Disclosures

› Nothing to disclose
Outline

› Opioids:
  – Novel synthetic analogs
  – Special considerations in testing
  – Managing acute intox/withdrawal during resuscitation

› Opioids cont. Kratom

› Methamphetamine and analogues
  › How neurotransmitters can inform treatment

› Cannabis (delta-8/9 THC)

› Synthetic cannabinoids
Opioids definition

› Opiate vs opioid
  - Derived from *papaver somniferum* vs. synthetically altered/created
  - Common theme of binding to opioid receptors (most notably, mu)
  - B-arrestin pathway signaling can be altered in synthetic opioids (functional selectivity)
Nitazene’s et al

› “Template” molecules
› Unclear legality in some cases
  – Bill S.1006 recently introduced
  – Schedules many fentanyl analogues
› Very difficult to test for
› Difficult to track
› May require higher doses of naloxone
› Bottom line, treat the toxidrome in front of you
Novel Synthetic

- N-Pyrrolidino Etonitazene (commonly called PYRO)
  - At least one death in Denver
  - 20x more potent than fentanyl
  - NOT often found alone
  - NOT detected by UDS
  - NOT detected by test strips
Opioid acute intoxication and withdrawal

› Complicates resuscitations
› Can use naloxone by any route for treatment, but may induce acute withdrawal (remember, goal is respiratory status NOT mental status)
› Tachycardia and HTN may be related to withdrawal
› In acute setting with other concomitant issues, prefer opioids to treat acute opioid withdrawal; discuss induction later when stabilized
› Two opioid pearls:
  – Fentanyl is weakly serotonergic
  – Hydromorphone has highest binding affinity of commonly available opioids in the ED
Kratom

› Mitragyna speciosa is a tropical tree in the caffeine family
› Has been used for centuries, usually for stimulant effects
› Commonly sold as pills/powder for direct ingestion or drinking
Kratom

› Active ingredients: mitragynine/7-hydroxymitragynine

› Shows dose dependent effects:
  – Lower doses (often chewing leaves) causes euphoria and increased energy
  – Higher doses (usually extracts) produce more opioid effects

› Partial agonists of MOR, competitive antagonist at DOR
  – Thought to have profound B-arrestin aberrations, which accounts for the substantially lower rate of respiratory depression seen
  – Used frequently for chronic pain, opioid withdrawal, etc.

› Increasingly more common, >2 million people have used in the last 12 months
What Is Kratom? Uses, Side Effects, & Safety

Kratom is a powerful psychoactive herb from Southeast Asia. It's stimulating in lower doses & sedative in higher doses.
Phenylethylamines we know and love

› Trends from 2017 demonstrate nationally meth use increased to nearly 1 million people
› In Colorado, nearly 1% of young adults have tried meth at least once
› Much more common on the West Coast
› Meth related offenses have rising linearly over the last decade, while other stimulants (e.g. cocaine) have remained flat
› High risk of secondary disease (e.g. cardiomyopathy, infection, trauma etc.)
› Can be contaminated (e.g. lead poisoning outbreak in Oregon)
Acute treatment of the complicated meth pt

› Meth demonstrates dose related response
  - NorEpi predominates at low doses
  - Dopamine at larger doses

› This likely partially explains “meth psychosis”

› Consider antipsychotic use
  - Largely hemodynamically neutral
  - Directly treats high dopamine load

› Benzodiazepines mainstay of treatment
  - Benzo’s can decrease release of NT’s
  - Likely see improvement in HTN, tachycardia, and hyperthermia
What is being called marijuana and is there a difference?

› Delta-8 THC, delta-9 THC, synthetic cannabinoids

› Delta-9 is the predominant active ingredient in what is colloquially called MJ
  - Newer strengths and level of concentration now possible

› Due to the Farm-Bill, hemp growth was expanded
  - Delta-8 THC is present in small quantities in hemp
  - Can be extracted and concentrated, not necessarily illegal
  - 2/3’s as potent at CBD1/2
Synthetic Cannabinoids

- Common names: Spice, K2, synthetic MJ, herbal smoking blends etc.
- Named so for binding to CB1/2, but NOT very similar to MJ
- Often full agonists vs partial agonism of THC
- More frequently binds alternative receptors, such as NMDA, serotonin etc.
  - Can also affect enzymes like MAO
- More severe side effects and several deaths linked to these products
- Contaminates also a problem (brodifacoum)
Summary

› Opioids continue to be a difficult problem
  – Novel synthetics will NOT be detectable in most pt’s
› Kratom use is much higher than we likely know
  – Many pt’s use for withdrawal
  – Should be the focus of further study
› Meth use is, unfortunately, still on the rise
  – Consider anti-psychotic use
› Increasing MJ legalization will likely lead to novel products
  – Effects of these are yet to be determined
Thank you for your time

› Questions?
› References available upon request
› Please email with any other questions or concerns
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