On behalf of Vision Expo, we sincerely thank you for being with us this year.

Vision Expo Has Gone Green!

We have eliminated all paper session evaluation forms. Please be sure to complete your electronic session evaluations online when you login to request your CE Letter for each course you attended! Your feedback is important to us as our Education Planning Committee considers content and speakers for future meetings to provide you with the best education possible.

vision expo

1

ABO Advance Review

Thomas Neff MA, LDO, ABO-AC, NCLE-AC
Thomasneffldo@gmail.com

Presented By:

UOA United Opticians ASSOCIATION
Representing Contact Lens and Spectacle Opticians since 1925.

Visit the Opticon Hub for more information on joining and helping the UOA with there mission to improve Opticianry!

www.Opticians.org

2

Conflict of interest

- The speaker, Thomas Neff MA LDO, ABO-AC, NCLE-AC, has no conflicts of interest to disclose.
- Part of the Speaker Bureau with Mitsui Chemicals

3

ABO Advance Test Specifications New for 2024

- **1. Optics**
  - **30%**
- **2. Ocular Anatomy, Physiology, Pathology, and Refraction**
  - **33%**
- **3. Ophthalmic Products**
  - **10%**
- **4. Instrumentation**
  - **9%**
- **5. Dispensary Protocols and Procedures**
  - **10%**
- **6. Laws, Regulations, and Standards**
  - **8%**

4

Exam Makeup

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

5

ABO Masters Program

- The ABO Master in Ophthalmic Optics designation demonstrates to the public and colleagues that an individual has attained a superior level in ophthalmic dispensing.
- Any Optician who is currently Advanced Certified by the American Board of Opticianry for at least one complete three-year renewal cycle and satisfies one of two additional qualifications is eligible to apply for this designation.
- Today 10:30am: Panel discussion: Masters Designation hosted by Cira Collins in the OptiCon Hub

6

ABO Masters Program

Have written two published ABO-approved Advanced Level III articles

OR

An ABO-approved speaker with two ABO-approved Advanced Level III Courses, or

OR

Have one published ABO-approved Advanced Level III article AND one ABO- approved Advanced Level III Course for which you are the ABO-approved Speaker.

7

ABO Advance Review Domain 2

Ocular Anatomy, Physiology, Pathology, and Refraction

Thomas Neff MA, LDO, ABO-AC, NCLE-AC

Presented By:

United Opticians ASSOCIATION

Representing Contact Lens and Spectacle Opticians since 1925.

www.Opticians.org

Scan the QR code to learn about complimentary UOA membership, made possible through an investment by ABO & NCLE to:

- state associations,
- state licensees &
- ABO-NCLE certificants.

8

Domain 2 Tasks

Ocular Anatomy, Physiology, Pathology, and Refraction

I. Structure of the Eye and Function
   a) Anterior Adnexa
   b) Anterior Segment
   c) Posterior Segment
II. Pathology
   a) Facial asymmetries
   b) Ocular pathologies
   c) Systemic pathologies with ocular complications
III. Assessment of Visual Function
   a) Refractive status of the eye
   b) Visual acuity, contrast sensitivity, and color discrimination assessment
   c) Binocular function
   d) Accommodative Functions

9

Ocular Adnexa and Lacrimal System

- The ocular adnexa includes the structures situated in proximity to the globe of the eye
  - the eyebrows
  - the structures of the eyelids
  - the palpebral conjunctiva
  - the lacrimal system

10

OCULAR ADNEXA

- The Structures of the Eyelids
- Conjunctiva
- Lacrimal Apparatus
- Pre-Corneal Film

11

FUNCTIONS OF THE EYELIDS

1	2	3	4	5
Block light during sleep.	Protect the eye.	Remove foreign matter.	Secrete tear film component.	Spread tear film over the cornea

12

WHAT ARE THE LAYERS OF THE EYELID?

- Layers
  - Skin
  - Muscle:
    - Levator Aponeurosis
    - Müller
    - Riolan
    - Orbicularis Oculi
  - Tarsal plates
  - Conjunctiva

13

WHAT ARE THE LAYERS OF THE EYELID?

- Muscle:
  - Levator Aponeurosis
  - Müller
  - Riolan
  - Orbicularis Oculi

14

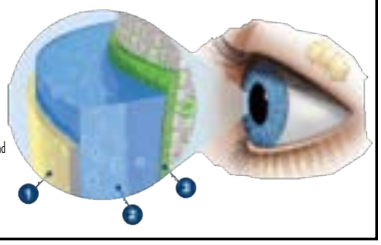
WHAT ARE THE GLANDS OF THE EYELID?

- Zeis Gland
  - Secrete sebum into the hair follicle of the cilia.
  - Coating the eyelash shaft to keep it from becoming brittle.
- Gland of Moll
  - Been called modified sweat glands.
  - More accurately described as specialized apocrine glands.
  - They are located near the eyelid margin and their ducts empty into:
    - The hair follicle
    - into the Zeis gland duct
    - directly onto the lid margin.

15

CORNEAL TEAR FILM FUNCTIONS:

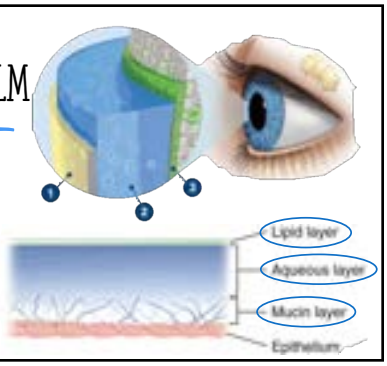
- Lubricate the cornea and conjunctiva.
- Remove dust and foreign bodies.
- Provides a smooth optical surface.
- Provides nutrition to the cornea.
- Protect against infection
  - Contains: lysozyme, beta-lysin, lactoferrin, and immunoglobulins
- Provide oxygen to the cornea.



16

CORNEAL TEAR FILM

- 4-8 µm (micrometers) thick
- Layers
  1. Lipid \ Oily film
  2. Aqueous \ Lacrimal
  3. Mucoid or Mucin



17

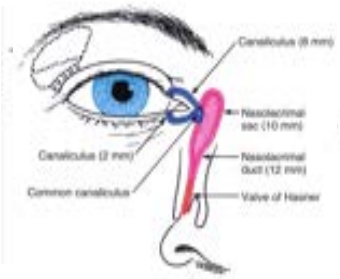
TEAR FILM ASSESSMENTS

- Schirmer Test
- Tear Break Up Test (T.B.U.T.)
- Rose Bengal
- Red Thread Test
- Lacrimal Lake

18

LACRIMAL APPARATUS

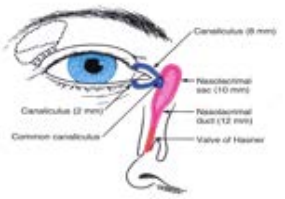
- Glands
  - Main Lacrimal Gland
  - Accessory lacrimal glands: Krauss & Wolfring
- Drainage
  - Punctum
  - Canaliculus
  - Nasolacrimal Sac
  - Nasolacrimal duct



19

LACRIMAL APPARATUS FUNCTIONS:

- Secrete tear film component.
- Drain tears
- Remove foreign particles from the eye.



20

COMMON LID CONDITIONS

Hordeolum	Chalazion	Blepharitis	Papillae	Trichiasis
Ectropion	Entropion	Epicanthus	Lagophthalmos	Allergies

21

HORDEOLUM

- Can be Internal or External
- External
  - An infected Zeis or Moll gland or common stye
  - Usually comes to a head on the skin of the eyelid
- Internal
  - A localized infection of a meibomian gland usually drains from the inside surface of the lid.

22

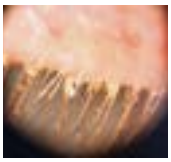
CHALAZION

- Is a localized, noninfectious, and sometimes painless swelling of a meibomian gland
- Often caused by an obstructed duct.
- The gland may extrude its secretion into surrounding tissue, setting up a granulomatous inflammation.

23

BLEPHARITIS

- is an inflammatory disease of the lid; meibomian gland dysfunction is often the cause
- Clinical presentation might include crusting at the lash base and erythematosus of the lid margin. It can become a chronic condition that requires periodic treatments with hot packs, lid scrubs, and antibiotic ointment.



24

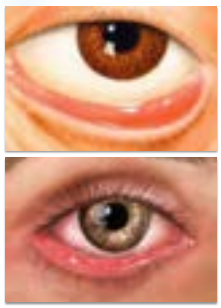
TRICHIASIS

- A common eyelid abnormality in which the eyelashes are misdirected and grow inwards toward the eye.
- Those inward-turning lashes rub against the:
  - Cornea.
  - The conjunctiva (the thin, clear membrane covering the sclera, which is the white part of the eye)
  - The inner surface of the eyelids,
- All can irritate the eye.

25

ECTROPION

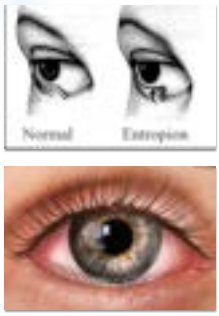
- Eversion of the eyelid margin.
- The common cause of which is loss of muscle tone, a normal occurrence in the aging process.
- As the lid margin falls away from its position against the globe.
- The lacrimal punctum is no longer in position to drain the tears from the lacrimal lake.



26

ENTROPION

- Inversion of the lid margin
- may result from spasm of the orbicularis oculi muscle causing the lid margin to turn inward.
- This inward turning puts the eyelashes in contact with the globe and, unless relieved, can cause corneal abrasion.



27

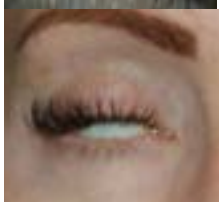
EPICANTHUS

- An epicanthal fold,
- A vertical fold of skin at the nasal canthus
- It is common in newborns and may cause the appearance of esotropia.
- A parent of an infant with an epicanthal fold might worry that the child's eyes are crossed; however, a cover test will identify a true esotropia.
- As the bridge of the nose develops, the epicanthal fold gradually disappears.
- An epicanthal fold is common in those of Asian descent.

28

LAGOPHTHALMOS

- An incomplete closure of the eyelids.
- Its cause may be physiological, mechanical (e.g., scarring), or paralytic.
- Most evident during sleep, when drying of the inferior cornea may result.
- Scratchy, irritated eyes are evident on awakening, and punctate keratitis can occur.
- Clinical assessment of the inferior cornea will show varying degrees of epithelial disruption, manifesting as staining with fluorescein dye.



29

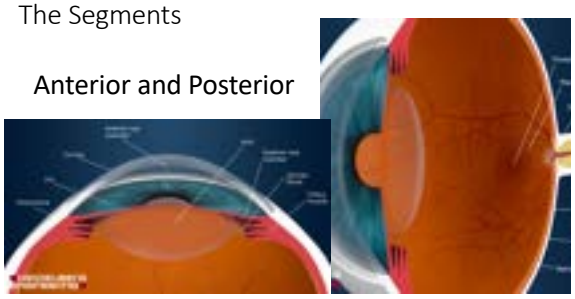
ALLERGIES IN THE EYELIDS

- Your doctor may prescribe use of a short-term topical or oral corticosteroid, which will reduce inflammation, swelling, and itching. If you decide to try an over-the-counter topical treatment, make sure to check the ingredient list first. Some of these products include preservatives and other ingredients you might be allergic to.
- Prescribed or over the counter antihistamine.

30

The Segments

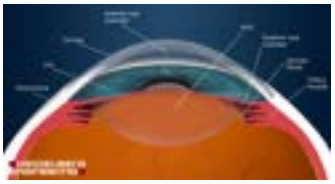
Anterior and Posterior



31

The Anterior Segment

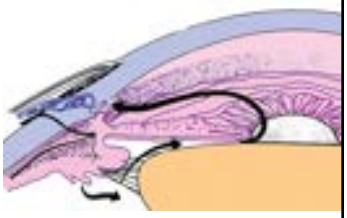
- 2 Chambers
  - Anterior Chamber: The Space Between The Cornea And The Iris. It Contains The Filtration Angle.
  - Posterior Chamber: The Space Between The Back Of The Iris And The Vitreous



32

The Anterior Chamber

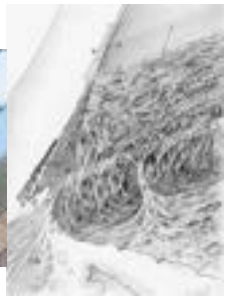
- Aqueous Humor
  - Provides necessary metabolites, primarily oxygen and glucose, to the avascular cornea and lens.
  - It is produced in the pars plicata of the ciliary body and is secreted into the posterior chamber through the epithelium covering the ciliary processes.
  - Maintains Intraocular Pressure



33

Filtration Apparatus

- Trabecular Meshwork
- Canal of Schlemm
- Aqueous Veins



34

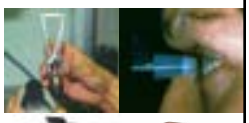
Intraocular Pressure (IOP)

- The aqueous carries nutrients to the lens and cornea and carries waste products away, and a constant volume of aqueous helps to maintain the intraocular pressure within the eye.
- Intraocular pressure must be kept at a level that is not detrimental to ocular tissue and is maintained within a fairly small range by the complex equilibrium between the rate of production and the rate of exit.
- Homeostatic mechanisms normally preserve this balance, but small variations in either the production or the exit can cause significant changes in intraocular pressure.
- Production remains fairly constant.
- Most cases of increased intraocular pressure are caused by decreased aqueous outflow.

35

Whats The Pressure And How We Measure It?

- Average tension is between 15-20mm Hg.
- Measurement of IOP
  - Schiotz Tonometer: Measures the indentation of the cornea using a known weight.
  - Applanation Tonometer: Measures pressure needed to an area of the cornea.
  - Non-contact Tonometer: Use a puff of air to flatten cornea. Uses infra-red reflection to assess flattening.
  - Pen Device: is a digital tonometer used to make the tonometry test more mobile while maintaining accuracy.



36

Posterior Segment

- Vitreous Chamber
  - is filled with the transparent gel-like vitreous body and occupies the largest portion of the globe.
  - Peripherally and moving posteriorly, it is attached by the pars plana of the ciliary body, the retina, and the optic disc.
  - The vitreous makes up about 80% of the entire volume of the eye.

37

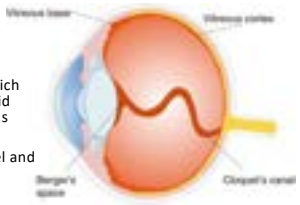
Vitreous Functions

- Provides physical support by holding the retina in place next to the choroid, as the neural retina and choroid are only connected to each other at the disc and the ora serrata.
- The vitreous is a storage area for metabolites for the retina and lens and provides an avenue for the movement of these substances within the eye.
- Acts as a shock absorber, protecting the fragile retinal tissue during rapid eye movements and strenuous physical activity.
- The vitreous transmits and refracts light, aiding in focusing the rays on the retina.
- Minimal light scattering occurs in the vitreous because of its extremely low concentration of particles.

38

Age Related Changes

- In the infant, the vitreous is a very homogeneous, gel-like body.
- With maturation, changes occur in which the gel volume decreases and the liquid volume increases; this is called vitreous liquefaction or synchisis senilis.
- By age 40 years, the vitreous is 80% gel and 20% liquid.
- By 70 or 80 years it is 50% liquid.
- Most of the liquefaction occurs in the central vitreous.



39

Conditions

What they Effect

Treatment

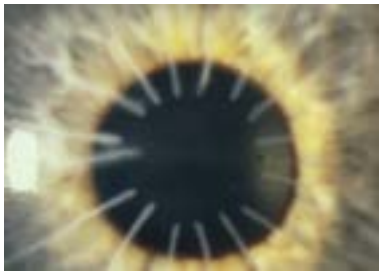
40

Cornea: Keratoconus

Keratoconus is a progressive conical thinning of the central area of the cornea. Myopia and irregular astigmatism increase as the condition progresses. It is very difficult to get an accurate prescription, and eyeglasses are of limited value. Rigid contact lenses will correct the irregular astigmatism. Ultimately, the patient may require a corneal transplant.

41

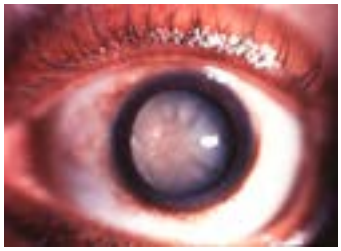
Corneal Scars: RK



RK is a procedure of corneal surgery it involves multiple linear incisions in the anterior cornea that cause central cornea flattening and thereby reducing its focusing power.

42

Cataracts



A cataract is an opacity or cloudiness of the crystalline lens. May be congenital (present at birth), senile (due to age), or traumatic (due to injury). Retinoscopy can be very difficult with cataract patients.

43

Retinitis Pigmentosa

Retinitis Pigmentosa is a disease in which the rods of the retina are slowly destroyed and the remainder of the retina atrophies. The loss of rods initially effects the patient's night vision and creates a mid-peripheral field loss. As the condition progresses, the peripheral field is reduced.

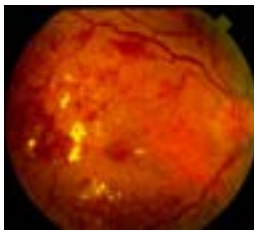
44

Macular Degeneration

Age Related Macular Degeneration (ARMD) is seen in elderly patients, in which the cones in the macular area progressively deteriorate. As the condition advances, a central vision loss will occur; however, peripheral vision remains intact. Macular Degeneration is the leading cause of blindness for those aged 55 and older in the United States, affecting more than 10 million Americans.

45

Diabetes and Diabetic Retinopathy



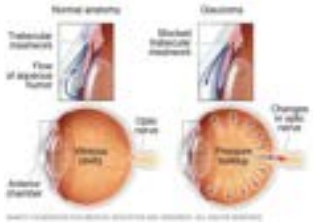
The diabetic patient may experience variable vision. The crystalline lens loses water because of the high level of sugar in the anterior chamber and therefore its index of refraction increases.

Diabetic Retinopathy is the term used for retinal changes caused by Diabetes. It creates a premature aging of the blood vessels. Hemorrhages, new vessel growth, and fibrous tissue growth can create retinal detachments and visual field losses. Laser beams are used to seal of the hemorrhages.

46

Glaucoma

- Glaucoma is a complex disease process that is not completely understood. Many patients with glaucoma have higher than normal intraocular pressure.
- Increased intraocular pressure can contribute to damage of the retinal nerve fiber layer, either directly by mechanical pressure or indirectly through impeding blood perfusion.
- A condition in which poor aqueous outflow creates high intraocular pressure. This elevated pressure damages the optic nerve and retinal function. The condition effects peripheral vision first.



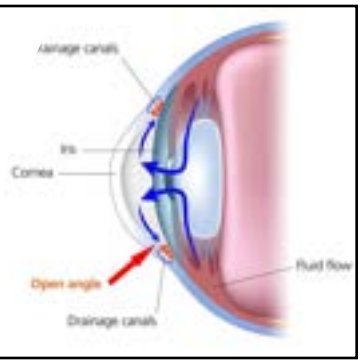
47

Vision With Glaucoma

48

Open Angle Glaucoma

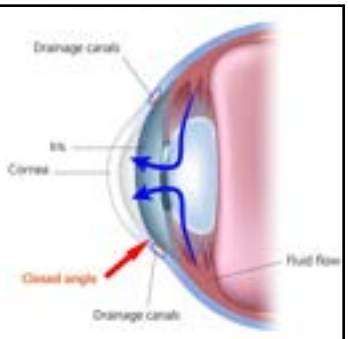
- Usually the result of either overproduction of aqueous by the ciliary body, or blocked outflow
- Can be treated with miotic drugs, beta blockers or surgery



49

Closed Angle Glaucoma

- Uncommon form usually develops suddenly
- Very close or narrow angle between the iris and cornea.
- Dilating eye drops and certain medicines may trigger an acute glaucoma attack.
- Demands immediate medical attention
- Laser peripheral iridotomy (LPI)



50

Drugs that help reduce intraocular pressure

- Glaucoma treatment consists of attempts to reduce intraocular pressure using drugs that either decrease aqueous production or increase aqueous outflow.
- One of the earliest treatment plans involved the use of pilocarpine
  - It causes the iris sphincter and ciliary muscle to contract, thus changing the configuration of the trabecular sheets to facilitate outflow, perhaps by allowing more separation between the sheets.
  - Pilocarpine was commonly used; however, compliance was often poor because of the uncomfortable side effects—miosis and ciliary spasm.

51

Drugs that help reduce intraocular pressure

- Most drugs that inhibit aqueous production act on the ciliary epithelia
- beta-blockers and alpha2-adrenergic agonists do decrease aqueous production perhaps by interfering with ciliary epithelial function.
- Drugs that have vasoconstrictive action, such as brimonidine, an alpha2-adrenergic agonist, decrease aqueous production by decreasing blood flow in the ciliary vessels, causing a reduction in oxygen availability to the tissue.
- Brimonidine also increases uveoscleral outflow. Carbonic anhydrase inhibitors are also common in glaucoma treatment. They decrease aqueous production by inhibiting key enzymes necessary for ionic transport across the epithelial layers.

52

Floaters

- Most eye floaters are caused by age-related changes that occur as the jellylike substance (vitreous) inside your eyes becomes more liquid.
- Microscopic fibers within the vitreous tend to clump and can cast tiny shadows on your retina.
- The shadows you see are called floaters.

53

When to Refer

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

54

The Eye Exam

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

55

Patient History

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

56

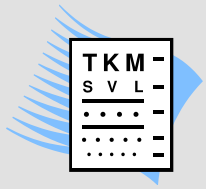
Preliminary Tests

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

57

Visual Acuity

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



58

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.

59

- 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

60

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)

61

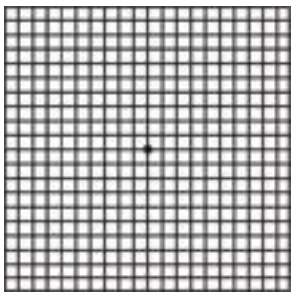
Pin Hole

- The pinhole is an eye shield with several small holes that allow light rays to reach the retina without the interference of optical problems of the eye.
- However, young children, elderly people, and mentally impaired individuals often have difficulty using it.
- How it Works
  - The pinhole screens out the out-of-focus light rays and allows the in-focus or axial rays to strike the retina.
  - This reduces the diameter of the blur circle improving visual acuity.
  - If the pinhole acuity shows improvement, 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

62

Visual Fields: (peripheral vision)

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



63

Legal Categories:

1

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

2

Legally Blind: 20/200 best corrected acuity or 20 degree field or less

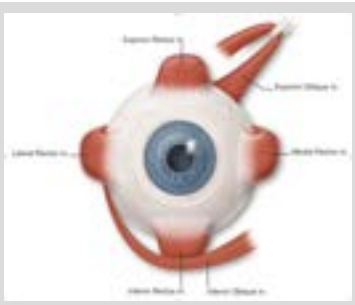
- Social Security used in US as definition
- Other definitions exist (WHO, etc), but we use above.

3

Low percentage of the legally blind are totally blind (NLP)

64

Ocular Motility



65

Ocular Muscle Deviations

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

66

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.

67

Cover / Uncover Test

Determine	Determine Phoria or Tropia • Phoria: Both eyes aligned 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.

68

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

69

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.

70

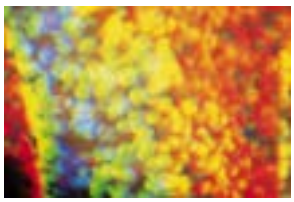
Color Vision

- 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

71

Color Vision

- Pseudoisochromatic Plates
  - Ishihara
  - Wool Test



72

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

73

Color Defects

Trichromat: Possesses all three pigments

Anomalous Trichromat: A partial deficiency of one of the three pigments. Most common, 8-10% Male .4-1% Female

- Protanomaly: Red deficient (most common)
- Deuteranomaly: Green deficient (most common)
- Tritanomaly: Blue deficient

Dichromat: A complete deficiency of one of the pigments.

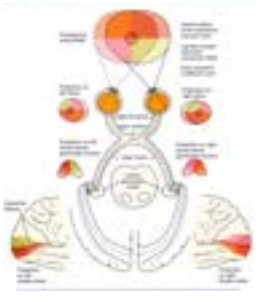
- Protanopia - Red
- Deuteranopia - Green
- Tritanopia - Blue

Monochromat: Sees shades of Grey

74

The Visual Pathway

- Optic Nerve: Comprised of the axons of the retinal ganglion cells surrounded by pia, arachnoid, and dura sheaths.
- Optic Chiasma: Nasal retinal fibers cross, temporal fibers do not. This enables stimulation of corresponding points of the two retinas to send simultaneous messages to the visual centers on one side of the brain
- Optic Tract: Carries nerve impulses from the Chiasma to the Lateral Geniculate Body.
- Lateral Geniculate Body: A relay station for nerve impulses on their way to the visual cortex.
- Optic Radiations: Nerve fiber bundles whose cell bodies lie in the LGB. Their axons fan out and terminate at the visual cortex.



75

Refraction

- Keratometry
- Retinoscopy
- Subjective Refraction

76

Methods of Corneal Analysis

- Keratoscope, Placido's Disc
- Ophthalmometer / Keratometer
- Autokeratometer
- Corneal Topgrapher

77

Types of Astigmatism: Corneal

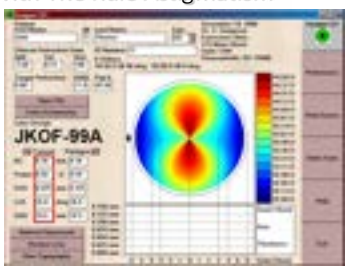
Regular: Meridians 90 Degrees Apart

- "With the Rule" Flattest "K" @ 180 Degrees (+/- 30 Degrees) ex: 41.00@180 / 43.00@90
- "Against the Rule" Flattest "K" @ 90 Degrees (+/- 30 Degrees) ex: 45.00@180 / 42.00@90
- "Oblique" Flattest "K" between 30 & 60 or 120 & 150 Degrees ex: 42.50@35 / 44.75@125

Irregular: Flattest & Steepest meridians are notably more or less than 90 Degrees Apart ex: 41.00@180 / 42.00@60

78

Regular With The Rule Astigmatism



79

Total / Refractive Astigmatism

The amount of astigmatism found in the spectacle prescription. It represents the combined effect of the cornea and internal astigmatism.

If they both have the same orientation they are additive. Ex: both have the flattest curve in the horizontal meridian.

Minus cylinder axis 180 (+/- 30 degrees) corrects with the rule astigmatism Ex: -3.00 -1.00 x 180

80

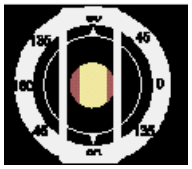
Objective Refraction: Retinoscopy

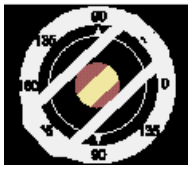
- Purpose
- Objectively determine the refractive status of the patient's eyes.
- Retinoscopy Lens
  - With Motion
  - Against Motion

81

Retinoscopy Procedures

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





82

Subjective Refraction: Starting Point

- Lensometry
- Auto Refraction
- Retinoscopy
- Patient Instructions

83

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

84

Refining The Sphere Power

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

85

Binocular Balance

- Purpose
- Prism Dissociation Test
- Duochrome Test

86

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 (Mydriacyl) 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 Pontocaine

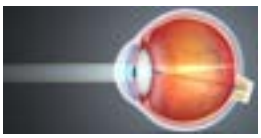
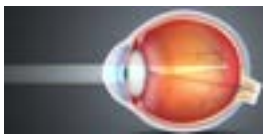
87

Cycloplegic Refraction

- Purpose
- Precautions
- Cycloplegic Agents
  - Tropicamide (Mydriacyl) 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)

88

Refractive Errors


89

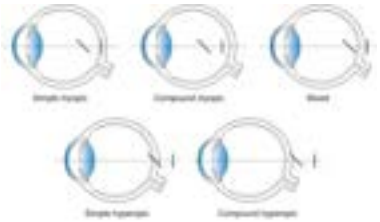
Refractive Errors

- Emmetropia
- Myopia
  - Pseudomyopia - caused by an involuntary contraction of the ciliary muscle. The unintended accommodation will blur distance objects. This accommodative spasm may be caused by excessive near work
- Hyperopia
  - Latent Hyperopia - refers to when a portion or all of the hyperopia is being compensated for through accommodation. A cycloplegic refraction is need to measure the amount of hyperopia particularly in a young patient.
- Astigmatism
- Presbyopia

90

Types of Astigmatism

- 3 Types:
  - Simple
  - Compound
  - Mixed
- 5 Total Versions
  - Simple Myopia
  - Simple Hyperopia
  - Compound Myopia
  - Compound Hyperopia
  - Mixed Astigmatism



91

Refractive Errors

Spherical Rx:
- Simple Hyperopia
- Simple Myopia

Spherocylindrical:

• Simple Hyperopic Astig	Plano / +
• Simple Myopic Astig	Plano / -
• Compound Hyperopic Astig	+ / +
• Compound Myopic Astig	- / -
• Mixed Astigmatism	+ / -

92

Accommodation

- Amplitude of Accommodation
  - Age
  - Push-Up Method
- Accommodative Facility
- Accommodative Insufficiency
  - Flipper

93

Accomadation

- amplitude of accommodation = is the max amt of accommodation in an eye
- The amplitude of accommodation declines with age
  - Approx 14 diopters at age 10
  - Approx 0.50 diopters at age 60.
- Push Up Test move 20/20 near chart until blurs

94

Accommodation

- Accommodative facility is the eyes ability to focus on stimuli at various distances and in different sequences in a given period of time.
- The patient looks at a small target while a flipper with plus and minus lenses is alternated in front of the eyes.(for example, +2.00D lenses on one side and -2.00D lenses on the other side)
- Insufficient accommodation below age level may be caused by fatigue, stress, mTBI, systemic medications, ocular inflammation, thyroid disease or juvenile diabetes mellitus.

95

Flipper

96

Convergence

- Near Point of Convergence (NPC)
- Light
- Break Point
- Greater then 7cm abnormal

97

On behalf of Vision Expo, we sincerely thank you for being with us this year.

Vision Expo Has Gone Green!

We have eliminated all paper session evaluation forms. Please be sure to complete your electronic session evaluations online when you login to request your CE Letter for each course you attended! Your feedback is important to us as our Education Planning Committee considers content and speakers for future meetings to provide you with the best education possible.

vision expo

98