Effective Prescribing of Oral Pharmaceuticals in Primary Eye Care

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Overview

- Statistics: State of the profession
- Terminology
- General uses for Oral agents
- Anti-infective agents
  - Antibiotics
- Antiviral agents
- Oral analgesics
  - Narcotics
  - Non-narcotics

Some Updated Statistics

- 47 States and D.C. now allow some use of oral pharmaceuticals
- Only 3 states have no orals in their bill
  - Mass, NY, FLA
- Bills pending in more states

State of Our profession

- Massachusetts is only state with out glaucoma medications
- 11 States have no authority to prescribe oral meds for Glaucoma
- All but 6 states have some authority to prescribe controlled substances
- 14 states have injectables in their law.

Overview of New Bill in VA

- Oral Analgesics – schedule III, IV, and VI and non narcotic agents
- Anti-infectives (Bacterial and Viral)
- Anti-fungal medications
- Glaucoma agents (CAI’s, Hyperosmotics)
- Anti-inflammatory and Immunosuppressive agents (steroids)
- Anti-allergy agents
- Anti-fibrolytic agents (Amicar)

Overview VA Bill

- Oral meds for Inflammation/ allergy
- Orals meds in glaucoma
Some Terms:

- **MIC** – The lowest conc. of drug that inhibits visible growth after overnight incubation
- **MBC** – Lowest conc. of drug that kills 99.9% of the bacterial inoculum.

Terms: Static vs. Cidal

- **Bacteriostatic Agents** – Inhibit bacterial growth but do not kill the organism at conc. that are achieved clinically.
- **Bactericidal Agents** – cause a microbial cell death and lysis at concentrations that are achieved clinically.

“Static vs. Cidal”

- Treatment with **Bacteriostatic** drugs stops bacterial cell growth, allowing neutrophils, macrophages and other host defenses to eliminate the pathogen.
- "**Cidal**" agents will be more effective when total reliance must be placed on chemotherapeutic effect (i.e. not aided by host defenses) neutropenic.

Resistance – Why do we have it?

- **Intrinsic** – stable genetic property encoded in all organisms of species.
- **Acquired** – organisms develop the ability to resist a drug (implies a DNA change) so new phenotypic traits are exposed. (mutation/plasmids)

Microbiology Review

- 70% of ocular infections caused by gram (+) bacteria
- 30% gram negative (ie Pseudomonas)

  * Since most eye infections are caused by gram (+) we often use AB’s with good gram (+) coverage

A Little Review

<table>
<thead>
<tr>
<th>Gram (+)</th>
<th>Gram (-)</th>
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</thead>
<tbody>
<tr>
<td>Staphylococci (staph aureus*)</td>
<td>Haemophilus influenza</td>
</tr>
<tr>
<td>Streptococci (S.Pneumonia*)</td>
<td>Nesseria gonorrhea</td>
</tr>
<tr>
<td>Corynbacterium</td>
<td>*Pseudomonas Aeruginosa</td>
</tr>
<tr>
<td>Clostridia</td>
<td>*Moraxella</td>
</tr>
<tr>
<td>*Proteus</td>
<td>*Enterobacteriaceae</td>
</tr>
<tr>
<td>Enteric Bacteria</td>
<td>Klebsiella</td>
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* Asterisks denote common antibiotic-resistant strains.
General uses for oral agents…

- Internal hordeolum
- Pre-septal cellulitis
- Blepharitis/Rosacea
- MGD
- Lid abscess
- Cat scratch Dz.
- Chlamydial disease
- Orbital fracture
- HSV-skin, prophylaxis
- HZO
- HSV keratitis prophylaxis
- Episceritis
- Scleritis
- Contact dermatitis
- Orbital pseudotumor
- Orbital myositis
- Severe allergic rx.
- Vernal/GPC
- Post-op CME
- Conjunctival chemosis
- Etc., etc
- Dacryocystitis, dacryoadentitis

The Antibiotics

Format

- Class
- Mechanism of Action
- Indications/contraindications
- Dosing
- Side Effects
- Real World Clinical applications

Antibiotics by Class

- Inhibition of cell wall synthesis
  (B-lactam AB’s, Vancomycin, cephalosporins)
- Inhibition of protein synthesis
  (clindamycin, erythromycin, tetracyclines)
- Inhibition of nucleic acid synthesis
  (sulfa, quinolones)
- Inhibition of cytoplasmic membrane function
  (polymyxins)

Pregnancy category for drugs: Fetal Risk

- Category A: the possibility of fetal harm appears remote.
- Category B
- Category C
- Category D
- Category X
  - Studies in animals or human beings have demonstrated fetal abnormalities, or there is evidence of fetal risk based on human experience or both.
  - Risk of the use of the drug in pregnant women clearly outweighs any possible benefit.

The Macrolides - bacteriostatic

Mechanism:
All bind to 50s Ribosomal subunit inhibiting protein synthesis.
**Erythromycin**
- Indications in staph lid disease
- Active against non-enterococcal streptococcus species,
- Staph aureus, neisseria, chlamydia, rickettsia, treponema pallidum.
- DOC in mycoplasma + legionella pneumonia
  - Fluoroquinolones, macrolides
  - SE: GI upset
- Very safe drug in kids
- Category B of FDA’s classification for fetal risk.
  - (used in pregnant mothers)
- Dose 250 mg – 500 mg (BID – qid)
  - Syphillis 500 mg qid x 14 days (can take up to 4 grams)

**Macrolides – clarithromycin (Biaxin) (250,500)**
- Indications for staph
- Effective against chlamydia
- Best gram (-) coverage in the group
- 2 x ½ life of Erythromycin
- Dose: 250 – 500 mg BID (7-14) days
- SE: GI irritation

**Macrolides – Azithromycin (Zithromax) (250, 500,600 mg tabs)**
- One of the safest drugs out there
- Common indications: chlamydia and Toxo
- Dose comes as:
  - 2-pak (6) 250 mg tabs / 500-250 qd 2-5 (sinusitis)
  - Tri-pak (3 day dose) 500 qd x 3 days
- For Chlamydia: 1g or 1 day vs. Doxycycline 100 BID x 1 week, (effective for urethritis, cervicitis)

**Other antimicrobials**
- **Vancomycin – (Vancocin) (125,250 mg)**
  - Class: A “glycopeptide”, antibiotic
  - Mech: inhibits cell wall synthesis and RNA synthesis
  - Bactericidal
  - Virtually all gram (+) sensitive to vanco
  - Poor gram (-) action,
  - Poorly absorbed from GI
  - Best fortified topically or IV, pair with Tobramycin or gentamycin, cephalosporin
  - Effective against MRSA
  - Adverse Rx: ototoxicity, nephrotoxicity

- **Other antimicrobials:** Linezolid–(Zyvox)
  - Newer class: Oxazolidinones
  - Dosing: 600mg q12h for 10-14 days
  - Indications: bacteremia, pneumonia, skin infections
  - Adverse Rx: optic neuropathy and vision loss
  - Myelosupression: anemia, leukopenia, pancytopenia, thrombocytopenia
  - Ophthalmic exams and CBC recommended if tx. > three months
Orbital fractures

Recognizing Orbital Fractures

- Pain local tenderness
- Binocular diplopia
- Eyelid swelling after nose blowing
- Recent hx. Of trauma
- Eyelid edema, ecchymosis

- Restricted eye movement
- Sub-Q or conjunctival emphysema
- Hypoesthesisia in region of infraorbital nerve, V2
- enophthalmos

Work up Blowout fracture of the Orbital Floor

- Measurement of extraocular movements, globe displacement
- Compare sensation, cheek, V2
- Palpate eyelids/ crepitus
- Evaluate globe carefully for rupture
  - Do you need to see a siedel sign to establish a diagnosis of choroidal rupture?
- Hyphema / microhyphema
- Traumatic iritis
- Retinal or choroidal sequellae, DFE
Treatment

- Nasal decongestants
- Broad Spectrum oral Antibiotics!
- Instruct patient; no nose blowing
- Ice packs, first 24-48 hours
- Surgical repair?

Criterion for surgical repair

- Apparent enophthalmos
- Diplopia in a useful field of gaze
- Large fractures
- Neurosurgical consult is recommended for most orbital roof fractures!

B-Lactam Antibiotics- Penicillins/Cephalosporins

Mechanism:

- Inhibition of cell wall synthesis triggers bacterial autolytic enzymes → lysis
- Cell wall is a peptidoglycan structure that is unique to bacteria
- Therefore PCN’s Cephalosporins relatively non-toxic to human cells

Natural Pennicillins (I)

As a group good gram + coverage

Penicillin G:

- Active against gram (+)
- Narrow Spectrum
- Degraded by Bacterial penicillinases
- Gastric acid, Labile
- Not a good oral AB

Penicillin V:

- Acid resistant
- Better oral agent / GI absorption
- Good gram (+) coverage
- Degraded by penicillinases

Penicillinase Resistant Penicillins (II)

Methicillin (Staphcillin) given IM or IV

*Dicloxacillin (Dynagen) (125 mg, 250, 500)
- Best in class (synthetic AB) Drug of choice

-Ampicillin (OMNIPEN)
-SE: diarrhea and rash

*Amoxicillin (Amoxil)
- much easier on GI system
- These have some gram (-) coverage
-Both destroyed by staph penicillinase
-Selective for E.Coli, and Haemophilus. Flu was good for use in kids

Aminopenicillins
**Extended Spectrum Penicillins**

- Carbenicillin (Geopen) activity against (Pseudomonas)
- Piperacillin (IV or IM)
- Ticarcillin (Ticar) discontinued
- PNC’s were of limited use until β-lactamase inhibitors developed

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**Clavulanic Acid (Beta-Lactamase Inhibitor)**

- Added to PCN’s to provide resistance against neutralizing bacterial enzymes
- Extends the spectrum of these drugs
- Only group II penicillins and amoxicillin with clavulanate

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**Amoxicillin/Clavulanate**

(Augmentin)

- 250/125, 500/125, 875/125
  - Indicated against – H. Flu, dacrocystitis, preseptal cellulitis
  - Excellent drug in kids – not allergic to pcn
  - Adverse effects: allergy; allergy to one is considered allergy to all PCN’s

Doses: 500-875 mg BID to TID (with food)

SE: urticaria, angioedema, anaphylaxis, bronchospasm.

- Note: Dicloxacillin and amoxicillin have best GI absorption

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Adverse effects: allergy; allergy to one is considered allergy to all PCN’s
Cephalosporins –
inhibit cell wall synthesis

Three Generations:
1st Gen: Hydrolyzed by B-Lactamases produced by gram (-) ie. Keflex
   best gram + spectrum
2nd Gen: Better B-Lactamase stability...broader spectrum gram (-)
3rd Gen: Resistant to B-lactamases...broad gram (-) coverage.

Cephalosporins (1st Generation)

1.) Cefazolin – (Ancef) fortified topical, IM,IV
2.) Cephalexin (kelflex) 250, 500 mg
   Dose: 250-500 qid or BID
3.) Cefadroxil (duricef) 500, 1000mg
   Dose: 1-2 tabs qd or BID
   *2,3 Acid stable + absorbed in GI
   *Cephalexin good in dacryocystitis and other soft tissue infections
   *Good gram (+) coverage, poor gram (-)

Cephalosporins (2nd Gen)

- Cefaclor (Cector) (250,500)
  Dose: 250-500 TID
- Cefuroxime (Ceftin) (125,250,500mg)
  Dose: 125-500 BID
  *Most effective in class against Neisseria
  *Acid Stable
  *Intermediate activity for both gram +/-

Orbital cellulitis

- Red eye, pain, fever, headache, diplopia
- Eyelid erythema, edema, conjunctival chemosis, warmth, tenderness
- Decreased vision, motility disturbance and pupil abnormalities
  (when orbit apex involved)
- Proptosis, with restricted motility
- Primarily occurs as extension from sinusitis or trauma

Orbital cellulitis / Treatment

- Hospital admission
- Emergent CT scan (examine extent)
- Generally requires systemic / IV antibiotics
  - Ceftriaxone (III) and Vancomycin.
- Oral Augmentin or cefclor outpatient
Orbital pseudotumor

F/U after 3 days of steroids

Cephalosporins/3rd Gen

Ceftriaxone (Rocephin) IV or IM injection
Cefperazone (Cefobid)

*All parenteral use only
*Good gram (-) coverage
*Cross over BBB→CNS infections
  encephalitis, meningitis

Important Points / Cephalosporins

- 5-10% of patients allergic to PCN’s exhibit cross over reactivity/allergy to cephalosporins
- Main SE’s: stomach upset, diarrhea
- Spectrum of 1st gen is almost identical to penicillinase resistant PNC’s
Aminoglycosides
(as a group; poor gram+ coverage, good gram -)

- Tobramycin
- Gentamycin
- Neomycin
- Amikacin

Mechanism: Inhibit protein synthesis
- Rapidly bactericidal
- Poorly absorbed in the intestinal tract
- SE: ototoxicity, nephrotoxicity
- Not for use orally but parenterally; topically or intravitreal

Fluoroquinolones

Mechanism: Inhibition of bacterial nucleic acid synthesis
- Inhibition of bacterial DNA gyrase.

- Broadest spectrum
- Well tolerated
- Low levels of resistance

Fluoroquinolones

Indications:
- Effective against staph, and strept eye infections, UTI’s, URI’s, Gonorrhea
- Very safe drugs in kids
- Excellent for soft tissue infections

SE: infrequent nausea, vomiting, and diarrhea, dizziness, metallic taste, arthropathy.

Contra-indications: Hypersensitivity to any quinolone

Fluoroquinolones (oral)

- Fluoroquinolones work well as broad spectrum agents.
  1. Ciprofloxacin (Cipro) 100, 250, 500, 750mg
     - Typical dose 500 mg BID x 1wk
  2. Levofloxacin (Levaquin) 250, 500, 750mg
     qd x 7-14 days
     - Great against staph
     - 42% market share
     - Some staph resistance
  3. Moxifloxacin (Avelox) 400mg qd 7-14 days
  4. Gatifloxacin (Tequin) 200/400mg qd 7-10 days
  5. Ofloxacin (Floxin) 200/400mg q12h

Tetracyclines

- Inhibit protein synthesis
  - (effects 30s subunit)
- Bacteriostatic
- Side benefits: liquefies fatty acids and inhibits collagenase activity.
  - Alters lipid metabolism
  - Very useful in tx of MGD, Rosacea, Chlamydia
  - Dose 250 mg qid

Tetracyclines...

- Complexes with Ca+, Mg+, and Al++
  *(Can't take with food; 1 hr before or 2 hrs post)
- Contraindicated in children < 11 or 8
- Pregnant and nursing mothers

- Risk of breast cancer?
  Indicated in RCE’s and infectious keratitis
  Inhibits matrix metalloproteinases.
Doxycycline- (Vibramycin) 50mg/100mg; Periostat 20mg

- Indicated for MGD-recurrent chalazia
- Can be taken without regard to meals.
  Dose: 20, 50, 100mg; 100mg BID x 3-6 months
- *If px is sensitive cut to 100mg qd

- Chlamydia: 100mg BID x 7 days
- These drugs can be photosensitizing
- Bound by calcium/avoid dairy/milk

New trend Less is more....

- Alodox (23mg) Doxycycline hyclate

- Oracea (40mg) Doxycycline monohydrate
  - 30mg/10 mg delayed release

- Doryx (75mg, 100mg) delayed release
  - Doxycycline hyclate

Low Dose doxycycline: Alodox

OCuSOFT Launches Adjunctive Eyelid Therapy, Hygiene Product

- ALODOX Convenience Kit contains:
  - Doxycycline Hyclate 23 milligrams
  - OCuSOFT Lid Scrub PLUS Extra Strength Pre-Moistened Pads;
  - OCuSOFT Lid Scrub Original Foaming Eyelid Cleanser
  - a more potent collagenase inhibitor than Minocycline.
Low Dose doxycycline: Alodox
- Use of low-dose doxycycline hyclate has demonstrated effective enzyme modulation treatment of inflammatory disease.
- At such low levels -- 50 milligrams or less -- doxycycline reduces inflammation, yet still maintains maximum plasma drug concentrations below the anti-microbial threshold, resulting in fewer side effects.

Low Dose doxycycline: Oracea
- Capsules 40 mg*, 30 mg Immediate Release & 10 mg Delayed Release beads
- Doxycycline monohydrate
- ORACEA is indicated for the treatment of only inflammatory lesions of rosacea in adult patients.

Low dose Doxycycline: Oracea
- One ORACEA Capsule (40 mg) should be taken qd in the AM on an empty stomach; at least one hour prior to or two hours after meals.
- Doxycycline may interfere with the effectiveness of low dose oral contraceptives. To avoid contraceptive failure, females are advised to use a second form of contraceptive during treatment with doxycycline.

Doryx
- Doxycycline hyclate delayed-release Tablets.
  - Dose: 75 mg, 100 mg and 150 mg

Minocycline – (50-100mg)
- Typical dose 50 mg qd
  - 100 mg BID for gonorrhea and other infections.
- SE: much worse than with other two.
  - Causes more liver toxicity
  - Most likely to cause P.T.C.
  - Can take with meal
SE’s of Tetracyclines: (Con’t)

PTC, neutropenia, thrombocytopenia, liver toxicity, ↑ICP, skeletal retardation, nausea, vomiting, photosensitivity, teeth discoloration in kids (<9 years old)

Drugs affecting folic acid synthesis: Sulfonamides

- Mechanism: inhibit folic acid synthesis
- Moderate coverage for gram +/-.
- Resistance is high
- Adverse reactions: Stevens – Johnson Syndrome
- Bactrim (trimethoprim / sulfamethoxazole)
  80/400mg, 160/800 mg BID X 10 days
  A good fall back drug in those with PCN allergy

My Solid “Six” antibiotics

1.) Ciprofloxacin – excellent spectrum; use in soft tissue infections
2.) Azithromycin – easy Tx of chlamydial Infection and safety (1 gram 1X)
3.) Dicloxacillin – good / cheap / penicillinase resistant
4.) Keflex – excellent gram (+) coverage
5.) Doxycycline – MGD & rosacea / collagenase and matrix metalloproteinase inhibition
6.) Augmentin – efficacy, safety in kids, penicillinase resistance.

Anti-Viral Medications

**Mechanism:** Inhibits viral DNA synthesis by affecting DNA POLYMERASE without interfering with host DNA.
- This Class is virus specific!

**Indications:** HZO, HSV (skin), HSV keratitis prophylaxis, ARN

Acyclovir (Zovirax)
(200 mg caps, 400,800mg tabs)

- Offers patient generic availability
- Tx of HZO most effective if within 1st 72 hours
- ½ Life 2.5-3.3hrs. (short)

**Dosing:**
- HZO 800 mg 5 x day x 7-10 days
- HSV 400 mg 5 x day
- HSV prophylaxis 400 mg BID x 12 months
Valacyclovir – (Valtrex) (500,1000 mg)
- Pro-drug of Acyclovir
- Caplets

Doses:
- HZO 1000 mg TID x 7-10 days
- HSV 500 TID
- HSV keratitis prophylaxis 500 mg qd

Famiclovir – (Famvir) (125,250,500mg) tabs
- Pro-drug of penciclovir
- Dose: HZO 500 TID x 7 days
  - HSV 250 TID
  - HSK prophylaxis 500 qd-BID

SE’s: remarkably safe, rare GI irritation, skin rash, neutropenia and thrombocytopenia (rare)

HEDS I / SKS
- Designed to eval. efficacy of oral acyclovir (400 mg 5 x day x 10 wks) in Tx. of stromal keratitis
- Pred-phosphate qid / trifluridine qh
- Randomized to acyclovir or placebo
- Results; no benefit to oral acyclovir regarding time to resolve, rate of treatment failure, or 6 month V.A.
HEDS II/ EKT

Designed to determine if oral acyclovir (400 mg 5x day x 3 wks) was beneficial as adjunct to topical trifluridine in preventing progression to stromal DZ or iridocyclitis.

Results: oral acyclovir of no benefit.

HEDS 2/ APT

- Aimed to answer question, does low dose oral acyclovir (400 mg BID x 1 year) prevent any recurrent HS eye Dz.
- Px’s Tx 12 months / observed for 1 year
- Study found taking low dose oral acyclovir decreased risk of recurrent HS eye Dz. by 41% in 1st year

Anti-Virals / HEDS

Note: Oral anti-virals should also be considered as adjunctive therapy in Tx of herpetic iridocyclitis. (400 mg 5x for 10 wks)

Contraindications: Hx of Hypersensitivity

Remember: Use standard dose to treat HZO
  • ½ doses to tx HSV
That’s gotta hurt………..

The Principles of Pain
- Pain is highly personal
- Address the subjective dimensions of pain
- Highly variable
- Personality and cultural influences

Reasons Dr.’s under Tx Pain
- Studies show Dr.’s under medicate for pain 50% of the time!
- Fear of Px’s addiction
- It makes us uncomfortable
- Disbelief of Px’s reports

Pain Treatment Management: 3 steps to consider
1. Determine if patient in pain and to what extent
2. Decide whether to provide analgesia and how much.
3. Consider adjuvant measures

Most Common Causes of Ocular Pain
Corneal abrasion, corneal ulceration, dendritic keratitis, HZO, post-herpetic neuralgia, bullous K, acute iritis, scleritis, dacryocystitis, orbital pseudotumor, optic neuritis, orbital myositis, peri-ocular sinusitis, blunt trauma.

That’s gonna leave a mark….
Treatment of Pain

- Create a pain scale from (1 – 10 worst):
  
  Grade 1-3 mild (OTC)  
  4-6 moderate (non-narcotic)  
  7-10 (narcotic)

The Pharmacological Armamentarium

1.) NSAID’s
2.) Oral narcotics schedule (II – VI)

NSAID’s : Derive from 3 Classes

I. Salicylate derivatives (ASA)
II. Propionic acid derivatives (ibuprofen, naproxen)
III. Acetic acid derivatives (Indocin)

*They all exert anti-inflammatory, analgesic and antipyretic effect.

NSAID’s – Propionic Acid Derivatives

Indications: mild to moderate pain/inflammation.

- Ibuprofen (Motrin/Advil)
- Naproxen (Naprosyn, Anaprox, Aleve)
- Ketorolac (Toradol) 10mg q4-6h prn

*best analgesic activity in class  
*worst GI effects

Indications: corneal abrasion, ulcers, myositis, CME.
Typical dose for CME 600-800mg (3-4 x day)  
200-400 mg qid for pain

NSAID’s – Acetic Acid Derivatives

- Indomethacin – (Indocin) 25, 50 mg  
  Dose: 25 mg BID-TID
- Diclofenac – (Voltaren) 25, 50, 75 mg  
  Dose: 50 mg BID
- Sulindac – (Clinoril) 150, 200 mg  
  Dose: 150-200 mg BID

*All are indicated for use in painful eye conditions, even better where inflammation is cause:  
- Uveitis  
- Scleritis  
- Orbital myositis

*Rx greater doses for inflammation than pain
**NSAID’S/ Mechanisms of Action**

- Inhibits cyclo-oxygenase (cox-1 + cox-2) to varying degrees.
- Inhibits prostaglandin and thromboxane production
- Inhibits migration of inflammatory cells

*Note: Cox -1 important for GI mucosal maintenance (inhibits GI irritation)*
- Selective Cox-2 inhibitors are easier on the gut
- Beware CV side effects!

**NSAID’S**

- Diff between nonselective Cox and selective Cox-2 inhibitors is not in analgesic efficacy
- >GI bleed and ulcer with non selective NSAI DS
- Drugs bound to plasma proteins
- Drugs bound to plasma proteins
- Careful when Rx-ing with other plasma bound drugs (sulfa, anti-coagulants, oral hypoglycemics, TCN, alcohol)

*Risk for GI bleeds

**NSAID’S – Selective Cox-2 Inhibitors**

- **Rofecoxib (Vioxx)** off market as of 2004
- **Celecoxib (Celebrex)** 100, 200, 400 (Pharmacia) Dose: 200 mg BID
- **Valdecoxib (Bextra)** off market

- Indicated for acute + chronic pain and inflammation
- Considerations for cardiovascular complications MI, CVA, pulmonary embolism
- Very long list of adverse Rx’s including: HTN, CHF, acute renal failure

*P’s that warrant special consideration when prescribing NSAID’s:
- GI ulcers, pregnancy, renal or hepatic impairment, anticoagulated, CHF, HTN
Before You Prescribe Scheduled substances……..

- Careful Hx of current meds
- Allergic Rx vs. adverse Rx
- Hx of drug abuse
- Review of systems
- Document pain in chart! CYA

Do’s and Don’ts of Rx-ing Scheduled Substances

- Dsp Line: written in arabic numbers, then spelled out
  - Dsp: 10 (ten)
  - * 10 can become 40 or 100!
- Don’t prescribe for more than 7 days at a time
- Signature and DEA are required

Do’s and Don’ts of Rx-ing Scheduled Substances

- Don’t leave out the Rx pad
- Don’t pre-print signatures, or DEA #
- Black pen
- Don’t Rx for yourself or family
- Don’t Rx refills for controlled substances

Narcotic Analgesics - Opioids

- Morphine derivatives
- No ceiling for analgesia
- Abuse/dependence potential

Narcotic Analgesics

Pearl: Note NSAID’s and ASA are peripherally acting analgesics; narcotics, tramadol and Tylenol work centrally.

-Opioids are often combined with NSAID’s/ASA to get dual action.

Mechanism: Block brains perception of pain by stimulating Mu receptors. Binds to opiate receptors producing analgesia and sedation.

Narcotics – Side Effects

SE’s: nausea, vomiting, constipation, euphoria, resp. depression, dependence, dizziness, sedation. C.V. effects tachycardia.

Dependence: Characterized by withdrawal syndrome when drug is d/c’d. Typically after several wk’s Tx at high doses

Respiratory Depression: most serious SE. Augmented by ETOH, TCA, anti-seizure meds.
Oral Narcotics – Schedule II’s

- Codeine, Duragesic (fentanyl)
- Dilaudid (hydromorphone) 2,4,8mg qid
- Demerol (meperidine)
- MS Contin (morphine) 15-30mg BID
- Oxycontin (oxycodone)
- Tylox (oxycodone)
- Percoset, Percodan

Unfortunately we can’t prescribe them!

- But some of my favorites:
  - Demerol 50,100 mg q4h
  - Tylox APAP/Oxycodone 500/5
    Dose 1 tab qid
  - Percoset APAP/Oxycodone (many forms)
    Dose 1 – 2 tabs qid
  - Percodan ASA/Oxycodone
    Dose 1 tab qid

Schedule III Narcotics

Tylenol / Codeine
- Tylenol II 15/300 1 – 2 q4h
- Tylenol III 30/300 1 – 2 q4h
- Tylenol IV 60/300 1 q4h

Empirin (ASA)/Codeine
- Dose 30/325 1 – 2 tabs q4h
  60/325

Sched III Narcotics

Yes Virginia, you can prescribe these!

- Hydrocodone / APAP: Lortab, Vicodin
- Lortab – 2.5,5, 7.5, 10 mg of hydrocodone with 500 mg APAP; Lortab ASA
- 2.5 + 5 mg Doses 1 – 2 tabs qid
- 7.5 + 10 mg Doses 1 tab qid
- Vicodin – 5/500, 7.5/500 Dose 1 tab qid
  10/660 Vicodin HP
- Vicodin ES 7.5/750 1 tab qid
**Schedule III Narcotics**

- Lorcet Plus, hydrocodone/ APAP 7.5/ 650mg
- Lorcet 10/650

**Ultram (tramadol)**  
(Centrally Acting Analgesic)

- *Tramadol (Ultram)*  
  - indicated for moderate to severe pain.  
  - Non narcotic 50 mg/ 1-2 tabs qid  
  - Hybrid drug; works like an antidepressant

- *Ultracet*  
  - Tramadol / APAP 37.5/325  
  - Dose 1-2 tabs qid for acute pain
  - SE: Dizziness, constipation, somnolence, seizures

**Schedule IV**

- Indicated for mild to moderate pain
- Darvon-N propoxyphene
  - Dose 100 mg q4h  
  - (suicide warning)

**Narcotics Don’t Mix With:**

- ETOH  
- TCA’S  
- Antihistamines  
- Anticholinergic agents  
- Anti-seizure meds  
- Benzodiazepines  
- Barbiturates

**The Drug Seeker…..Beware**

- Drug seeker; wants narcotics for euphoria and prevent withdrawal symptoms
- Pain Px’s want relief for pain and to return to normal life
Classic Signs – Drug Seeker

- Personal appearance
- Weight loss
- Layered clothing
- Defensive moods

Characteristics of the drug seeker……

- Non specific complaints
- Overly complimentary
- Excuses, excuses
- Demanding
- Lost Rx’s
- Lack of cooperation with tests
- Lack of punctuality
- Memory lapses
- Doc shopping
- Calls after hours

Oral Pharmaceuticals for inflammation: Steroids

- Indicated for contact dermatitis, scleritis, severe vernal conjunctivitis, AAION, orbital pseudotumor, severe uveitis, DLK (stage 2-3) orbital myositis.

- Mechanism: steroids inhibit phospho-Lipidase A2. Blocks both arms of arachidonic pathway

*changes prostaglandins & leukotriene production
Steroids

Contraindications:
- PUD, TB, fungal infection, psychosis, pregnancy, osteoporosis, HTN, DM

Steroids in 3 Categories

- **Short Acting:**
  - Cortisone Acetate; 5, 10, 25 mg
  - Hydrocortisone (cortef) 5, 10, 20 mg
  - 10-320 mg BID to QID div. doses for inflammation

Intermediate Acting

- Prednisone – 1, 2.5, 5, 10, 20, 50 mg
  - Max dose 5 – 60 mg day
- Delta Cortef – Prednisolone 5 mg tab
- Triamcinolone (aristocort) 1, 2, 4, 8 mg tab
- Medrol – methylprednisolone
  - 2, 4, 8, 16, 24, 32 mg tabs
- Medrol dose pak (21 pills) as directed
*We love this for severe allergies contact dermatitis and DLK*
Long Acting Steroids

- Decadron (Dexamethasone) 
  .25, .5, .75, 1.0, 1.5, 2.0, 4.6

- Celestone (Betamethazone) (.6mg tabs)

- Rarely used in primary eye care

Oral Glaucoma Agents

- Acetazolamide (Diamox)
  - Available in 250mg tabs/ time released 500 mg sequels
  - Tabs have shorter onset of action
  - Use in acute IOP rise as in Narrow angle closure/attack

- Both are rarely used alone but as adjuncts

- Typical dose 250 mg BID – qid
- 500 mg sequels BID (fewer SE)
- Max Dose (1000 – 1500 mg)

- Note: for P1o pressure spikes >35 consider dispensing 2 or 3 sequels
Oral Glaucoma Agents/ Indications

- Indicated in advanced or endstage glaucoma marginally controlled
- Complicated glaucoma; uveitic or NVG
- Patients who can’t master drops
- Post-op IOP spikes
- PTC, CME

SE’s/ Diamox (B & L)

- Tingling fingers and toes
- Metallic taste
- Digestive problems
  - Contraindicated in Px’s with poor renal capacity or advanced COPD (acidosis)
  - Remember Sulfa derivitaves

Methazolamide – Neptazane (B & L)

- Similar to acetazolamide
- Adjunctive therapy
- Typical dose 25 – 50 mg BID-TID
  Max Dose 150 mg day

Key: Does not alter acid/base balance as much as Diamox; less risk for acidosis.
  useful in COPD patients

Oral Hypoglcemics

- Osmoglyn
- Isosorbide

Osmoglyn

- Indication
  - Acute angle closure attacks
  - Pupil block glaucoma
  - Recalcitrant Uveitic glaucoma
- Contraindications
- Dosages
Isosorbide

- Indications
- Contraindications
- Dosages