“What A Pain In The E%$E!”
Pain Management for the OD

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Ocular Pain: Common Sources

- Corneal (Trigeminal, CN V)
  - S/P foreign body removal
  - S/P refractive surgery procedures
  - UV keratitis
  - CL related issues
    - Overwear
    - H2O2
    - Phylectenulosis
  - Infiltrative/ulcerative keratitis
  - Thermal keratitis
  - REE
  - H2O2 keratitis
  - Thygeson’s SPK
  - SLK
- Uveitic (anterior chamber) pain
- Post surgical pain
- Trauma related pain
- Periorbital pain
  - Sinus
  - Blunt trauma
Clinical Signs

- Symptoms
  - Pain
  - Tearing
  - Photophobia

- Signs
  - Ptosis
  - Miosis
  - Perilimbal injection
  - Anterior chamber cell/flare
  - Eyelid edema
  - “The uveitis hold”
Route of administration for ocular pain management

- Topical
- Oral
- Mechanical
Topical Pain Management

- Generally, the first line of defense.
- Advantages:
  - Fewer systemic side effects
  - Higher concentration at sight of source of pain
- Diluted proparacaine*
- Cycloplegic agents
- Topical NSAIDS
- Topical steroids

*CAUTION: risk of toxicity and potential abuse. NOT the standard of care!
Cycloplegic Agents

- Often ocular pain is associated with an inflammatory component
- Blocks acetylcholine thus giving mydriasis
- Function:
  - Comfort- relieve pain by paralyzing the ciliary spasm
  - Reduce leakage- by stabilizing the blood aqueous barrier, prevent further protein leakage, which reduces anterior chamber inflammation.
  - Prevent posterior synechiae which can lead to iris bombe & elevated IOPs- keeps the pupil moving
Cycloplegic Agents

- Considerations: duration and extent of cycloplegia and mydriasis
  - Short acting to long acting agents
  - Determine on a case by case basis given etiology and confounding factors

- Cyclopentolate 0.5%, 1%, 2%
  - Short acting
  - In office until patient can pick up prescriptions
  - Mild pain, minor trauma

- Scopolamine .25%
  - BID

- Atropine 0.05%, 1%, 2%
  - BID to TID dosing
  - Most potent cycloplegic agent
  - Lasting 10-12 days

- Homatropine 5%, 2%
  - BID to QID
  - Consider 2-4 gtts in office
    - This may need to be continued on an in office basis for 2-3 days.
    - Cycloplegic recovery in approximately 3 days

- CNS effects increased with multi doses
Topical NSAIDS

- FDA approval for post-op inflammation
  - Surgical centers
- MOA: inhibition of prostaglandin synthesis by competing for receptors and blocking cyclooxygenase (COX)
  - COX: an enzyme responsible for the production of inflammatory mediators (is prostaglandins).
- These drugs reduce inflammation and induce an analgesic effect.
- Documented cases of delayed wound healing and corneal melts.
- Precaution in ASA allergy for cross-sensitivity reaction
Original NSAID versions:

- Acular (ketorolac), QID
  - *0.5%, historical: allergy
  - LS 0.4%
  - Acuvail 0.45% unit dose
    - Preservative free!
    - Individual ampules
    - Perioperative use BID, one day prior to surgery
- *Voltaren (diclofenac 0.1%), QID

- Both burn upon instillation (some recommend refrigeration).
- Both show decreased corneal sensation.
Newer NSAID formulas:

- Nevanac (nepafenac 0.1%), TID
  - A prodrug: nepafenac at initially delivery to the corneal surface then converted enzymatically to COX-inhibitor amfenac as it penetrates the intraocular tissues.
- Bromday (Bromfenac 0.09%)
  - ONCE DAILY
  - Original formula known as Xibrom
- Prolensa (Bromfenac 0.07%)
NSAIDS: Helpful hints

- Can be used in office for initial pain management treatment
- Uses in pain management
  - S/P cataract surgery (CME)
  - S/P refractive surgery
  - S/P FB removal
  - Corneal abrasion
  - Photophobia
  - Supplement in uveitis, episcleritis, scleritis, pingueculitis
- Caution in compromised corneal epithelium: corneal toxicity → delayed wound healing → corneal melts
- Caution in RA patients and diabetics
- Limit use to approximately 1 week (with the exception of CME)
- Stick to recommended dosages
Corticosteroid use in pain management

- **Corneal pain**
  - S/P FB
  - UV keratitis
  - Infiltrative/ulcerative keratitis
  - Thermal keratitis
  - REE
  - Thygeson’s SPK
- **Uveitic pain**
- **CL related pain**
  - Overwear
  - Hydrogen peroxide burn
  - Phylectenulosis
  - **Post surgical pain**
  - **Trauma related pain**
  - SLK
Topical Steroids

- Steroids inhibit phospholipase A2:
  - which in turn inhibits both pain & the patient’s immune system
- They decrease inflammation
  - by reducing the production of exudates, stabilize cell membranes, inhibit the release of lysozymes by granulocytes & suppress the circulation of lymphocytes
- Potency, concentration, corneal penetration & ocular contact time.
  - acetate vs ester based
  - Ester based: less likely to cause IOP elevation
  - drop vs ointment
IOP response

- Ketone-based steroids more likely to cause elevated IOP than ester-based.
Topical Steroids: A role in epithelial healing

Insult to cornea → Leukocytes migrate from perilimbal blood vessels into anterior stroma

Steroid

Suppress

Inflammatory cascade

Non-healing epithelial defect

Aids in healing
Topical Steroids

• Can generally be safely added by day 2 or 3 in corneal insult cases

• Commonly used topical steroids
  • Lotemax gel (loteprednol 0.5%)
    • For use in mild inflammatory conditions
  • Pred Forté (prednisolone acetate 1%)
  • Durezol (diflupednate 0.05%)
    • Typical dosing schedule is BID to TID postoperatively
    • Shown to be as effective at QID dosing schedule as prednisolone acetate administered eight times a day with endogenous anterior uveitis
    • Therefore, effective used at a lower dosage schedule compared to PF.
Oral Pain Management Options

- Considerations: alcohol use, antidepressants, stomach ulcers, pregnancy, concurrent medications and OTC medications, medical allergies (ie. ASA).
- Looking for interactions
- Kidney or liver disease
  - Metabolism of drugs
- Non-narcotics
  - Analgesics
  - NSAID
  - Cox-2 inhibitor
  - Non-narcotic centrally acting agents
- Narcotics
  - Schedule II-IV
  - More ➔ less addictive
OTC options for mild to moderate pain

- **ASA**: Salicylates*
  - Not really a good choice
  - 650 to 975 mg every 4 hours
  - Contraindicated in ASA allergy, bleeding ulcers, bleeding disorders, people who drink more that 3 alcoholic beverages a day, pregnancy (category D), under 18 yo with viral infection

- **Acetaminophen** (ie. Tylenol): analgesic
  - 650-975mg every 4 hours, max 3000 mg
  - Contraindicated in liver disease, alcoholism and acetaminophen hypersensitivity

- **Ibuprofen**: NSAID (ie. Motrin)
  - 200 to 800 mg every 4 hours, max 2400 mg
  - Side effects stomach upset, GI toxicity (better if max dose is 1600 mg)

- **Naproxen**: NSAID (ie. Aleve)
  - 200 mg every 8 to 12 hours, max 1500 mg
  - Can use 2 tabs as a loading dose, with no more that 3 tabs in 24 hour period.
Oral NSAIDS

- Contraindicated in ASA allergies
- Precaution used in active peptic ulcer or GI disease, renal or liver impairment, heart failure, edema, HTN
- Adverse reactions: GI ulcer/bleeding/upset, headache, dizziness, fluid retention, rash, pruritis, tinnitus
- Prescription options:
  - Cataflam (Diclofenac)
    - 50 mg TID
    - Initially can give 100 mg then follow with 50 mg TID
  - Naproxen (Naprosyn)
    - 500 mg BID
Cox 2 Inhibitors

- Better GI tolerance
- Celebrex
  - “Acute pain”
  - 400 mg initial dose, then 200 mg day 1 followed by 200 mg BID
Non-narcotic centrally acting

- Ultram 50 mg
  - Tramadol
  - For moderate to severe pain relief
  - Clinically equivalent to tylenol #3
  - Minimal side affects
  - Irrespective of meals
  - 1 to 2 tabs q 4-6 hrs. (max of 400 mg/day)
Non-narcotic centrally acting

- Ultracet
- Opioid + acetaminophen
- 37.5 mg Tramadol, 325 mg of acetaminophen
- Indications: Short-term (5 days) management of acute pain
- ii tabs q 4-6 hrs
Ultram/Ultracet

- Contraindications:
  - Acute intoxications
  - Hypnotics
  - Narcotics
  - Centrally acting analgeics
  - Other opioids
  - Psychotropics

- Precaution in opioid-dependent patients, respiratory depression, head injury, seizure disorders etc.

- Adverse affects (minimal): dizziness, nausea, constipation, headache, somnolence, GI upset, dry mouth, itching, CNS stimulation
Narcotics (+analgesic)

- **Examples**
  - **Tylenol III**
    - Codeine phosphate 30mg, acetaminophen 300 mg
    - Adverse reactions: nausea, vomiting common
  - **Percocet** 2.5/325 or 5/325 or 7.5/500 etc.
    - Oxycodone and acetaminophen
    - Highest street value
  - **Lortab** 2.5/500, 5/500, 7.5/500, 10/500
    - 5.0 mg hydrocodone bitartrate, 500 mg acetaminophen
    - Sig: 1 or 2 tabs q 4-6 hrs as needed for pain
  - **Vicodin**
    - Hydrocodone bitartrate and acetaminophen
• Adverse reactions: Dizziness, CNS and respiratory depression, GI upset, constipation, hepatotoxicity, urinary retention etc.

• Interactions: Alcohol, CNS depressants, MAOIs, tricyclic antidepressants, anticholinergics
Tips

• Check boxes: state law in some states
• Consider write out # given
• Never more that 5 refills
• Not valid after 6 months

• Beware: Drug seeking behavior!
Bandage Contact Lenses

• Does not promote healing

• Used in central or large abrasions
• DO NOT use in conjunction with ointments or lubricant ointments.
• For large abrasions, may not remove on the first follow-up visit.
• Safely used in conjunction with drops
• DO NOT use in CL induced abrasions
• RTC 24-48 hrs to check for healing
As a reminder, this is a **chargeable** fee!

- Medicare guidelines:
  - Specify which eye
  - 1 x month
  - $62.08 (Natl. 2008)
Patients In Pain
Always remember: “what else could it be”

- **Mild to moderate ocular**
  - DES
  - Blepharitis
  - Conjunctivitis
  - Ocular ischemic syndrome
- **Periorbital**
  - Herpetic prodrome
  - Lid/lacrimal infection
  - Referred pain
    - Dental
    - Sinusitis
- **Moderate to severe ocular**
  - Scleritis
  - Endophthalmitis
  - Acute angle-closure glaucoma
- **Orbital**
  - Sinusitis
  - Cellulitis
  - Orbital pseudotumor
  - Mass effect
  - Optic neuritis
  - Migraine/cluster headache
In summary

• Know what you are treating.
  • Caution in masking the pain
• Understand the nature of the pain and the severity.
• Most ocular pain is short lived.
• Keep in mind concomitant inflammation.
• Make therapeutic choices based on the nature and severity of the pain.
Thank you!