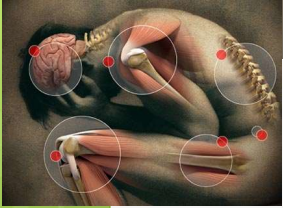


# PAIN MANAGEMENT



## IN THE ERA OF OPIOID ABUSE

Jill Autry, OD, RPh  
Eye Center of Texas  
Houston

1

# PAIN

- Most common reason to seek medical care
- Acute
  - Sudden and severe
  - Broken bones, cuts, burns
  - Corneal abrasion, preseptal cellulitis, iritis
- Chronic
  - Lasts longer than 3 months
  - Back pain
  - Post-herpetic neuralgia
  - Sinusitis
  - Migraine

2

# TYPES OF PAIN

- Somatic
  - Skin, muscles, soft tissue
- Visceral
  - Internal organs
- Neuropathic
  - Pain from damage to the nervous system
- Psychogenic
  - Pain associated with psychological disorders
  - Severity of pain doesn't match clinical appearance

3

# TWO TYPES OF ANALGESICS

- Non-narcotic
  - Don't significantly depress the central nervous system
  - Non-addictive
  - ASA, APAP, NSAIDs, migraine meds
- Narcotic
  - Significantly depress the central nervous system
  - Addictive
  - Natural (codeine/morphine) and synthetic (oxycodone/hydrocodone/methadone/fentanyl, meperidine)

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# ANALGESICS

- Mild
  - Aspirin
  - Acetaminophen
- Moderate
  - Stronger NSAIDs
  - Codeine and synthetic derivatives
    - Hydrocodone, Oxycodone
  - Tramadol
  - Anti-migraine medications
- Severe
  - morphine, meperidine, fentanyl, methadone

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# HISTORY OF OPIOIDS AND ABUSE

- 1817-isolation of morphine from raw opium
  - Was made available in tablet and powder formulations
  - Gastric side effects limited use
- 1870s-first wave of morphine addiction seen with adoption of hypodermic needles
  - "Soldier's Disease"
  - "Lazy physician's remedy"
  - Dangers soon realized and doctors began to control prescribing habits
  - "Pleasure seekers" through black markets/criminal activities

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## HISTORY OF OPIOIDS AND ABUSE

- 1898-Bayer introduced heroin, the next "wonder drug"
  - Used as cough suppressant, pain reliever
  - Addictive nature soon realized
  - Started taxing production/sales in 1914
  - By 1920s, doctors realized again the addictive and harmful nature
  - Heroin became illegal in 1924
- WWII
  - Brought need for pain control back to forefront for physicians

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## HISTORY OF OPIOIDS AND ABUSE

- 1970s
  - Drug Enforcement Administration (DEA) due to illegal heroin use
  - Percocet (oxycodone) and Vicodin (hydroxycodone) on the market
- 1980s
  - Papers were published that opioids can be prescribed safely and addiction is rare in patients with no history of addiction
- 1990s
  - OxyContin (sustained release oxycodone) approved 1996

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## CONTROLLED SUBSTANCES

- A substance subject to the Controlled Substances Act (1970), which regulates the prescribing and dispensing of substances according to:
  - Potential for or evidence of abuse
  - Potential for psychological or physiological dependence
  - Contributing to a public health risk
  - Harmful pharmacological effect
  - Role as a precursor of other controlled substances

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## AMERICA'S CURRENT EPIDEMIC

- Early 2000s, oxycodone Rx's increased by 402 percent
- Teenagers raided their medicine cabinets
- By 2010, Americans were consuming 99% of the world's hydrocodone
- 2013 270,000 drug dependent newborns
- 2015 15,000 overdose deaths, 2016 60,000 overdose deaths
- Leading cause of death under age 50 is drug overdose—142 Americans per day

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## CODEINE

- Opioid analgesic
- For mild to moderate pain
- Pain relief (Schedule III)
- Cough suppressant (Schedule V)
- Metabolized in the liver, excreted by the kidneys

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## TYLENOL #3

- Schedule III
- Central acting narcotic analgesic
- 300mg acetaminophen + 30mg codeine
- Tylenol with codeine® elixir is APAP 120mg/5cc with 12mg codeine/5cc
- Avoid in liver/renal disease/alcoholism
- No extra acetaminophen/Tylenol/APAP in addition
- No alcohol
- GI distress and sedation are main side effects

12

<b>Edward Wade, M.D. Chris Allee, O.D.</b>	<b>Ting Fang-Suarez, M.D. Jill Autry, O.D.</b>	<b>Mark Mayo, M.D. Randy Reichle, O.D.</b>
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450 Medical Ctr Blvd, #305 Webster, TX 77598 (281) 332-1397	11914 Astoria Boulevard, #325 Houston, TX 77089 (281) 484-2030	21700 Kingsland Blvd. Katy, TX 77450 (281) 578-4815

NAME **Jack Cooper** AGE \_\_\_\_\_

ADDRESS **6565 Golden River Drive, Houston, TX 77082** DATE **3-3-25**

Rx **Tylenol #3 #20 (twenty)**  
**1-2 po q4-6h prn pain**

REFILLS-- **zero**

**Jill Autry, O.D.**  
**MA0123456**

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## ALLERGIC TO CODEINE?

- Most codeine "allergies" are GI side effects or codeine initiated histamine release
  - "Stomach upset"
  - Flushing
  - Itching
- True IgE mediated allergic reaction low
- Can use hydrocodone because it is a semi-synthetic form of codeine

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## HYDROCODONE

- Moved from Class III status to Class II status in 2014
- Acetaminophen amounts decreased in combination products 2014
- Significantly more pain relief and duration of action compared to codeine
- Induces euphoria
- Highly addictive
- Also has antitussive properties

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## HYDROCODONE PRODUCTS

- All products now Schedule II
- Significantly more pain relief and duration of action compared to codeine
- More addictive
- Vicodin® (APAP w/hydrocodone)
  - 300mg APAP + 5mg hydrocodone
- Vicodin® ES (APAP w/hydrocodone)
  - 300mg APAP + 7.5mg hydrocodone
- Vicoprofen®
  - 200mg ibuprofen + 7.5mg hydrocodone
  - When Tylenol® is contraindicated/liver disease

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## OXYCODONE

- Semi-synthetic
- Less potent than morphine
- More potent than codeine/hydrocodone
- Dependence occurs with chronic dosing
- Used alone or in combination
- All products are Schedule II
- Oxycodone 5mg plain
- Percodan®
  - 5mg oxycodone + 325mg ASA
- Percocet®
  - 5mg oxycodone + 325mg APAP

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## APAP INDUCED LIVER FAILURE

- In addition to overdosing, liver failure is another cause of opioid morbidity and mortality
- 42% of acute liver failure cases in the US result from acetaminophen-induced toxicity
- Of those who overdosed unintentionally, 62% were using opioid-containing compounds
- Counsel patients concerning amount of APAP in prescribed medication—avoid additive APAP alone or in combination products such as cough and cold remedies

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## TRAMADOL

- Dual mechanism of action
  - Opioid receptor agonist
  - Inhibits serotonin and norepinephrine reuptake
- Synthetic codeine analogue with equivalent analgesic effect
- Schedule IV controlled substance
- Less potential for abuse
- High incidence of nausea and vomiting

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## TRAMADOL®

- Ultram®
  - 50mg tablets
- Ultracet®
  - Tramadol 37.5mg + APAP 325mg
- Also has extended release formulations
- Max of tramadol per day is 400mg
- Reduce dosage in patients >75 years old
- Reduce dosage in hepatic/renal disease

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**Randy Reichle,**

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Sugar Land, TX 77478  
(281)277-1010

21700 Kingsland Blvd.  
Katy, TX 77450  
(281) 578-4815

NAME Jack Cooper AGE \_\_\_\_\_

ADDRESS \_\_\_\_\_ DATE 3-3-25

Rx ***Ultram 50mg #30 (thirty)***  
***1 q4-6h prn pain***

REFILLS-- zero

**Jill Autry, O.D.**

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## SIDE EFFECTS OF OPIOID ANALGESICS

- Constipation
- Nausea and vomiting
- Sedation
- Dizziness
- Miosis
- Itching
- Respiratory depression
- Addiction

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## NARCAN

- Generic name-Naloxone
- Treats narcotic overdose
- Available IV(2 min), IM(5min), nasal(10min)
- Blocks effects of opioids on brain and restores breathing
- Will not work in someone who doesn't have opioids in their system
- Nasal spray available OTC \$25/each

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## OPIOID ALTERNATIVES



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## ASPIRIN AND THE FOUR "As"

- **Analgesic**
  - Relief without sedation
  - Works on peripheral pain receptors
- **Anti-inflammatory**
  - Still recommended by many rheumatologists
  - Chronic use limited by side effects
- **Anti-platelet**
  - For heart attack/stroke/DVT prevention
  - Inhibits platelet adhesiveness and coagulation
  - "Baby" aspirin commonly used at 81mg qd
- **Antipyretic**
  - Affects the hypothalamus
  - Decreases temperature but not below normal
  - Inhibits pyrogen stimulated prostaglandins

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## ASPIRIN (aka ASA)

- **Dosing**
  - 325mg or 500mg (extra strength)
  - 1-2 q4-6h prn pain/inflammation
  - Anti-platelet dosing 81mg/day
  - Max of 4000 mg (4g)/day
- **Side Effects**
  - Reye's Syndrome in children with flu-like symptoms
  - GI irritation/Nausea
  - Bleeding ulcers
  - Increased anticoagulation
  - Tinnitus
    - More common when approaching max daily dosage

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## ALLERGIC TO ASPIRIN?

- Triad leading to anaphylaxis
  - Aspirin allergy
  - Asthma
  - Nasal polyps
- Avoid the following:
  - Aspirin
  - Oral NSAIDS
  - Topical NSAIDS

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## ACETAMINOPHEN (aka APAP)

- Clear mechanism of action elusive
  - May affect oxidation of cyclooxygenase(COX) and inhibit prostaglandin synthesis in the CNS
  - May increase endogenous cannabinoids
  - Centrally acting
- **Analgesic action**
- **Anti-pyretic action**
- No anti-inflammatory action
- No anti-platelet action

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## ACETAMINOPHEN

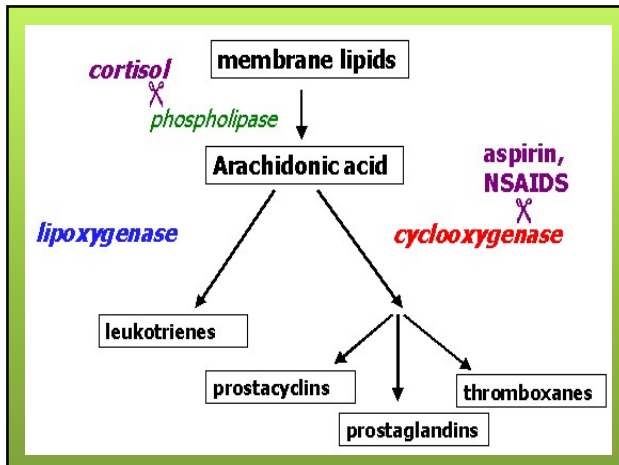
- **Dosing**
  - 325mg regular strength or 500mg extra strength
  - 1-2 q6h prn
  - 3000mg/day (3 gram) max dosage (hx of 4 gram)
  - Used extensively in flu/cold/pain preps
  - Watch ingredient lists to avoid overdosage
- **Side effects**
  - Generally well tolerated at therapeutic dosages
  - Overdosage causes irreversible kidney/liver damage
  - Cannot use in patients with hepatic disease/alcoholics
  - Do not use with alcohol

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## NSAIDS

- None are controlled substances
- Little to no abuse potential
- Many available in OTC strength
- Patients vary in response to various products
- **NSAID ACTIONS**
  - Inhibit cyclo-oxygenase pathway
  - Results in decreased prostaglandin formation
  - Reduces pain
  - Reduces inflammation
  - Reduces edema

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## NSAID INDICATIONS

- Arthritis
  - Osteoarthritis
  - Rheumatoid arthritis
- Moderate pain
  - Post-operative pain
  - Dental pain
- Headache
- Premenstrual cramping
- Additional control of ocular inflammation
  - Adjunctive therapy with topicals
  - Episcleritis, iritis, non-specific ocular pain

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## COMMON ORAL NSAIDS

- OTC
  - Ibuprofen 200mg
    - Motrin®, Advil®, Nuprin®
  - Naproxen 200mg
    - Alleve®
- Rx
  - Ibuprofen 400mg, 600mg, 800mg
  - Voltaren
  - Lodine
  - Ketorolac
  - Celebrex
  - Mobic

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21700 Kingsland Blvd.  
Katy, TX 77450  
(281) 578-4815

NAME Joe Johnson

AGE \_\_\_\_\_

ADDRESS \_\_\_\_\_

DATE 3-3-25

Rx ***Ibuprofen 600mg #30***  
***1 po q6h***

REFILLS-- 0**Jill Autry, O.D.**

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## NSAID SIDE EFFECTS

- All oral NSAIDs have been associated with inducing ulcers
  - Risk increased for elderly
  - Risk increased for patients on steroids, anticoagulants, daily aspirin, alcohol use
  - Consider Zantac® 150mg bid for extended NSAID therapy
  - Take with food or milk

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## NSAID SIDE EFFECTS

- Kidney toxicity
  - Dose and duration-dependent
  - Risk factors for kidney failure
    - Elderly
    - Diabetes, hypertension, heart failure
    - Concomitant diuretic use
    - Concomitant ACE inhibitor or Angiotensin II blocker use
- Risk of cardiovascular events with long-term use

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## NEUROPATHIC PAIN

- Underlying mechanism is nerve injury/dysfunction
- Injury to peripheral nerves results in disinhibition of spinal cord impulses
- Spontaneous activity to sympathetic system
- Increased responsiveness to sympathetic system
- Pain descriptors
  - Electrical
  - Burning
  - Frostbite feeling
  - Numbness
  - Tingling
  - Pins and needles

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## NEUROPATHIC PAIN TREATMENT

- Anticonvulsants
  - Tegretol®, Neurontin®, Lyrica®
- Non-opioid analgesics
  - Clonidine, Baclofen®
- Topical agents
  - Capsaicin creams/Lidocaine patch
- Antidepressants
  - Tricyclics (TCAs)-amitriptyline
  - SSRIs-less consistent than TCAs for pain

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## PSYCHOGENIC PAIN

- Psychotherapy
- Antidepressants
- Non-opioid analgesics
  - Also placebo treatment
- Non-medicinal therapies
  - Acupuncture
  - Hypnosis

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## TOPICAL OPHTHALMICS FOR PAIN



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## TOPICAL STEROIDS

- Reduce inflammation
- Reduce pain
- Reduce photophobia
- Ocular conditions
  - Iritis, sterile corneal infiltrates, episcleritis, post-operative inflammation, inflamed pterygia/pingueculae,
- Pred Forte 1%, Lotemax, Durezol etc.
- Generally start q1-2h for moderate to severe inflammation
- Taper per response

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## TOPICAL OPHTHALMIC NSAIDS

- Indicated most often for pain and inflammation associated with cataract surgery
- Used off label for prevention of CME
- Used off label for non-specific pain/dry eye/itching
- Ketorolac (Acular)
- Nepafenac (Ilevro)
- Bromfenac (Bromsite, Prolensa)
- DO NOT USE ON COMPROMISED CORNEAS

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## OCULAR TOPICAL ANESTHESIA

- Topical anesthesia
  - Onset of action within 20 seconds
  - Duration of action 15-20 minutes
  - Anesthesia of surface nerve endings
  - Work by blocking both the initiation and conduction of nerve impulses
  - May retard epithelial regeneration with prolonged and repeated use
  - Consider "comfort drops" for acute non-infectious pain control

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## ANESTHETIC REACTIONS

- Anesthetics generally have either an amide chemical structure or an ester chemical structure.
- In cases of allergy or increased side effects, an anesthetic from the alternate class may be utilized without cross sensitivity.

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- Ester Anesthetics
  - Procaine
  - Tetracaine
  - Benzocaine
  - Cocaine
  - Proparacaine
  - Benoxinate \*\*\*Found in Fluress™\*\*\*
- Amide Anesthetics
  - Bupivacaine
  - Etidocaine
  - Lidocaine
  - Mepivacaine
  - Dibucaine

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## CYCLOPLEGICS

- Provides ocular pain control in certain inflammatory ocular conditions
- Relaxes ciliary spasm by ciliary body paralysis
- Ocular pain uses are numerous
  - Iritis
  - Corneal abrasions/RCE
  - Corneal foreign body removal
  - Post-operative pain
- Contraindicated in pain from angle closure
- Atropine, cyclopentolate

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## NON-ANALGESIC MEDS

- Anti-depressants
- Anti-convulsants
- Corticosteroids
- Ointments /creams/patches
  - Capsaicin, lidocaine
- Muscle relaxants
  - Cyclobenzaprine (Flexeril)
- Injections
  - Steroids, anesthetics, botox
- Enhancers
  - Caffeine, diphenhydramine

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## ANALGESIC PAIN MANAGEMENT PEARLS

- Synergy
  - Topical and orals
  - Central acting and peripheral acting
  - Ibuprofen and acetaminophen combination
- Concerns
  - Pain that worsens despite treatment
  - Hepatic disease
  - Renal disease
  - GI ulcer history
  - Anticoagulants/antiplatelet use
  - Diabetic
  - Aspirin/Codeine allergies

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## NON-MEDICINAL PAIN TREATMENTS

- Cold/hot packs
- Exercise, weight loss, physical therapy
- Meditation, yoga, hypnosis
- Massage, chiropractic treatments
- Psychotherapy
- Acupuncture
- TENS
  - Transcutaneous Electro-Nerve Stimulator

55

## OCULAR AND RELATED PAIN



## CASE STUDIES

56

## CASE EXAMPLE

- 25 year old female with pain in eyelid, tender to touch, eyelid swelling
- Started 3 days ago; getting worse and now draining blood
- No pertinent medical history
- History of "stye" 3 years ago
- NKDA

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## Hordeolum

- Infection and subsequent inflammation of eyelid margin gland(s)
- Localized pain, erythema, swelling
- External hordeolum
  - Localized staph aureus infection of Zeiss or Moll glands
  - Situated at eyelid margin
- Internal hordeolum
  - Involving deeper meibomian glands
  - More obstructive than infectious etiology
  - "Early chalazion"

59



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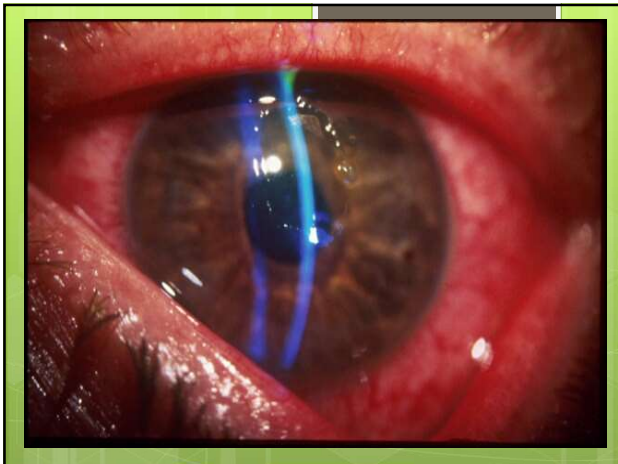


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### CASE EXAMPLE

- 32 year old male patient presents with unilateral pain, photophobia, redness, watering
- "Poked in eye" by 9 month old child 2 hours previously
- No pertinent systemic/ocular history
- Takes Claritin® qd for allergies
- NKDA

62

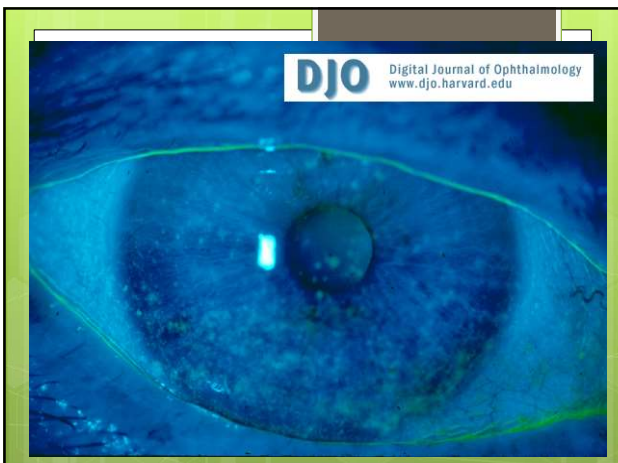


63

### CASE EXAMPLE

- 65 year old white female
- Complains of 1-2 year history of eyes that
  - Burn
  - Water
  - Feel sandy, gritty
- Ocular history unremarkable
- Takes Tamoxifen with history of breast CA

64



65

### CASE EXAMPLE

- 32 year old male
- Presents with foreign body sensation, tearing, sensitivity to light x 2 days OD
- Reports similar episode two years ago and was told he had pink eye
- No pertinent systemic history
- NKDA

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67

### CASE EXAMPLE

- 27 year old contact lens patient
- Presents with pain, redness, tearing, photophobia x 2 days
- Was mowing the grass when it started hurting
- No pertinent systemic history
- NKDA

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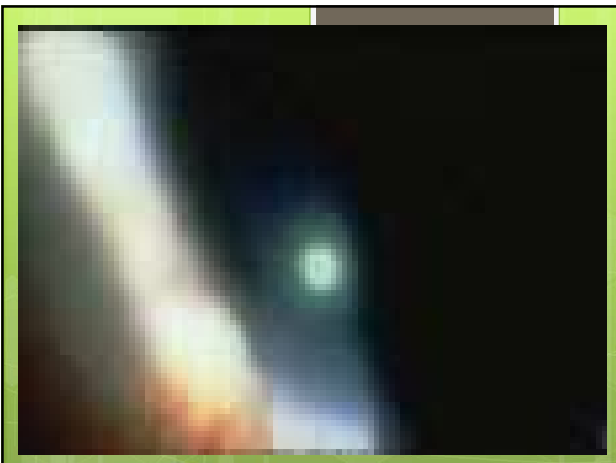


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### CASE EXAMPLE

- 25-year-old male presents with pain, photophobia, tearing, redness, decreased VA
- Wears contact lenses
- Has been using topical antibiotic x 2 weeks without improvement
- No pertinent systemic history
- NKDA

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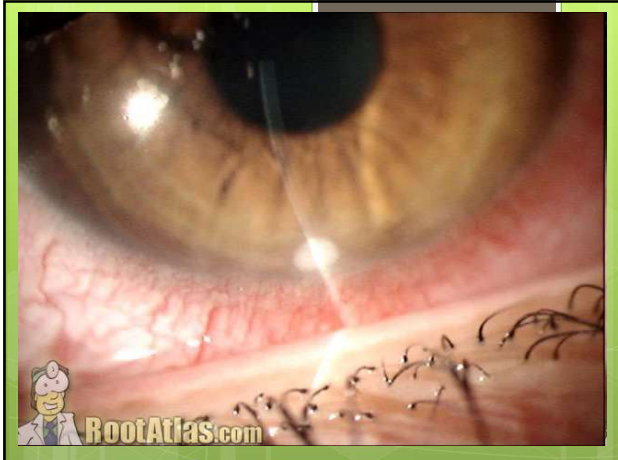


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72





73

### CASE EXAMPLE

- 28 year old female patient complains of unilateral redness on temporal white part of eye x 3 days
- Eye feels uncomfortable and tender to touch and upon eye movements
- No pertinent systemic/ocular history
- Takes birth control pills
- NKDA

74

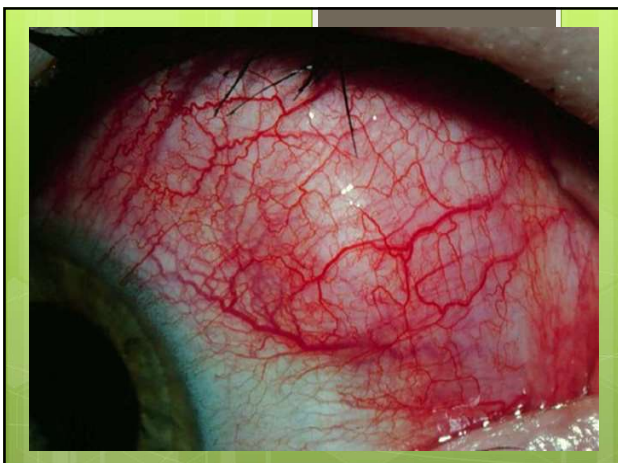


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### CASE EXAMPLE

- 39-year-old female complains of severe, deep pain OD for 3 days
- Difficulty moving the eye, pain is getting worse despite acetaminophen and ibuprofen OTC
- Has been told in past she may have rheumatoid arthritis
- Takes aspirin or ibuprofen if joint pain

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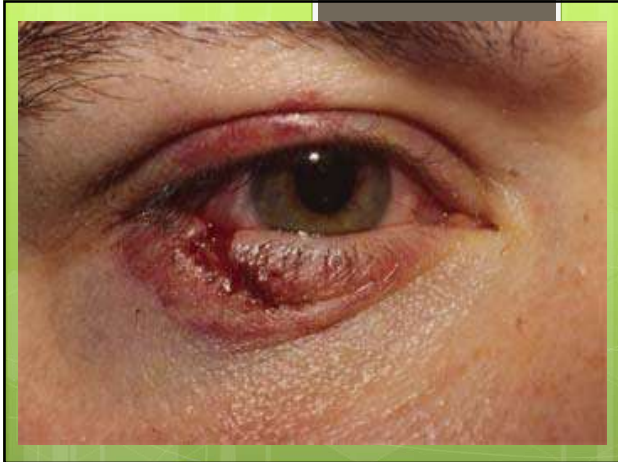


77

### CASE EXAMPLE

- 25-year-old male complains of pain and bleeding from the eyelid OD
- Hit by a tree branch while riding 4-wheeler 3 hours previously
- No pertinent systemic/ocular history
- Codeine allergy-reports facial flushing
- Takes no medications

78

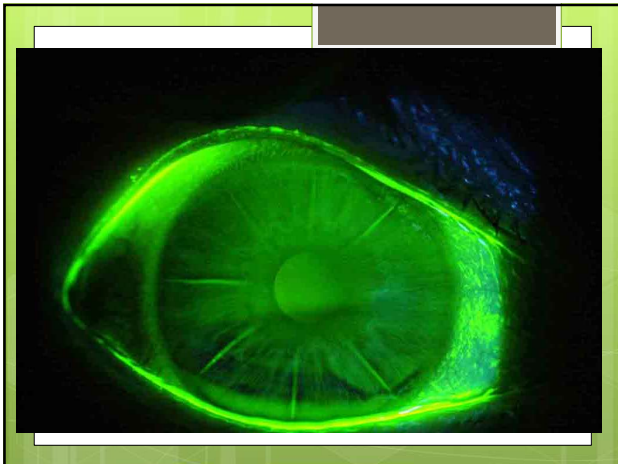


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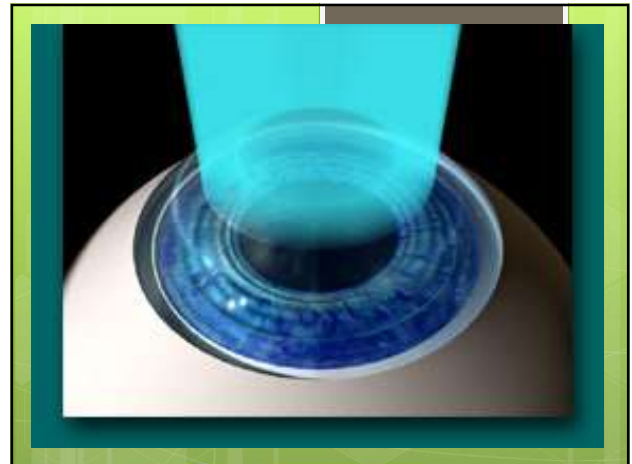
### CASE EXAMPLE

- 57-year-old male scheduled for PRK over RK
- NKDA
- Takes Metoprolol for HTN, Flomax for BPH
- History of liver disease/Recovering alcoholic

80



81



82

### CASE EXAMPLE

- 33-year-old female presents with unilateral redness, pain, photophobia, decreased VA
- Ocular history of iritis x 3
- Systemic history positive for Lupus
- 4+ cell and flare, heavy KP, posterior synechiae, 15mmHg IOP
- Takes Plaquenil® 200mg daily
- NKDA

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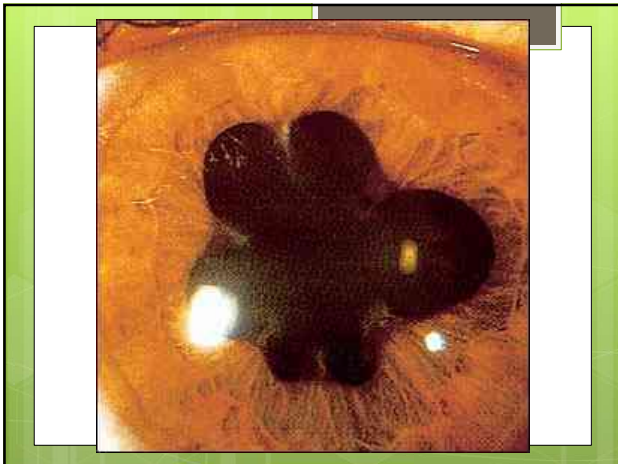
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86



87

### CASE EXAMPLE

- 70-year-old male complains of severe burning, sensitivity to even light touch, electrical shock on right side of face/head
- History of same sided herpes zoster one month prior to visit/No ocular involvement
- Takes metformin for Diabetes, enalapril for HTN, Flomax® for BPH, ASA 81mg, Lipitor® for cholesterol

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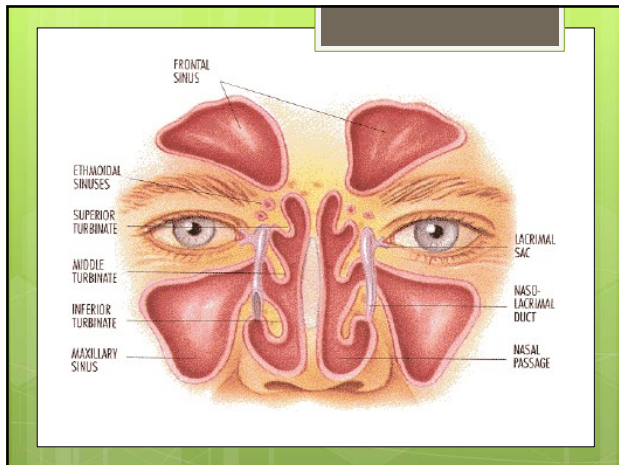
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### CASE EXAMPLE

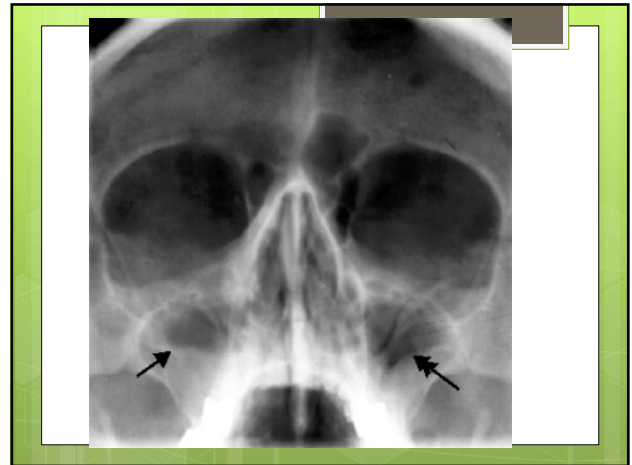
- 40-year-old male patient complains of pressure behind eyes and pain on eye movements
- No pertinent systemic/ocular history
- History of seasonal allergies
- Ocular exam WNL

90

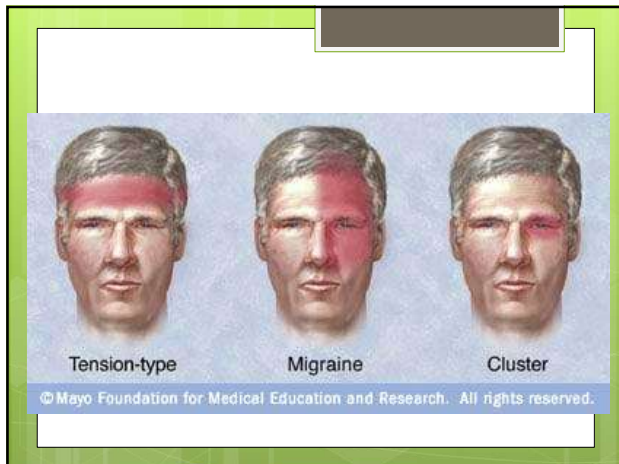




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92



93

### CASE EXAMPLE

- 32-year-old female with pain on eye movements OD
- Decreased vision x 3 days OD
- +APD, 20/200 BVA OD
- No pertinent systemic or ocular history

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95

### CASE EXAMPLE

- 42-year-old female with history of penetrating ocular injury five years ago
- Retinal detachment surgery, lensectomy, etc. with NLP result
- Patient complains of deep ocular pain, photophobia
- IOP 6mmHg

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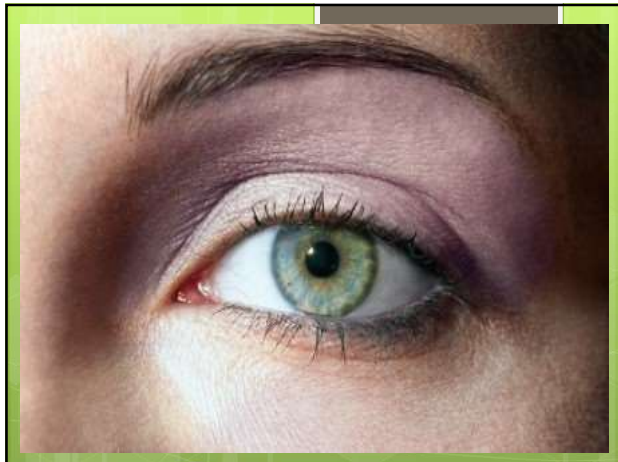


97

### CASE EXAMPLE

- 40 year old white female
- Presents with complaints of "fullness feeling to the eye"
- Visual acuity 20/20
- IOP normal, anterior chamber without cells, cornea with mild SPK OU, rest of ocular exam within normal limits
- Takes Xanax for anxiety

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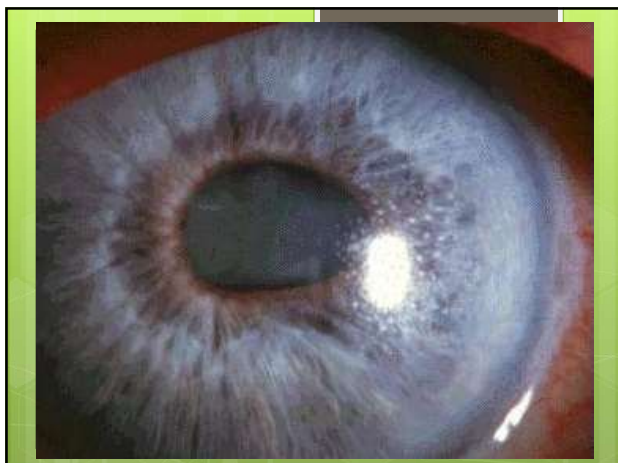


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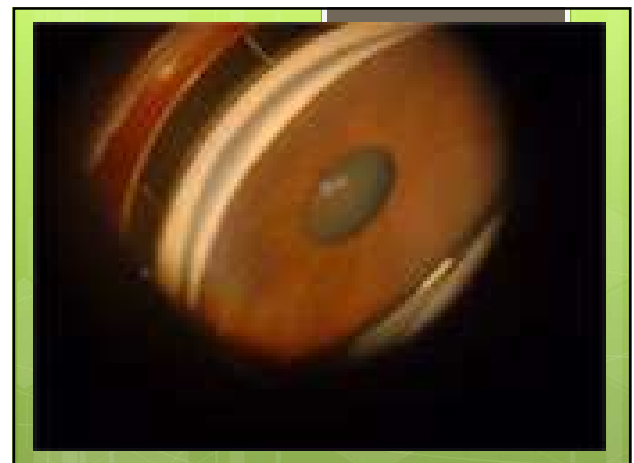
### CASE EXAMPLE

- 70 year old white female
- Presents with severe ocular pain OD, nausea, right-sided headache
- Visual acuity 20/200
- IOP OD 65mmHg, fixed mid-dilated pupil, shallow anterior chamber, corneal edema OU

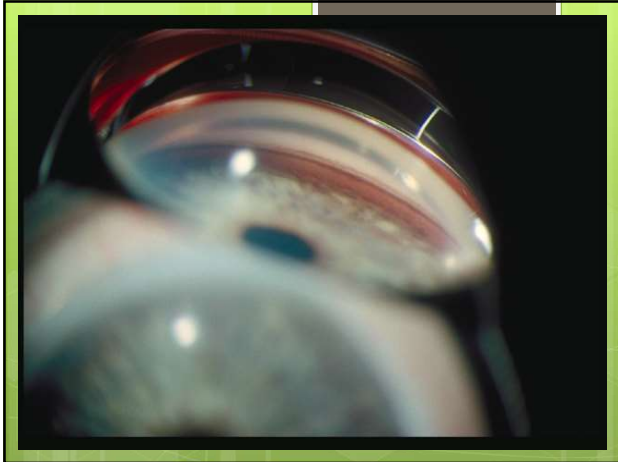
100



101



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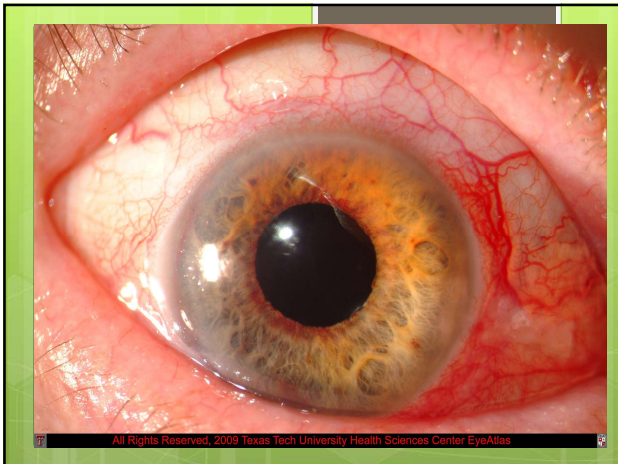


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### CASE EXAMPLE

- 75 year old African-American male
- Presents with severe ocular pain OD, nausea, right-sided headache
- Visual acuity CF
- IOP OD 55mmHg

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