

OCULAR PHARMACOLOGY

Pharmacology for Technicians

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Overview

- Role of the Assistant
- Medication Check
- Patient Safety
- Reaction Prevention
- Drug Categories
- Drug Administration
- Vitamin Supplements
- Drug Instillation Procedure
- Drug Documentation

Sight Gags by Scott Lee, O.D.



The Gallery of Eye Drop Faces

ROLE of the ASSISTANT AND TECHNICIAN

- Accurate documentation/recording
- Patient Education...can assist in preventing mistakes
- **NEVER** Work in Doubt!
- Read and re-read the medication request
- Be careful with hand-offs/transfers!
- Patient Safety



The Medication Check

- For "Ophthalmic Use", must be on the container
- Check name
- Check dosage
- Check expiration date
- Check for contamination



The Patient Checks

- Reason for visit
- Check patient's current health condition
- Verify patient allergies
- Provider medication request
- Check visual acuity...**always**
- Check IOP...**always**
- Do not leave the patient unattended and routinely monitor
- Check blood pressure before dilation



PATIENT CASE HISTORY

The best way to prevent an adverse reaction is to perform an excellent case Hx?

- General Health
- Medications
- Allergies



Current Medications

- ❑ Name
- ❑ Amount taken
- ❑ Frequency
- ❑ Prescribed for
- ❑ Prescribed by
- ❑ Illegal drugs too!



Why is illegal drug use important?

Critical checks

- Doctor's request
- Pupils
 - PERRLA
- Angles
 - Open/clear
- Pressures
- Medications...always inspect medication
 - Heart meds
 - Blood pressure...before dilation
- Current health

Blood Pressure

- Please understand the procedure
- Correct position
- Explain it
- Perform it
- Document it
- No more than 3 attempts



What is the speed in which you regulate the release of pressure during the measurement

Readings

- **Normal**
 - The "normal" for adults is approximately 120mmHg /between 70-80mmHg
- **Abnormal**
 - Mild Hypertension
 - 145-159mmHg/90-104mmHg
 - Severe Hypertension
 - 160mmHg or more/100mmHg or more
 - Hypotension
 - Below normal blood pressure

Tonometry



- **Instruments**
 - **Applanation- Goldmann...touches patient**

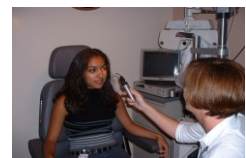
This is the industry gold std

What medication is used during this test?



Pupil Testing

- Explain test
- Proper lighting
- Perform direct and consensual
- Swinging flashlight
- Evaluate near response
- Recording accuracy



Pupil Testing

- Light the pupil for _____ seconds?
- Assure that the sensory pathway is working
- Direct/consensual responses to light
- Response to accommodation



APD

Pupil Testing

- **Anisocoria- unequal pupil sizes**
 - “cor” = pupil
 - “aniso”=difference
- **Hippus- “jumping” pupil**
 - Most commonly seen in younger patients

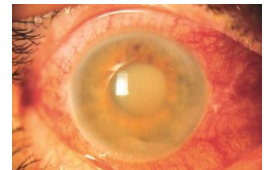
Recording

- P-pupils
- E-equal
- R-round
- R-react to
- L-light
- A-accommodation
- -RAPD/-Marcus Gunn



Verify Angle Depth

- When the doctor has seen the patient
- When the doctor has not seen the patient



Wash your hands! Before and After Patient Care!



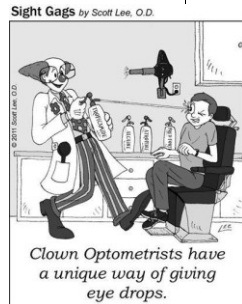
Drop Instillation

- Clean hands
- Explain procedure
- Remember safety
- Inspect bottle
- Check expiration date
- Do not contaminate the container



What is wrong with this picture?

Drops...



TPA – vs DPA

- **Therapeutic Pharmaceutical**
Application...when the problem is known and you treat the condition
- **Diagnostic Pharmaceutical**
Application...when the problem is unknown and you treat the symptoms

Pharmacology: Diagnostic Agents Mydriatic Drugs

- **Phenylephrine (Neo-Synephrine, Mydrin)**
 - Strength: 2.5%, 10%
 - Effective: 4-6 hours
 - Systemic Side Effects:
 - Irregular heart beat, headache, hypertension, cardiac arrest (very rare)
 - Action: Stimulates the iris dilator muscle

Pharmacology: Diagnostic Agents Cycloplegic Drugs

- **Tropicamide (Mydracyl)**
 - Strength: 0.5%, 1%
 - Effective: 5-6 hours
 - Systemic Side Effects: Uncommon

Pharmacology: Diagnostic Agents Cycloplegic Drugs

- **Cyclopentolate (Cyclogel)**
 - Strength: 1.0% and 2.0%
 - Effective 24 hours
 - Side Effects: Dry mouth, excitation, facial flushing, tachycardia, angle closure due to dilation
 - Action: Paralyzes the sphincter muscle of the iris (dilation) and the ciliary muscle (prevent accommodation)

Pharmacology: Diagnostic Agents Stains

- **Fluorescein...used to stain cornea surface**
 - Strips
 - Mixed with anesthetic
 - Injected (angiography)
- **Rose Bengal...used to stain dead cells**

Pharmacology: Anesthetics



- **Commonly used anesthetics:**

- Proparacaine 0.5%
- Tetracaine 0.5%
- Lidocaine 1.0%-5.0%
- Benoxinate plus fluorescein (Fluress)
- Proparacaine plus fluorescein (Fluoracaine)

What is the typical duration for routine anesthetics?

Pharmacology: Therapeutic Agents



- **Miotics**

- **Action:** contraction of the iris sphincter muscle (pupil constriction)
- **Use:** lowering of intraocular pressure by improving drainage of the aqueous humor through the trabecular meshwork.

Pharmacology: Therapeutic Agents



- **Glaucoma Treating Drugs**

- **Adrenergic-blocking agents**
 - Timolol, Betaxolol, Levobunolol
- **Adrenergic-stimulating agents**
 - Epinephrine
 - Dipiverfrin
- **Carbonic Anhydrase Inhibitors**
 - Acetazolamide
 - Methazolamide
 - Dorzolamide

Pharmacology: Therapeutic Agents



- **Glaucoma Treating Drugs**

- **Alpha Agonists**
 - Apraclonidine
 - Brimonidine
- **Prostaglandin Analogs**
 - Bimatoprost
 - Latanoprost
 - Travoprost

Pharmacology: Therapeutic Agents



- **Antibiotics**
- **Antivirals**
- **Antifungals**
- **Corticosteroids...prevents swelling**
- **Non-steroidal Anti-inflammatory Drugs (NSAIDS)**
- **Decongestants**
- **Antihistamines**
- **Mast Cell Stabilizers**
- **Lubricants**

Medication Application Procedures



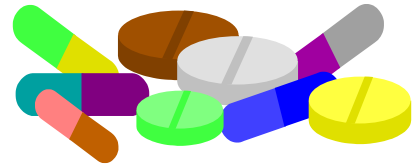
- Wash hands thoroughly before administration
- Give medications with patient in inclined position...why?
- Tilt head backward or lie down and gaze upward/downward
- Gently grasp lower eyelid below eyelashes and pull the eyelid away from the eye to form a pouch
- Place dropper directly over the eye. Avoid contact of the dropper with the eye, finger or any other surface
- Release the lid slowly and close the eye
- Occlude puncta for 2-3 minutes
- Wait 5 minutes before administering a second medication or drop
- Dim room lighting can assist in reducing blink reflex

Punctal Occlusion

- Prevent systemic absorption
- Aids in reducing reactions
- Patients with heart condition must be watched
- Close eyes for 2-3 minutes



VITAMIN SUPPLEMENTS



CLASSIFICATIONS

- Orals
- Solutions
- Suspensions
- Ointments
- Pumps
- Implants

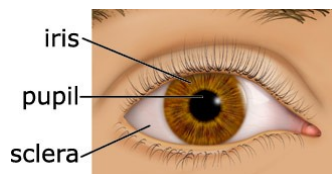
Topical Anesthetics

- Proparacaine
- Tetracaine
- Cocaine



Mydriatics & Cycloplegics

- Tropicamide
- Phenylephrine 2.5-10%
- Cyclogyl
- Atropine
- Homatropine
- Scopolamine



Dyes & Stains

- Fluorescein
- Rose Bengal
- Lissamine Green
- Fluorescein

CLINICAL ADMINISTRATION



- Patient History
- Clinical Procedures Which May Be Influenced by Medications

THERAPEUTIC AGENTS TPA – known problem



- Antibiotics
- Anti-virals
- Drugs that lower IOP
- Anti-inflammatory agents
- Non-Steroidal
- Combinations

GLAUCOMA MANAGEMENT



- Pilocarpine
- Beta-Blockers
- Carbonic Anhydrase Inhibitors
- Adrenergic Agonists

OCULAR INFLAMMATION



- Corticosteroids
- Steroid-Antibiotic Combinations
- Non-Steroidal Anti-inflammatory Drugs (NSAIDS)
- Oral Analgesics

OCULAR INFECTIONS



- Topical Antibiotics
- Oral Antibiotics
- Anti-Viral
- Analgesics

OCULAR ALLERGIES



- Artificial Tears
- Antihistamine-Decongestants
- Corticosteroids

Other considerations

- Eye color
- Chronic illnesses ... diabetic pts
- Age
 - Older patients take longer to dilate due to small pupils
 - Very young patients take longer due to trust
- Ask the patient if they have ever been dilated before



CAP Colors

Cap Color	Drug Class
Tan	Antibiotics, Antivirals, Antifungals
Pink	Anti-inflammatory/Steroids treats allergic reactions, swelling, redness (slows healing can cause cataracts and glaucoma). Do not use on fungal infections
Red	Mydriatics/Cycloplegics (dilate pupil)
Grey	Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) control inflammation caused by ocular allergies without steroidal side-effects
Green	Miotics (stimulates sphincter and causes pupil constriction)
Yellow or Blue	Beta-Blockers traditionally used to treat glaucoma, reduce IOP by decreasing aqueous humor
Purple	Adrenic Agonists (reduce IOP)
Orange	Carbonic Anhydrase Inhibitors (reduce IOP)
Turquoise	Prostaglandin Analogues (reduce IOP by increasing aqueous outflow)



IN-OFFICE PROCEDURES



Patient Instruction- Solutions and Suspensions

- Wash hands thoroughly before administration
- Tilt head backward or lie down and gaze upward
- Gently grasp lower eyelid below eyelashes and pull the eyelid away from the eye to form a pouch
- Place dropper directly over the eye. Avoid contact of the dropper with the eye, finger or any other surface
- Release the lid slowly and close the eye
- Occlude punta for 2-3 minutes
- Wait 5 minutes before administering a second medication or drop

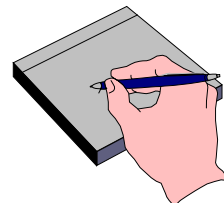


Patient Instruction- Ointment

- Wash hands thoroughly
- Tilt head backward or lie down and gaze upward
- Gently pull down the lower lid to form a pouch
- Place .25 to .50 inch of ointment with a sweeping motion
- Close the eye for 1-2 minutes
- Temporary blurring of vision may occur.
- Remove excess ointment with a tissue
- Wait 10 minutes before applying the second ointment



ABBREVIATIONS



Examples

- ad lib- freely as needed
- ac – before meals
- bid- twice a day
- gtt- Drops
- hs- at bedtime
- pc -after meals
- po- by mouth
- prn- as needed



Examples- con't

- oint- ointment
- q- every
- qh- every hour
- q4h- every four hours
- qid- 4 times a day
- sig- instructions
- sol- solution
- susp- suspension



Examples- con't

- tab- tablet
- tid- three times a day
- top- topically
- ung- ointment
- ut dict- as directed



HOW TO WRITE AN Rx



Make sure that you include:

- Full name of patient
- Address can be optional
- Date of Rx
- Inscription: name of drug; concentration
- Subscription: amount to be dispensed
- Instructions: route of administration; number of drops or tablets; frequency of use; refill



What else?

- Make sure that it is legible!
- Legal considerations
- Never go beyond your training
- Don't rush patient care
- Protect your patients and your practice
- Documented training



References and resources

- Ophthalmic Drug Facts 2002
- Ophthalmic Medications and Pharmacology
- Review of Optometry: 2002 Clinical Guide to Ophthalmic Drugs (Melton and Thomas) May issue

THANK YOU!
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