



Ocular Terminology in Primary Eye Care

Susan A. Resnick, O.D. FAAO, FSLS
New York, NY



Agenda

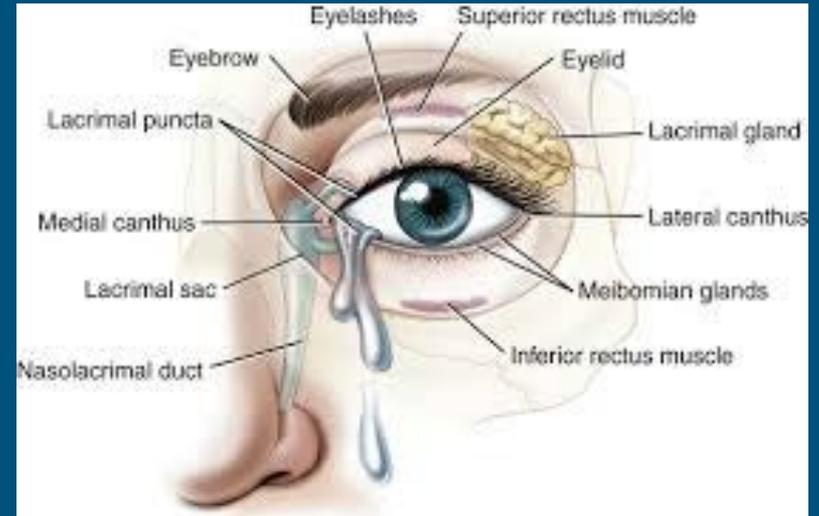
- ★ Basic Ocular Anatomy
- ★ The Optics of the Eye and Refractive Error
- ★ Common Ocular Conditions
- ★ Optometric Instrumentation

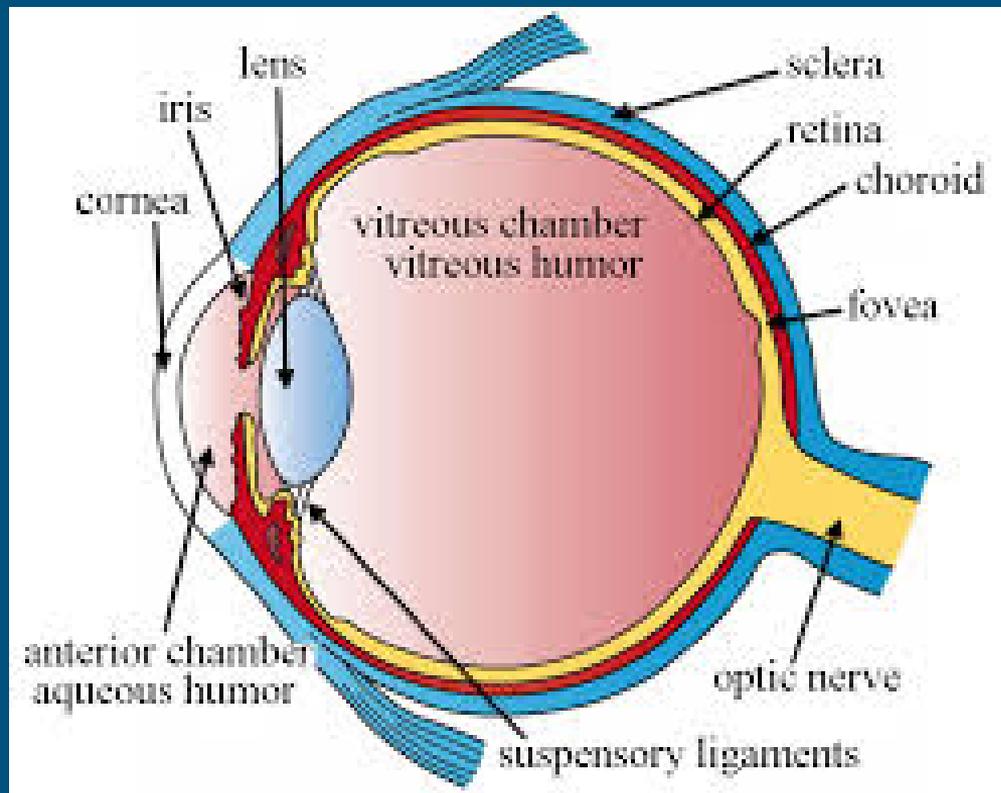
Ocular Anatomy



Ocular Adnexa

- ❑ Adnexa' is a Latin term meaning 'fasten to' and in this case refers to accessory structures attached to the eye itself.
- ❑ Includes
 - ❑ Orbits
 - ❑ Extraocular muscles
 - ❑ Eyelids
 - ❑ Lacrimal system
 - ❑ Optic nerves



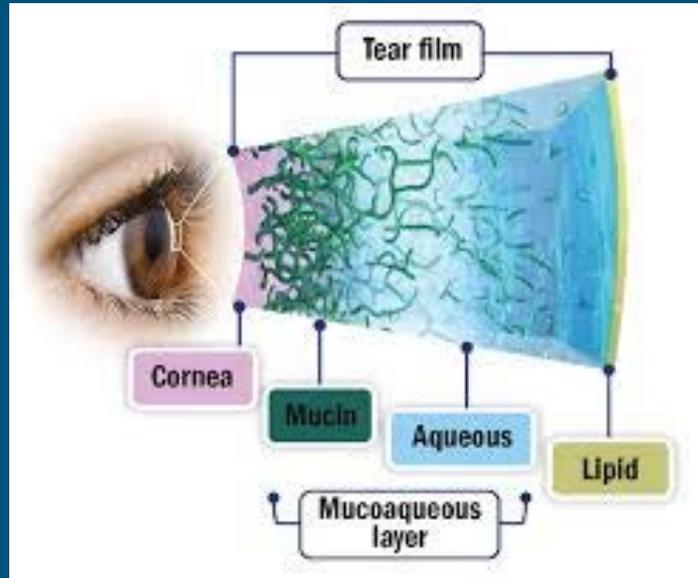


Tear Film

Structure

Function

- Protection
- Nutrition
- Lubrication



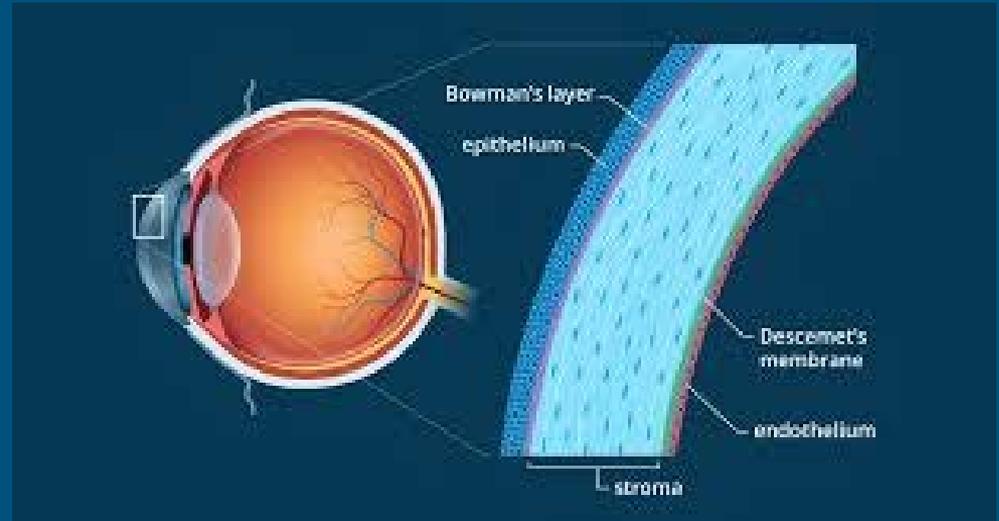
Cornea



Function

- ❑ The eye's outermost lens
- ❑ Focuses the entry of light
- ❑ Contributes 65-75% of total power

Structure

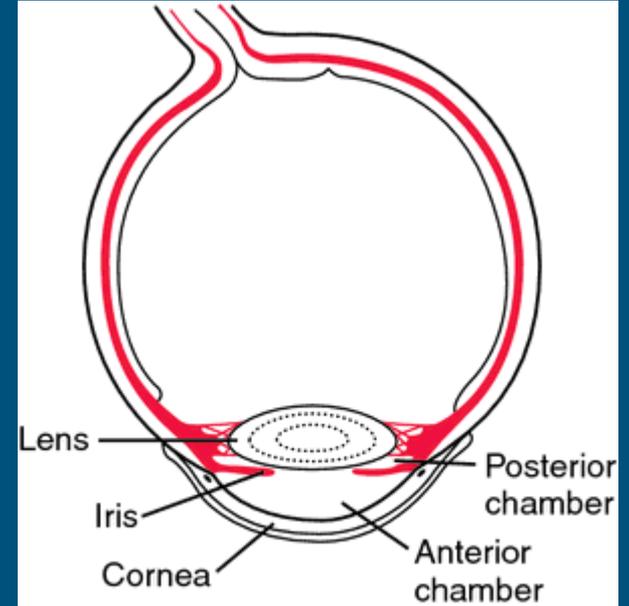


Anterior Chamber

Function

- ❑ The space behind the cornea and in front of the iris.
- ❑ Filled with water fluid known as **aqueous**.
 - ❑ Nourishes cornea, lens and iris.
 - ❑ Maintains intraocular pressure.
 - ❑ Provides optically clear medium
 - ❑ Responds to inflammation and infection

Structure

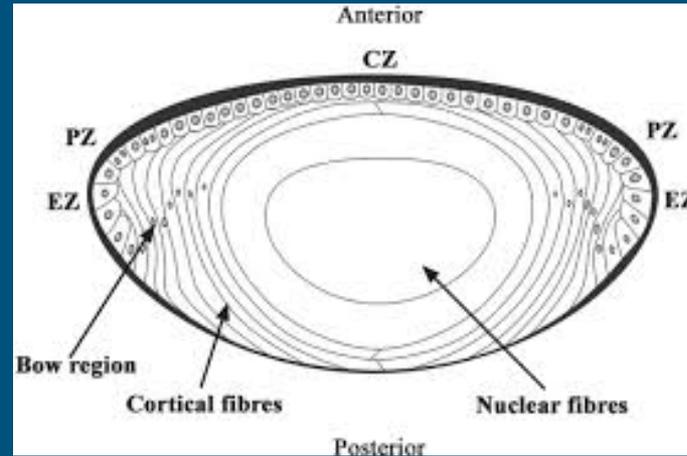
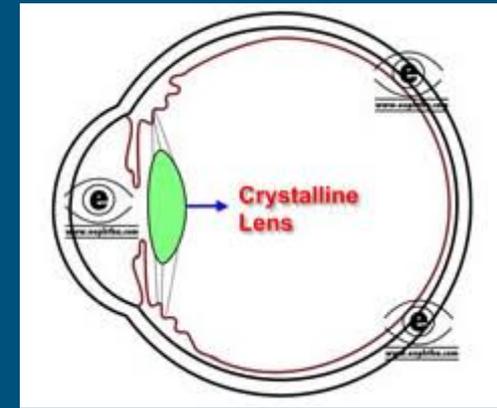


Crystalline Lens

Function

- ❑ Provides $\frac{1}{3}$ of focusing power of the eye
- ❑ Flexible and changes focus to provide extra power for near vision “accommodation”

Structure

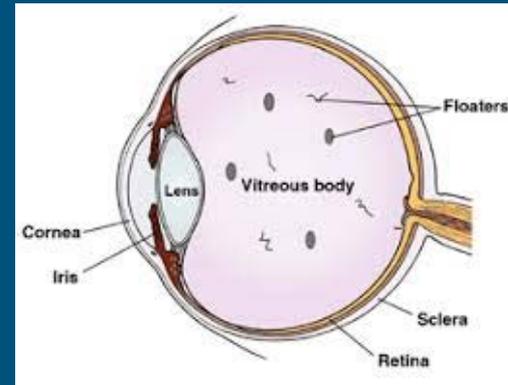
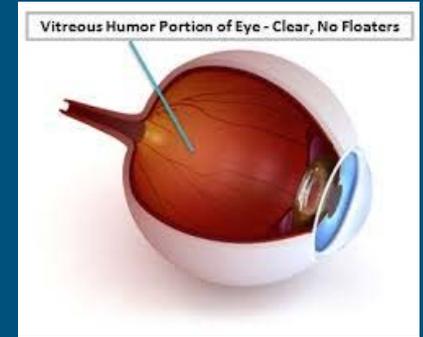


Vitreous

Function

- ❑ Clear gel that fills the space between the lens and the retina
- ❑ Helps to maintain the shape of the eye
- ❑ Shock absorption
- ❑ Keeps the retina in place
- ❑ Transmits light to the retina

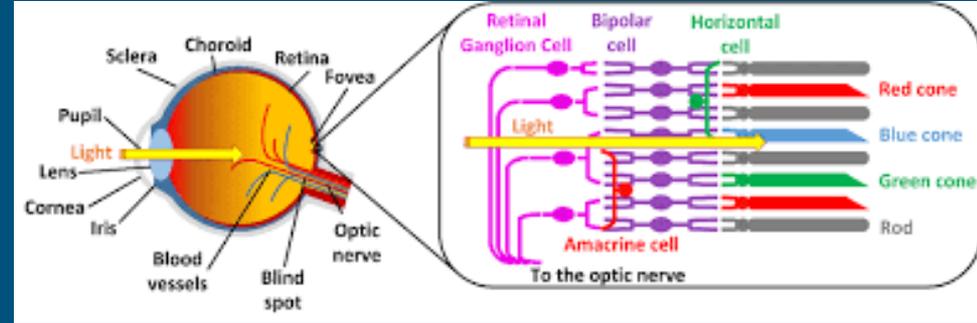
Structure



Retina

Function

- ❑ Innermost light sensitive layer
 - ❑ Rods: dim light; black and white
 - ❑ Cones function in well-lit conditions and are responsible for the perception of color, as well as high-acuity vision used for tasks such as reading
- ❑ Translates two-dimensional image into electrical neural impulses to the brain to create visual perception



Polling Question #1

Which of the following is responsible for most of the eye's refractive power?

1. The Retina
2. The Lens
3. The Cornea
4. The Vitreous

Optics of the Eye



Visual Acuity

- ❑ Sharpness of vision
- ❑ Measured by the ability to discern letters or numbers at a given distance according to a fixed standard
- ❑ In adults, usually measured with a Snellen eye chart
- ❑ 20/20 vision is a term used to express normal visual acuity (the clarity or sharpness of vision) measured at a distance of 20 feet.

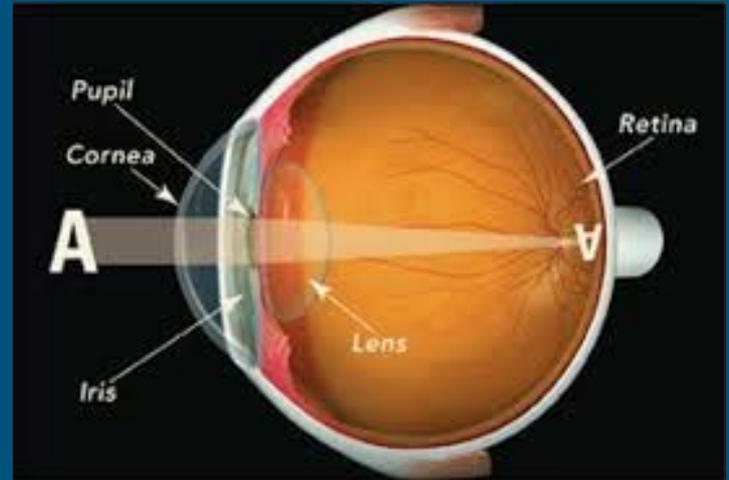


- ❑ If you have 20/20 vision, you can see clearly at 20 feet what should normally be seen at that distance. If you have 20/40 vision, it means that you must be as close as 10 feet to see what a person with normal vision can see at 20 feet.

Refractive Errors and Binocular Dysfunction

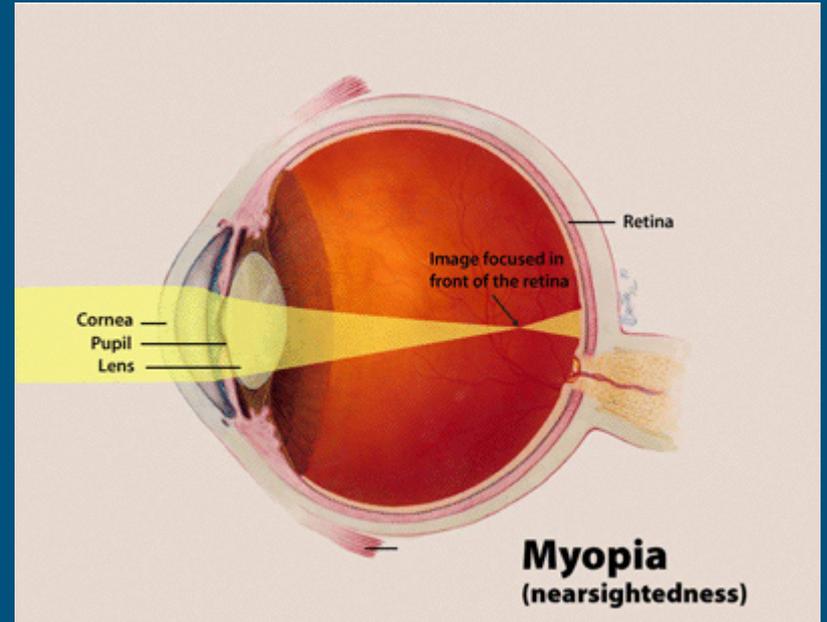
Emmetropia

- ❑ Refers to an eye that has no visual defects
- ❑ Emmetropia is the state of vision in which a faraway object at infinity is in sharp focus with the eye lens in a neutral or relaxed state



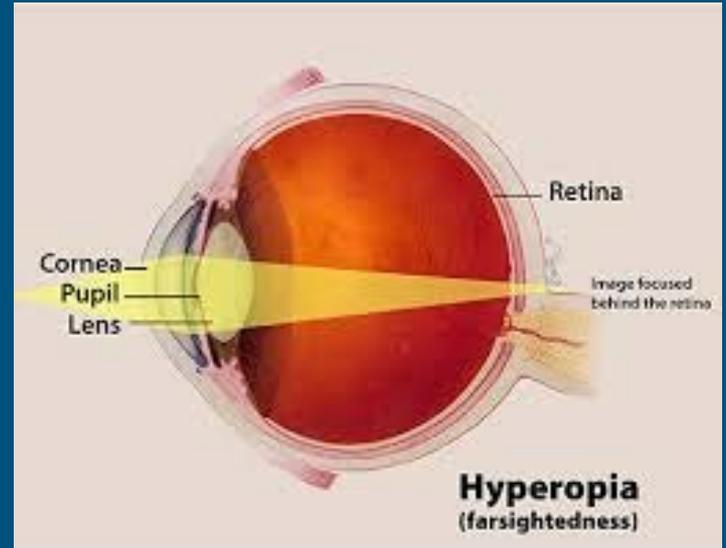
Myopia

- ❑ Nearsightedness, the ability to see close objects more clearly than distant objects.
- ❑ Myopia can be caused by a longer-than-normal eyeball or by any condition that prevents light rays from focusing on the retina.
- ❑ Nearsightedness can be corrected with eyeglasses, contact lenses or refractive surgery.
- ❑ Can be managed or controlled with special contacts, eyedrops or spectacles.



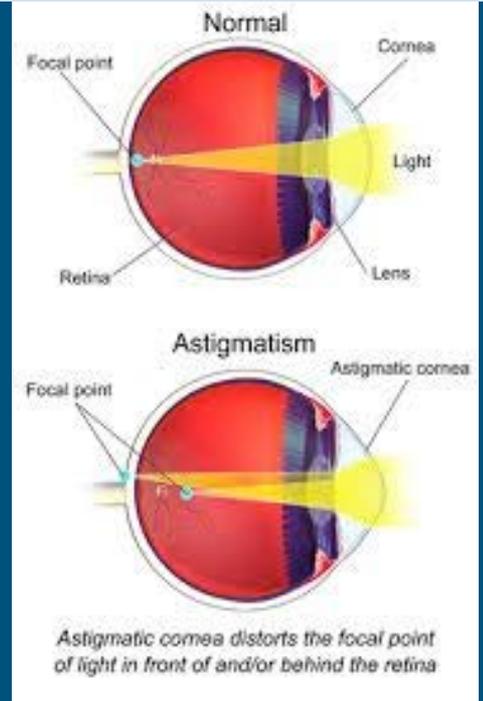
Hyperopia

- ❑ Also known as farsightedness
- ❑ Distant objects are seen clearly but near objects appear blurred
- ❑ Small amount in young patients is usually corrected by their accommodation, without any defects in vision
 - ❑ Due to this accommodative effort for distant vision, people may complain asthenopic symptoms with constant reading
- ❑ If the hyperopia is high, there will be blur at both distance and near



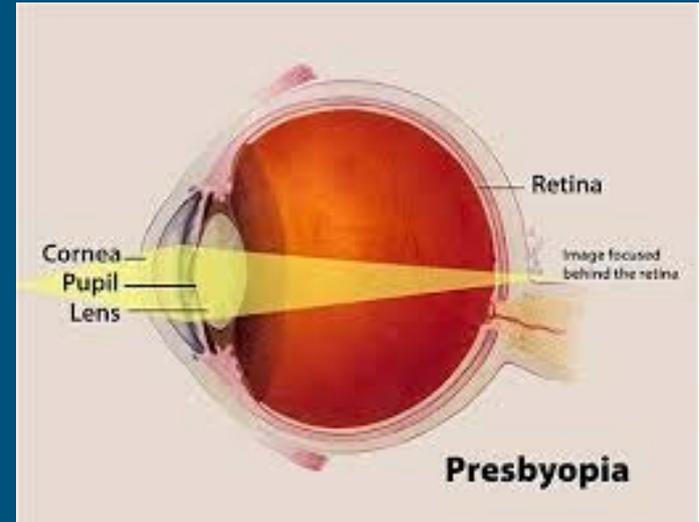
Astigmatism

- ❑ Light is not focused to one point on the retina
- ❑ Due to differences in curves on either the cornea or the crystalline lens
- ❑ Results in distorted or blurred vision at any distance
- ❑ Can be corrected by glasses, contact lenses or surgery



Presbyopia

- ❑ A gradual, age-related loss of the eyes' ability to focus actively on nearby objects
- ❑ Usually becomes noticeable in the early to mid-40s and worsens until around age 65
- ❑ Symptoms include a need to hold reading material at arm's length to make letters clearer, blurred vision at normal reading distance, and eye strain after reading
- ❑ Can be corrected with non prescription or prescription eyeglasses, contact lenses, and less often, surgery.



Amblyopia

- ❑ Amblyopia (also called lazy eye) is a type of poor vision that happens in just one eye.
- ❑ It develops when there's a breakdown in how the brain and the eye work together, and the brain can't recognize the sight from 1 eye.
- ❑ Amblyopia starts in childhood, and it's the most common cause of vision loss in kids. Up to 3 out of 100 children have it.

Symptoms

- ❑ Squinting
- ❑ Shutting one eye
- ❑ Head Tilt
- ❑ Risk Factors
 - ❑ Were born early (premature)
 - ❑ Were smaller than average at birth
 - ❑ Have a family history of amblyopia, childhood cataracts, or other eye conditions
 - ❑ Large difference in RE between the 2 eyes

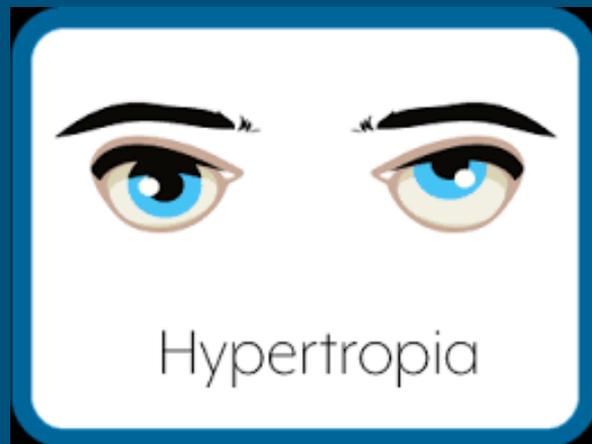
Strabismus

- ❑ Disorder in which the eyes don't look in exactly the same direction at the same time.
- ❑ The eyes may alternate their focus
- ❑ May be constant or intermittent
- ❑ May vary with distance of object
- ❑ If present during a large part of childhood, it may result in **amblyopia** or loss of **depth perception**
 - ❑ If onset is during adulthood, it is more likely to result in double vision.
- ❑ Strabismus can occur due to muscle dysfunction, **farsightedness**, problems in the brain, trauma or infections
- ❑ Esotropia: eyes are crossed
- ❑ Exotropia: eyes diverge
- ❑ Hypertropia: vertical misalignment
- ❑ Treatment options: glasses, vision therapy, surgery

ESOTROPIA



Exotropia



Hypertropia

Polling Question #2

The gradual, age-related loss of the eyes' ability to focus actively on nearby objects is known as:

1. Presbyopia
2. Myopia
3. Emmetropia
4. Hyperopia

Instrumentation

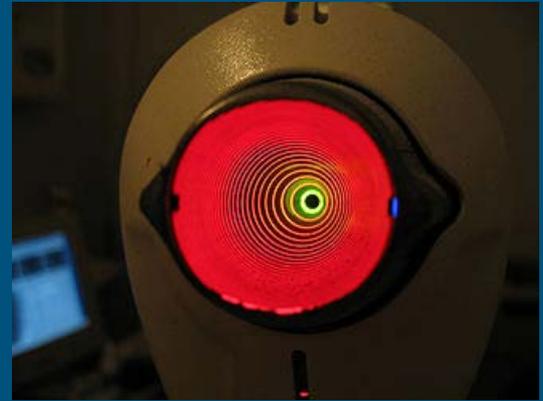


Autorefractor/Autokeratometer

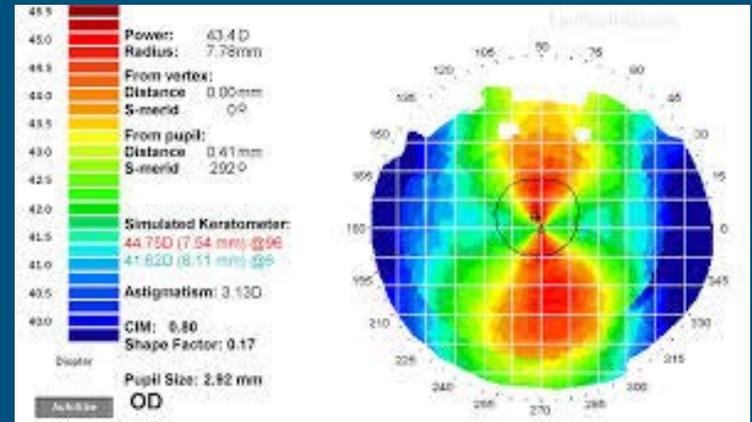
- ❑ The autorefractor automatically determines the correction needed to place your “focus point” on the retina, the light-sensitive area at the back of the eye responsible for correctly processing images.
- ❑ Used in place of retinoscopy
- ❑ Is the starting point for a subjective refraction
- ❑ Autokeratometry measures the curvature of the anterior surface of the cornea, particularly for assessing the extent and axis of astigmatism



Corneal Topographer

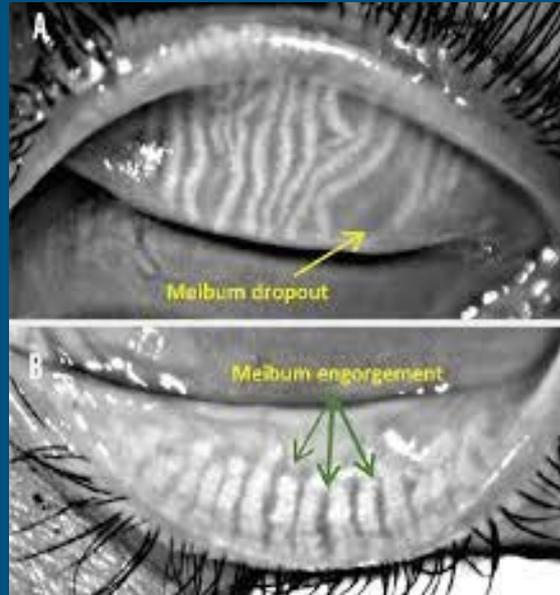


- ❑ Maps the surface curvature of the cornea
- ❑ Analyzes multiple anatomic factors and compares to a normative database
- ❑ Aids in the diagnosis and treatment of a number of conditions
 - ❑ In planning **cataract surgery** and **intraocular lens (IOL)** implantation (plano or toric IOLs);
 - ❑ In planning **refractive surgery** such as **LASIK**, and evaluating its results;
 - ❑ In assessing the fit of **contact lenses**



Meibom ographer

- ❑ Images the meibomian glands
- ❑ Permits evaluation of the structure of the glands
- ❑ Uses a camera and infrared light source



Tonometer

- ❑ Used to determine Intraocular pressure
- ❑ “Normal” pressure is pressure which does not lead to damage of the optic nerve head
- ❑ Types of tonometry
 - ❑ Contact
 - ❑ Applanation
 - ❑ Rebound
 - ❑ Non-contact (“air puff”)



Phoropter

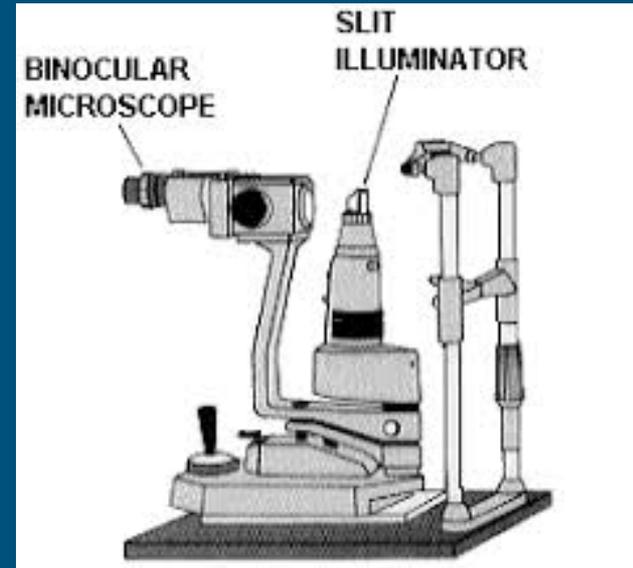
- ❑ A phoropter or refractor is an ophthalmic testing device.
- ❑ Used by eye care professionals during an eye examination
- ❑ Contains different lenses used for refraction of the eye during sight testing, to measure an individual's refractive error and determine his or her eyeglass prescription



Slit Lamp (Biomicroscope)

- ❑ Low-powered microscope, combined with a high-intensity light
- ❑ Views of:
 - ❑ Eyelids
 - ❑ Conjunctiva
 - ❑ Iris
 - ❑ Lens
 - ❑ Sclera
 - ❑ Cornea
 - ❑ Retina
 - ❑ Optic nerve

Contains different light filters to be done with or without NaFL



Visual Field Test

- ❑ Detect dysfunction in central and peripheral vision which may be caused by various medical conditions such as glaucoma, stroke, pituitary disease, brain tumours or other neurological deficits
 - ❑ Static perimetry tests different locations throughout the field one at a time
 - ❑ First, a dim light is presented at a particular location. If the patient does not see the light, it is made gradually brighter until it is seen.
 - ❑ The minimum brightness required for the detection of a light stimulus is called the "threshold" sensitivity level of that location. This procedure is then repeated at several other locations, until the entire visual field is tested



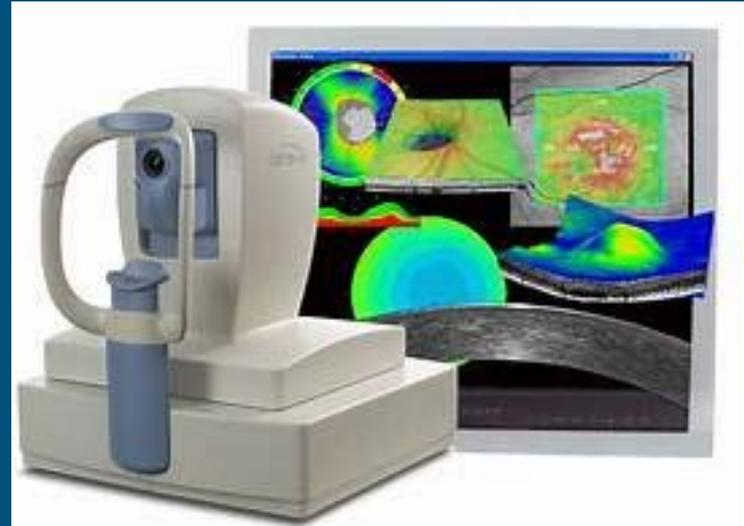
Fundus Camera/Retinal Imaging

- ❑ Fundus photography is also known as retinal photography.
 - ❑ Specialized fundus cameras consisting of an intricate microscope attached to a flash enabled camera are used in fundus photography.
 - ❑ The main structures that can be visualized on a fundus photo are the central and peripheral retina, optic disc and macula.
 - ❑ Fundus photography can be performed with colored filters, or with specialized dyes including fluorescein and indocyanine green.
- ❑ Optomap is a digital image of the retina produced by Optos scanning laser technology; captures 82% view of retina at one time



OCT (Optical Coherence Tomography)

- ❑ Non-invasive imaging device
- ❑ Uses light waves to take cross-section pictures of both the front (Anterior Segment OCT) or the back (Posterior Segment OCT) of the eye
- ❑ Provides a 3-D image
- ❑ Uses the back reflection of infrared light
- ❑ Very high resolution



Polling Question #3

To measure intraocular pressure use a:

1. Phoropter
2. OCT
3. Visual Field Device
4. Tonometer

Ocular Conditions

Lids/Lashes/Ocular Surface

LIDS	Lashes	Conjunctiva
Ptosis	Trichiasis	“Pink Eye”
Entropion/Ectropion	Madarosis	Pinguecula/Pterygia
Papilloma	Blepharitis	Dry Eye
“Styes”	Demodex	Subconjunctival Hemorrhage



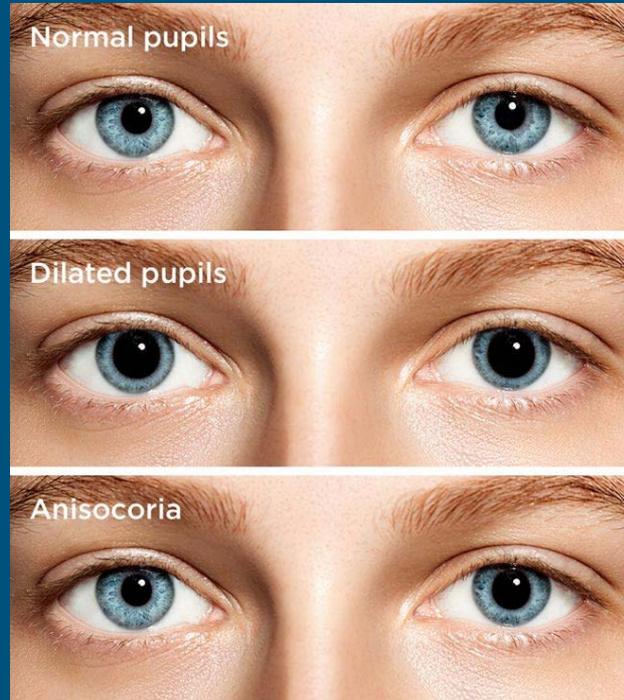
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- Abrasions
- Scars
- Keratoconus/Hydrops
- Keratitis/Ulcer
- Herpes



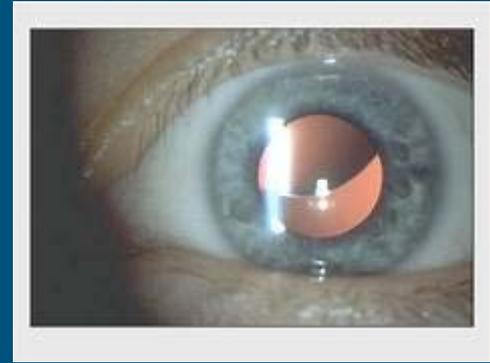
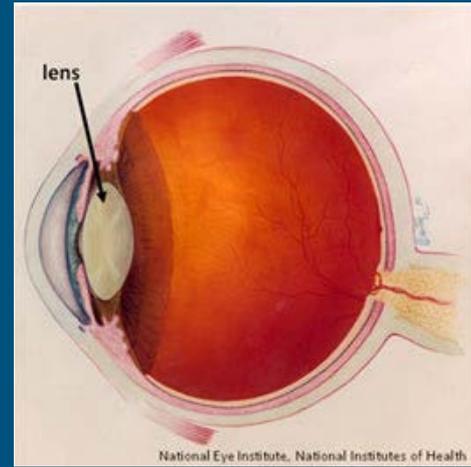
Pupil/Iris/Anterior Chamber

- Dilation
- Constriction
- Anisocoria
- Coloboma
- Horner's Syndrome
- Iritis
- Angle Closure
- Synechiae



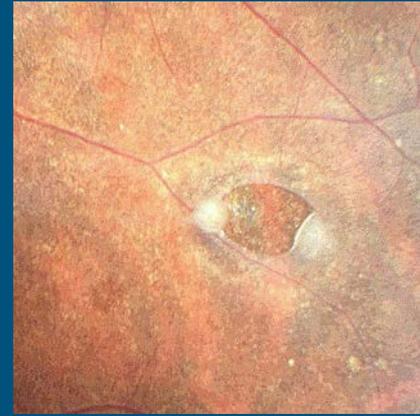
Crystalline Lens

- ❑ Cataract
- ❑ Aphakia
- ❑ Ectopia Lentis



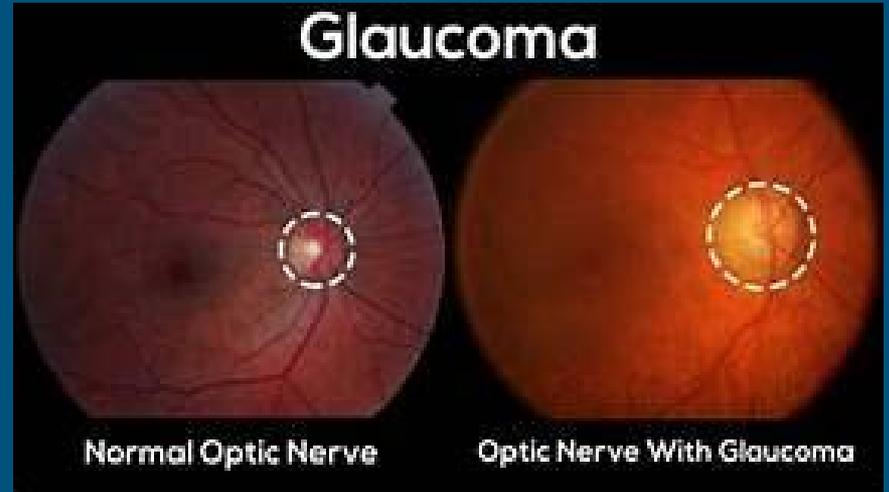
Vitreous and Retina

- Diabetic Retinopathy
- Age-related Macular Degeneration
- Macular Holes
- Detached Retina and Retinal Tears
- Retinal Infection (Endophthalmitis)
- Flashes and Floaters
- Retinitis Pigmentosa



Glaucoma

- ❑ General term encompassing a group of conditions causing damage to the optic nerve and gradual loss of vision
- ❑ Can be congenital or acquired
- ❑ May be hereditary
- ❑ Most commonly associated with high intraocular pressure
- ❑ Can be acute or chronic
- ❑ Treated with drops, laser surgery or traditional surgery



Urgent or Emergent?

Urgent

- ❖ Slight to moderate/gradual decrease in vision
- ❖ Slight to moderate pain
- ❖ Green or yellow discharge
- ❖ Significant redness
- ❖ Slight to moderate swelling
- ❖ Slight to moderate light sensitivity
- ❖ Slight to moderate pain on eye movement

Emergent

- ❖ Sudden and significant change in vision
- ❖ Severe pain, light sensitivity, discharge
- ❖ Sudden or new floating spots or flashing light
- ❖ Trauma/injury

Polling Question #4

Cataracts occur in the:

1. Aqueous
2. Cornea
3. Lens
4. Vitreous

sresnick525@gmail.com

www.eyewise.com

THANK YOU!!
