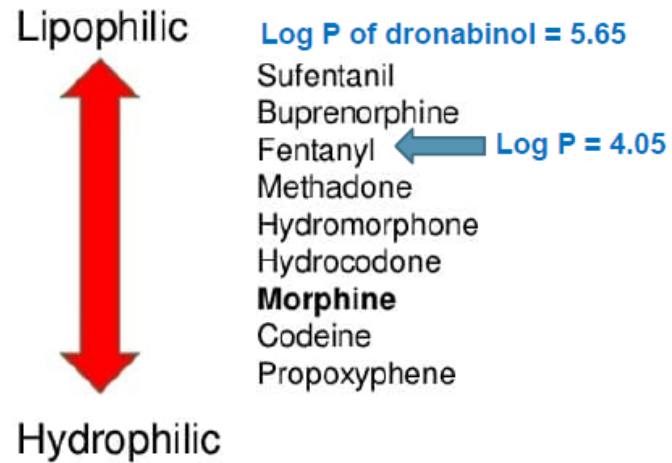
- 44 yo presents to clinic
- Hx alcohol use disorder and was recently asked to leave his recovery housing due to a +drug screen.
- He denies illicit substance use
- Naltrexone -> noroxymorphone

<https://pubmed.ncbi.nlm.nih.gov/31366308/>

	Units	
<input checked="" type="checkbox"/> Codeine-by LC-MS/MS	Cutoff: 25 ng/mL	Negative
<input checked="" type="checkbox"/> Dihydrocodeine-by LC-MS/MS	Cutoff: 25 ng/mL	Negative
<input checked="" type="checkbox"/> Hydrocodone-by LC-MS/MS	Cutoff: 25 ng/mL	Negative
<input checked="" type="checkbox"/> Norhydrocodone-by LC-MS/MS	Cutoff: 25 ng/mL	Negative
<input checked="" type="checkbox"/> Hydromorphone-by LC-MS/MS	Cutoff: 25 ng/mL	Negative
<input checked="" type="checkbox"/> Oxycodone-by LC-MS/MS	Cutoff: 25 ng/mL	Negative
<input checked="" type="checkbox"/> Noroxycodone-by LC-MS/MS	Cutoff: 25 ng/mL	Negative
<input checked="" type="checkbox"/> Oxymorphone-by LC-MS/MS	Cutoff: 25 ng/mL	Negative
<input checked="" type="checkbox"/> Noroxymorphone-by LC-MS/MS	Cutoff: 25 ng/mL	Negative
<input checked="" type="checkbox"/> Naloxone-by LC-MS/MS	Cutoff: 25 ng/mL	72
<input checked="" type="checkbox"/> Morphine-by LC-MS/MS	Cutoff: 25 ng/mL	Negative
<input checked="" type="checkbox"/> Opiates Interpretation		Positive.

Case #10

- 28 yo presents to clinic 9 days after starting buprenorphine-naloxone
- UDS+ Fentanyl
- Patient denies use, is this possible?



Resources

<http://eguideline.guidelinecentral.com/i/840070-drug-testing-pocket-guide/0?>

Part 1 http://www.youtube.com/watch?v=ag5BWxn_38I

Part 2 <https://www.youtube.com/watch?v=XNEEMrO0kdc>

☀ UNODC Early Warning Advisory (EWA) on New Psychoactive Substances (NPS)

☀ <https://www.unodc.org/LSS/Home/NPS>

☀ [European Monitoring Centre For Drugs and Drug Addiction](https://www.emcdda.europa.eu/)

☀ <https://www.emcdda.europa.eu/>

☀ Pubchem

☀ <https://pubchem.ncbi.nlm.nih.gov/>

☀ The Center for Forensic Science Research and Education (CFSRE) : Novel Psychoactive Substance Discovery

☀ <https://www.npsdiscovery.org/>

☀ Toxicology Investigators Consortium (ToxIC) Fentalog Study

☀ https://www.toxicregistry.org/Fentanyl_Analogs.html



THE ASAM APPROPRIATE USE OF DRUG TESTING IN CLINICAL ADDICTION MEDICINE

Consultants:

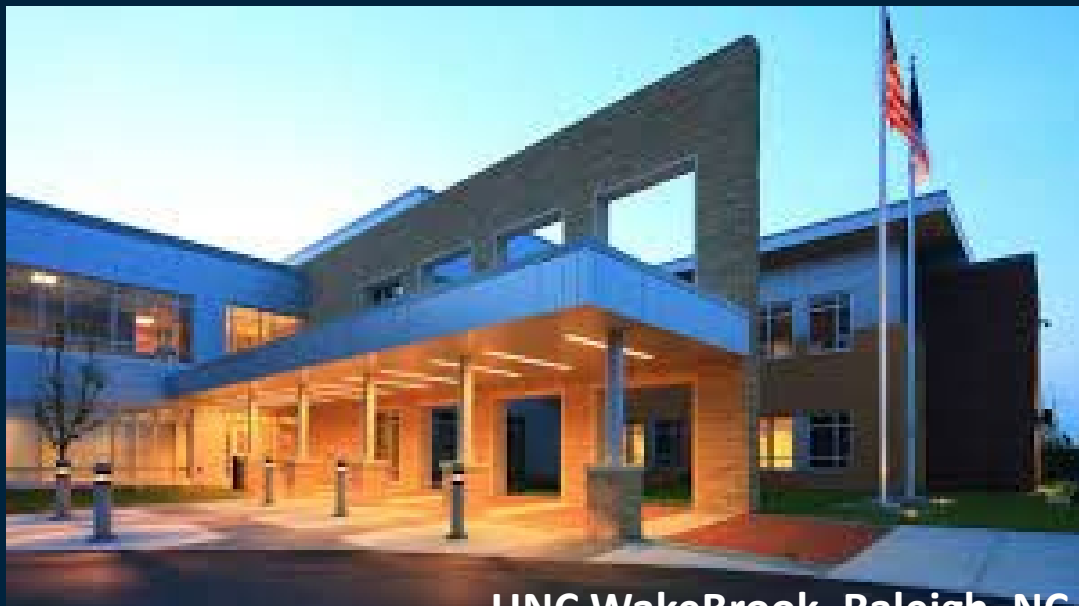
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American Society of Addiction Medicine
TREAT ADDICTION • SAVE LIVES
<http://www.ASAM.org>

Thank you!

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UNC WakeBrook, Raleigh, NC

PEOPLE WHO USE DRUGS DO NOT LOSE THEIR HUMAN RIGHTS



Decriminalize the personal use and possession of drugs.



End the death penalty for drug-related offences.



Ensure harm reduction measures are available to drug users, including in prisons.



End impunity for those responsible for **extrajudicial killings** and **torture of drug suspects**.



Ensure proportionate sentencing of people convicted of drug-related offences.



End prosecution of children for drug offences.



Prefer alternatives to imprisonment for minor, non-violent offences.



Allow indigenous peoples to use drugs when part of their **traditional or religious practices**.



End discrimination and stigmatisation of drug users.



UNITED NATIONS
HUMAN RIGHTS
OFFICE OF THE HIGH COMMISSIONER