Addiction Medicine 201
Inpatient to Outpatient SUD Care Transitions: Case-Based Workshop

October 17, 2025

Disclosures

None

Acknowledgements

Cawoski, DiClemente, and Menke. “Perioperative Pain Management in Opioid Use Disorder.” Pain Week 2023.

Objectives

1. Describe the clinical presentation for patients with Kratom dependence and strategies for management.

2. Describe the clinical approach to the management of patients with benzodiazepine dependence.

3. Identify strategies for managing acute pain in patients treated with medication for opioid use disorder (MOUD).

4. Name 2-3 novel psychoactive substances that are commonly found in gas stations or available for purchase online.

Case #1

Patient: 43-year-old male

- Admitted to an acute care hospital
- History of chronic Kratom use
- Presenting symptoms: agitation, tremors, nausea, anxiety
- Concern for both intoxication and potential withdrawal of unknown substance

Case #1 - Kratom Intoxication

VS:
BP 107/58, Pulse 85, Temp 97.7 °F (Oral), Resp 18, SpO2 98%,
Ht 1.803 m (5' 11"), Wt 64.3 kg (141 lb 12.1 oz), BMI 19.77 kg/m²

EXAM:
Neuro: tremors, headache
GI: nausea, vomiting, diarrhea
Psych: anxiety, depression, insomnia
General: Appears anxious, restless, diaphoretic
HEENT: Pupils dilated, tearing, rhinorrhea
Skin: Sweaty, possible gooseflesh
Neuro: Tremors, hyperreflexia, no focal deficits
Psych: Anxious, irritable, cooperative, oriented x4

	08/13/25 10:15
Amphetamine, Urine Screen	NEGATIVE
Barbiturate, Urine Screen	**POSITIVE !**
Benzodiazepines, Urine Screen	NEGATIVE
Cannabinoids, Urine Screen	NEGATIVE
Cocaine, Urine Screen	NEGATIVE
Methadone, Urine Screen	NEGATIVE
Opiate, Urine Screen	NEGATIVE
Oxycodone, Urine Screen	NEGATIVE
Fentanyl, Urine Screen	NEGATIVE

!: Data is abnormal

Clinical Opioid Withdrawal Scale

Standardized tool used by clinicians to quantify the severity of opioid withdrawal symptoms and guide treatment decisions. It includes **11 items**, each scored based on severity:

COWS may be used in both inpatient and outpatient settings:

During Detox: for the general monitoring of opiate withdrawal during opioid detoxification.

Results for COWS Score for Opiate
Range: Score 13-24
Interpretation: Moderate opiate withdrawal

Score: 16
Answers calculated to formulate result:

1. Resting pulse rate — 81-100
2. Sweating — Flushed or observable moistness on face
3. Restlessness observation during assessment — Reports difficulty sitting still, but is able to do so
4. Pupil size — Pupils possibly larger than normal for room light
5. Bone or joint aches — Mild diffuse discomfort
6. Rhinorrhea or tearing — Nasal stuffiness or unusually moist eyes
7. GI Upset — Nausea or loose stool
8. Tremor observation of outstretched hands — Slight tremor observable
9. Yawning observation during assessment — No yawning
10. Anxiety or irritability — Patient obviously irritable/anxious
11. Gooseflesh skin — Piloerection of skin can be felt or hairs standing up on arms

https://www.mdcalc.com/calc/1985/cows-score-opiate-withdrawal

Wesson & Ling, J Psychoactive Drugs. 2003 Apr-Jun;35(2):253-9.

COWS Clinical Opiate Withdrawal Scale

Resting Pulse Rate: ________ beats/minute *Measured after patient is sitting or lying for one minute* 0 Pulse rate 80 or below 1 Pulse rate 81-100 2 Pulse rate 101-120 4 Pulse rate greater than 120	GI Upset: *over last 1/2 hour* 0 No GI symptoms 1 Stomach cramps 2 Nausea or loose stool 3 Vomiting or diarrhea 5 Multiple episodes of diarrhea or vomiting
Sweating: *over past 1/2 hour not accounted for by room temperature or patient activity.* 0 No report of chills or flushing 1 Subjective report of chills or flushing 2 Flushed or observable moistness on face 3 Beads of sweat on brow or face 4 Sweat streaming off face	Tremor *observation of outstretched hands* 0 No tremor 1 Tremor can be felt, but not observed 2 Slight tremor observable 4 Gross tremor or muscle twitching
Restlessness *Observation during assessment* 0 Able to sit still 1 Reports difficulty sifting still, but is able to do so 3 Frequent shifting or extraneous movements of legs/arms 5 Unable to sit still for more than a few seconds	Yawning *Observation during assessment* 0 No yawning 1 Yawning once or twice during assessment 2 Yawning three or more times during assessment 4 Yawning several times/minute
Pupil size 0 Pupils pinned or normal size for room light 1 Pupils possibly larger than normal for room light 2 Pupils moderately dilated 5 Pupils so dilated that only the rim of the iris is visible	Anxiety or irritability 0 None 1 Patient reports increasing irritability or anxiousness 2 Patient obviously irritable anxious 4 Patient so irritable or anxious that participation in the assessment is difficult
Bone or Joint aches *If patient was having pain previously, only the additional component attributed to opiates withdrawal is scored* 0 Not present 1 Mild diffuse discomfort 2 Patient reports severe diffuse aching of joints/ muscles 4 Patient is rubbing joints or muscles and is unable to sit still because of discomfort	Gooseflesh skin 0 Skin is smooth 3 Piloerrection of skin can be felt or hairs standing up on arms 5 Prominent piloerrection
Runny nose or tearing *Not accounted for by cold symptoms or allergies* 0 Not present 1 Nasal stuffiness or unusually moist eyes 2 Nose running or tearing 4 Nose constantly running or tears streaming down cheeks	Total Score ________ The total score is the sum of all 11 items Initials of person completing Assessment:______________

Score: 5-12 mild; 13-24 moderate; 25-36 moderately severe; more than 36 = severe withdrawal

Case #1 - Kratom Intoxication

Acts as a stimulant at low doses, opioid-like effects at higher doses

• Symptoms of intoxication:
  - Euphoria, increased energy
  - Sweating, tachycardia, hypertension
  - Confusion, hallucinations, seizures (high dose)

• Risk: respiratory depression when combined with other CNS depressants

Case #1 - Kratom Withdrawal

- Symptoms:
  - Irritability, anxiety, depression
  - Muscle aches, insomnia
  - Nausea, vomiting, diarrhea
  - Autonomic instability (sweating, chills, runny nose)

- Clinical picture resembles opioid withdrawal

These symptoms can vary in intensity and duration, typically starting within 12 to 24 hours after the last dose and lasting around 3 to 10 days.

Case #1 - Inpatient Management

Supportive care: IV fluids, antiemetics, NSAIDs for pain
• Symptomatic treatment for anxiety, insomnia, hypertension

• Monitor for complications (seizures, arrhythmias)
• Consider Medication-Assisted Treatment (MAT):
  - Buprenorphine for moderate-severe withdrawal

Case #1 - Inpatient Management

Opioid Detoxification Orders ✔ Accept

Use for opioid withdrawal in the setting of treatment for another acute condition (pregnancy, medical, or surgical).
Patients with primary opioid withdrawal (no other diagnosis) require outpatient management.

- [ ] Medication Options
- [x] All Patients
  - [x] Clinical Opiate Withdrawal Scale (COWS) assessments qshift x 4 days
    Routine, Every shift, First occurrence today at 1524, For 4 days
    Call provider for consideration of medication adjustment for COWS >12
  - [x] hydrOXYzine (ATARAX) tablet 50 mg
    50 mg, Oral, Every 4 hours PRN, anxiety, Starting today at 1523
  - [x] dicyclomine (BENTYL) capsule 10 mg
    10 mg, Oral, 4 times daily PRN, abdominal cramping, Starting today at 1523
  - [x] ondansetron (ZOFRAN ODT) disintegrating tablet 4 mg
    4 mg, Oral, Every 8 hours PRN, nausea, Starting today at 1523
  - [x] diphenoxylate-atropine (LOMOTIL) 2.5-0.025 mg per tablet 1 tablet
    1 tablet, Oral, 4 times daily PRN, diarrhea, Starting today at 1523
  - [x] trazodone (DESYREL) tablet 100 mg
    100 mg, Oral, Nightly PRN, insomnia, Starting today at 1523
  - [ ] clonidine (Catapres) tablet PRN
    0.1 mg, Oral, Every 6 hours PRN, COWS >7, Hold if SBP <100 or DBP <60 or HR <60. Do not exceed 0.8 mg clonidine per 24 hr (1.2 mg if >90 kg)
  - [ ] Consult Mental Health/Psychiatry
  - [ ] Consult Behavioral Health Case Manager

Case #1 - Buprenorphine for Kratom Withdrawal

- Partial opioid agonist – helps alleviate withdrawal
  - Induction:
  - Begin when moderate withdrawal symptoms present
  - Initial dose: 2–4 mg, titrate as needed
- Benefits:
  - Reduces cravings
    - Stabilizes withdrawal symptoms
  - Improves inpatient comfort and outcomes

- Buprenorphine is preferred over Methadone
  - Unless patient has co-occurring Opioid Use Disorder

- Therapy and Counseling
  - Cognitive-Behavioral Therapy (CBT), Motivational Interviewing.

- Support Groups
  - Narcotics Anonymous (NA), Celebrate Recovery

Case #1 - Discharge Planning & Referral

Provide education on risks of Kratom use
• Arrange referral to outpatient addiction treatment program
• Consider continuation of MAT (buprenorphine) in outpatient setting
• Encourage behavioral therapies (CBT, group therapy, peer support)
• Link patient with community recovery resources

Case #1 - Outpatient Management

- Trial / continuation of MAT
  (buprenorphine first; consider methadone in refractory cases or history of OUD)

- Assess for concurrent substance use
  - Toxicology testing: 7-OH Kratom often not detected (even on urine confirmation)

- Monitor co-occurring mental health issues (depression, anxiety, insomnia, ADHD, etc.)

- Encourage behavioral therapies

- Linkage with recovery supports (mutual help / 12 Step; peer support; etc.)

Visit Framework: Outpatient Med Management

- Any use since last visit? If yes, explore context (date, amount, triggers, consequences)
- Benefits of abstinence? ***(Motivational interviewing)***
- Cravings? Close calls? How did you manage? ***(Relapse prevention)***
- Medication adherence, tolerability, effects (+ and -)
- Recovery supports? Gaps? (therapy, groups, mutual aid, etc.)
- Collaborate with patient to modify plan as needed

Credit: Roy Stein, MD

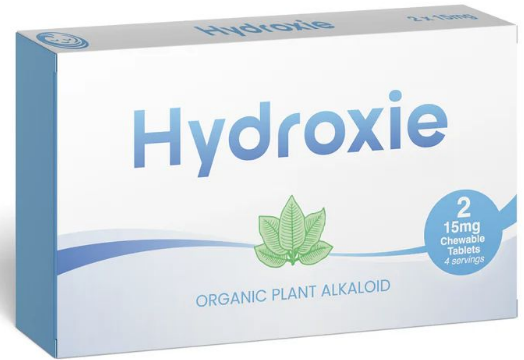
7-OH Kratom

- naturally occurring component of Kratom plant *Mitragyna speciosa* (< 0.5 to 2%)

- 7-OH is **10-20x more potent** than *mitragynine* at mu opioid receptor
  - 3x more potent than morphine for respiratory depression
  - increased risk for physical dependence and withdrawal
  - more severe withdrawal syndrome and possible seizures

- increasingly available as high-concentration 7-OH products and extracts
  - chewable / sublingual tablets
  - liquid "shots"
  - gummies
  - marketed as "7-OH" only, avg cost ~$4 per serving

7-Hydroxymitragynine (7-OH): An Assessment of the Scientific Data and Toxicological Concerns Around an Emerging Opioid Threat. FDA 2025.



Hydroxie 15mg 7-OH Tablets

$14.00

Shipping calculated at checkout.

Quantity

2 pack | 5 pk - SAVE $1/TABLET! | 10 pk - SAVE $2/TABLET!

Quantity

− 1 +

Add to cart

Hydroxie

- "the power of pure botanicals"
- reminiscent of "Roxies" / street Oxy

Dozo

Dozo Liquid Perks 7-OH Shot Blueberry Slushie 40mg

3 Reviews

$12.89 or 4 payments of $3.22 with sezzle

BULK DISCOUNT RATES

Below are the available bulk discount rates for each individual item when you purchase a certain amount

Buy 1 - 5	Buy 6 - 11	Buy 12 - 23
$12.89	$12.50 (3.03%)	$12.11 (6.05%)
Buy 24 - 35	**Buy 36 - 47**	**Buy 48 or above**
$11.72 (9.08%)	$11.33 (12.1%)	$10.94 (15.13%)

Dozo

Dozo Perks 7-hydroxymitragynine 20mg Mellow Blend Chill Berry

13 Reviews

$9.45 or 4 payments of $2.36 with sezzle

BULK DISCOUNT RATES

Below are the available bulk discount rates for each individual item when you purchase a certain amount

Buy 1 - 4	Buy 5 - 9	Buy 10 - 19
$9.45	$9.14 (3.25%)	$8.86 (6.25%)
Buy 20 - 29	**Buy 30 - 39**	**Buy 40 or above**
$8.58 (9.25%)	$8.29 (12.25%)	$8.01 (15.25%)

Dozo Perks

- "calm and relaxing effect"
- reminiscent of Percocet

7-OH: Regulatory Action

- June 2025: FDA warning letter to manufacturing companies

- July 2025:
  - FDA warning to consumers
  - FDA “Dear Colleague” letter to clinicians
  - FDA recommendation to classify 7-OH as controlled substance

7-Hydroxymitragynine (7-OH): An Assessment of the Scientific Data and Toxicological Concerns Around an Emerging Opioid Threat. FDA 2025.

Case #1 - Conclusion

Kratom use disorder can mimic opioid use disorder

- Intoxication: stimulant and opioid-like effects
- Withdrawal: resembles opioid withdrawal
- Hospital care: supportive management + possible buprenorphine
- Transition to outpatient treatment is essential for long-term recovery
- Emerging consensus supports maintenance treatment with MOUD in outpatient setting

- Diagnosis (billing and coding):
  - ***"Other psychoactive substance dependence, uncomplicated" (F19.20)***

Case #2

36 yo F presents to clinic with anxiety, tremors, and sense of doom. Her husband thinks she may have had a seizure at home this morning.

On further questioning, she reveals that she has been purchasing “***Etizolam***” on the internet and using daily for the last year, but recently tried to stop cold turkey.

In the past she was prescribed Clonazepam for many years until her Psychiatrist retired. She took some Xanax from a friend yesterday to calm down.

Case #2 - Etizolam

- Synthetic / “designer” benzodiazepines:
  - etizolam, flualprazolam, clonazolam, flubromazolam, diclazepam, others
- Schedule I status. NOT approved for medical use
- Unregulated online markets: questionable dosages, purity

Case #2: Benzodiazepine withdrawal

PDMP/CSRS: no entries

VS: HR 125, BP 165/110, RR 18, SpO2 98%, T 99.1

Exam: anxious, tremulous, tongue fasciculations, horizontal nystagmus

How do you proceed?

Case #2 – Benzodiazepine

Inpatient treatment for benzodiazepine use disorder (BUD) is indicated when outpatient tapering is unsafe or unsuccessful, or when the patient presents with severe withdrawal, polysubstance use, or psychiatric instability.

Comprehensive overview based on current best practices and clinical guidelines:

- History of failed outpatient tapers
- High-dose or long-term use (e.g., >50 mg diazepam equivalents/day)
- Severe withdrawal symptoms (e.g., seizures, psychosis, delirium)
- Polysubstance use, especially with opioids or alcohol
- Unstable psychiatric or medical comorbidities
- Homelessness or lack of support system
- Patient preference when safety is a concern

Case #2 – Benzodiazepine

Medication Management

- Initiate benzodiazepine taper using long-acting agent (e.g., diazepam or clonazepam)
- Diazepam taper by 5–10% every 2–4 days based on symptoms
- Adjunctive medications:
  - Gabapentin 100 mg PO TID
  - Clonidine 0.1 mg PO BID for autonomic symptoms
  - Trazodone 50–100 mg PO qHS for insomnia
- Hold benzodiazepines if signs of oversedation

Case 2 - Benzodiazepines

UDS: +BZD
Ethanol: not detected

Pt is monitored for 2 days with CIWA-Ar protocol and initiation of Diazepam with no further seizure activity.
Withdrawal is well controlled.

She is prescribed 7-day Diazepam taper at discharge and referred to Addiction Medicine clinic for follow-up within one week.

Case #2: Benzodiazepines Outpatient Management

Pt returns to clinic after hospitalization. She is feeling less anxious and is no longer tremulous.

She has a two day supply of Diazepam remaining from the hospital and is scared of stopping the medication.

How would you manage?

Continuum of Benzodiazepine Use

Episodic Use	Chronic Use with Dependence	BZD Use Disorder (1.5%)
Non-daily Use	Daily Use as Prescribed	Compulsive Use

Physical Dependence

Tolerance

Withdrawal

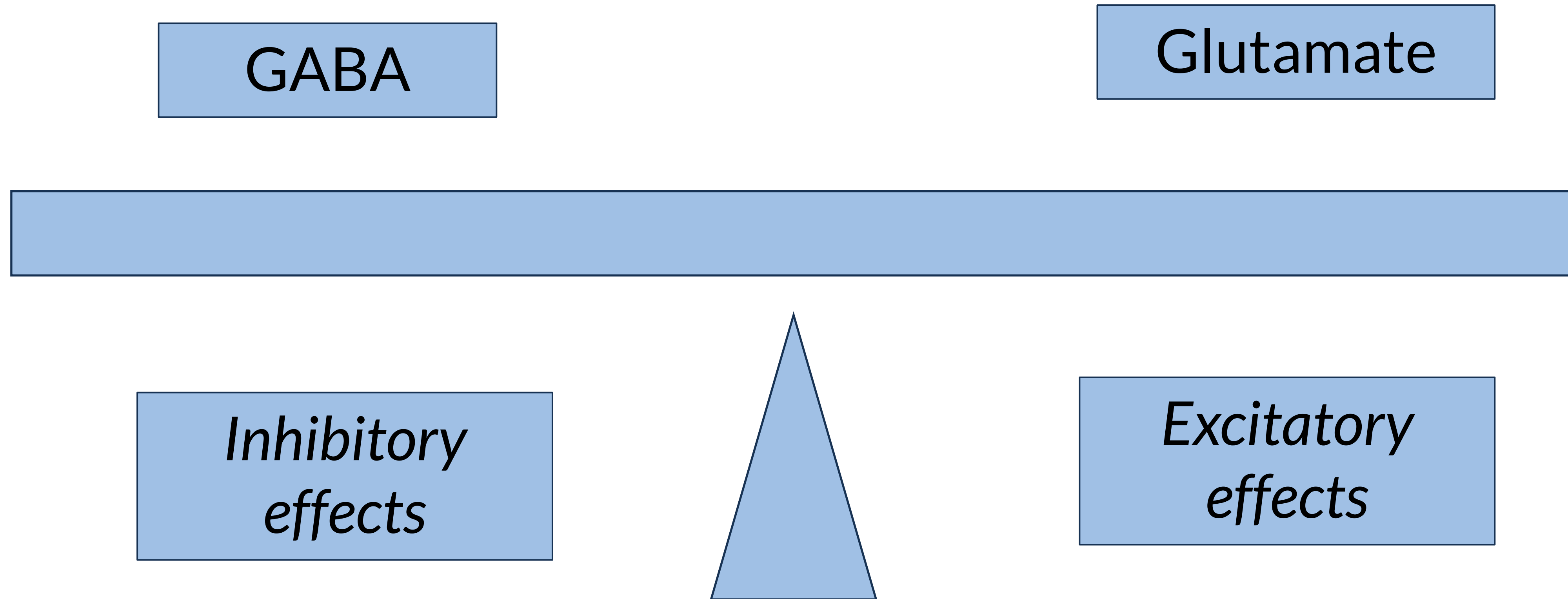
Cravings

Compulsive Use

Loss of Control

Continued Use Despite Negative Consequences

Benzodiazepine Physiology



Benzodiazepine Withdrawal Syndromes

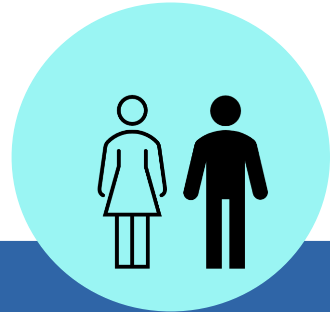
Acute BZD withdrawal

- Most concerning: seizures, hallucinations, delirium tremens
- Anxiety, insomnia, irritability
- Hypersensitivity to sensory stimuli (sound, light, touch)
- Perceptual disturbances
- Muscle twitches, paresthesia, dizziness, headaches

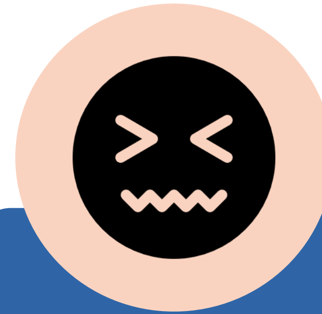
Protracted BZD withdrawal (can persist 3-12 mos)

- Most of the above (minus seizures, hallucinations, DT's)
- Tinnitus
- GI symptoms
- Other neuropsychiatric symptoms

Potential Harms of Chronic Benzodiazepine Use



Physical Dependence

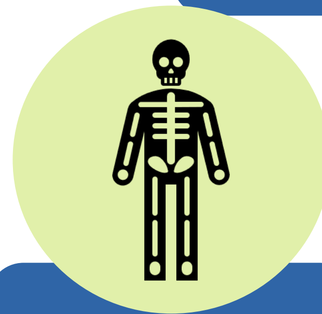


Worsening anxiety & depression

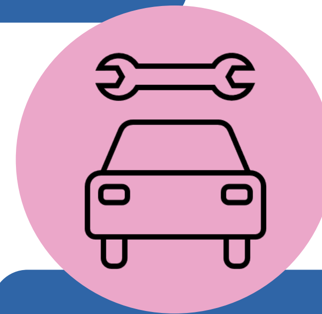
Cognitive impairment, memory issues, risk of dementia

Impaired sleep

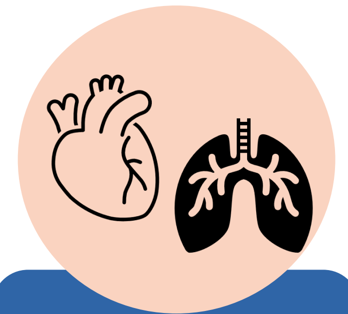
Falls



Fractures



Motor vehicle collisions



CNS depression (esp. if concurrent alcohol, opioids, etc.)

Special Considerations

Chronic use of benzodiazepines (whether prescribed or non-prescribed) is generally discouraged, as the ***risks typically outweigh the benefits, especially for patients with substance use disorders.***

Anxiety- spectrum symptoms are expected to improve after discontinuation of benzodiazepines

The mainstay of treatment for anxiety involves effective psychotherapy +/- pharmacotherapy (SSRI/SNRI). BZD are not 1st, 2nd, or 3rd line meds!!

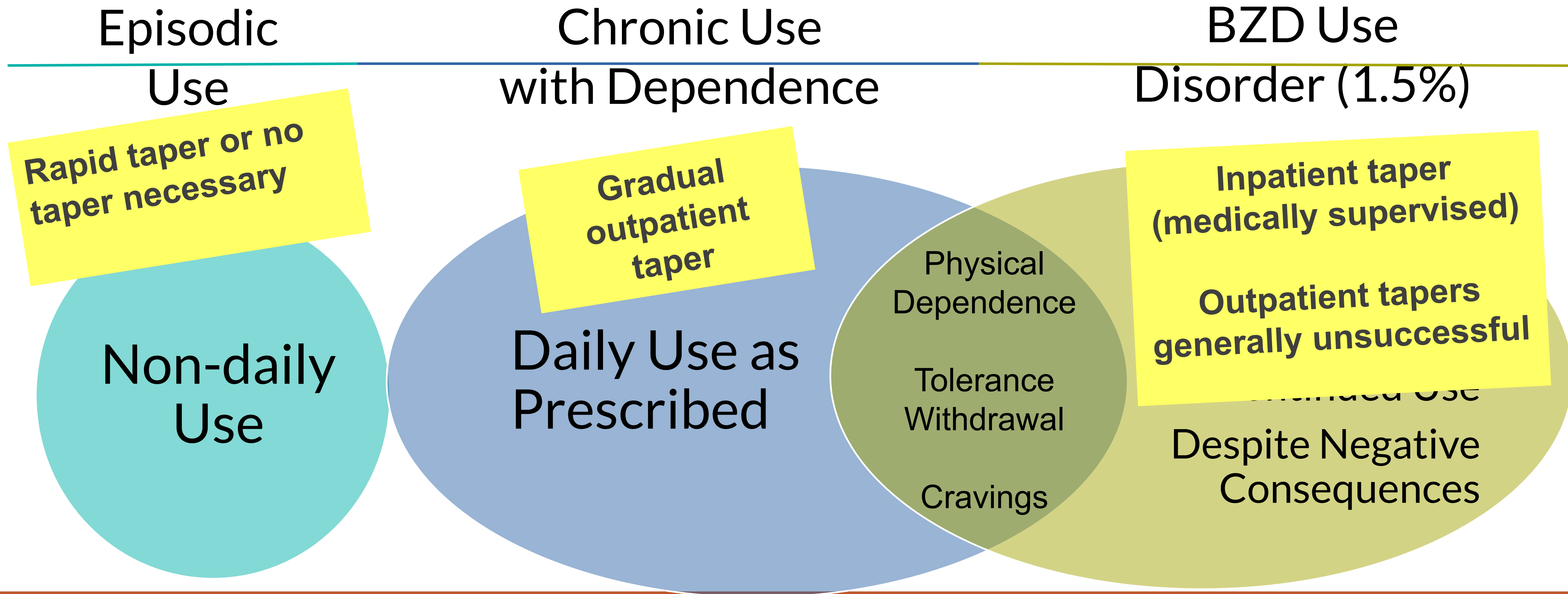
In some cases, however, benzodiazepines may be indicated and appropriate:

- Time-limited course for severe anxiety or specific phobia

  (EXAMPLE: 4-6 tablets of Xanax for air travel, once or twice a year)

- Medical or procedural sedation
- Management of acute alcohol withdrawal

Treatment of Chronic Benzodiazepine Use (When Risks > Benefits)



ASAM Clinical Practice Guidelines: Benzodiazepine Tapering (2025)

Slow Withdrawal Schedules: Ashton Manual

https://www.benzo.org.uk/manual/bzsched.htm

General principles:

- Recommend conversion to long-acting agent (e.g. Diazepam)
- Tapers can take time… (months to years in some cases!)
- Initial pace may be 5-10% reduction every 2-4 weeks
- Generally avoid exceed dose reductions > 25% every 2 weeks
- Goal may be discontinuation OR dose reduction for better risk:benefit balance

Sample Alprazolam Taper - 1st Steps

	Morning	**Midday**	**Evening**	**Daily Diazepam Equivalent**
Starting Dose	Alprazolam 1 mg	Alprazolam 1 mg	Alprazolam 1 mg	60 mg
Stage 1 (1 wk)	Alprazolam 1 mg	Alprazolam 1 mg	Alprazolam 0.5 mg Diazepam 10 mg	60 mg
Stage 2 (1 wk)	Alprazolam 1 mg	Alprazolam 1 mg	Diazepam 20 mg	60 mg
Stage 3 (1 wk)	Alprazolam 0.5 mg Diazepam 10 mg	Alprazolam 1 mg	Diazepam 20 mg	60 mg
Stage 4 (1 wk)	Diazepam 20 mg	Alprazolam 1 mg	Diazepam 20 mg	60 mg
Stage 5 (1 wk)	Diazepam 20 mg	Alprazolam 0.5 mg	Diazepam 20 mg	50 mg

Alprazolam 1 mg ≅Diazepam 20 mg

BZD Tapers: Monitoring and Tips

Treat underlying anxiety.

- consider SSRI/SNRI, mirtazapine, or other pharmacotherapy
- psychotherapy

Address sleep concerns.

Monitor toxicology including ***benzodiazepine confirmation panel***

- Metabolite patterns should be consistent with prescribed regimen

Monitor alcohol biomarkers (urine ethyl glucuronide, serum phosphatidyl ethanol).

- due to similar physiology, some patients will ↑ alcohol to offset ↓BZD

Ok to slow down and pause, but never go backwards.

BZD Tapers: Monitoring Toxicology

Issues with Immunoassay UDS:

1. False negatives. Most immunoassays will miss Clonazepam and Lorazepam.

2. False positives (e.g. Sertraline)

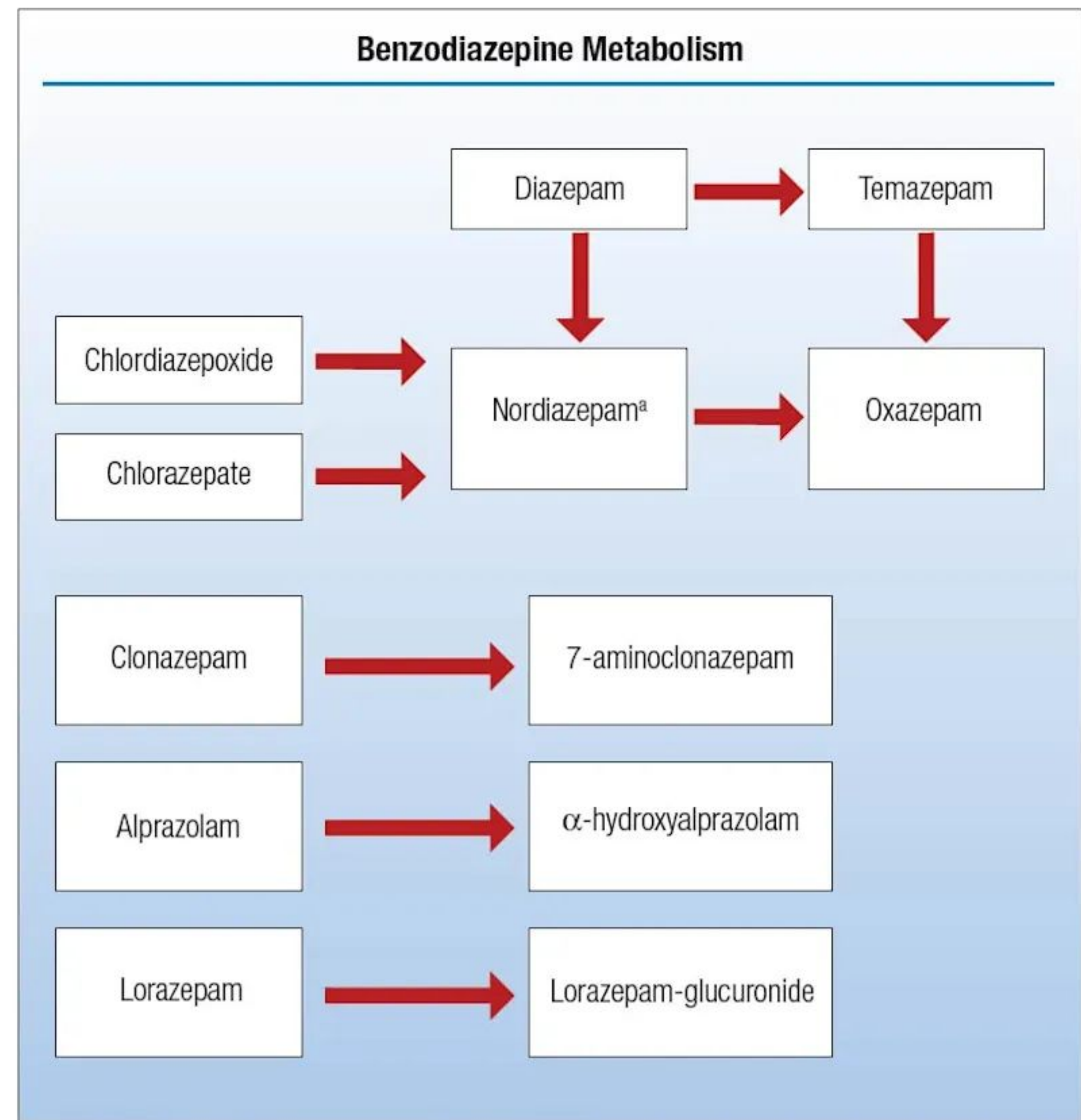


Figure 1: Illustrations of benzodiazepine metabolism.
Arrows indicate metabolic pathways
[a]Nordiazepam is also a metabolite of halazepam, medazepam, prazepam, and tetrazepam

Case #2 - Conclusion

1. Abrupt discontinuation is NOT recommended in patients with chronic BZD usage due to withdrawal risk.

2. BZD tapers can typically be managed in the outpatient setting. Inpatient treatment may be necessary in some cases (acute severe withdrawal; BZD use disorder).

3. Refer to ASAM guide and/or Ashton Manual for support with outpatient tapers.

Case 3: OUD + Pain

42 year old female who presented to the Emergency Department with right leg pain. She was found to have an acute DVT of the right lower extremity and severe rhabdomyolysis (CPK > 80,000 IU/L) and AKI with Cr 4.6 mg/dL. She was taken for emergent surgery for compartment fasciotomy.

She has a history of OUD/IVDU and is prescribed BUP/NAL 8-2 mg film three times daily. Pt reports last dose taken one day ago.

AKI = acute kidney injury, BUP/NAL = buprenorphine-naloxone, CPK = creatine phosphokinase, SCR = serum creatinine

Case 3: Buprenorphine and Acute Pain

Not a candidate for neuraxial or regional procedures for pain management due to systemic anticoagulation.

UDS: (-)THC, (+)Opioids, (-)Barbiturates, (+)Cocaine, (-) Amphetamine

GCMS: cocaine, methylecgonine, buprenorphine, norbuprenorphine, fentanyl,

Addiction Consult Team and Acute Pain Service are both consulted for pain management.

AKI = acute kidney injury, CPK = creatine phosphokinase, SCR = serum creatinine

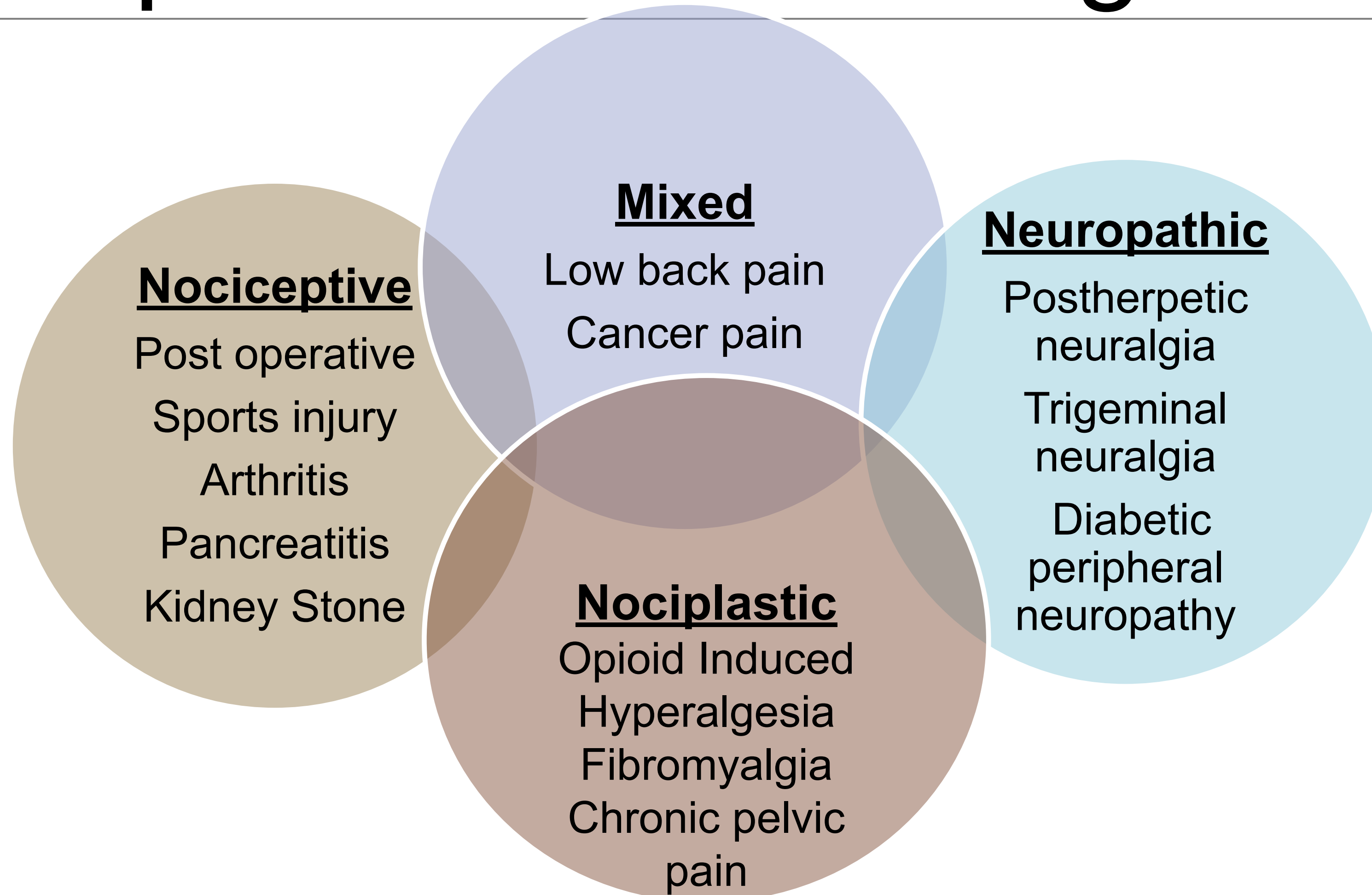
Case 3: Buprenorphine + Acute Pain Inpatient Management

How would you manage the patient's home buprenorphine-naloxone regimen (8-2 mg sublingual TID) while she is hospitalized?

- Continue current dose?
- Decrease dose?
- Stop?

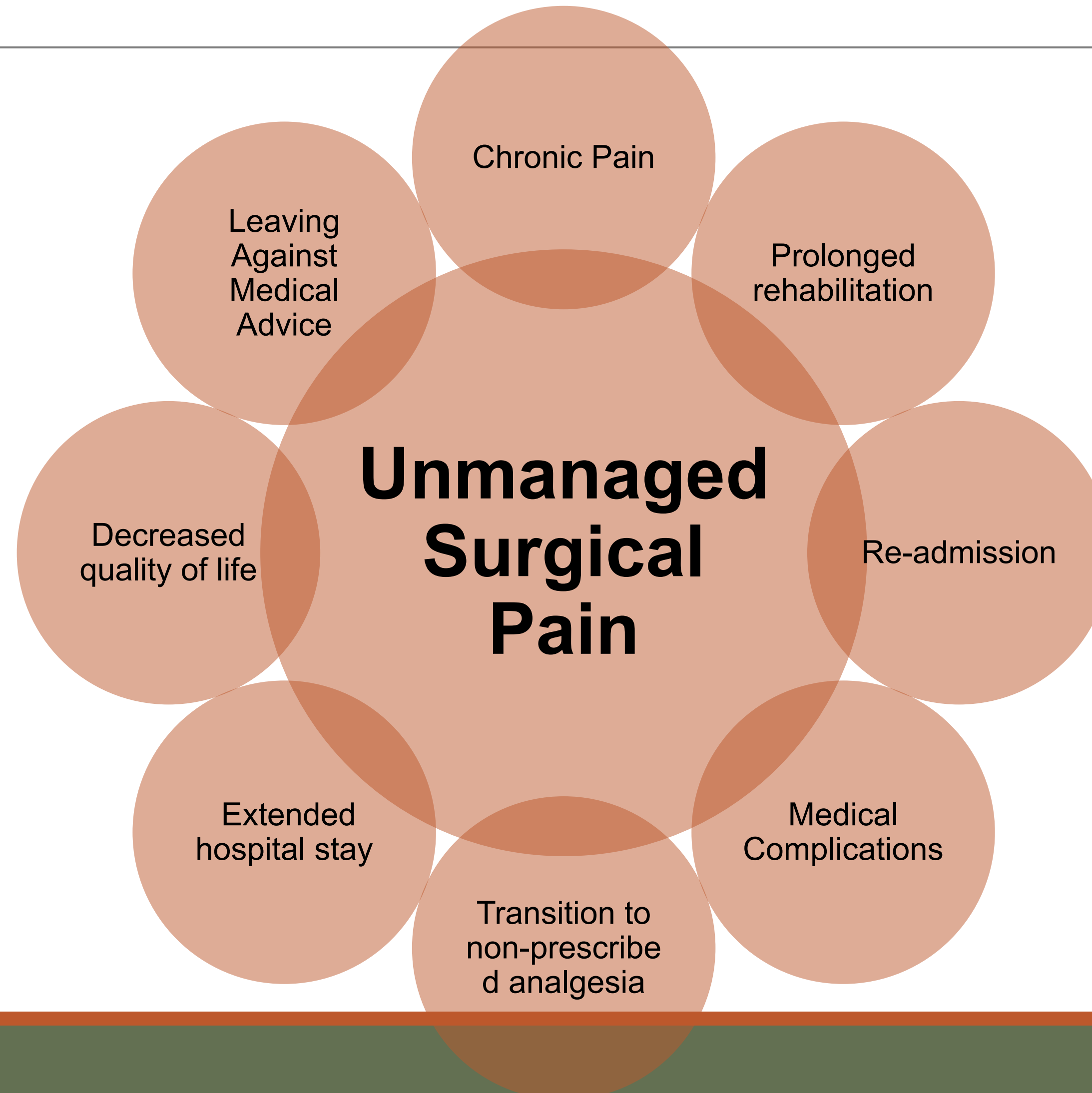
AKI = acute kidney injury, CPK = creatine phosphokinase, SCR = serum creatinine

Examples of Pain Etiologies in OUD



Cohen, Steven P et al. Lancet vol. 397,10289 (2021): 2082-2097.
Fitzcharles, M et al. Lancet. vol. 397,10289 (2021): 2098-2110.

Unmanaged Postoperative Pain



Clin Colon Rectal Surg 2013;26:191-196
Br J Anaesth 2001;87(1):62-72
Lancet 2006;367(9522):1618-1625
JPain 2016;17(2): 131-157

Multimodal Pain Therapies

Regional Anesthesia

- Neuraxial infusions, Peripheral nerve block, Neurolytic block, Intrathecal pump

Interventional Strategies

- Cryoablation, Neuromodulation, Trigger point injections, Joint injections

Psychology

- CBT, Behavioral Therapy, Acceptance Therapy, Mindfulness Based Stress Reduction, Emotional Awareness, Self-regulator practice

Restorative Therapies

- Physical therapy, Exercise, Yoga, Tai Chi, Occupational Therapy, Cold/Heat, Ultrasound, Bracing

Integrative strategies

- Acupressure, Acupuncture, Massage, Aromatherapy, Manipulation, Healing Touch

Mind-Body Techniques

- Hypnosis, Biofeedback, Abdominal breathing, Meditation, Mindfulness, Distraction, Guided Imagery

Spirituality

- Meditation, Prayer, Faith communities

Non-opioid analgesics

- Acetaminophen, NSAIDs, COX-2 inhibitors, Alpha agonists, Gabapentinoids, TCAs, NMDA Antagonists, Na Channel Blockers, SNRIs, capsaicin

Opioids

- Morphine, hydromorphone, oxycodone, hydrocodone, fentanyl, methadone, buprenorphine

Preoperative Education

Educate

- Patient
- Family
- Caregiver

Individualize

- Age-appropriate
- Literacy level
- Culturally appropriate
- Linguistically appropriate

Discuss

- Questions
- Concerns
- Options
- Expectations

JPain 2016; 17(2): 131-157

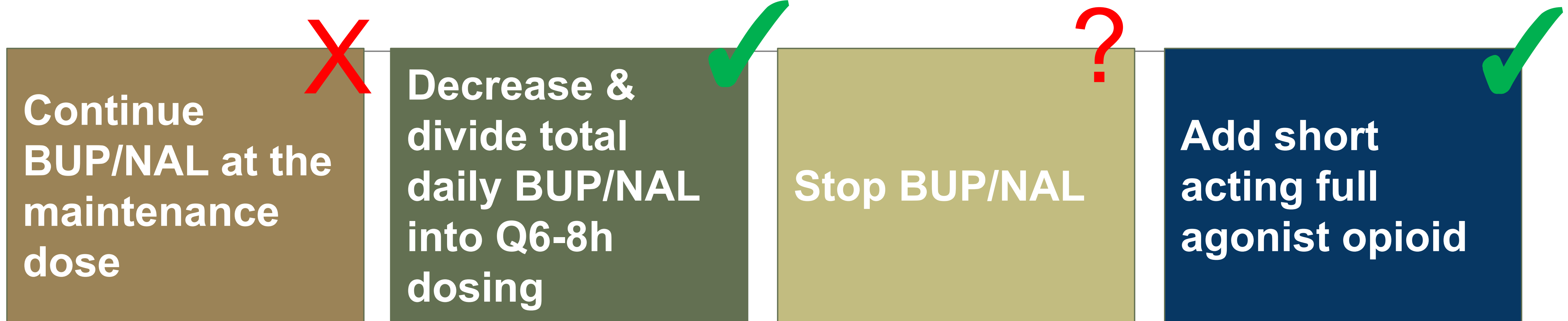
Case 3: Buprenorphine + Acute Pain Inpatient Management

How would you manage the patient's home buprenorphine-naloxone regimen (8-2 mg sublingual TID) while she is hospitalized?

- Continue current dose?
- Decrease dose?
- Stop?

AKI = acute kidney injury, CPK = creatine phosphokinase, SCR = serum creatinine

Case 3: Buprenorphine + Acute Pain Management



Considerations

- Plan for now vs. plan for later
- Etiology of the new acute pain
- Non-pharm interventions or treatments
- Ability to tolerate oral meds post op
- Patient preferences and goals
- Effectiveness/adherence to MOUD
- Transitions of care

Bup/Nal = buprenorphine-naloxone, Q6-8h = every 6-8 hour dosing interval

American Society of Addiction Medicine (ASAM). J Addict Med. 2020;14(2S)(suppl 1):1-91.
Alford AP, Compton P, Samet , JH. Ann Intern Med. 2006;144(2):127 134.

Acute Pain Management in MOUD

WHY Divide MOUD dose?

Buprenorphine ~ 37 hours
Methadone ~ 20-35 hours

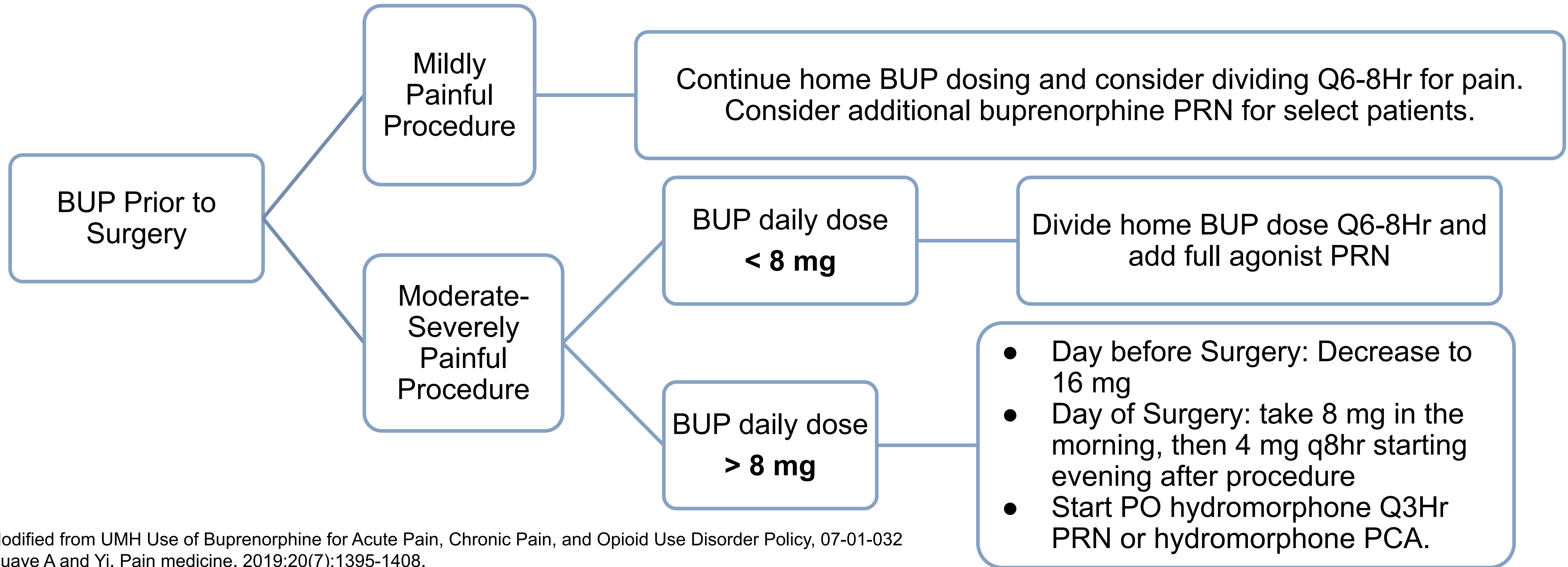
Occupation at mu-opioid receptor

6-12 hours

Analgesic effect

Harrison, T et al. *Anesthesiology clinics* vol. 36,3 (2018): 345-359.
Kreutzwiser, D, and Qutaiba A. CNS drugs vol. 34,8 (2020): 827-839.
Childers J et al. *J Palliat Med* 2012;15(5):613-614
Johnson R et al. J Pain Symptom Manage 2005; 29(3):297-326

Example Perioperative Buprenorphine Protocol

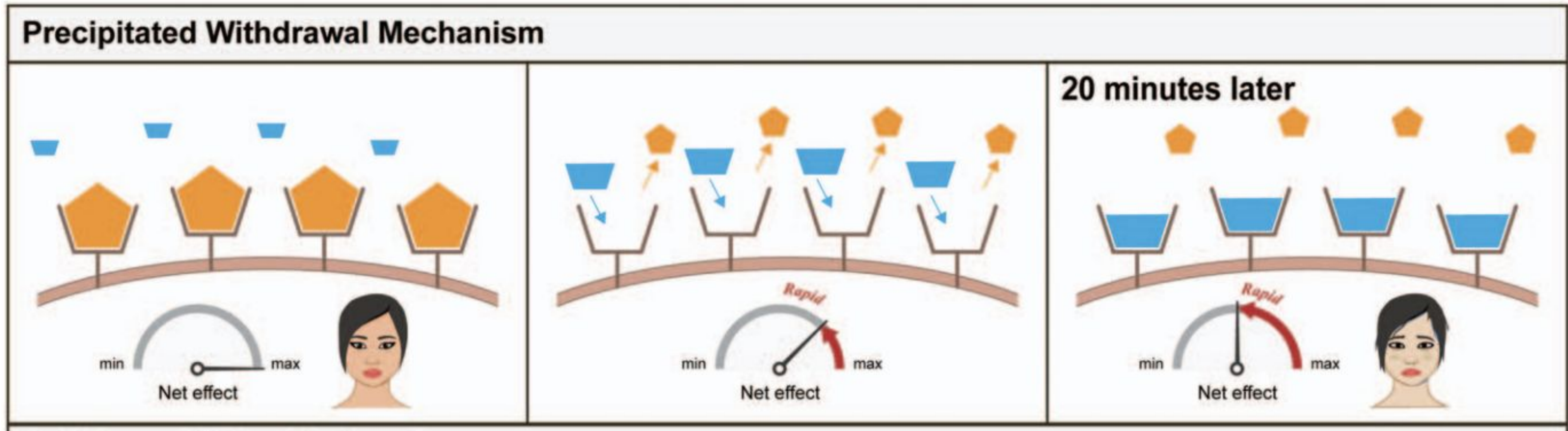


Modified from UMH Use of Buprenorphine for Acute Pain, Chronic Pain, and Opioid Use Disorder Policy, 07-01-032
Quaye A and Yi. Pain medicine. 2019;20(7):1395-1408.
Kohan, L et al. Regional anesthesia and pain medicine. 2021;46(10):840-859.
Jalili M, et al. Ann Emerg Med. 2012;59(4):276-80.
Silva M and Rubinstein A. Journal of Pain & Palliative Care Pharmacotherapy. 2016;30(4):289-293.

Case 3: OUD + Acute Pain Inpatient Management

- continue buprenorphine with divided dosing (consider 4 mg TID)
- add short acting, full agonist opioid if indicated (oxycodone, hydromorphone)
- maximize non-opioid pain medications (if not medically contraindicated):
  - acetaminophen (1000 mg PO q6h scheduled; reduce for liver disease)
  - NSAID
  - gabapentinoid (gabapentin 100 mg TID; titrate as tolerated up to 600 mg TID)
  - muscle relaxant (e.g., Robaxin 500 mg PO TID; titrate as tolerated up to 1000 mg PO QID)
  - topical analgesics
  - topical anesthetics

Precipitated Withdrawal



Blue = buprenorphine (partial agonist)
Orange = other opioid (full agonist)

[Ghosh et al. A Review of Novel Methods To Support The Transition From Methadone and Other Full Agonist Opioids To Buprenorphine/Naloxone Sublingual In Both Community and Acute Care Settings. *Canadian Journal of Addiction*. 2019]

Case 3: OUD + Acute Pain
Methadone considerations

For patients on methadone rather than buprenorphine:

- continue maintenance methadone dose (unless acute concerns: QTc prolongation, sedation, etc.)
- do NOT reduce methadone dose
- ok to add short-acting opioids on top of methadone for pain management
- consider dividing methadone (BID or TID dosing) for better pain control
  - for short hospitalizations, may continue with once-daily dosing
  - if dividing the dose, must consolidate back to once-daily dosing at time of discharge
- coordinate with methadone clinic at time of discharge
  - avoid Saturday discharges (many methadone clinics closed on Sundays)
  - print copy of MAR to show methadone dosing: fax to clinic and provide copy to patient

Clinical Pearls

- OUD dosing of methadone and buprenorphine = significantly different than pain dosing
- Dispo planning is imperative (SNF? jail? home?) and may impact treatment plan
- Opioid withdrawal, urges/cravings, and undertreated pain = risk factors for AMA discharges
- Patients injecting fentanyl have high opioid tolerance, may not respond to high dose opioids
- Multimodal pain treatment is crucial for pain management, especially with opioid tolerant pts
- Treating withdrawal does not necessarily suppress urges/cravings to use

Case 3: OUD + Acute Pain Outpatient Management

- Pts may be discharged with short course of opioids
  - recommend lowest effective dose and shortest effective duration (generally 3-7 days)
  - environmental safeguards: family members may store and dispense opioids
- Continue buprenorphine (reduced dose, divided regimen)
- Continue multimodal regimen if not medically contraindicated
- Close coordination with Surgeon
  - if ongoing / unresolved pain, consider complications (surgical site infection, etc.)
- When no longer requiring full agonist opioids, titrate buprenorphine back to usual regimen
- Manage polypharmacy. Gently de-prescribe multimodal agents as able.
- Candid discussion with patient regarding triggers / urges. Utilize recovery supports.
- Stressful situations require more care and closer monitoring, not less!

Summary & Recommendations

Set expectations

Plan ahead

Consult subspecialties

Continue MOUD

Be aggressive

Transitions of Care

Addiction Medicine 201
Inpatient to Outpatient SUD Care Transitions: Case-Based Workshop

THANK YOU!

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APPENDIX

Binding Affinities for Mu Opioid Receptor (MOR)

Opioid	MOR binding Affinity, Ki (nM)
Sufentanil	0.1380
Buprenorphine	**0.2157**
Hydromorphone	0.3654
Oxymorphone	0.4055
Morphine	1.168
Fentanyl	1.346
Naloxone	1.518
Nalbuphine	2.118
Methadone	3.378
Remifentanil	21.1
Oxycodone	25.87
Hydrocodone	41.58
Tramadol	12,486

Which full agonist should I select for my periop BUP patient?

Volpe, D et al. *Regulatory toxicology and pharmacology : RTP* vol. 59,3 (2011): 385-90.