What Do Those Drops Really Do?
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In Office Diagnostic Drops

Diagnostic Medications
- Mydriatics
- Cycloplegics
- Reversal drops
- Dyes
- Anesthetics

Pupillary Muscles
- Dilator muscle of iris
- Sphincter muscle of iris

Mydriatics
- Dilate the pupil by stimulating the iris dilator muscle
- Used for fundus and lens evaluation
- SE: stinging, headache, increased BP, photophobia
- Can cause angle closure glaucoma in patients with narrow anterior chamber angles
- Phenylepherine 2.5% and 10%

Cycloplegics
- Dilation of the iris by temporarily paralyzing the iris sphincter muscle (constrictor)
- Also paralyzes ciliary muscle
- Limit or prevent accommodation
- Used in some refractions, DFE, treating uveitis, PO inflammation
- Mydriacyl (tropicamide), cyclopentolate, atropine, homatropine, scopolamine

Schematic of Human Eye

Reversal Drop
- Dapiprazole 0.5%
- Not available in the US

Ophthalmic Stains or Dyes
- Sodium Fluorescein
- Stains dead and devitalized cells
- Used to show defects on the cornea as well as for checking IOP via Goldmann applanation tonometry
- Used to assess contact lens fit
- Fluorescein
Olive green
- Used to stain the conjunctiva
- Shows early signs of dry eye disease
- Stains dead devitalized cells
- Rose bengal
- Also stains conjunctiva
- Stains normal healthy living cells along with dead or dying ones

Fluorescein Angiography
- Temporarily numbs the nerve endings in the cornea resulting in a loss of feeling in the surrounding area
- Drug with suffix of -caine
- Last 10-30 min
- Tonometry, gonioscopy, ultrasonography
- Toxic to the cornea if overused
- Delay resurfacing of the cornea by corneal epithelium, inhibits healing and disrupt normal ocular structure

Injectable Anesthetics
- Used to anesthetize the eyelids, globe and ocular muscles
- May be combined with epinephrine to cause constriction of the blood vessels resulting in decreased bleeding
- Lidocaine 1%, 2%
- Mepivacaine 1%, 2%
- Bupivacaine 0.25%-0.75%

Therapeutic Medications
- Large variety of medications available to treat eye conditions and diseases

Allergy
- Antihistamines and Mast cell stabilizers
- Both can be used by themselves or together to help give relief of seasonal or allergic conjunctivitis symptoms
- Topical
- Pataday, Zyrtec, Claritin
- Oral
- Zyrtec, Claritin, Allegra

Antibiotics
- Treat bacterial infections
- Oral
- Prophylactic: antibiotics, baccilaren
- Topical
- Post-surgical, bacterial conjunctivitis

Antiviral
- Treat virus caused ophthalmic conditions
- Oral
- Valtrex/valaciclovir
- Topical
- Bacitracin

Artificial Tears and Lubricants
- Used to relieve symptoms of dry eye disease and keratoconjunctivitis sicca
- Preservative free
- Gel
Decongestant
- Ocular decongestants aka EYE CRACK
- Visine
- Clear Eyes
- Moisture Tears Plus
- Air-Con
- Alcon
- Alcon
- Constricts the superficial blood vessels in the conjunctiva to reduce redness.

Steroids
- Reduces inflammation
- Oral
- Topical or oral
- Post surgical pain/inflammation
- Uveitis/iritis
- Oral
- Topical
- Post surgical pain/inflammation
- CME post surgical

Non-Steroidal Antinflammatory Drugs (NSAIDS)
- Treatment of inflammatory conditions and ocular allergies without the side effects associated with steroids
- Oral
- Topical
- Post surgical pain/inflammation
- CME post surgical

Glaucoma Medications
- There are multiple classes of glaucoma medications:
  - Beta-adrenergic blockers
  - Alpha 2 selective agonists
  - Carbonic Anhydrase Inhibitors (CAI)
  - Prostaglandins
  - Rhokinase inhibitors
  - Miotics
  - Combination agents.

Glaucoma Medication
- Beta-adrenergic Blockers
  - MOA: decrease aqueous production
  - SE: bronchospasm, bradycardia, increased heart block, hypotension, reduced exercise tolerance, CME, dry eyes, dizziness
  - timolol (Imoptic, Istrato, Betimol)
  - betaxolol (Betoptic)
  - levobunolol (Betagan)

Glaucoma Medication
- Alpha 2 Agonist
  - MOA: decrease aqueous production and increase uveoscleral aqueous outflow
  - SE: contact dermatitis (itching, redness, tearing), slight dilation, upper lid elevation, dry mouth, bradycardia, follicular conjunctivitis due to BAK (preservative)
  - apraclonidine (Iopidine)
  - brimonidine (Alphagan and Alphagan P)

Glaucoma Medication
- Carbonic Anhydrase Inhibitor
  - MOA: decrease formation and secretion of aqueous humor
  - Inhibit CA II in ciliary processes slowing formation
  - SE: tingling sensation in hands/feet, loss of appetite, metallic taste, kidney stones, Stevens-Johnson syndrome
  - Avoid in patients who have sulfa allergies
  - brinzolamide (Azopt)
  - dorzolamide (Trusopt)
  - ethazolamide (Neptazane)

Glaucoma Medication
- Prostaglandins
  - MOA: increased aqueous outflow
  - 28-30% IOP reduction
  - SE: conjunctival injection, increased lash growth, increased pigmentation of the periocular skin, iris pigmentation, corneal thinning, reactivation herpes keratitis, ocular hyperemia, CME in DB
  - Should be cautious in using this in patients with uveitis, iritis, cystoid macular edema or DM
  - latanoprost 0.005% (Xalatan)
  - travoprost 0.004% (Travatan)
  - bimatoprost 0.03% (Lumigan)
  - tafluprost 0.0015% (Zioptan) PF

Glaucoma Medication
- Rhokinase Inhibitor
  - MOA: increase uveoscleral aqueous outflow
  - SE: increased IOP, pain, headache, dizziness
  - Brimonidine (Alphagan and Alphagan P)
Glaucoma Medication

- Miotics
  - Stimulates the sphincter muscle of the iris causing constriction of the pupil
  - Used to help to decrease IOP by increasing aqueous humor drainage through TM
  - Pilocarpine, carbachol, edrophonium

Combination Agents

- Cosopt: brinzolamide/timolol (CAI/beta)
- Combigan: brimonidine/timolol (alpha2/beta)
- Simbrinza: brinzolamide/brimonidine (CAI/alpha)
- DuoTrav: travoprost/timolol (prostaglandin/beta)

Prescription Writing

- Must contain:
  - The prescribing doctors name, address and phone number
  - The patients name and address and date of Rx
  - Name of the drug written out in full and percentage of concentration/dose (strength)
  - Dispense quantity: Total amount of the drug to be dispensed headed by the symbol M
  - Sig: Directions for pharmacist and patient on the label as to how should be taken
  - Number of allowed refills
  - If generic is ok to substitute
  - The doctors signature

Common Abbreviations

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<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Gtt</td>
<td>Drop</td>
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<tr>
<td>PO</td>
<td>By mouth</td>
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<tr>
<td>QAM</td>
<td>Take in the morning</td>
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<tr>
<td>QHS</td>
<td>Take in the evening</td>
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<tr>
<td>QD</td>
<td>3 x day</td>
</tr>
<tr>
<td>BID</td>
<td>2 x day</td>
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<tr>
<td>TID</td>
<td>3 x day</td>
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<tr>
<td>QID</td>
<td>4 x day</td>
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Questions?