


ABO Advanced Exam Review
Domain I Part 2

NFOS

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NFOS



Who is NFOS?
The National Federation of Opticianry Schools (NFOS) is a non-profit organization that represents the interests of the opticianry profession and its students. It is the only national organization of its kind, and it is dedicated to promoting the highest standards of education and practice in the field of opticianry.

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We need you!

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Review Course Topics

- ▶ ABOAC Blueprint
- ▶ Analyze & Interpret Prescription
- ▶ Design, Fit & Dispense Eyewear and Other Ophthalmic Devices
- ▶ Use Ophthalmic Instrumentation

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Exam Makeup

- ▶ 125 Multiple Choice Questions
- ▶ Analyze & Interpret Prescription (38%)
- ▶ Design, Sell, Fit & Dispense (39%)
- ▶ Use Ophthalmic Equipment (23%)
- ▶ Three Hours to Complete

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Analyze and Interpret Visual Assessment

Part 2

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The Eye Exam

- ▶ Medical History
- ▶ Preliminary Tests
- ▶ Refraction
- ▶ Eye Health
- ▶ Special Tests

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Patient History

- Chief Complaint (CC)
- Patient's Medical History
- Medications
- Visual & Ocular History
- Family Ocular History
- Family Medical History
- Vocational and Recreational Demands

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Preliminary Tests

- Vision Assessment
- Visual Fields
- Accommodation
- Convergence
- Color Vision
- Ocular Muscle Deviations
- Neutralize Glasses

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Chart Abbreviations

- VA Visual Acuity
- cc with correction (latin: cum correctione)
- sc without correction (latin: sine correctione)
- N Near
- D Distance
- PH Pinhole
- J Jaeger notation

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Visual Acuity

- Acuity Charts
- With Current Rx
- 20/20
- Pinhole
- +/- Recordings

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What is 20/20?

Ability can distinguish two points separated by an angle of one minute of arc

- Each letter on an acuity chart subtends a five minute angle to the eye independent of distance.

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What is 20/20?

Easy way to remember

Numerator (top number) = patient is from the chart.

Denominator (bottom number) = distance "normal" Person would have to stand to see same letter

20/20

20/30

20/100

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- if < 20/20, Use pinhole
- Increased depth of focus/blocks out of focus light rays
- If the pinhole acuity shows improvement = refractive, or a change in prescription should help.
- If there is no improvement with the pinhole, it may be a medical problem causing the reduction in acuity (cataract, Mac D, corneal opacity, etc)

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Visual Fields: (peripheral vision)

- Normal Monocular Visual Field:
- Normal Binocular Visual Field:
- Scotoma: Blind spot
- Testing:
 - Perimeters
 - Amsler Grids
 - Confrontation Test

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Legal Categories:

- Motor Vehicle: varies by state:
 - 20/40 at MVD or 20/70 from doctor: (Florida)
 - 20/40 unrestricted, 20/70 or better daytime restrictions (CT)
 - Check your state
- Legally Blind: 20/200 best corrected acuity or 20 degree field or less
 - Social Security used in US as definition
 - Other definitions exist (WHO, etc), but we use above.
- Low percentage of the legally blind are totally blind (NLP)

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Ocular Motility

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Ocular Muscle Deviations

- Alternating Cover Test
- Cover / Uncover Test
- Phoria
- Tropia

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Alternating Cover Test

- Look at isolated letter with current Rx
- Cover right eye 2-3 sec.
- Switch occluder to left eye and observe right eye for movement
- If right eye moves in when uncovered, it was exo.

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Cover / Uncover Test

Determine	Determine Phoria or Tropia <ul style="list-style-type: none"> Phoria: Both eyes closed with target when eyes are open. Tropia: Only one eye aligned with target.
Cover	Cover left eye and if right eye does not move, it was fixating on the target.
Cover	Cover right eye and check left eye.

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Eye Movements: Ductions & Torsions

- Rotations around vertical axis (Z-Axis)
 - Abduction: Rotate out
 - Adduction: Rotate in
- Rotations around horizontal axis (X-Axis)
 - Supraduction (Elevation) Rotate up
 - Infraduction (Depression) Rotate down
- Rotations around sagittal axis (Y-Axis)
 - Intorsion: Rotates nasally from position
 - Extorsion: Rotates temporally from position

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Involuntary Movement

- Phoria – Latent tendency of the eyes to deviate that is prevented by fusion. Thus, a deviation occurs only when a cover is placed over an eye; when uncovered the eye straighten.
- ESOPHORIA, EXOPHORIA, HYPERPHORIA, HYPOPHORIA, ORTHOPHORIA
- Tropia – Eye misalignment caused by extraocular muscle imbalance: one fovea is not directed at same object as the other.
- ESOTROPIA, EXOTROPIA, HYPERTROPIA, HYPOTROPIA, ORTHOTROPIA

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Extraocular Muscle Innervation

- 12 Cranial Nerves
- Number and Name
- Oculomotor (CN III)
- Trochlear (CN IV)
- Abducens (CN VI)

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Extrinsic / Extraocular Eye Muscles:

- Superior Rectus
- Inferior Rectus
- Lateral Rectus
- Medial Rectus
- Superior Oblique
- Inferior Oblique

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The Retina

- Optic Disc: Exit site of retinal nerve fibers from the eye. (Blind Spot)
- Macula Lutea (Yellow Spot): Small, specialized central area of the retina, surrounding the fovea.
- Fovea: Central pit in the macula that produces sharpest vision; contains a high concentration of cones and no retinal blood vessels.

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Color Vision

- Three photosensitive pigments in the cones
 - Blue - 460nm
 - Green - 525nm
 - Red - 650nm
- Color depends on:
 - Hue – Wave-length
 - Saturation - Purity of hue
 - Brightness - Light intensity

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Color Vision

- Pseudoisochromatic Plates
 - Ishihara
 - Wool Test

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Color Vision

- Congenital color defects (BORN with it)
 - occur in:
 - 8%-10% of the male population
 - 0.4% of the female population.
- Acquired Color defect (disease, dystrophy, etc)
 - sickle cell anemia, diabetes, macular degeneration, Alzheimer's disease, multiple sclerosis, glaucoma, Parkinson's disease, chronic alcoholism and leukemia

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Retinoscopy Procedures

- Patient
- Acuity Chart
- Refractor/Phoropter
- Working Distance
- Intercept
- Sphere/Cylinder
- Verifying Neutrality

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Set Up

- Position patient behind phoropter
- Look at Chart (not at light, not at any object at near, including refractionist)
- Keep distance from pt
- Shine light in eye back and forth and observe reflex

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Intercept

- Streak opposite the meridian you are neutralizing
- With Motion: Eye has too much minus power, add plus
- Against motion: Eye has too much plus power, add minus
- Light extending beyond pupil
- Aligns with reflex if no astigmatism or on axis

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Sphere/Cylinder

- Neutralize each meridian separately

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Verifying Neutrality

- Pupil fills with light when neutralized.
- To verify, move toward patient and you should see with motion.
- Move away from the patient and you should see against motion.

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Subjective Refraction: Starting Point

- Lensometry
- Auto Refraction
- Retinoscopy
- Patient Instructions

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Subjective Refraction: Sequence

- Monocular
 - Refine Cylinder
 - Jackson Cross Cylinder Test
 - Axis
 - Power
 - Refine Sphere Power
 - Fogging
 - Duochrome Test
- Binocular Balance
 - Prism Dissociated
- Duochrome Test
 - Ensure NOT overminused

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Jackson Cross Cylinder (JCC) Test

- Purpose
- Procedure
- Refine Axis
 - Cyls @ 45 Degrees
- Refine Cyl. Power
 - Cyls. @ Axis
- Results

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Refining The Sphere Power

- Fogging
- Add Minus
- Duochrome, Bichrome or Red-Green Test
- Results

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Binocular Balance

- Purpose
- Prism Dissociation Test
- Duochrome Test



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Medications Used During an Exam

- Mydriatics**
 - Act on the iris muscles causing the pupil to dilate, common ones used Phenylephrine (Neo-Synephrine), Hydroxy amphetamine (Paredrine), Epinephrine (Adrenalin)
- Cycloplegics**
 - Work on the pupil causing it to dilate and they paralyze the ciliary muscle to inhibit accommodation, common ones used
 - Tropicamide (Mydracyl) 0.5% to 1% (20min - 3Hrs)
 - Cyclopentolate (Cyclogyl) 0.5% (Infants) or 1%(3-6 Hrs)
 - Homatropine 2% or 5% (1-3 Days)
 - Atropine 0.5% or 1% (Up to two weeks)
- Miotics**
 - used to stimulate the sphincter muscle of the iris causing it to constrict, common ones are Pilocarpine and Carbachol
- Topical Anesthetics**
 - Reduce Corneal Sensitivity common ones are Ophthaine, Ophthetic and Portocaine

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Cycloplegic Refraction


- Purpose**
- Precautions**
- Cycloplegic Agents**
 - Tropicamide (Mydracyl) 0.5% to 1% (20min - 3Hrs)
 - Cyclopentolate (Cyclogyl) 0.5% (Infants) or 1%(3-6 Hrs)
 - Homatropine 2% or 5% (1-3 Days)
 - Atropine 0.5% or 1% (Up to two weeks)

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Conditions

- What they Effect
- Treatment

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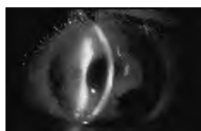


Cornea: Keratoconus

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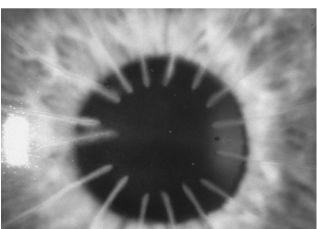
Corneal Scar

- Due to injury or disease.
- Nebula : Faint lack of transparency
- Macula : Translucent but well defined
- Leukoma : Dense and opaque.



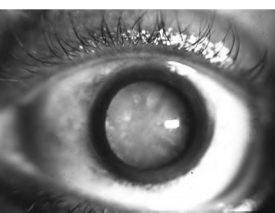
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Corneal Scars: RK



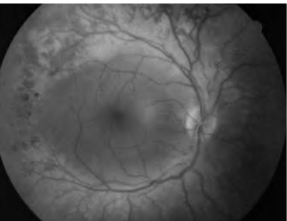
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Cataract

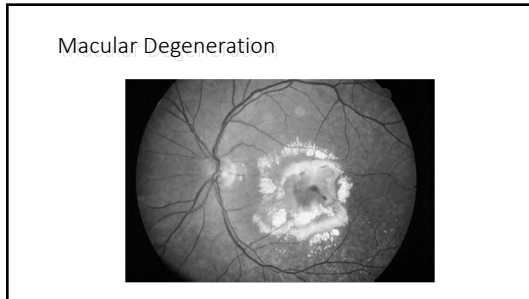


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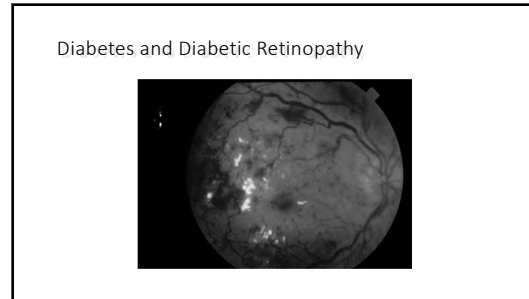
Retinitis Pigmentosa



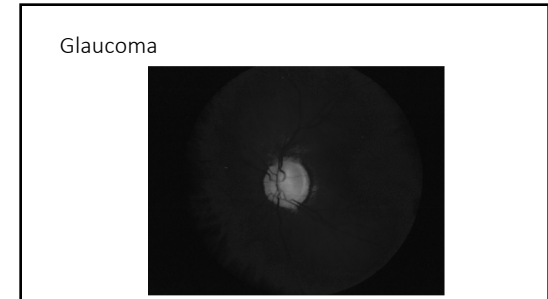
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When to Refer

- ▶ Reduced Acuity (sudden or unexplained)
- ▶ Flashes/Floaters (possible Retinal Detach)
- ▶ Pathology
 - ▶ Cornea
 - ▶ Cataract
 - ▶ Retina
 - ▶ Visual Pathway
 - ▶ Muscles

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Other Refractive Errors Terms

- Ametropia** – refractive error. Any optical error(e.g., myopia); can be corrected by eyeglasses, contact lenses, or refractive surgery.
- Anisometropia** – Opposite refractive errors in the eyes: one nearsighted (myopic), one farsighted (hyperopic)
- Anisopia** – Unequal vision in the two eyes.
- Anisometropia** – Unequal refractive errors in the two eyes; usually at least 1 diopter different.
- Aniseikonia** – Unequal retinal image sizes in the two eyes, usually from different refractive errors
- Diplopia** – Perception of two images from one object.

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Other Refractive Errors Terms

- Amblyopia** – The loss of vision without any apparent defect to the eye.
- Aphakic** – patients have had their crystalline lens removed.
- Ptosis** - A drooping lid. Corrected by using a Ptosis Crutch.
- Pseudophakia** - have an implant to replace the crystalline lens.
- Nystagmus** - A fluctuation of the eye often associated with light sensitivity AKA:Photophobia.
- Cycloplegia** - Inhibit accommodation.
- Scotoma** - Blind spot, An area of retinal vision loss.
- Mydriatic Drops** - Dilates pupil.

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