Pain Management: Opioid Use, Misuse, and Principles of Prescribing

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Financial Disclosures

- Speaker-Carl Zeiss Meditec, Bausch and Lomb, Oyster Point Pharma, Thea Pharma, Alcon, Allergan, Astellas
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- Shareholder-Clearside Biomedical (<0.01% ownership)
- *All relevant relationships have been mitigated*

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Objectives

- 1. Discuss specific ocular conditions for which pain management may be necessary
- 2. Discuss pharmacologic options for management of ocular pain
- 3. Identify features of opioid misuse, adverse effects of opioid use, and treatment of opioid overdose
- 4. Understand the decision making process in the choice of analgesics

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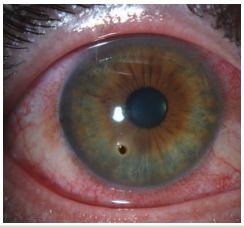
Case

- 38 year old Hispanic male presents with 3 day history of tearing, redness, and irritation in the right eye
  - He thinks something got in his eye at work…
    - He had to leave work because of the severe discomfort that day
- Remove the foreign body, dilate, then what?



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Prescription Choices

- In emergency situations resulting in pain:
  - NSAIDs or Tylenol
  - …or narcotics…
  - *Very few options in between*
- Topical options?
  - Cycloplegic agent
  - NSAID
  - Bandage contact lens
  - *Anesthetic?*

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Pain Management

- Anterior segment pain
  - Corneal abrasion, erosion
  - Corneal ulcers, severe ocular surface disease
  - Uveitis(?)
  - Scleritis
  - Acute angle closure
  - Herpes zoster ophthalmicus (& post-herpetic neuralgia)
    - Ocular neuropathic pain
- Posterior segment conditions causing pain
  - …
  - Posterior scleritis
  - Idiopathic orbital inflammation
  - Tolosa-Hunt syndrome
    - Cavernous sinus inflammation
  - Inflammatory optic neuropathy

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Treatment Goals in Ocular Pain Management

- Find and treat the underlying cause!
- Then, manage the associated pain
- **Reduce (not eliminate) pain to restore functionality**

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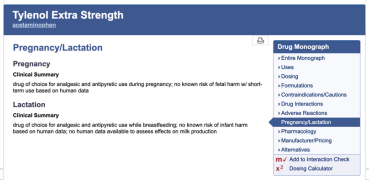
Resources

- Epocrates Online
- https://online.epocrates.com/



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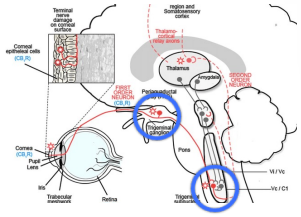
Ocular Sensory Pathway

- *The simple approach*
- First order neuron
  - Nerve ending in the cornea→cell body in the trigeminal ganglion
  - Synapse in the subnucleus caudalis/upper cervical transition zone



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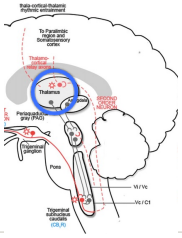
Ocular Sensory Pathway

- Second order neuron
  - Cross and join the (contralateral) spinothalamic pathways
  - Synapse in the thalamus



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Ocular Sensory Pathway

- Third order neuron
  - Relay information to the supraspinal centers
    - Somatosensory cortex
- Perception of pain is modified by descending pathways

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Complex Experience of Pain

- Multisystem illness that involves the neurologic, endocrine, and immune system
  - Thousands of genetic modifiers influence risk of experience of chronic pain
- Everyone with chronic pain experiences it differently

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Understanding Pain Mechanisms

- Multiple molecular pathways which lead to a single pain syndrome
  - i.e. migraine. Even in a small subgroup, there may be variation in response to treatment
- Common pathways in pain, addiction, and depression
  - May look beyond targeting the mu-receptor and type 3 dopamine receptor

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Challenges in Clinical Trials

- The placebo effect is real
  - Biological, genetic, neurocircuitry mechanisms underlie the response
- How do we measure pain?
  - Currently, most common used pain assessment measures are subjective i.e. numerical pain rating scales
- Plus emotional, experiential, cultural, and cognitive factors

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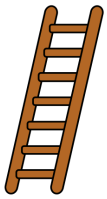
WHO Ladder Approach

- General approach to pain management:
  - Begin with non-opioid medications
  - Mild opioids (i.e. codeine) +/- adjuvants +/- non-opioids
    - Adjuvants enhance analgesics, may be prescribed to control side effects
      - Nausea, depression, insomnia, anxiety
        - i.e. pregabalin, gabapentin, amitriptyline



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NSAIDs

- Inhibit COX-1 and COX-2
- Ibuprofen
  - Advil or Motrin IB (200mg tablets)
  - Up to 1200mg daily (OTC)
  - Up to 2400mg daily (Rx) for pain (although maybe up to 3200mg/day for rheumatoid arthritis)
    - Available as 100mg, 200mg, 400mg, 600mg, 800mg tabs

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What is the maximum daily dosage?!

Adult Dosing ⓘ

Dosage forms: CAP: 200 mg; TAB: 100 mg, 200 mg, 400 mg, 600 mg, 800 mg; CHEWABLE: 50 mg, 100 mg; SUSP: 100 mg per 5 mL, 50 mg per 1.25 mL

osteoarthritis

[300-800 mg PO tid-qid]

Max: 3200 mg/day; Info: use lowest effective dose, shortest effective tx duration; give w/ food if GI upset occurs

rheumatoid arthritis

[300-800 mg PO tid-qid]

Max: 3200 mg/day; Info: use lowest effective dose, shortest effective tx duration; give w/ food if GI upset occurs

for anti-inflammatory uses (off-label)

[600 mg PO qid x7-14 days]

Max: 2400 mg/day; Info: 800 mg PO tid; Info: use lowest effective dose, shortest effective tx duration; give w/ food if GI upset occurs

pain, mild-moderate

[400 mg PO q4-6h prn]

Max: 2400 mg/day; Info: use lowest effective dose, shortest effective tx duration; give w/ food if GI upset occurs

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NSAIDs

- Naproxen sodium
  - Available as 220mg, 275mg, 550mg, 375mg ER, 500mg ER Up to 1375mg-acute; 1100mg-maintenance; 1500mg ER
  - Aleve (naproxen sodium)
    - 220mg tabs, max 660mg/day (3 tabs)

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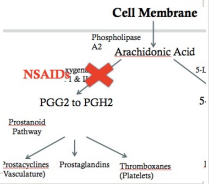
NSAID Cautions

- Increased risk of bleeding
  - Inhibits thromboxane production
- Decreases stomach mucous production-may result in gastric ulcers and intestinal perforation
- Caution in patients with CV disease history, history of stroke, heart failure, and hypertension
- Risk of nephrotoxicity in CKD-**do not use in individuals with kidney disease**



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Topical Ocular NSAIDs

- Block COX-1 and COX-2
  - Leaves the leukotriene pathway unaffected
- Reduces prostaglandin formation
  - Reduces pain at the level of the ocular surface
- Some indication that inhibition of COX-2 inhibits MMPs within the corneal epithelium
  - Pan 2002, Ottino 2001

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Ocular ADRs of Topical NSAIDs

- Generally very mild
  - **Stinging upon instillation**
  - Corneal infiltrates, corneal melting, delayed epithelial growth (most problematic with 'old' generic Voltaren)
    - Those at risk include RA, corneal denervation, DM, dry eye
  - Prolonged use can mask signs of infection
  - Infiltrates (WBC) due to over production of leukotrienes which cause leakage of WBC

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Topical NSAIDs-Older

- Acular LS (ketorolac 0.4% solution)
  - Dosed **QID** for up to 4 days after keratorefractive surgery
  - Generic
- **Acular (ketorolac 0.5% solution)**
  - Generic only; approved for tx of ocular allergy QID ($50→$20)
- Acuvail (ketorolac tromethamine 0.45% solution); PF
  - **BID** for pain and inflammation following cataract surgery x 2 weeks
    - Approx $360 for 30 vials

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Topical NSAIDs-Newish

- Bromday (bromfenac sodium 0.09% solution)-generic only
  - QD for post-operative inflammation and reduction of pain
  - Mainly used to decrease risk of CME post op
    - $65 for 1.7 mL bottle (2.5mL bottle discontinued)
- ***Bromfenac should not be used in patients with sulfite allergy***
- Nevanac (nepafenac 0.1% **suspension**)
  - TID x 2 weeks for post-op pain and inflammation associated with cataract surgery; increased posterior segment action
    - $350 for 3mL bottle

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Topical NSAIDs-Newer

- Prolensa (bromfenac sodium 0.07%)-2013
  - QD for treatment of postoperative inflammation and reduction of ocular pain
  - Lower concentration vs Bromday; also more physiologically neutral pH = improved penetration
  - $340 for 3mL bottle—with a coupon as low as $90
- Bromsite (bromfenac sodium 0.075%)-2016—and generic (February 2024)
  - BID
  - Durasite vehicle
  - First NSAID to be approved for 'preventing ocular pain in patients undergoing cataract surgery'
  - $285 for 5mL bottle
  - ***Bromfenac should not be used in patients with sulfite allergy***
- Ilevro (nepafenac sodium 0.3% suspension)-2012
  - QD for treatment of postoperative inflammation and reduction of ocular pain (2 weeks)
  - $340+ for 3mL bottle

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ketorolac 0.5% solution QID

Or diclofenac 0.1% solution BID

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Acetaminophen

- Antipyretic and analgesic effect-weak anti-inflammatory effect
  - Little to now effect on platelets or inflammation
    - But does increases the blood thinning effect of warfarin
- Typically weaker effect than NSAIDs, but overall, better tolerance
- Well absorbed orally, peak blood levels reached in 30-60 minutes

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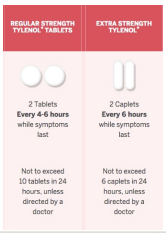
Acetaminophen Dosing

- Regular strength (325mg): 325-650mg q4-6hours
  - Max 3250mg/day
- Extra strength (500mg): 1000mg q6-8 hours
  - Max 3000mg/day



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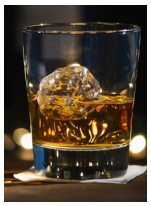
Acetaminophen

- Caution in patients with liver disease
  - Cirrhosis, Hepatitis C
- Caution in heavy alcohol drinkers
  - *5 oz. glass of wine*
  - *1.5 oz 80-proof spirit*
- Caution in patients with severe renal disease
  - <= 30CrCL mL/min
- *According to the Dietary Guidelines for Americans & NIAAA:*
  - *Moderate = 1 drink per day for women, 2/day for men*
  - *Heavy = 3 drinks/day for women, 4 drinks per day for men*
    - *8 drinks per week for women, 15 drinks/week for men (CDC)*



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Acetaminophen Toxicity

- Partially metabolized by hepatic enzymes and converted to inactive metabolites
- Small amount is metabolized into a highly active metabolite-toxic to liver and kidney
  - This is quickly broken down into no-toxic compounds in the normal state

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Pain Management Pearl

- Aim to treat on a fixed-dose schedule around the clock
  - Vs. "PRN"

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Common Opioids

- **Tramadol**
- **Codeine**
  - **Tylenol #3**
- Hydrocodone
  - Hydrocodone/acetaminophen
- Oxycodone
  - Percocet, Percodan
- Morphine

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General Pharmacokinetics

- Well-absorbed orally
- Cross placental barrier
- Metabolized by hepatic enzymes, eliminated by the kidneys
- Codeine, hydrocodone, tramadol target the mu opioid receptor
  - G protein coupled receptors in the brain and spinal cord (and gut)

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Opioid Effects

- **Limbic system:** create feelings of pleasure, euphoria, and relaxation
- **Brainstem:** slow breathing, stop coughing, reduce pain
- **Spinal Cord:** reduce pain
- ***Cause analgesia, sedation, euphoria, respiratory depression, suppression of the cough reflex***

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Opioid Side Effects and Contraindications

- Significant side effects-especially with chronic use
  - GI effects-constipation
  - Pupillary miosis
  - Fatigue, cognitive impairment, dry mouth, sweating, weight gain
  - Tolerance→ dependence
- Contraindications-asthma, respiratory depression, history (or family history) of addiction
  - MAOi use within 14 days
  - Hypersensitivity
  - Concomitant benzodiazepine, alcohol use

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Polypharmacy

- Increasing trend of concurrent use of benzodiazepines
  - Alprazolam (Xanax), lorazepam (Ativan), clonazepam (Klonopin)
- Combination is correlated with higher levels of pain, physical and mental health disability
  - Increased risk of opioid related fatality

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Polypharmacy

- Black box warning added in 2016

WARNING: RISKS FROM CONCOMITANT USE WITH OPIOIDS

Concomitant use of benzodiazepines and opioids may result in profound sedation, respiratory depression, coma, and death *[see Warnings, Drug Interactions]*.

- Reserve concomitant prescribing of these drugs for use in patients for whom alternative treatment options are inadequate.
- Limit dosages and durations to the minimum required.
- Follow patients for signs and symptoms of respiratory depression and sedation.

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Opioid Side Effects and Contraindications

- Caution in treatment of pain in children younger than 12
  - Codeine and tramadol contraindicated in under 12 years of age
- Warning in breastfeeding mothers and pregnant individuals

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Opioids and Sleep Apnea

- Sleep apnea
  - Obstructive-periodic closure of the upper airway during sleep
    - Pauses in breathing for at least 10 seconds
- Opioids depress respiratory rate
  - May relax the tongue and upper airway muscles
- May increase sensitivity to opioids

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Opioid Use in the United States

- >13 million prescriptions dispensed **per month** in the USA (2014)
- 4.6% of the world's population, 69% of the world's supply of opioids in 2014
  - 99.7% of hydrocodone
- From 2000 to 2014, use of opioids increased 216%
  - Peak US consumption was in 2012
- Opioid overdoses in the United States have reduced the life expectancy by more than 2 month (Dowell 2017)
- Overall recent downward trend in prescribing
  - Increase in opioid-related fatalities from heroin and fentanyl

(International Narcotics Control Board Annual Reports. 2010 to 2014)

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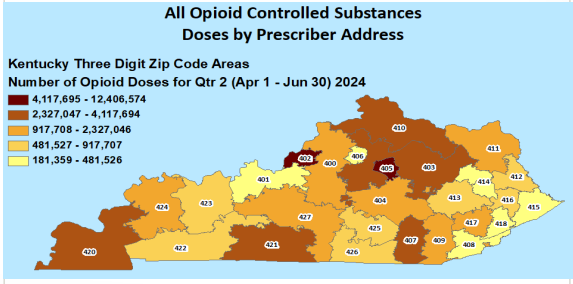

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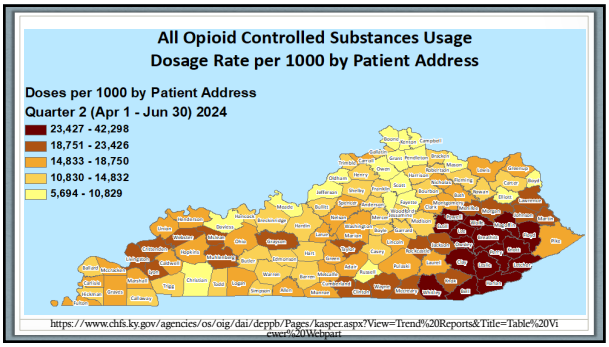

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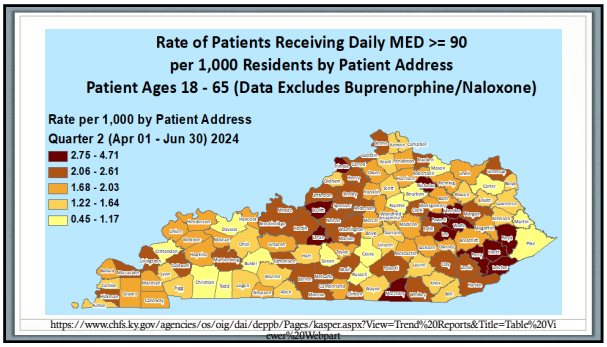

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Office of Public Affairs
U.S. Department of Justice

Friday, May 10, 2024

Dentist Sentenced for Unlawfully Distributing Opioids That Caused Patient's Death

Friday, July 19, 2024

Pain Management Physician and Former Member of Kentucky's Medical Board Convicted of Unlawfully Prescribing Opioids

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Drug Overdose Deaths

- 3 waves beginning in 1999
  - 1) Prescription opioids
  - 2) Heroin
  - 3) Fentanyl and synthetic analogs

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Drug Overdose Deaths in the United States

- 107,543 drug overdose deaths in the United States in 2023; 3% decrease from 2022
- Alaska, Washington, Oregon increased at least 27%
- 107,622 drug overdose deaths in the United States in 2021
  - 15% increase from 2020
  - 30% increase from 2019-2020

DRUG TYPE*	(ESTIMATED DEATHS 2023)	(ESTIMATED DEATHS 2022)
Synthetic Opioids (fentanyl)	74,702	76,226
Psychostimulants (including methamphetamine)	36,251	35,550
Cocaine	29,918	28,441
Natural/semi-synthetic	10,171	12,135

https://www.cdc.gov/nchs/pressroom/nchs_press_releases/2024/20240515.htm

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Overdose Deaths in Kentucky

- In 2023, 1984 overdose deaths
  - Represents a 9.8% decrease from 2022
- 2020: 1964 overdose deaths (49% increase from 2019)
- Fentanyl accounted for 79.1% of overdose deaths
  - Methamphetamine 55.2%

https://governor.ky.gov/attachments/2023-Drug-Overdose-Fatality-Report.pdf

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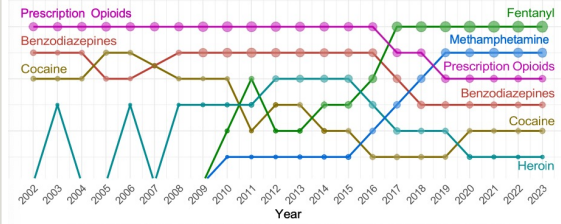

Produced by the Kentucky Injury Prevention and Research Center, as bona fide agent for the Kentucky Department for Public Health. Data are provisional and subject to change. Data extracted May 2024.

https://governor.ky.gov/attachments/2023-Drug-Overdose-Fatality-Report.pdf

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Substance	Frequency
Fentanyl	1,570
4-ANPP	1,356
Methamphetamine	1,095
Amphetamine	848
Acetylfentanyl	778
Cocaine	427
Gabapentin	371
THC	363
Ethanol	318
Morphine	184
Alprazolam	158
Hydrocodone	155
Oxycodone	154
Clonazepam	150
Buprenorphine	98
Oxymorphone	95
Dihydrocodeine	91
Hydromorphone	89
Methadone	87
Nordiazepam	78
Oxazepam	66
Caffeine	56

https://governor.ky.gov/attachments/2023-Drug-Overdose-Fatality-Report.pdf

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How Did We Get Here?

- Opioids are very effective in management of **acute** pain
  - Are ***always*** highly rewarding and addictive
- Overprescribing amongst certain providers led to drug diversion
- In chronic pain (>3-6 months), overall, opioids are less effective
- Tolerance can develop-which can lead to addiction

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How Did We Get Here?

- Strict clinical guidelines were developed which dropped the number of prescriptions (quickly and significantly)
- Some patients who were addicted to prescription opioids were switched to other drugs
  - Heroin-cheaper and **more** accessible in many regions
  - Fentanyl, 4-ANPP-developed as a synthetic agent
  - Isotonitazene (ISO)—20+ times stronger than fentanyl
  - Synthetic opioids also found in cocaine, crystal meth, pills, and heroin

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How Did We Get Here?

- Fentanyl binds much more strongly to opioid receptors
  - 100s of times greater than morphine; multiple naloxone administrations may be needed in one case
  - Cheaper and easier to obtain than heroin—often used as a filler or cutting agent for heroin

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Tropicamide

- Adverse effects associated with anti-cholinergic syndrome
  - Tachycardia, elevated temperature, flushed, warm skin, dry mouth
- At even higher dosages (i.e. intravenous administration): **euphoria**, visual and auditory **hallucinations**, convulsions, ataxia
- When used in conjunction with heroin—reduces symptoms of heroin withdrawal
- *Should we be treating tropicamide like a controlled substance?*
  - *Documentation, storage in protected area*

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Barriers To Treatment

- Fewer than 1 in 4 patients with an opioid use disorder received treatment in 2015 in the United States
- **That means at least 75% of patients need—but are not receiving addiction treatment**
- Shame, guilt, embarrassment
  - Lack of treatment options precipitates long-term effects on patients and families

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In Kentucky

- 18% of 1.1 million Medicare Part D enrollees received medication to treat substance abuse disorder
  - Vs. 6% in Florida…

https://oig.hhs.gov/oei/reports/naloxone-opioid-disparities-one-pager-508.pdf

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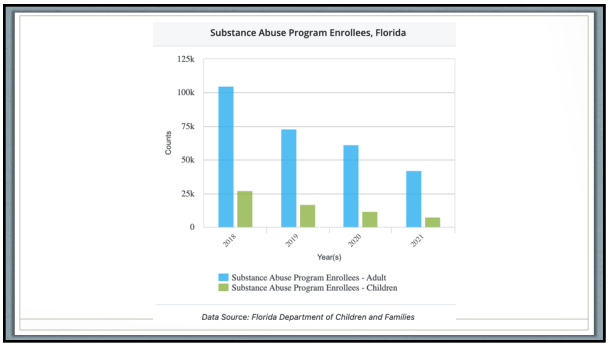

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Pharmacological Approaches

- Methadone
  - 1970s-full agonist of opioid receptor
- Buprenorphine (Suboxone)
  - Sublingual-partial agonist of mu-opioid receptor
    - Also seems to improve mood by blocking kappa receptors
- Naltrexone
  - Oral in 1984, injectable in 2010 (Vivitrol)-antagonist of opioid receptor
- But--behavior therapies are key to cope with cravings, addiction, relapses

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Overdose Reversal

- Naltrexone options in 2023
  - Intramuscular injection (generic 0.4mg/mL) with 23-25 gauge needle
  - Injectable branded (Zimhi)
  - Nasal spray (generic, Narcan, Kloxxado)
    - No assembly required
- ***As of March 29, 2023: the FDA approved Narcan for over-the counter, nonprescription use***

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Naloxone Access

- OTC shift means increased access
  - Now, no longer covered by Medicare Part D
    - Means another out of pocket expense
- 160,000 doses of Narcan distributed in 2023 in Kentucky

https://governor.ky.gov/attachments/2023-Drug-Overdose-Fatality-Report.pdf

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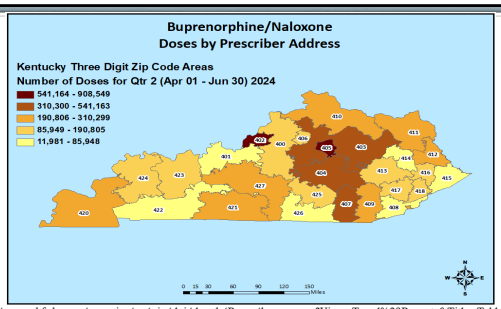

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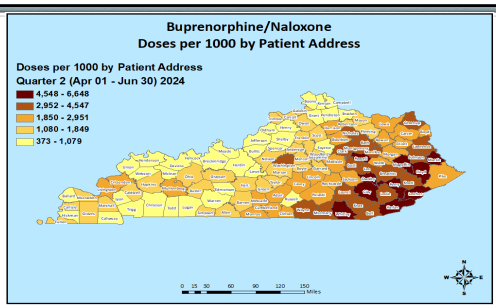

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Co-Prescribing Trends

- To reduce risk of overdose-prescribers are encouraged to co-prescribe naloxone to patients at risk of overdose
  - Dosage >50 MME daily
  - Concomitant respiratory condition (COPD, sleep apnea)
  - Concomitant benzodiazepines
  - Non-opioid substance use disorder
    - Excessive alcohol use
    - Mental health disorder

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Naloxone Prescribing Trends

- Also—
- Patients who are at high risk of experiencing (or responding to) an opioid overdose
  - Heroin, or synthetic opioid use
  - Other illicit drugs-including stimulants
    - Concern of fentanyl contamination
  - Receive treatment for opioid use disorder
  - History of opioid misuse and recently released from incarceration

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Relapse

- More than half of patients relapse within 6-11 months
  - Typically, all relapse in the first month without treatment
- More than 90% of patients who survive an overdose continue to receive prescription opioids after the event
  - Repeat prescriptions are often given by the same prescriber-but at lesser doses

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Looking Ahead

- Harm reduction sites (needle exchange programs)
  - 30 years of research (most international)
  - Reduce risk of transmission of viral hepatitis and HIV
  - New users of these sites are 5x more likely to enter drug treatment and 3x more likely to stop using drugs vs. those who do not
  - Provide naloxone
  - Do not increase illegal drug use or crime

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Looking Ahead

- Public support for syringe exchange programs is generally low
  - McGinty et al 2018
- 1004 adult Americans sampled
- 29% supported legalizing safe consumption sites
- 39% supported needle exchange programs
  - Those who were more likely to be supportive:
    - Registered Democrats, unemployed, bachelor's degree or higher
    - No significant difference in age, race, gender

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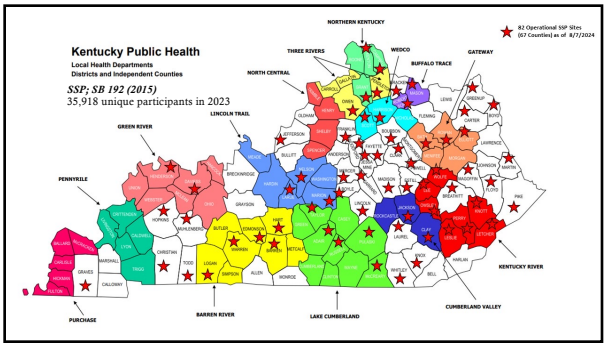

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Looking Ahead

- Supervised consumption sites AKA overdose prevention centers
  - Allow people to consume pre-obtained drugs under supervision of trained staff
  - Provide sterile injection supplies, answer questions on safe injection practices, offer first aid if needed
    - Arrange for referrals to drug treatment and social support programs
  - *Exist in 12 countries; about 100 centers worldwide*
    - *Canada, Europe, Australia*

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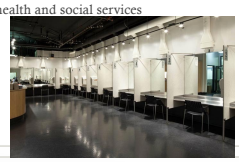
Looking Ahead

- Do SCS encourage drug use—or do they save lives?
  - Reduce HIV, HCV and other blood-borne infections
  - **Decrease the number of overdoses**
  - Minimize public drug use
  - Improve access to health and social services



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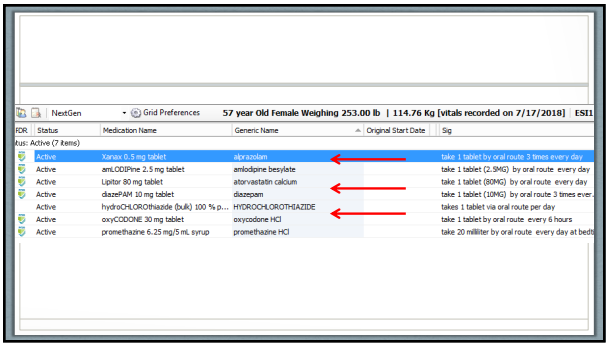


86

Case

- 38 year old female patient presents for comprehensive eye examination
- Correctable to 20/20; unremarkable anterior and posterior segment evaluation
- Walker in the corner of the room
- Was in a car accident 9 months ago-left ankle reconstruction
- Has been on medical leave for 9 months
  - Worked at the local police station in an administrative position

87

Case

- No medications in her chart
- *When things don't add up, how do you approach the patient's care?*
- "You must be in such pain, how are you managing your discomfort?"

88

How Do We Fix This?

- Non-addictive pain medications
  - Addresses the needs of patients with severe pain
- Treatment for those who become addicted
  - Interventions to prevent or reverse overdosing

89

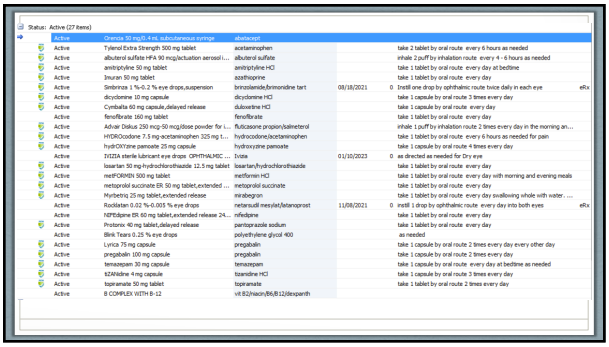
Guidelines for Responsible, Safe, Prescription of Opioids

90

CDC Clinical Practice Guidelines for Prescribing Opioids for Pain

- An update was determined to be needed from the 2016 guidelines to address:
- 1) Barriers exist to access pain care and evidence-based treatment
- 2) Shared decision-making is central
- 3) Discontinuing opioids after extended use can be challenging **(and harmful)**

91



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CDC Clinical Practice Guidelines for Prescribing Opioids for Pain

- Bottom line:
- 1) Maximize nonopioid pain medication
  - *This does not require failure on all non-opioid medications*
- 2) Only prescribe opioids when anticipated benefits outweigh risks
- 3) When opioids are needed-prescribed at the lowest effective dosage
- Dowell D, Ragan KR, Jones CM, Baldwin GT, Chou R. CDC Clinical Practice Guideline for Prescribing Opioids for Pain — United States, 2022. MMWR Recomm Rep 2022;71(No. RR-3):1–95. DOI: http://dx.doi.org/10.15585/mmwr.rr7103a1.

93

Prior to Prescribing

- Determine a diagnosis and document your managing plan for the condition causing pain
- Perform a **complete** history
  - Including experience with non-opioid and opioid medications
  - Pregnancy, breastfeeding, sleep apnea, current benzodiazepine use
  - History of substance abuse, family history of substance abuse
    - Overdose history or history of a bad reaction to opioid medications
    - ***Witness to an overdose***
- Identify medical necessity, establish treatment goals
  - Pain relief, improvement in activity, while minimizing adverse effects

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Prior to Prescribing

- Informed consent and treatment consent
- Discussion of risks:
  - **Even when taken as prescribed**, risk of physical or psychological dependence
  - Short-term use can lead to unintended long-term opioid use
  - Serious adverse effects of opioids including potentially fatal respiratory depression and development of a potentially serious opioid use disorder than can cause distress and inability to fulfill major role obligations at work, school, or home exist
  - Common effects of opioids include constipation, dry mouth, nausea, vomiting, drowsiness, confusion, tolerance, physical dependence, and withdrawal symptoms when stopping opioids
  - Risks to household members and other persons exist if opioids are intentionally or unintentionally shared with others for whom they are not prescribed
  - Opioids should be secured in a locked location
  - Naloxone can be kept available for overdose reversal

Dowell D, Ragan KR, Jones CM, Baldwin GT, Chou R. CDC Clinical Practice Guideline for Prescribing Opioids for Pain — United States, 2022. MMWR Recomm Rep 2022;71(No. RR-3):1–95. DOI: http://dx.doi.org/10.15585/mmwr.rr7103a1

95

There is no validated way to predict who will benefit and who will experience harm

96

Prior to Prescribing

- Access Prescription Monitoring Program (PMP)-KASPER
  - Provide data on patterns of prescription usage for Scheduled drugs
  - State-wide data
    - Include prescription data, prescriber, dispensing pharmacy
- KRS 218A.182 (January 1, 2021)
  - Mandates electronic prescribing

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Prescribing Reminders

- Aim to treat for the shortest period of time possible
  - Maximum number of days varies by State
- Lowest effective dose of immediate-release opioid drug
  - **Low dose = 40 morphine milligram equivalent (MME)**
  - Moderate = 41-90 MME
  - High >91 MME
- *Patients who do not respond to low or medium dose will typically not respond to higher dosages*

99

Acetaminophen 300mg with codeine 30mg

- Trade name: Tylenol #3
  - *Tylenol No. 1-4. Vary by strength of codeine (7.5mg-60mg)*
- Little to no effect on platelets—or inflammation
- 1-2 tabs q4-6h as needed for pain
  - Max. 3250mg acetaminophen daily *(max max is 4000mg daily)*
  - Max. 300mg codeine daily (0.15MME); 40MME/day = 266.67mg/day
    - 10 tablets daily = 3000mg/day acetaminophen
    - 10 tablets daily = 300mg/day codeine
  - ***Take two tablets by mouth every 6 hours*** ✓
  - ***Take one tablet by mouth every 3 hours*** ✓
    - 8 tablets daily—maximum 3 days; no refill

100

Hydrocodone

- Hydrocodone
  - 1 MME; maximum 40 MME/day
  - Moved to Schedule II in 2014
    - Changed the ability to prescribe for some of our colleagues
- Hydrocodone + acetaminophen (2.5mg, 5mg, 7.5mg, 10mg + 300mg or 325mg)
  - Vicodin: 5mg/300mg (max 8 tablets per day)
  - Most common generic is 5mg/325mg (max 8 tablets per day)
  - 1-2 tablets every 4-6 hours as needed for pain

101

Tramadol

- Trade Name: Ultram
- Weak mu-receptor agonist; inhibits reuptake of serotonin
- Synthetic analogue of codeine (less effective)
- **Opioid** analgesic
  - Avoid in history of anaphylaxis secondary to codeine or other opioids
  - Analgesia 1 hour after administration

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Tramadol

- Tramadol (MME 0.1)
  - 40 MME/day = 400mg of tramadol per day
  - 50mg tabs (immediate release); maximum 8 tablets per day
  - i.e. 50mg q4h (6 tablets per day) = 300mg per day = 30 MME/day
  - i.e. 2 x 50mg q6h (8 tablets per day) = 400mg per day = 40 MME/day
  - *Take one tablet by mouth every 4 hours*
  - *Take two tablets by mouth every 6 hours*
- Contraindications and cautions are similar to codeine

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What Else Have We Got?

104

Evidence-based clinical practice guideline for the pharmacologic management of acute dental pain in adolescents, adults, and older adults

A report from the American Dental Association Science and Research Institute, the University of Pittsburgh, and the University of Pennsylvania

JADA 2024:155(2):102-117
https://doi.org/10.1016/j.adaj.2023.10.009

Recommendations

1. For the management of acute postoperative dental pain in adolescents, adults, and older adults* undergoing surgical tooth extraction(s), the panel recommends the postprocedural use of nonopioid analgesics† as first-line therapy instead of opioid analgesics (conditional, low certainty).
   - 1.1. For surgical tooth extraction(s), the panel suggests initiating the postoperative pain management using a nonsteroidal anti-inflammatory drug (NSAID) alone (eg, 400 mg of ibuprofen or 440 mg of naproxen sodium) or in combination with acetaminophen (eg, 500 mg) (conditional, low certainty).
   - 1.2. In the rare instances when postprocedural (ie, surgical tooth extraction) pain control using NSAIDs alone is inadequate, the panel suggests the addition to the previous first-line therapy prescription (ie, NSAID) of 325 mg of acetaminophen plus a combination of 325 mg of acetaminophen with an opioid[2,3,4] (eg, 5-7.5 mg of hydrocodone or 5 mg of oxycodone) at the lowest effective dose, fewest tablets, and the shortest duration, which rarely exceeds 3 days (conditional, low certainty).

105

An Observational Study to Determine Whether Routinely Sending Patients Home With a 24-Hour Supply of Topical Tetracaine From the Emergency Department for Simple Corneal Abrasion Pain Is Potentially Safe

Neil Waldman, MD[a]; Ben Winrow, MBCHB; Ian Densie, BSR; Andrew Gray, BA, BCom; Scott McMaster, DO; George Giddings, MBCH; John Meanley, MBCHB

- 1.5mL preservative free tetracaine 1% dispensed for 24 hours was 'a safe and effective means of controlling ocular pain'

106

ELSEVIER
Annals of Emergency Medicine
Available online 6 February 2024
In Press, Corrected Proof ? What's this?

General medicine/concepts

Use of Topical Anesthetics in the Management of Patients With Simple Corneal Abrasions: Consensus Guidelines from the American College of Emergency Physicians

Steven M. Green MD [a], Christian Tomaszewski MD [b], Jonathan H. Valente MD [c], Bruce Lo MD [d], Ken Milne MD [e]

107

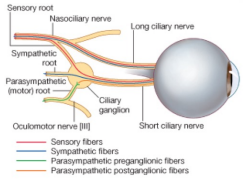
Bandage Soft Contact Lens

- Bandage contact lens
  - Protection from mechanical contact
    - Acuvue Oasys with hydraclear plus
    - Air Optix Night and Day Aqua
    - PureVision

108

Cycloplegic Agents

- Cycloplegic agent
  - Prevents ciliary body spasm



109

Case

- 38 year old Hispanic male presents with 3 day history of tearing, redness, and irritation in the right eye
  - He thinks something got in his eye at work…
- Remove the foreign body, dilate, then what?

110

Case

- Remove the foreign body
  - 30G needle
- 1 drop of 5% homatropine instilled in office
- Prescribed topical antibiotic (Polytrim QID)
- ***Recommended (FL)*** to take over the counter ibuprofen (2x200mg every 4 hours
  - Max 1200mg or 2400mg/day?
- Emergency contact information provided; scheduled for follow up next day
- *Lost to follow up…telephone number disconnected*

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Bottom Line

- Pain is the complex manifestation that involves the neurologic, endocrine, and immune system
- Oral and topical ocular agents are effective in the treatment of short term pain
- Prescribe opioids when necessary, as allowed by your State—but must ensure to do your due diligence as an Optometric Physician

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Thank You

- Jessicaa.steen@gmail.com
- 480.289.0613

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