Ocular Pain Management for the Primary Care Optometrist

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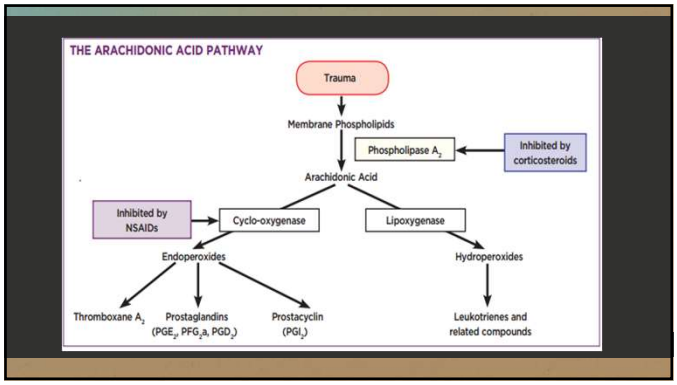
Disclosures

- I have nothing to disclose.

Pain

- Necessary reaction for survival and overall well being
- Pain pathways in every system are redundant
  - More than one opportunity to "get out" of the situation
- Sensory nerves in and around the eye are mainly supplied by the trigeminal nerve and its branches
- Cornea one of the most sensitive organs in the body
  - 300-600 more receptors per unit area than the skin



Acute vs. Chronic Pain

ACUTE	CHRONIC

• Life sustaining symptom
• Motivates us to minimize further harm and to heal
• Normal processing of nociceptive stimuli from tissue damage
	• Lasts longer than 3 months, or persists after tissue is healed
	• Abnormal, maladaptive, pathologic disorder of pain pathway
	• Many genetic and epigenetic factors
	  • Nociceptive – chronic smooth muscle or musculoskeletal injury, disease, inflammation
	  • Neuropathic – damage to nerves resulting in abnormal nerve signaling/processing
	• **Higher risk of fatal and non-fatal suicide attempts**

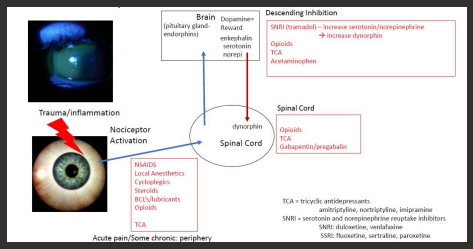
Pain Treatment Goals

ACUTE	CHRONIC
• Reduce pain as it heals, not eliminate it immediately • Identify the source of the pain → treat the source for the pain to ultimately resolve it • Minimize adverse drug reactions during treatments • Pain expectations (~timelines for relief and when/how to call back if worsening)	• Reduce pain, not eliminate it • Increase function • Minimize adverse drug reactions needed for long-term use • Gabapentin, pregabalin, topiramate, sleep aids/hygiene, anti-depression, anti-anxiety, muscle relaxants, physical therapy, occupational therapy, steroids, cognitive behavioral therapy, exercise, acupuncture, opioids (not first line)

Opioid Receptors

- Opioid Receptors
  - Mu (MOP; MOR); kappa (KOP; KOR); delta (DOP;DOR)
- Found widely in brain and spinal cord
- Lesser extent peripherally
  - GI tract, mast-cells
- When bound by opioids (endogenous or exogenous drugs) inhibit neuron firing, blocking pain signals to and from the brain
  - Endogenous neurotransmitters modulating pain: dynorphin & enkephalin (brain and spinal cord); endorphin (released from pituitary)
- Why opioids can be used for acute moderate-severe pain

Pain Pathway



Routes of Ocular Pain Management

Topical

- Fewer systemic side effects and drug interactions
- Higher concentration at source of pain
- Cycloplegics
- Lubricants
- NSAIDs & Steroids
- Proparacaine (to help confirm cornea is source of the pain)
- IOP lowering agents
- Anti-infectives
- Cool compresses or lubricants

Oral

- NSAIDs
- Steroids
- Antibiotics
- IOP lowering agents
- Opioids

Mechanical

- Bandage CL's
- Taping/patching
- Tarsorrhaphy

Causes of Ocular Pain

- Foreign bodies
- Dry eye
- Corneal/conjunctival abrasions
- Blunt trauma
- Inflammation
  - e.g. hordeolum, episcleritis/scleritis, uveitis, keratitis
- Post-surgical

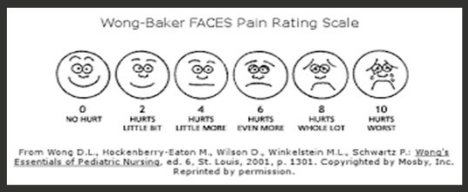
History Is Paramount

- When did this start?
- How often are you feeling the pain? Constant? Intermittent?
- Have you had it in the past?
- Does anything make it better/worse?
- Can you associate the pain with any particular action or time of day?

Pain Scale

- Important to use pain scale
  - Many variations
  - Gives a starting point/baseline
    - On a scale of 1 to 5—5 being the worst pain you have experienced—how would you rate the level of the pain?
  - Helps determine how pt progressing through treatment
- Regardless of the scale, remember that pain is subjective

Wong-Baker Classification Scale



History Continued

- Medical History is important:
  - Pregnancy
  - Allergies to Medication
  - Alcohol use
  - Other medications that may cause interaction
  - Liver function
  - Kidney function

Determine Goals

- Determine the goal of pain management
  - Treat/manage an obvious inflammation, infection or injury?
  - Analgesic effect, i.e. symptomatic relief?
  - Symptomatic relief until the hidden source of the pain is identified and eliminated if possible?

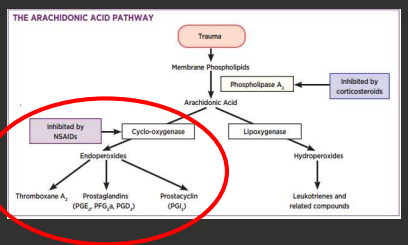
Treatment: From the Top Down

- There are ways to treat pain that don't necessarily involve medications
  - Removal of some type of foreign body
    - Lashes, small fibers or dust, bugs
  - Bandage contact lens
  - Compression/Pressure patch (rarely used)

Topical Medications: Artificial Tears

- Artificial tears
  - Great for lubrication
  - Useful for dry eye
  - In conjunction with use of other medications
  - Assist in healing mild corneal erosions/abrasions
  - Usually only a mild sense of relief
  - Available OTC, easy to access
  - Cost varies

Topical Medications: NSAIDS



The Evolution of Topical NSAIDS…

1986	1991	1992	2003	2005
flurbiprofen 0.03% (Ocufen, Allergan) QID	diclofenac 0.1% (Voltaren, Novartis) QID	ketorolac 0.5% (Acular, Allergan) QID	ketorolac 0.4% (Acular LS, Allergan) QID	bromfenac 0.09% (Xibrom, B&L) BID nepafenac 0.1% (Nevanc, Allergan) TID

2009	2010	2013	2014	2016
ketorolac 0.45% PF (Acuvail, Allergan) QID	bromfenac 0.09% (Bromday, B&L) QD	bromfenac 0.07% (Prolensa, B&L) QD	nepafenac 0.3% (Ilevro, Alcon) QD	bromfenac 0.075% (BromSite, Sun Ophthalmics BID

Topical NSAIDS Side Effects

- Burning
- Stinging
- Hyperemia
- Delayed wound healing

Topical NSAIDS Side Effects

- Rare, but possible corneal ulceration and melt
  - Most cases with generic Voltaren
  - Associated with misuse
  - Follow FDA dosing
  - At risk patients – those with decreased corneal sensation and compromised corneas
    - Limit use to short term when patient in pain
    - Follow appropriately to ensure proper healing
    - Sarcoidosis, rosacea, chemical burns, local radiation around eye, graft vs. host disease with epithelial compromise– may not good candidates NSAID use

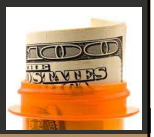
Choosing an NSAID…accessibility, convenience, cost

Older Formulations

- Decreased Cost
- May have more discomfort
- Increased dosing required – may decrease compliance

Newer Formulations

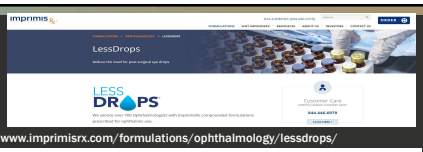
- Improved Comfort
- Convenient/improved compliance with less frequent dosing
- Comparable efficacy
- Increased Cost



Commonly Used Topical NSAIDS

- Flurbiprofen: 0.03%, 2.5 mL
- Diclofenac: 0.1%, 5 mL
- Ketorolac tromethamine: 0.5%, 3 mL/5 mL/10 mL
- Ketorolac tromethamine: 0.4%, 5 mL
- Ketorolac tromethamine: 0.45%, PF, 30 vials/box
- Bromfenac: 0.09%, 1.7 mL/2.5 mL/5 mL
- Bromfenac: 0.07%, 1.6 mL/3 mL
- Bromfenac: 0.075%
- Nepafenac 0.1%, 3 mL suspension
- Nepafenac 0.3%, 1.7 mL/4 mL suspension

Less Drops



http://www.imprimisrx.com/formulations/ophthalmology/lessdrops/

Formulation	Classification	Strength
MKO Melt (Midazolam/Ketamine HCl/Ondansetron), Lemon	Oral Medications	3/25/2mg
Mydriatic 3 Tropi-Cyclo-Phenyl – 1mL – $17.00	Topical Medication	1/1/2.5%
Mydriatic 4 Tropi-Prop-Phenyl-Ketor – 1mL – $17.00	Topical Medication	1/0.5/2.5/0.5
Pred-Gatti – 3mL – $25.00	Topical Medication	1/0.5%
Pred-Gatti-Nepaf – 3mL – $30.00	Topical Medication	1/0.5/0.1%
Pred-Ketor – 3mL – $25.00	Topical Medication	1/0.5%
Pred-Moxi – 3mL – $25.00	Topical Medication	1/0.5%
Pred-Moxi-Ketor – 3mL – $30.00	Topical Medication	1/0.5/0.4%
Pred-Nepaf – 3mL – $25.00	Topical Medication	1/0.1%

Cycloplegic Agents

- Help control inflammation, which in turn helps control pain
- How?
  - Cycloplegics block acetylcholine, therefore stops the contraction of the iris and the ciliary body

Cycloplegic Side Effects

- Common:
  - Blurred vision, itching, burning, stinging, irritation at application site, photophobia
- Severe:
  - Rashes, hives, itching, difficulty breathing, tightness of chest, swelling of mouth, face, lips or tongue, difficulty urinating, dry mouth, eye pain, fever, flushing or dryness of skin, irregular or rapid heartbeat, unsteadiness on your feet.

Interactions

- Review the patient's medical history and current medications and allergies
- Educate patient before starting drops on the following:
  - Cardiovascular changes
  - GI issues
  - Toxicity
  - Sudden allergic reactions
  - Neurologic changes

Cyclopegics

	Atropine	Scopolamine	Homatropine	Cyclopentolate	Tropicamide
Peak Effect	30-40 minutes	20-45 minutes	20-90 minutes	20-45 minutes	20-30 minutes
Duration	1-2 weeks	4-7 days	2-3 days	24 hours	3-6 hours
Uses	Amblyopia Tx Uveitis Tx	Uveitis Tx **for those sensitive to Atropine	1st line Uveitis Tx	Most commonly used for cycloplegic refraction	Mydriadic (DFE)
Side Effects	Blurred vision Eye irritation Dry Mouth Flushing Fast pulse Mental Confusion **Use cation with kids and children with Down's syndrome and CP due to possible CNS effects when used in high doses	Blurred vision Fast Pulse Difficulty Breathing **Higher rate of toxic reactions vs. Atropine—no deaths reported	Blurred vision Eye Irritation Fast Pulse Flushing Tiredness	Blurred vision Transient psychosis in kids when 2% used multiple times **Use cation with kids with Down's, CP and emotional problems	Blurred vision Fast Pulse Flushing Tiredness **Similar SE to Atropine but much less likely

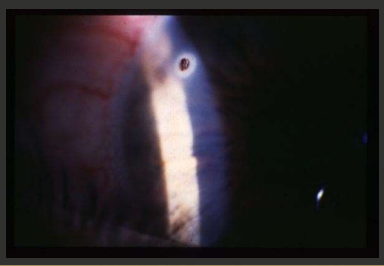
Foreign Body Case

- 35 year old male
  - "got something in my right eye yesterday"
  - Mechanic
  - Working underneath a car and something, "maybe rust" fell into eye while working
  - +Pain 2-3 out of 5
  - Meds: None
  - Medical: None
- Allergies: None

Foreign body case

- VAs: OD: 20/40-, pH 20/25, OS: 20/20-
- Entrance testing: Normal, PERRLA, no APD

Foreign Body Case



Foreign body case

- Assessment: 1. Corneal Foreign Body OD
  2. Mild Corneal Edema Secondary to Foreign Body OD
  3. Corneal Abrasion OD
  4. Secondary Iritis OD due to foreign body

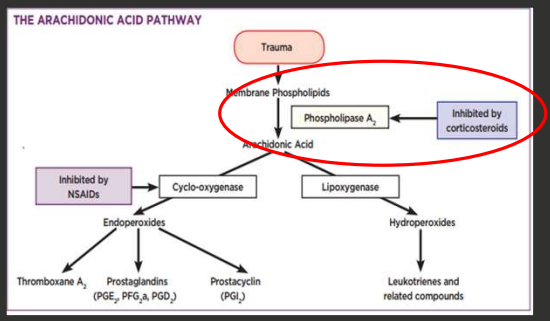
Foreign body case

- 1 gtt proparacaine instilled into OD
- Removed foreign body with spud, followed by use of Alger brush for rust removal
- 1 gtt of Moxeza was given OD in office
- 1 gtt of Prolensa given OD in office
- 1 gtt of 5% HA given OD in office
- Bandage CL AV Oasys was placed in OD 8.4/-0.50 to be worn until next appointment. Moxeza QID OD.

Ibuprofen 400 mg every 4-6 hours prn for pain

Ocular Steroids

- Mimic hormones naturally produced by adrenal gland
- Control pain by:
  - suppressing inflammation when introduced at a higher dose than secreted naturally by the body
  - suppressing the immune system



Ocular Steroids Side Effects

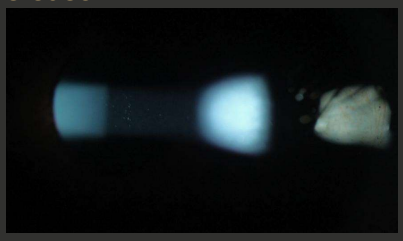
- Blurred vision, burning, itching, possibly development of glaucoma, cataract formation, photophobia, headaches, ONH damage, visual acuity and field defects, corneal perforation, delayed wound healing, mask other ocular infections, flare up of herpes
- Increased IOP

Commonly Used Topical Steroids

- Pred Forte: 1%, 1 mL/5 mL/10 mL/15 mL
- Lotemax: 0.5%, ung/drop/gel
- Durezol: 0.05%, 5 mL emulsion

- As an add on: Tobradex and Zylet

Uveitis Case



Uveitis Case

- 18 year old female
- Irritation, swelling in left eye, x 1 day
  - +tearing, +photophobia, +redness, +foreign body sensation, constant, no vision decrease
- Meds: +Minastrin 24 Fe, +Nexium

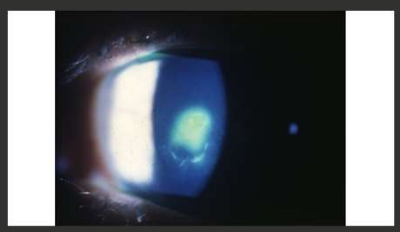
Uveitis Case

- VAs: OD 20/20-, OS 20/20-
- Entrance testing: Normal, mild miosis OS, but reactive and no APD
- Anterior Segment: Conj: OD normal, OS gr 1+ ciliary injection
  Cornea: OD normal, OS normal
  Anterior Chamber: OD normal, OS gr 1+ cells, mobile, no flare
- Posterior Segment: ONH normal color, distinct margins, 0.3/0.3 OU, +FLR, vitreous clear with no cells or flare

Uveitis Case

- Assessment:
  - 1. Anterior Uveitis OS
- Plan:
  - Pred Forte 1% trade name qid while awake OS for 7 days, shake bottle before each use
  - HA 1% 1 gt/day for 5 days

Recurrent Corneal Erosion



Recurrent Corneal Erosion

- "Woke up and it felt like there was a rock in my eye." OS. Saw OD the day before for "tear". Given a bandage lens and told to use FreshKote TID, NaCL ung at night and Moxeza BID OS.
- +pain, 4 out of 5 on severity scale, +photophobia; +watering
- VAs: OD 20/20, OS 20/40- pHNI
- Entrance testing: Normal OU, OS reactive, but sluggish. Pupil sizes asymmetric, but pt was dilated yesterday with 5% HA
- Meds: Metformin, Crestor, Moexipril, Vit D2
- Allergies: Coconut, Adhesive tape

RCE

- Conjunctiva: OD trace injection, OS gr 2+ diffuse injection
- Cornea: OD normal, OS erosion 1mm high X 0.5 mm long, +staining, no edema, no cell or flare

RCE

- Assessment
  - 1. Recurrent Corneal Erosion OS
- Plan
  - 1 gt 5% HA OS in office
  - 1 gt Prolensa 0.07% OS in office for pain
  - Continue Moxeza BID OS until follow up with other OD,
  - Continue FreshKote TID and new bandage contact lens placed in the OS AV Oasys 8.4/-0.50 to be left in until the other doctor evaluates the cornea.
  - 400mg Ibuprofen every 4-6 hours prn for pain.

CJEM. 2010 Sep;12(5):389-96.

Dilute proparacaine for the management of acute corneal injuries in the emergency department.

Ball IM[1], Seabrook J, Desai N, Allen L, Anderson S.

- Study done in 1 ER in Canada
- Two groups, 0.005% proparacaine vs. a placebo
- 15 in proparacaine group, 18 in placebo
- The proparacaine group had more pain relief than the placebo
- No wound healing delay or other complications

Oral Analgesics

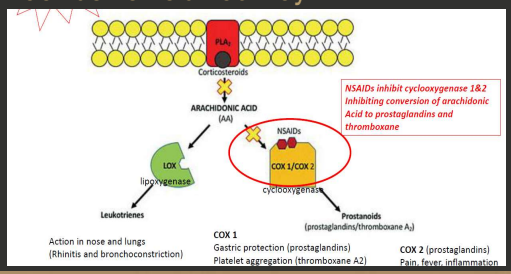
- Three categories
  - Over the Counter
  - Prescriptions that are Non-Narcotic
  - Narcotics

Oral NSAID Activity

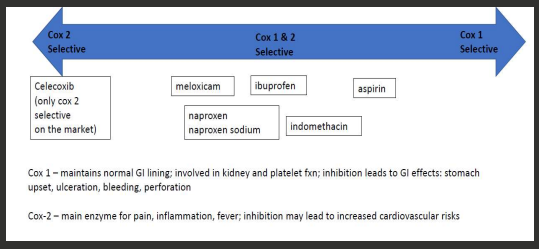
1. Analgesic
   - Relieve pain without sedation
2. Anti-inflammatory
   - Dose for inflammation tx is higher than pain relief
     - E.g. ibuprofen pain: 400 mg TID-QID; recurrent episcleritis or scleritis: 600-800 mg TID-QID
3. Anti-platelet
   - Not related to pain
   - Inhibit platelet's to reduce clot formation in MI and CVA prevention
4. Anti-pyretic
   - Fever treatment

Drug activity varies and have different side effect profiles

Arachidonic Acid Pathway



PO NSAIDS: Efficacy the Same but Selectivity Matters for Side Effects



Cox 1 – maintains normal GI lining; involved in kidney and platelet fxn; inhibition leads to GI effects: stomach upset, ulceration, bleeding, perforation

Cox-2 – main enzyme for pain, inflammation, fever; inhibition may lead to increased cardiovascular risks

Common Oral NSAIDS for Acute Pain

Generic	Brand	OTC/Rx Availability	Cox selectivity	PO Adult Dose	Max Daily Dose	
ibuprofen	Advil, Motrin	OTC (200mg)& Rx(200,400,600, 800 mg)	cox1/cox2	400mg TID-QID	3200 mg	
naproxen sodium	Aleve (OTC), Anaprox DS (Rx)	OTC (220mg) & Rx (220,275, 550mg)	cox1/cox2 (leans cox2)	440mg BID 550mg BID	1150 mg	Sodium form preferred for acute pain – faster acting Maybe safer if higher CV risk (on low ASA therapy) Less GI s/e
naproxen	Naprosyn (Rx)	Rx (250, 375, 500mg)	cox1/cox2 (leans cox2)	500mg BID	1000 mg	Less GI s/e
indomethacin	Indocin	Rx (25,50 mg)	cox1/cox2 (leans cox1)	50 mg BID	200 mg	More GI s/e
meloxicam	Mobic	Rx (7.5-15mg)	cox1/cox2 (leans cox2)	15 QD 7.5 BID	15 mg	Less GI s/e
celecoxib	Celebrex	Rx (50, 100, 200, 400)	cox 2	400 QD-200 BID	400 mg	Less GI s/e

All NSAIDS Boxed Warnings

1. Increased Risk of GI ulcerations, bleeding, perforations
   - Higher risk in age > 60 y.o. and higher doses
   - h/o GI ulcer or bleed pre-NSAID use, 10X higher risk having it again with NSAID use; avoid if has h/o of GI ulcer or bleed.
   - Increased risk with alcohol, advanced liver disease or other bleeding disorders use
   - Increased risk (3-6X) if taking anti-coagulants (e.g. aspirin, warfarin; Xarelto etc.)
   - Increased if taking systemic steroids
2. Increased Risk of Cardiovascular events: MI & CVA
   - More concern with chronic use and higher doses
   - If on ASA, need to take ASA dose first – wait 30 min before taking NSAID dose
3. Contraindicated in peri-operative period of CABG surgery
   - ~7 days before and 14 days after

Other NSAID Concerns

- Nephrotoxicity
  - Acute kidney injury – reduce blood flow to kidney; tell patient's to take with water
  - More likely to occur if dehydrated or if are on other drugs that can cause pre-renal acute kidney injury (diuretics, ACE inhib 'prils', ARBs 'sartan')
  - More likely to occur with chronic NSAID use
- Allergy
  - If allergic to aspirin must avoid all NSAIDs
- Aspirin Triad + leading to anaphylaxis (avoid all NSAIDs)
  - Aspirin intolerance
  - Nasal polyps/rhinitis/chronic sinusitis
  - Asthma – NSAIDs can worsen asthma (leukotrienes)
  - Urticaria (hives)

Counseling the Patient

- Take with food and hydrate to help reduce GI effects and kidney effects
- Best to avoid alcohol (increased GI risks);
- If has issue of GI upset even when take with food
  - Can use proton pump inhibitor (PPI): omeprazole (Prilosec); lansoprazole (Prevacid); pantoprazole (Protonix); esomeprazole (Nexium)
  - Also consider PPI:
    - if > 60 y.o. and on high dose of NSAID
    - If on low-dose ASA

Acetaminophen (Tylenol)

- abbreviation APAP
  - labels also abbreviate: AC, Acetominoph, Acetaminop, Acetamin, Acetam
- aka paracetamol
- Mechanism of action unknown
  - Seems to act centrally (brain/spinal cord) pathway
- Works on decreasing fever and pain
- No anti-inflammatory or anti-platelet action

Acetaminophen (Tylenol)

- OTC
- Regular strength 325 mg; 2 tabs q 4-6h while symptoms last
  - Extra Strength 500 mg; 2 caps q 6h
  - 8HR Arthritis 650 mg; 2 caps q 8h
- Max Dose 4000 mg/day
  - 3000 mg/day on labels
- Found in MANY flu/cold/antacids/pain combos
  - Educate patients to check ingredients
  - Ask about use of any other products before prescribing
- Need to be vigilant to avoid accidental overdose

Acetaminophen Side Effects

- Irreversible liver damage
- Contraindicated liver disease
- Contraindicated alcoholics
- Can not take with alcohol

Ok if aspirin allergy and in pregnancy/breast feeding

Oral Analgesics for Post Op Pain

Analgesic(s)	Dose (mg)	NNT vs Placebo ≥ 50% maximum pain relief over 4-6 hours
SINGLE AGENTS:		
Ibuprofen	600	**2.7**
Naproxen	500	**2.7**
Celecoxib	400	**2.6**
Acetaminophen (APAP)	1000	**3.6**
Oxycodone	15	**4.6**
Codeine	60	**12.0**
Gabapentin	250	**11.0**
COMBINATIONS:		
Ibuprofen + APAP	400+1000	**1.5**
Ibuprofen + oxycodone	400+5	**2.3**
APAP + oxycodone	325+5	**5.4**
APAP + codeine	300+30	**6.9**

Moore, R. Andrew, et al. *The Cochrane Library*. 2015

~50,000 participants

~460 high-quality studies
(mostly dental extractions)

Ibuprofen + acetaminophen works as well or better for pain control vs. acetaminophen + oxycodone or codeine

Scope of Pain. Activity 1.

Acetaminophen + Ibuprofen = Synergy

Analgesic/Pain Dosing

PO Ibuprofen
200mg X 2 = 400 mg
400 mg x TID/**QID** = **1600** mg/day

PO acetaminophen
500 mg x 2 = 1,000 mg
1,000 mg x TID/**QID** = **4,000** mg/day*

Careful…make sure not taking other things containing acetaminophen if Rx QID, could lead to acute liver failure

Analgesic & Anti-inflammatory Dosing

PO Ibuprofen
200mg X 4 = 800 mg
800 mg x TID/**QID** = **3200** mg/day

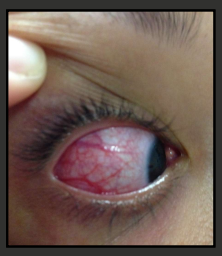
PO acetaminophen
500 mg x 2 = 1,000 mg
1,000 mg x TID/**QID** = **4,000** mg/day*

Careful…make sure not taking other things containing acetaminophen if Rx QID, could lead to acute liver failure

Pain Management Tips for the Eye

- Rx lowest effective dose for the shortest duration
- Immediate release formulations should be used for acute pain, not extended release
- NSAID analgesic pain doses lower vs. higher dose needed to treat ocular inflammation
- Know max dose limits to reduce risk for adverse events

Scleritis



Scleritis

- 25 year-old
- Red right eye "several" days ago. No burn, no sting, no tearing, more sensitive to light OD and "throbbing"
- 4 out of 5 on the severity scale.
- Started Pred Forte TID OD for 3 days, BID for 3 days, QD for 3 days. "Drops do give relief" 90% improvement, thinks skin is hot to touch, feels puffy and swollen. Similar episodes started 3 years ago, has had 6 episodes total.
- Sees a rheumatologist for unspecified connective tissue disorder
- Meds: Zinc, Vitamin D
- No allergies

Scleritis

- VA's OD 20/20-, OS 20/20 3-
- Entrance testing: Normal
- Adnexa: Puffy appearance to cheeks right
- Conjunctiva: OD bulbar gr 3 diffuse injection, most dense temporal and superior, trace chemosis. Sclera gr 3 diffuse injection temp/superior/nasal with thickening temporal and superior
  OS normal

Cornea: Clear

Anterior Chamber: Clear

Posterior: ONH good color, distinct margins, OD 0.35/0.35, OS 0.3/0.3, +FLR, No H/B/T 360 OU

Scleritis

- Assessment:
  - 1. Anterior Scleritis OD
- Plan
  - 1. Spoke with pt's rheumatologist on the phone. Agreed to have pt start Ibuprofen 600mg TID until signs and symptoms resolve. Will follow up in two weeks and reassess at that time. Rheumatologist plans to start the pt on a systemic medication for unspecified connective tissue disorder.

Prescription NSAIDs

- Work the same way Non-Prescription NSAIDs do
- Higher in dose requires a prescription
- The side effects are the same as Non- Prescription NSAID's
- Contraindications are the same as Non-Prescription NSAID's
- Pregnancy:
  - First two trimesters Category C
  - Last trimester Category D

Prescription NSAIDs

- Uses:
  - Episcleritis and Scleritis
    - Very useful in these instances
- Uveitis
  - To try to help control inflammation
- Cystoid Macular Edema
  - Topical is more effective with this

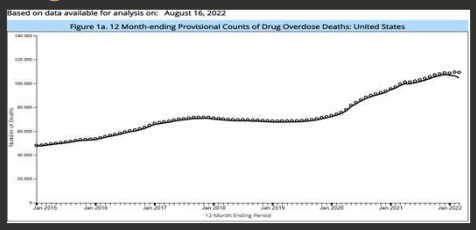
Remember the Scleritis patient???

- So, it happened again…

Why do an Opioid CE?

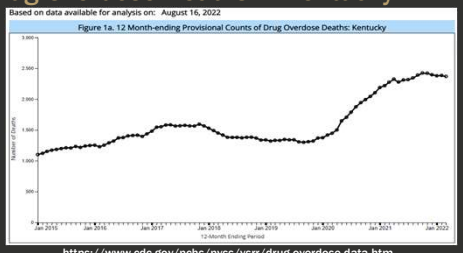
- Opioid over-prescribing
- Opioid misuse and addiction at epidemic levels
- Public health crisis – we work with the public
- March 2016 CDC guidelines for chronic pain management
  - 12 chronic pain recommendations
  - 1 deals with acute pain
- 2017 opioid overdose deaths declared U.S. National Emergency

12 Month—ending Provisional Counts of Drug Overdose Deaths in the US



https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm

12-Month-ending Provisional Counts of Drug Overdose Deaths in Kentucky



https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm

How Did This Begin?

- Well intentioned, but overzealous advocacy for controlling chronic pain
  - Chronic pain is multi-modal problem, simplified to just take a pill for it: slow release oxycodone
  - Regulatory boards evaluating performance based on pain control satisfaction
- Misleading pharmaceutical claims the new slow release versions made opioid less addictive
  - Doctors start Rxing large amounts for lots of things: sprained ankles/backs and chronic pain
  - Physicians prescribing were not trained in addiction, even in medical school
  - Listening to Pharma and "expert leaders" quoting poor evidence (or no evidence…)
  - Eventually claims on not only addiction but also effectiveness of slow release oxycodone found to be false, but cat was out of the bag

Opioid Risks/Effects

Even when taken correctly opioids can cause:

- ***Respiratory depression – can be fatal**
- Analgesia
  - And indifference to pain
- Pin-point pupils
- Drowsiness/Sedation
- Euphoria
- Nausea and Vomiting
- Endocrine Effects
  - Reduced libido in men
  - Menstrual irregularities and infertility in women
- Constipation
- Cough suppressant
- Itching or bronchoconstriction
  - Release histamine from mast cells
- Sweating
- Urinary Retention
- Dysphoria (confusion, anxiety, hallucinations)
- Immune system alterations
- Physical Dependence
- Tolerance
- Addiction

Increased Risk of Respiratory Depression

- Use of other CNS depressant (sedative) drugs
  - Alcohol or other opioids
  - Benzodiazepines "-lams; -pams"
    - Alprazolam (Xanax); diazepam (Valium); lorazepam (Ativan); clonazepam (Klonopin)
  - Barbiturates "-barbitals"
    - Phenobarbital (Luminal); thiopental (Pentothal)
  - Muscle relaxants
    - cyclobenzaprine (Flexaril); carisoprodol (Soma)
  - Sleep aids/Hypnotics
    - Eszopiclone (Lunesta); zolpidem (Ambien)
  - Anti-histamines
    - Diphenhydramine (Benadryl)
  - Head injury
  - CYP 3A4 inhibitors (macrolide antibiotics; anti-fungal agents; HIV protease inhibitors)
    - Erythromycin, azithromycin, clarithromycin
  - Acute or severe asthma, COPD or other respiratory issues; Sleep apnea
  - >65yo, Kidney or Liver Disease

Opioid Side Effects

- **Constipation**
- **Drowsiness**
- **Confusion**
- **Nausea and vomiting**
- **Liver Toxicity**
- **Addiction/abuse potential**
- **Itching**
- **Breathing problems**

Opioid Contraindications

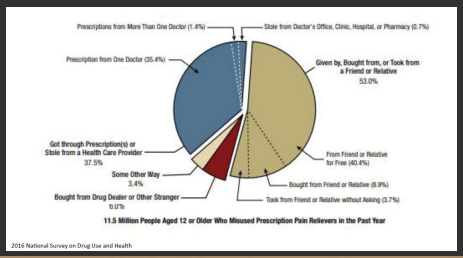
- Known allergies/hypersensitivities
- Respiratory diseases (asthma; COPD; sleep apnea)
- Liver and Kidney issues
  - Drug metabolism and excretion become an issue
- Pregnancy and Breast Feeding
- History of substance abuse
- Psychiatric illness, anxiety, depression
- Combination with other CNS sedating drugs
  - antihistamines, sleeping aids, and some antidepressants
  - benzodiazepines

Opioid Metabolism and Genetics

- Not all patients respond to the same opioid in the same way
  - >3,000 polymorphisms in human mu opioid receptor gene
  - Single nucleotide polymorphisms (SNPs) identified that affect opioid metabolism, transport across the blood brain barrier, and activity at receptors and ion channels
- Broken down in liver by cytochrome P450 (CYP) 2D6 & 3A4 enzymes
  - 20-30% may have genetic opioid metabolic defect (GOMD)
  - Enzyme too active = metabolized more quickly, pain returns faster
    - Require higher than normal dose to manage pain
    - Toxic, life-threatening side effects from excessive metabolites building up, even with codeine or tramadol
  - Enzyme inactive or absent = life threatening allergic reactions or respiratory depression

https://cpicpgx.org/guidelines/guideline-for-codeine-and-cyp2d6/

Prescription Opioid Misuse Problem



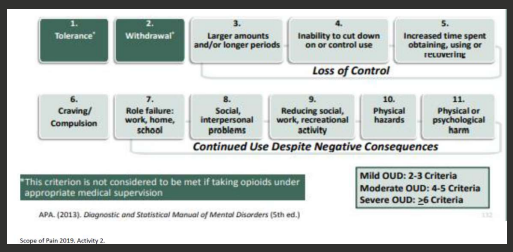
2016 National Survey on Drug Use and Health

Lessons Learned over the 20+ of Opioid Epidemic

- Not recommended first line (or 2nd…) for chronic pain treatment
- Beware of simple solutions for complex problems
- Must evaluate quality of clinical evidence
- Teach health care professionals about addiction and learn from past mistakes
- Some conflicts of interest require a stronger response than disclosure alone
  - Physician speakers admitted to spreading misinformation
  - Organizations that took funding from opioid manufacturers:
    - Federation of State Medical Boards, American Pain Society, American Geriatrics Society, American Academy of Pain Medicine. All supported statements or reports that encouraged physicians to prescribe opioids for chronic pain.
- Increase accessibility to medications used to treat Opioid Use Disorder

Sharfstein JM, Olsen Y. Lessons Learned from the Opioid Epidemic. JAMA 2019; 322(9); 809-810
Weimer MB, Wakeman SE, Saltz R. Removing One Barrier to Opioid Use Disorder Treatment. Is It Enough? JAMA 2021; 325 (12): 1147-1148

DSM-5: Spectrum of Opioid Use Disorder (OUD)



Opioid Tolerance and Dependence

Happens to everyone: physiologic adaptation to chronic use

Tolerance: Increased dose needed to maintain effect

Physical Dependence: Withdrawal symptoms occur when stopping the opioid, reducing the dose of the opioid, or upon exposure to an opioid receptor antagonist (naloxone, naltrexone) that block opioids from reaching the receptors. Withdrawal symptoms: "like the flu x 1,000!"

Opioid Withdrawal Symptoms

- Rhinorrhea
- Lacrimation
- Yawning
- Chills
- Goosebumps
- Hyperventilation
- Hypothermia
- Mydriasis
- Muscle aches
- Vomiting
- Diarrhea
- Anxiety
- Hostility

Feels like you are dying, but is not fatal

Opioid Addiction

- Compulsive use despite harm
- Treatable but complex, chronic, relapsing brain disorder
  - Brain changes involved in reward, stress, and self control
  - Changes persist even after stopping drug
  - Progressive if not treated leading to permanent disability or premature death
- Like many chronic diseases, a combination of genetic, environmental, and social factors contribute to a person's vulnerability to addiction and ease of recovery from it

National Academies of Sciences, Engineering, and Medicine 2019. Medications for Opioid Use Disorder Save Lives. Washington, DC: The National Academies Press. https://doi.org/10.17226/25310.

Treatment for Opioid Disorder

- Treatment
  - Long-term pharmacologic therapy
  - Non-pharmacologic: psychosocial behavioral therapies, but not required to start pharmacologic therapy
  - Only ~20% of ~2 million with Opioid Use Disorder are receiving treatment
- Three FDA approved medications are effective and save lives
  - Methadone – full opioid agonist, only distributed special care facilities
  - Buprenorphine – partial opioid agonist, must have "X-waiver" on DEA license; limit on number can Rx
    - Brand Suboxone = buprenorphine + naloxone-rapid acting opioid antagonist
  - Naltrexone – long acting opioid antagonist
  - Alleviate withdrawal symptoms, reduce opioid cravings, and decrease the response to future drug use

Leshner A, Dzau VJ. Medication-Based Treatment to Address Opioid Use Disorder. JAMA 2019; 321(21) 2071-2072

Treatment for Opioid Disorder Methadone

- Treats multiple things – don't automatically assume addiction:
  - Chronic pain
  - Reduce opioid withdrawal symptoms
  - Treat opioid use disorder
  - Pain treatment option in true morphine/codeine allergies
- Wonky drug pharmacokinetics…one of most dangerous opioids
  - Long, variable, unpredictable drug half-life that varies based on length of treatment and dose levels
  - Many other prescription drug-drug interactions

Treatment for Opioid Disorder Buprenorphine

- Opioid partial agonist
- Suboxone; Bunavail; Subsolv (buprenorphine + naloxone)
- Often combined with naloxone to decrease likelihood of diversion and misuse, since buprenorphine alone does have opioid effects (just weaker than a full agonist like hydrocodone, heroin, etc.)
- Helps treat pain as well
- Less respiratory depression and abuse potential
- If patient experiencing withdrawal, can send to ER and they can get this started

Treatment for Opioid Disorder Naltrexone (ReVia; Vivitrol)

- Naltrexone: oral tablet (50 mg per day) or IM injection (extended release, IM monthly)
  - Also used to treat alcohol use disorder
- Long-acting opioid receptor antagonist
- Used to treat opioid use disorder
- Helps reduce cravings

Treatment of Opioid Use Disorder

- Strongly discouraging simple withdrawal therapy (i.e. just stop drug and get through withdrawal symptoms)
- Simple withdrawal therapy not only ineffective but dangerous
  - Often will seek-out street drugs, laced with illicit fentanyl, or turn to IV use, increasing risk HIV and Hepatitis C
  - Return to taking past doses, not realizing they have lost tolerance, more likely to result in fatal respiratory depression/overdose
- Medication therapies are highly regulated, many barriers to access
  - Federal level
  - Many physicians not trained or comfortable prescribing
  - Not enough physicians prescribing or eligible to prescribe to meet demand

Opioid Overdose Reversal with Naloxone

- Opioid antagonist
  - Binds to opioid receptor, but does not activate it (i.e. no effects). Blocks opioid present in the body from binding and activating opioid receptors.
  - Rapidly restores normal respiration
  - "Antagonist Precipitated Withdrawal"
    - Rapid onset withdrawal symptoms
    - Very uncomfortable but not life-threatening
- Very safe, only has effects if person has opioid in their system
- Three formulations
  - Injectable
  - Auto-injectable
  - Nasal spray

Naloxone (Narcan; Evzio)

- Many states do not require a prescription for Narcan
- CDC recommends all patients high dose or on extended release formulas have Narcan on hand due to greater risk of accidental overdose or death from respiratory depression
- Narcan = Nasal spray (4mg spray) – fast acting
  - Tilt head back, give one spray in one nostril, call 911
  - Can readminister in other nostril every 2-3 min until emergency services arrive
- Evzio = 2, IM auto-injections – fast acting
  - Administered like epipen (IM hold for 5 seconds then release), call 911, can give the other one as well
- Naloxone IV/IM/SQ injection – fast acting

National Academies of Sciences 2019

BOX S-2
Summary of Conclusions

1. Opioid use disorder is a treatable chronic brain disease.
2. U.S. Food and Drug Administration (FDA)-approved medications to treat opioid use disorder are effective and save lives.
3. Long-term retention on medications to treat opioid use disorder is associated with improved outcomes.
4. A lack of availability of behavioral interventions is not a sufficient justification to withhold medications to treat opioid use disorder.
5. Most people who could benefit from medication-based treatment for opioid use disorder do not receive it, and access is inequitable across subgroups of the population.
6. Medication-based treatment is effective across all treatment settings studied to date. Withholding or failing to have available all classes of FDA-approved medication for the treatment of opioid use disorder in any care or criminal justice setting is denying appropriate medical treatment.
7. Confronting the major barriers to the use of medications to treat opioid use disorder is critical to addressing the opioid crisis.

National Academies of Sciences, Engineering, and Medicine 2019. Medications for Opioid Use Disorder Save Lives. Washington, DC: The National Academies Press. https://doi.org/10.17226/25310.

AOA Opioid White Paper for Optometry

- Nov 2017: The Opioid Public Health Emergency and How Doctors of Optometry Can Help

Health Policy Institute
AMERICAN OPTOMETRIC ASSOCIATION

Opioid Crisis—A U.S. Public Health Emergency: Recommendations for Doctors

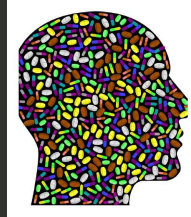
- Opioid epidemic prompted re-examination of best practices for using opioids in acute pain – ongoing debate; no consensus
- *"It should be noted that long-term opioid use often begins with treatment of acute pain"*

3 general themes: 1. Non-opioid treatment is preferred for acute and chronic pain treatments
2. Use lowest effective dose for shortest duration (usually < 72 hours)
3. Exercise caution when prescribing any opioid and monitor patients closely

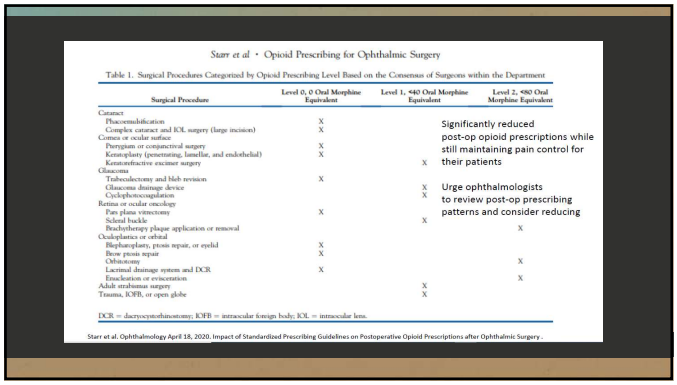
JAMA Ophthalmol. 2019 Oct 31:138(1):76-80. doi: 10.1001/jamaophthalmol.2019.4432.
Online ahead of print.

Association of Limiting Opioid Prescriptions With Use of Opioids After Corneal Surgery

- PKP, Collagen Crosslinking, Superficial Keratectomy, PRK
- 82 patients surveyed post-surgery; 2 cohorts
  - How many pills actually used?
  - What did they do with leftover pills?
  - How was post-op pain control?



- Cohort 1 (before clinic policy change to decrease opioids):
  - Received average 18.8 pills; patient used 8. Rest still at home.
- Cohort 2 (after policy change to decrease opioids):
  - Received average 6.6 pills; patient used 4.
- ***Reducing number of opioids had no negative impact on post-surgical pain control.***



Starr et al · Opioid Prescribing for Ophthalmic Surgery

Table 1. Surgical Procedures Categorized by Opioid Prescribing Level Based on the Consensus of Surgeons within the Department

Surgical Procedure	Level 0, 0 Oral Morphine Equivalent	Level 1, <40 Oral Morphine Equivalent	Level 2, <80 Oral Morphine Equivalent
Cataract			
Phacoemulsification	X		
Complex cataract and IOL surgery (large incision)	X		
Cornea or ocular surface			
Pterygium or conjunctival surgery	X		
Keratoplasty (penetrating, lamellar, and endothelial)	X		
Keratorefractive excimer surgery		X	
Glaucoma			
Trabeculectomy and bleb revision	X		
Glaucoma drainage device		X	
Cyclophotocoagulation		X	
Retina or ocular oncology			
Pars plana vitrectomy	X		
Scleral buckle		X	
Brachytherapy plaque application or removal			X
Oculoplastics or orbital			
Blepharoplasty, ptosis repair, or eyelid	X		
Brow ptosis repair	X		
Orbitotomy			X
Lacrimal drainage system and DCR	X		
Enucleation or evisceration			X
Adult strabismus surgery		X	
Trauma, IOFB, or open globe		X	

DCR = dacryocystorhinostomy; IOFB = intraocular foreign body; IOL = intraocular lens.

Starr et al. Ophthalmology April 18, 2020. Impact of Standardized Prescribing Guidelines on Postoperative Opioid Prescriptions after Ophthalmic Surgery.

Significantly reduced post-op opioid prescriptions while still maintaining pain control for their patients

Urge ophthalmologists to review post-op prescribing patterns and consider reducing

Collateral Damage of Excess Pills

- Young children ingestion and overdose
- Adolescent experimentation leading to overdose or addiction
- Other household contacts (family, visitors)

- Some will misuse extra pills to self-treat pain later on
  - Another eye pain episode, migraine, sprained ankle, sinus pain, tooth ache…etc.

- Because of misuse/diversion of opioids, caution should be used even if prescribing only a short-course of opioid treatment and patient's need to be told why it is important to dispose of any leftovers and how to get rid of them.

Getting Rid of Opioids

https://www.fda.gov/drugs/safe-disposal-medicines/disposal-unused-medicines-what-you-should-know

FDA Flush List

U.S. NATIONAL LIBRARY OF MEDICINE

DAILYMED

https://dailymed.nlm.nih.gov/dailymed/index.cfm

Active Ingredient	Found in Brand Names
Benzhydrocodone /Acetaminophen	Apadaz
Buprenorphine	Belbuca, Buprenorphine, Butrans, Suboxone, Subutex, Zubsolv
Fentanyl	Abstral, Actiq, Duragesic, Fentora, Onsolis
Diazepam	Diastat/Diastat AcuDial rectal gel
Hydrocodone	Anexsia, Hysingla ER, Lortab, Norco, Reprexain, Vicodin, Vicoprofen, Zohydro ER
Hydromorphone	Dilaudid,Exalgo
Meperidine	Demerol
Methadone	Dolophine, Methadose
Methylphenidate	Daytrana transdermal patch system
Morphine	Arymo ER, Embeda, Kadian, Morphabond ER, MS Contin, Avinza
Oxycodone	Combunox, Oxaydo (formerly Oxecta), OxyContin, Percocet, Percodan, Roxicet, Roxicodone, Roxybond, Targiniq ER, Xartemis XR, Xtampza ER
Oxymorphone	Opana, Opana ER
Tapentadol	Nucynta, Nucynta ER
Sodium Oxybate	Xyrem oral solution

- https://www.fda.gov/drugs/disposal-unused-medicines-what-you-should-know/drug-disposal-dispose-non-flush-list-medicine-trash

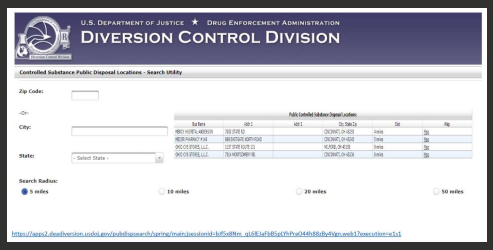
DETERRA Bag

Proprietary activated carbon

1. Add meds to bag
2. Add warm water
3. Shake gently
4. Close bag – dispose in trash

How to Dispose of Medication with Deterra | Deterra Drug Deactivation System (deterrasystem.com)

DEA Authorized Drug Take Back Near You



Oral Narcotics

- Schedule I
  - No accepted medical use
  - High potential for abuse
  - Most dangerous of all the drugs
  - Potentially severe psychological or physical dependence
    - Heroin, marijuana, LSD, ecstasy
      - Marijuana is still considered a Schedule I narcotic even though it is legal in some States
- Schedule II
  - High potential for abuse, but less than Schedule I
  - Potential to lead to severe psychological or physical dependence
  - Considered dangerous drugs
    - OxyContin, Demerol, Methadone, Adderall

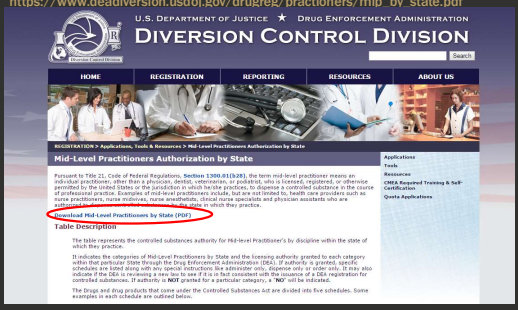
Oral Narcotics

- Schedule III
  - Low to moderate potential for physical or psychological dependence
  - Dependence less than Schedule I or II
    - Testosterone, anabolic steroids, Tylenol with codeine
- Schedule IV
  - Low potential for abuse
  - Low risk of dependence
    - Xanax, Ambien, Tramadol, Valium

Oral Narcotics

- Schedule V
  - Lower potential for abuse than Schedule IV
  - Generally antidiarrheal, antitussive, analgesic purposes
    - Lyrica, Robitussin AC, Motofen

State Laws:
https://www.deadiversion.usdoj.gov/drugreg/practioners/mlp_by_state.pdf



Prescription Drug Monitoring Program

- PDMP electronic database tracking controlled substance prescriptions
- Helps identify patients who may be misusing opioids, receiving opioids from multiple providers, or using other prescription drugs (e.g. benzodiazepines) who may be at risk for overdose even with low, short prescription
- What if something looks suspicious on PDMP?
  - Confirm the PDMP is correct
  - Use the opportunity to provide potentially life-saving communication on risk
  - Discuss your concerns and your interest in their safety

Formulations

Immediate Release (IR)

- Short Acting
- **Used in acute pain**
- Used in chronic pain (not first line)
- Used in opioid naïve patients

Formulations

Controlled Release (CR) (AKA extended release (ER) or sustained release (SR)

- Long Acting
- NOT used in acute pain or in opioid naïve patients
- NEVER disrupt (e.g. chew, break, crush, cut in half, etc.)
- Entire dose released at once can lead to overdose/death by respiratory depression!

Morphine

Morphine is the standard for comparison of other opioid agents

30 mg PO morphine = 200 mg PO codeine
30 mg PO morphine = 20 mg PO oxycodone
30 mg PO morphine = 20-25 mg PO hydrocodone
30 mg PO morphine = 8 mg PO hydromorphone

Fentanyl…so potent dosed in micrograms….

All are estimates, can't account for differences in genetics and pharmacokinetics that vary a lot among individuals

Morphine

- First active ingredient isolated from a plant
- Works on CNS to decrease feeling of pain
- Used in both acute and chronic pain, moderate to mild
- High potential for abuse and dependency
- Frequently used for MI and labor
- Schedule II drug

Codeine

- Used to treat mild to moderately severe pain
- Side Effects:
  - Constipation
  - Drowsiness
  - Sweating
  - Mild itch or rash
- Should NOT drink while on codeine
- Can slow or stop breathing

Codeine

- Codeine by itself is a Schedule II drug
- With products containing no more than 90mg of codeine per dosage unit it is a Schedule III drug
- Pregnancy:
  - Category C
  - However, prolonged use during pregnancy can lead to dependence in neonate
  - It is found in breast milk
- Comes in combinations:
  - With APAP
  - With ASA

Codeine

- Codeine and Tylenol
  - Tylenol #2: 15mg codeine/300mg APAP
    - 1-2 tabs every 4 hours
  - Tylenol #3: 30mg codeine/300mg APAP
    - 1-2 tabs every 4 hours
  - Tylenol #4: 60mg codeine/300mg APAP
    - 1 tab every 4 hours
  - Max dose of Codeine in 24 hours: 360mg
  - Max dose of APAP in 24 hours: 3000mg

Codeine

- Codeine with Aspirin
  - Empiric with codeine #3: 30mg codeine/325mg ASA
    - 1-2 tabs every 4-6 hours
  - Empiric with Codeine #4: 60mg codeine/325mg ASA
    - 1-2 tabs every 4-6 hours

Hydrocodone

- Used to treat moderate to severe pain and an anti-tussive for cough management
- It is stronger than codeine, but only 59% as potent as morphine in analgesic properties
- The side effects of constipation and sedation are lesser in hydrocodone
- It gives a sense of euphoria, especially in higher doses
- Most common side effects:
  - Dizziness and lightheadedness
- Trade names are: Lortab, Norco, Vicodin, Vicoprofen

Hydrocodone

- Vicodin
  - 5mg hydrocodone/300mg of APAP
    - 1-2 tabs every 4-6 hours
      - Max: 8 tabs in 24 hours
- Vicodin ES
  - 7.5mg hydrocodone/300mg of APAP
    - 1 tab every 4-6 hours
      - Max: 6 tabs in 24 hours

Hydrocodone

- Vicodin HP
  - 10mg hydrocodone/300mg APAP
    - 1 tab every 4-6 hours
      - Max: 6 tabs in 24 hours
- Vicoprofen
  - 7.5mg hydrocodone/200mg ibuprofen
    - 1 tab every 4-6 hours
      - Max: 5 tabs in 24 hours

Hydrocodone

- Effective October 6, 2014 hydrocodone became a Schedule II narcotic
  - Can no longer have refills
  - Must have a handwritten paper script for each fill
    - Some states can e-scribe if the doctor has the proper technology and electronic signature license
  - Measure adopted in an attempt to reduce drug abuse and ultimately drug related deaths
    - This decision was fought by many groups, such as medicine, Pharmacy and the AOA.
- It limits availability to patients, especially in rural locations

Hydrocodone

- In 2012, hydrocodone was the most prescribed drug
- In 2015, hydrocodone was not even in the top ten
- In 2018, hydrocodone was still not in the top 10
  - Acetaminophen/hydrocodone was #13
- In 2020, acetaminophen/hydrocodone was #10…creeping back up

Oxycodone

- Used to treat moderate to severe pain
- It has a greater analgesic effect than morphine
- It is a Schedule II drug
- Produces high levels of euphoria, so very addictive and high abuse potential
- In Pregnancy C

Oxycodone

- Can slow or stop breathing
- DO NOT drink alcohol when taking Oxycodone
- Common side effects:
  - Mild drowsiness, headache, dizziness, tired feeling
  - Stomach pain, nausea, vomiting, constipation, loss of appetite
  - Dry mouth
  - Mild itching
  - Trade names: Percodan, Percocet, OxyContin

Oxycodone

- Percodan:
  - 4.8355mg oxy/325mg ASA
    - 1 tab every 6 hours
- Percocet:
  - 2.5mg oxy/325 APAP
    - 1-2 tabs every 6 hours
  - 5mg oxy/325mg APAP
    - 1 tab every 6 hours
    - **Most frequently Rx'ed dose**
  - 7.5mg oxy/325mg APAP
    - 1 tab every 6 hours
  - 10mg oxy/325 APAP
    - 1 tab every 6 hours

Tramadol

- Used for moderate to severe pain
- Considered to be an "opioid-like" drug
- Works by two mechanisms of action:
  - 1. Activates opioid receptors
  - 2. Inhibits uptake of serotonin and norepinephrine
- Analgesic efficacy lies between codeine and morphine
- Schedule IV drug

Tramadol

- Should not give to people that have a history of seizures
- Common side effects:
  - Constipation
  - Itchiness
  - Nausea
- Several drug interactions:
  - Antidepressants, MAOI's, SSRI's, digoxin, Coumadin and several others
- Pregnancy category C
- Not as addictive as the other narcotics
- Trade names: Ultram, Ultracet

Tramadol

- Ultram
  - 50mg
    - 1 tab every 4-6 hours
    - Max dose is 300mg/day
- Ultracet
  - 37.5mg tramadol/325mg APAP
    - 1-2 tabs every 4-6 hours
    - Max 8 tabs/day

Conjunctiva Rip

- 60 year old white male, severe OS pain.
- Lost right arm at the elbow and wears a prosthesis with a metal piece on the end. He was working on his farm, trying to open a bag of fertilizer with a pair of pliers. The pliers slipped and he scratched his eye. He was wearing a GP lens at the time of the accident. Extreme pain, "7 out of 5" on the severity scale, +tearing, thinks he is photophobic, but can't keep eye open.
- ***drop of proparacaine was given to perform examination
- VAs OD, 20/25, OS >20/200 (no GP)
- Entrance testing: normal

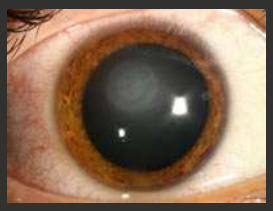
Conjunctival Rip

- Anterior Segment:
  - ***another drop of proparacaine given, had to hold lids.
  - OD: trace injection bulbar, cornea clear (GP still on), chamber dark and quiet.
  - OS: gr 3+ diffuse injection, large laceration nasal running slightly superior to edge of cornea both bulbar area and looks to be slightly in sclera, +staining, no fluid coming from wound. Cornea had mild defect in limbal region inferior nasal (possibly due to a secondary cut by GP lens). No cell and flare.

Conjunctival Rip

- Assessment:
  - 1. Conjunctival/scleral laceration OS nasal, moving nasal-superior
    - No orbital contents leaking/bulging out of wound
- Plan
  - Call OMD for consult. Pt referred for suturing of wound.
  - Consider narcotic for pain?

Disciform Keratitis



Disciform Keratitis

- 38 year old male
- HSK disciform keratitis OD
- Pain 4 out of 5 on the severity scale Pt states the pain varies from day to day
- +redness, +watering, +burning, +visual decrease, +photophobia.
- Has been going on for one month: Using Zirgan 5x/day OD and has recently discontinued Omnipred. Pt just moved to the US 2 months prior from Iran. Pt has a history of contact lens wear, 6 month replacement. Has been out of the lenses since the flare up. Currently wearing glasses.
- Medications: Zirgan OD
- Allergies: None

Disciform Keratitis

- VAs: OD: 20/400 pHNI, OS: 20/400 pHNI
- Entrance testing: Normal
- Anterior Segment: OD: trace diffuse injection, large central dendrite, opacified on edges, mild stromal involvement, mild edema, no cell or flare
  OS: normal

Disciform Keratitis

- Assessment: 1. Herpes Simplex Disciform Keratitis OD
  2. Secondary Corneal Edema OD
- Plan:
- d/c use of Omnipred until further notice.
- Continue Zirgan 5 times/day
- 400 mg Ibuprofen for the pain

When writing the Rx

- Write for 24 hours at a time
  - Reassess after that time
- Write out the number of tabs on the Rx form
- Usually a time limit on how long you can put patient on opioids
  - Most states: 72 hours
- Remember if it is a hydrocodone combination:
  - No refills
  - Needs to be paper, unless you meet the requirements
- Do not write a script for any issue that is not related to the eye

Last thoughts

- We all treat pain on some level
- Don't be afraid to go to the next level when necessary
- Ask for help if you are unsure

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