Clinical Ocular Concepts for Opticians, Technicians, and Ancillary Staff

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In every ophthalmic practice

- Basics that every member should know
 - Normal anatomy and function
 - What can go wrong
 - Signs and symptoms of emergency conditions
 - Why the docs do what they do
 - What patients should know about their eye care
 - Understanding of in-office tests
 - Commonly prescribed meds and their functions



Terminology (abbreviations)

- OD right eye
- OS left eye
- OU both eyes
- IOP intraocular pressure
- RD retinal detachment
- PVD posterior vitreous detachment
- VA visual acuity
- ET esotropia
 XT exotroia

- IOL intraocular lens
- POAG primary open angle glaucoma
- SLT selective laser trabeculoplasty
- ION ischemic optic neuropathy
- NAG narrow angle glaucoma
- BIO binocular
- indirect ophthalmoscope NV -
- neovascularization

Basic anatomy and physiology of the eye What are the structures and what do they do

Goals

- Ocular pathology
 What can go wrong
- Clinical signs and symptoms
 What the patient experiences
 Examination techniques
- Treatment of disease
 Medical, surgical, refractive
- Terminology

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- The cornea and crystalline lens are like the lens of a camera
- The iris is like the f-stop
- The retina is like the photographic film



The visual pathway

- Information from the retina travels along the optic nerve to the occipital lobe of the brain
- Like the film processing center
- Half of the brain is involved with vision





Ocular adnexae

Eyelids Eyelashes Lacrimal system (tear ducts) Conjunctiva Tear film

Protection



Eyelids

- You blink about 10,000 times a day
- Speed of a single blink is 100 to 400 milliseconds
- We blink 15 20 times per minute
- The thinniest skin in the body
- Eyelid surgery is called a blepharoplasty cost, about \$2500
- Blinking offers a period of wakeful rest so that our brains can focus
- Blinking lubricates the cornea by spreading tears onto the surface



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Ptosis – drooping lid



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Eyelid disorders

- Lagophthalmos incomplete closure
- 7th cranial nerve palsy (Bell's palsy)





7th Nerve Palsy



Eyelid Disorders - thyroid disease



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Eyelid disorders

Entropion



Ectropion





Blepharitis



Meibomian Gland Dysfunction

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Eyelid disorders - cellulitis

- Preseptal local infection spread from skin, sinus, or tear duct; bug bite, trauma
- Orbital infection spread to eye socket; decreased vision and motility, pain; lifethreatening



Eyelid disorders

- Internal hordeolum (stye): acute inflammation
 - Painful, tender
 - Hot compresses
 - Antibiotic ointment

Chalazion: chronic inflammation - blockage

- Nontender
- Amblyogenic in infants Surgical I & D
- Steroid injection







- Punctal occlusion





Conjunctiva and Sclera

- Outer coats of the eye Serve protective
- function Sclera and the clear cornea are same cells arranged differently

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- 1. Limbus Bulbar conj 2. Fornix
 Palpebral



- 5. Punctum 6. Gray line
- 7. Sclera

conj

Conjunctival disorders

Subconjunctival hemorrhage





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Conjunctivitis - "Pink Eye"



Scleritis

Inflammation

 Often associated with systemic diseases such as RA • Painful

• Can lead to perforation



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Scleral rupture

- Blunt or penetrating trauma
 - Breaks occur where sclera is thinnest
 - Prognosis for visual recovery is poor, but possible with surgery







Anterior Segment







Iris

choroid

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Laser peripheral iridotomy

- Painless, in office procedure
- Reduces risk of attack of angle closure glaucoma
- Cures ACG attack Sometimes
- necessary in order to dilate the pupil safely





Iritis

Causes

Causes

• Age

Trauma

Symptoms Painless

Glare

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Medications

Diabetes, HTN

UV exposure

Blurred vision

Decreased night vision

Frequent Rx change

- Blunt trauma
- Inflammatory
- Sarcoidosis
- Ankylosing spondylitis · IBD e.g., Crohn's
- Infectious
 - Herpes zoster
- Tuberculosis
- Signs/symptoms Redness
- Blurred vision
- Pain
- Photophobia
- Floaters
- Treatment
 - Topical and systemic steroids
 - Non-steroidal antiinflammatories
 - Cycloplegics

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Distance Vision

Near Vision



Crystalline lens

reading glasses, multifocal / monovision contacts and IOL's

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Cataract treatment - surgery



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Vitreous Humor

- Gel composed of water, collagen, hyaluronic acid
- Fills the hollow cavity of the eye, maintaining shape
- Liquefies with age Vitreous
- detachment (PVD) Vitreous floaters
- Always need to rule out PD



Posterior segment 》 Retina Vitreous Humor

Light receptors







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Optic nerve and visual pathway

Optic nerve
 Optic chiasm
 Optic radiations
 Visual cortex
 Visual association cortex



Optic nerve

- Transmits visual information from the retina to the brain
 - Like a large fiberoptic cable - carrying 1.2 million fibers from the photoreceptors
 - Color, contrast
 - Light and accommodative reflex



Disorders of the retina

Disorders of the optic nerve

- Glaucoma
- Trauma
- Toxicity
- Ischemia
- Compression
- Inflammation
- Infection
- Congenital



Glaucoma vision loss



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Glaucoma Disease of retinal ganglion cells Elevated intraocular pressure (IOP) · Peripheral visual field loss Symptoms None until advanced Treatment IOP lowering medicines Laser Trabeculectomy surgery

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Posterior visual pathway

- Optic chiasm
 The optic nerves from both eyes meet and cross
- Optic tract Crossed fibers from one nerve join uncrossed fibers from the other
- Left visual field processed by right side of the brain
- Optic radiations
- Visual cortex Where vision takes place
- Visual association cortex

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- Diseases affecting posterior pathway Tumors (e.g. pituitary)
- Inflammation (MS) Stroke
- Aneurysms Trauma
- Symptoms Bitemporal hemianopia Homonymous hemianopia
- Visual field testing can localize the problem

Posterior visual pathway





Eye is healthy, but out of focus

Visual acuity



Visual Acuity



Normal Eye and Refraction



Spectacle Correction of Myopia



Myopia- Nearsighted Eye



Hyperopic- Farsighted Eye



Hyperopic- Farsighted Eye



Astigmatism



Astigmatism



Presbyopia



Astigmatism



Presbyopia



Presbyopia



Presbyopia



Lens technology



Lens technology

(EOM)

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image)







Strabismus





Strabismus - 3 categories, different treatments

Restrictive
Paretic
Sensory
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Amblyopia

- Loss of vision due to unequal visual input between the two eyes
 - The brain ignores the lesser of the two inputs
 - Strabismus
 - Anisometropia
 - Opacities cataract, corneal scars
 Ptosis
 - Sometimes referred to as "lazy eye"
 Can occur in children up to
 - teenage years

Treated with patching, dilating drops

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Materials

- Soft most common, ~90% of wearers
 Multiple polymers, proprietary materials
- Oxygen: dK/t
- RGP "hard"
- Scleral
- Hybrid







- Multifocal
- Multirocal



Care

- Daily disposable CL
- Planned replacement CL
- Always use fresh solution (don't top off)
- Rub and rinse
- Never sleep in CL
- Never swim in CL
- Change CL cases



Questions or comments?

≫ Thank you.



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