

Building Your Own Medical Optometry Practice, Part 1: Medical Knowledge OUTLINE

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Course Description:

This course presents critical medical information for an optometrist to build their own Medical Optometry Practice. Prospective, multi centered, double blind studies are emphasized, photos of various diseases are presented and examples of actual patient care form the backbone of the course. A manual is given with the lecture. The lecture is shown with extensive graphs and diagrams. All photos and diagrams used in the slide presentation are listed in this outline from the left margin and are in italics. The “photos” and “diagrams” are copyrighted by the American Academy of Ophthalmology. Other photos and “patient examples” in the slide presentation are from my medical practice and represent real life examples of the diseases depicted. Diagrams reprinted in the manual itself are listed in the “text” section of this outline. The course is 14 hours long, broken into two 7 hour days. Materials for further study include the *Will’s Eye Manual* (a recent printing is given to all attendees), the *Neuro-Ophthalmology Review Manual* by Kline, the *Basic Clinical Science Course 13 volumes* by the American Academy of Ophthalmology, and *Effective Perimetry* by Heijl. The course also references 177 key articles from various journals and other sources, all of whom can be researched for further study.

Course Learning Objectives:

- To review the fundamentals of the eye exam.
- To review and emphasize the major research studies that form the basis of treatment for diseases that the average optometrist will encounter in a medical practice.
- To recognize diseases that are beyond the scope of a Medical Optometric Practice and when to refer those patients to specialists, similar to what a general ophthalmologist does.
- To review the treatments that will be most commonly prescribed for various diseases with an emphasis on glaucoma.
- Much of the material will focus on glaucoma recognition and treatment with an emphasis on recent large clinical trials and how they apply to the Medical Optometric Practice.
- A bound course manual and a copy of the will’s eye manual will be given to each participant.

Outline:

- Forward: my motive for writing this manual and hosting this CME

- The mission of my company in forming this lecture course
- Why and why not develop a Medical Optometry Practice?
- Critical issues for success in developing a Medical Optometry Practice

Exam basics:

A. Diseases you do not want to miss:

- The 4 A's
- B
- C
- D
- And 2 P's

A

- Patient example of retinal emboli with photo, was misdiagnosed as a glaucoma VF defect*
- Patient example of retinal emboli with photo, S/P heart transplant surgery*
- Patient example of retinal emboli with photo, unchanged photos from 2011 to 2013, with a negative cardiology work up*
- Patient example of retinal emboli with photo with a negative workup by cardiology*
- Photo of cherry red spot from CRAO is shown*
- Photo showing Horner's syndrome*
- Photo of ultrasound showing angle closure*
- Photo of angle closure with slit lamp view as well*
- Patient example of AION OD from Cialis, negative MRI of the brain, photos showing acute phase and stabilization of nerve*
- Patient example of old AION, a full work up was ordered by me*
- Photo of disk in GCA*
- Photo of GCA disk (C) with increased pallor next to non-GCA AION disk (A)*
- Photo of temporal artery biopsy*
- Photo showing non-arteritic AION disk*

B

- Photo of B scan being done on a patient*
- Photo of B scan of the posterior segment X 2*

C

- Photo showing hypopyon*

D

- Patient example of retinal detachment with photo*
- Photo of lattice degeneration with beginning RRD*

And 2 P's

- Patient with optic nerve drusen, multiple examples*
- Photo showing optic nerve drusen besides true papilledema*
- Photo showing true papilledema disk*
- Photo of meningioma on MRI X 3*
- Photo of optic chiasm showing location of pituitary gland to the optic nerves*
- Photo of disks in leukemic infiltration and papilledema OU*
- Patient example of true papilledema, no buried ON drusen, young pregnant female with headaches, sent to neurology*

Patient example of true papilledema, raised optic nerve not there 2010 but is 2014, patient did not do b-scan, negative MRI of the brain, patient sent to neurology

Patient example of pseudo-papilledema, optic nerve drusen visible on exam, no headaches

Patient example of pseudo-papilledema, optic nerve drusen visible on exam, no headaches

Patient example of pseudo-papilledema, optic nerve drusen visible on exam, no headaches

Photo of posterior optic neuritis with VF defect, disk photo and MRI result

Photo showing mucormycosis in diabetic patient

A table comparing 9 different symptoms seen with optic neuritis, papilledema, non-arteritic AION and arteritic (giant cell) AION is presented.

B. BCVA and the pinhole acuity with the importance of explaining less than pinhole 20/20 vision

C. Pupil exam:

-anisocoria and how to write a pupil exam in the record

-how to measure for the APD with a diagram of a normal pupil test, a pupil test showing an APD and an APD test testing for an APD with 1 fixed pupil

-what nerves supply the dilator and constrictor muscles of the iris?

-what are the causes of anisocoria worse in dim light?

The importance of neck pain in a new onset Horner's is explained

-what are the causes of anisocoria worse in bright light?

-light near dissociation, what it is and diseases that have this

Photo of Adies tonic pupil and LND

D. The external exam or the lid, lashes and lacrimal system exam

-what to measure in a ptosis patient with diagram

Photo of ptosis showing lifting of eyebrow

-proptosis

Photo of graves patient with CT of EOM's showing sparing of the tendons in TED

Photo of patient with TED and proptosis

-ectropion and entropion

Photo of patient with bad eyelid snap back test

Photo of blepharoplasty before and after

Photo of involuntional ectropion

-meibomianitis, ocular rosacea, blepharitis, and growths (covered later)

Photo of meibomianitis
Photo of angular blepharitis
Photo of demodex infection
Photo of acne rosacea patient X 2

-cranial nerve 2 through 7 exams

Photo of cranial nerve 3 patient
Photo of cranial nerve 4 patient
Photo of dermatome of cranial nerve 5
Photo of herpes zoster infection on face X 2
Photo of herpes simplex infection on face
Photo of 6th cranial nerve palsy
Photo of Bell's palsy 7th cranial nerve
Photo of patient with blepharospasm
Photo of patient with hemi facial spasm

E. Motility exam

- the 6 cardinal positions with a diagram showing them
- how to write over and under action of the EOMs
- definition of comitant and non-comitant deviations
- photo of EOM attachment onto the eyeball
- the clinical incidence of etiologies from a large community based study, shown as a bar graph and as a percentage of the total causes
- diplopia is rare in children with paralysis of EOM's, common in adults
- the 3 step superior oblique test

F. Visual fields:

1. Two diagrams of the individual fibers of the retina, showing the ganglion cell axons and how they form the pattern of VF loss seen in optic nerve diseases. One of the diagrams correlates the site of injury to the VF defect seen with that injury.

2. Optic nerve versus optic tract defects are explained

- signs that support an optic nerve disorder versus an optic tract disorder
- a diagram showing the VF defects at various point along the visual tracts

Patient example of a bitemporal VF loss that I diagnosed with a pituitary tumor, VF defect got better after surgery!

Patient example of a VF loss I diagnosed a pituitary tumor with

Patient example of VF loss from a CVA secondary to sepsis

Patient example of congenital optic atrophy OS with VF loss I diagnosed

Patient example of optic atrophy OS with VF loss

3. Common causes of pseudo glaucoma VF defects

-the importance of test variability in the ocular hypertensive study

4. The Humphrey visual field analyzer, the machine used in all large studies

- the distance between the spots in the 24-2 and 10-2 tests
- a diagram of the typical 24-2 test spot locations
- a diagram of those spots on the retina

5. Basics of the HVF analyzer's calibrations

- optical parameters of the Humphrey VF machine (HVF)
- how abnormal results are shown on the read out
- how to read a HVF test
- fixation losses
- false positives
- the falling asleep patient (cloverleaf) with 2 examples of a test print out
- the trigger happy patient test result with an example of the print out
- the pattern deviation plot
- the glaucoma hemifield test with a diagram simulating the areas correlated to the hemifield test from the AGIS study
- the new visual field index test with an example of the readout showing 5 year projected losses based on past rate of VF losses for the patient
- a number of studies that looked at rate of loss in glaucoma patients is reviewed
- a diagram showing how the rate of loss on a HVF accelerates as the loss progresses
- correlating both eyes visual fields and the importance of glaucoma treatment in CRVO's

G. The slit lamp exam

- what lens to use and why
- important items to look for in a slit lamp exam
- a photo of the 2 types of IOL's used in cataract surgery is shown

Patient example of iris atrophy from HSV infection

Patient example of lisch nodule in the iris

Photo of lisch nodules X 2

Patient example of a normal iris blood vessel X 2

Photo of NVI X 2

Patient example of large conjunctival blood vessel with negative TFT's and CT of orbits

Photo of conjunctival inclusion cyst

Photo of symblepharon from a Stevens Johnson patient

Photo of map/dot/fingerprint dystrophy

- the percentage of disk hemorrhages initially missed during the OHTS is reviewed

H. Binocular indirect ophthalmoscopy

- what lens to use and why

- how to determine which quadrant of the retina you are looking at during BIO
- scleral depression and how to do it with a diagram

I. Diseases:

I. 1. Glaucoma:

- the definition of glaucoma is given
- the goal of treatment is defined
- The causes of glaucoma are discussed

- two diagrams of the normal aqueous flow through the trabecular meshwork and uveal scleral pathway is shown
- two diagrams showing the resistance to outflow at the TM as seen in poag is shown

-The goal of treatment is discussed

- There are 2 main types of glaucoma, open angle (OAG) and closed angle (CAG)

-if there is an identifiable cause of the glaucoma, it is termed secondary glaucoma (secondary to the cause). Glaucoma without an identifiable cause is called primary.

A. Types of SOAG

- pigmentary dispersion syndrome
- what is causing it?

Photo of Kruckenburg's spindle

Photo of 4+ pigment in trabecular meshwork

Photo of pigment on zonules

Photo of above and transillumination defects on 1 slide

Photo of transillumination defects

- how to diagnose it
- prevalence studies of PDS in community based research
- risk of conversion to PDG
- pseudoexfoliation (PEX)

Photo of pseudoexfoliation on the lens X 3

Photo of 4 + pigment of trabecular meshwork in PEX

- prevalence studies
- studies that show the higher risk of glaucoma in PEX

-uveitic OAG

-Possner-Schlossman and fuch's heterochromic

Photo of small keratic precipitates in Possner-Schlossman

Photo of sarcoid mutton fat KP's

Photo of ANV in fuch's inridocyclitis OAG

-steroid induced

-angle recession

-when the glaucoma occurs

-increased episcleral pressure

-carotid-cavernous fistula

Photo of carotid-cavernous fistula

-sturge weber

Photo of patient with sturge weber on face

-ghost cell

Photo of ghost cells in the AC

B. What are the risk factors for POAG?

1. IOP

- a diagram of the goldmann tonometer endpoint is shown
- the definition of incidence and prevalence is explained
- graph from the Los Angeles Latino Eye Study (LALES) showing *prevalence* of OAG and that there is not one IOP that is safe and one that is not safe
- graph from the LALES showing the *incidence* of glaucoma development and that there isn't one IOP safe and one not safe
- a graph showing the *incidence* of developing OAG versus the IOP in the Barbados study is shown

At this point, an in depth discussion of pachymetry and which do we use, the corrected tonometry or non-corrected tonometry reading? This is a very important controversy undergoing today. The two opposing schools of thought are given by articles by Dr. Brandt and Dr. Weinrib which are given in their entirety at the end of the manual.

- questions from me regarding a thin cornea being regarded as a risk factor and not as a mis-measurement of the IOP are given

- a graph showing the *prevalence* data from the LALES broken down by corneal thickness versus the risk of developing OAG.

2. Age

- a graph showing the *prevalence* of OAG versus age in the Yazd study is shown
 - a graph showing the *incidence* of OAG versus age from 4 studies, the Melbourne, Rotterdam, Barbados and Dalby studies is reviewed
 - a graph of the *incidence* of OAG versus age from the Olmsted study is shown
- A diagram from the early manifest glaucoma trial (EMGT) is shown with a breakdown of the severity of OAG versus age
- these studies show that there is not one age that does not have a higher risk for OAG and the next year higher does have a higher risk, just like IOP

3. Family history

- controversial in the ocular hypertensive treatment study (OHTS) but is a widely recognized risk factor

4. Cup to Disk ratio

- as is seen in IOP and age, C/D ratio does not have one C/D that is OK and the next one higher associated with a higher risk of OAG

Patient example of a small optic nerve

Patient example optic nerve hypoplasia OS, normal optic nerve OD

Patient example of optic nerve hypoplasia and situs inversus

Patient example of optic pit OS in a poag suspect

- changes in the cup as measured by rim tissue thinning or blood vessel changes are very important in diagnosing glaucoma

Patient example of BV changes on serial disk photos

Patient example of BV changes on serial disk photos

Patient example of BV changes on serial disk photos

Patient example of BV changes on serial disk photos

Patient example of BV changes on serial disk photos

- a graph from the Singapore study of prevalence of OAG versus C/D ratios is shown, again showing the increase in risk with larger C/D ratios.

- the difference of rim tissue paleness and optic cup paleness is reviewed

5. Disk hemorrhages (DH)/ nerve fiber layer defects (NFLD)/notches of the rim tissue

- what risk the OHTS found for DH
- what percentage of DH were missed in the OHTS

Patient example of disk heme OD with NFLD OD with notch OU

Patient example of disk heme with a new diagnosis of diabetes

Patient example of disk heme with nflld defect also

Patient example of atypical disk heme

Patient example of disk heme OD not there in 2010, severe dry ARMD too

- notches and NFLD are reviewed
- a graph from the OHTS looking at DH rates between treated and untreated groups

Patient example of notches X 5

6. Asymmetry of C/D between the two eyes/in IOP between the two eyes and the diurnal curve in the same eye and the risk of OAG

- a graph of the Alice Williams study is reviewed showing the increase in risk of OAG the higher the difference is in IOP between the two eyes of a patient
- C/D asymmetry is reviewed for the European glaucoma prevention study and the blue mountain eye study

7. Race?

- the OHTS did not find race to be a significant risk factor for the development of OAG in its multivariate analysis
- the shortcomings of glaucoma risk calculators is discussed

C. Closed angle glaucoma (CAG)

Primary ACG:

- the etiology of primary CAG, how iris bombe defines primary ACG and the importance of LPI
- a diagram of angle closure is shown

Photo of ultrasound showing angle closure

Photo of angle closure with iris bombe with a slit lamp view

Photo of pupil in ACG showing mid-dilated position

Photo of iris bombe

- the importance of an LPI in primary AGC is discussed with the need for Iridoplasty if the iris is still closing off the trabecular meshwork

Secondary CAG:

- phacomorphic

Photo of subluxed lens

- neovascular, causes of NVG and the importance of PRP

Photo of NVI

Photo of PRP is shown

- plateau iris

-a diagram of iris plateau is shown

Patient example of what an Iridoplasty looks like from the slit lamp

- ICE syndrome

Photo of iris atrophy in ICE patient

Photo of trabecular meshwork in ICE patient

- ciliary block (malignant) CAG

Photo of patient with malignant glaucoma showing flat AC centrally and peripherally

- Topamax

- patients that have a high IOP despite a patent LPI have combined mechanism glaucoma

D. what are the risk factors for ACG?

PACG

- hyperopes above age 50

SACG

- CRVO > HRVO > BRVO

Photo of NVI is shown

Photo of CRVO is shown

Photo of ischemia from a CRVO on an IVFA is shown X 2

Photo of ischemia from BRVO initial and 4 months later on IVFA
Photo of PRP is shown
Photo of NVD is shown X 2

- ocular ischemic syndrome (OIS) and how it differs from diabetic retinopathy

- hyperopes above age 50

E. A list to think of in unilaterally high IOP is presented

- Possner-Schlossman

- NVG

- steroid responder including old episodes of high IOP

- Sturge-weber

- PDG

- ghost cell glaucoma

- ACG

F. Wild cards in glaucoma

1. Diurnal variation

- the advanced glaucoma intervention study (AGIS) is discussed with the higher risk of developing glaucoma with a higher diurnal variation in IOP

- the graph from the AGIS is shown

- the graph from a study of diurnal variation by Medeiros is shown

- graphs from 24 hour sleep studies showing erect and supine IOP patterns for normal younger and older people, untreated OAG people, and treated OAG patients is presented

2. optic nerve damage is permanent

3. visual field loss lags behind optic nerve damage

- studies by Harry Quigley are discussed with comparison between loss on manual VF and automated VF machines
- a graph showing rim tissue loss versus mean defect loss showing a non-linear pattern
- the Olmsted study showing the most important risk factor for the development of blindness is discussed

4. low tension glaucoma

- the results of the normal tension glaucoma study are discussed with relevance to IOP reduction
- a quote addressing any characteristic abnormalities of normal tension glaucoma is presented
- the differential diagnosis of low tension glaucoma is discussed including CNS tumors, AION, ON drusen, retinal conditions, optic atrophy, and optic nerve pits
- photo of an optic nerve meningioma on MRI

Patient example of an optic pit is shown

5. the percentage of patients with a normal IOP on exam is discussed

6. Variability of test results including VF as in the OHTS

G. What constitutes a glaucoma work up?

1. tonometry and how to perform it according to Zeiss

- photo of the mires in goldmann tonometry

2. corneal pachymetry

- diagram from the European glaucoma prevention study showing pachymetry readings versus age in 854 patients

3. optic disk photos and how often to do them

4. gonioscopy; what to look for, what to document and how, and how often to do it

- diagram of the gonioscopy view through the gonio lens X 2

- diagram of an open angle with estimation of the degree of the openness of the angle

5. visual fields and how often to do it

6. HRT and why it was developed and how often to do it

-a comparison of the 3 imaging systems for early glaucoma detection is presented

H. Why and how do we treat glaucoma?

-the studies that show lowering IOP lowers the risk of damage
- the early manifest glaucoma trial (EMGT) with a graph
- the OHTS with 15 year follow up with graph
- the normal tension glaucoma study (NTGS) with graph

-the time to progression with graph in the EMGT study for
high tension glaucoma
normal tension glaucoma
pseudoexfoliation glaucoma

The goal of glaucoma treatment is discussed

I. Treatment of glaucoma

- Xalatan; dosing and side effects
- beta blockers; dosing and side effects
- alpha adrenergic agonists; dosing and side effects
- carbonic anhydrase inhibitors; dosing and side effects
- SLT
-my personal approach to glaucoma treatment
- surgery; the tube versus trab study with a graph and discussion

Photo of low lying bleb from a trab surgery

-my approach to glaucoma treatment is again presented

L.2. Choroidal nevus:

- prevalence
- the comparative ocular melanoma study for small lesions (COMS) is discussed with relevance for clinical indications for a B-scan and follow up.

- the study by shields and the risk factors he found for metastasis from melanoma is presented. A quote giving the main clinical point from this study is given
- the mnemonic “to find small ocular melanomas” is given for growth of a nevus with relevance for clinical treatment
- the differential diagnosis of pigmented lesions of the retina is discussed

Patient example of choroidal nevus X 8

Patient example of choroidal melanoma X 2 that I diagnosed

Photo of melanoma

Patient example of metastatic lung cancer to choroid that I diagnosed

Photo of melanocytoma

Patient example of bear tracks

Photo of CHRPE

- a nevus requires yearly photos for life and this needs to be documented

CHRPE versus bear tracks is discussed

L.3. Meibomianitis:

- anterior versus posterior lid disease is discussed

Patient example of blepharitis and meibomianitis on 1 photo

Patient example of meibomianitis

Photo of ocular rosacea patient X 2

- the treatment of lid disease is outlined
- demodex infection of the eyelid is discussed with treatment

L.4. Dry eyes:

- the symptoms, diagnosis and treatment options are discussed
- artificial tears, restasis and punctal plugs are discussed

L.5. Plaquenil:

- the life time dose and how to calculate it, and the risk of retinopathy is outlined
- current recommendations from the American Academy of Ophthalmology for plaquenil screening is given

Patient example of plaquinil toxicity X 3

Photo of corneal verticillata

Photo of Tamoxifen retinal toxicity
Photo of mellaril retinal toxicity

L.6. Cataracts:

-the indications for cataract extraction is discussed

Patient example of subluxed lens

- complications of CE is discussed including endophthalmitis, TASS, and CME

Photo of endophthalmitis
Photo of retained cataract
Photo of CME on IVFA X 3
Photo of CME in retina

L.7. Ophthalmic migraine:

-a description of the symptoms is given

Photo of what a patient describes during an ophthalmic migraine episode

- when do you refer or get a MRI of the brain is discussed

- a classic migraine and the significance of the timing of the aura is discussed

L.8. PVD:

-2 diagrams of a PVD

-the 3 symptoms associated with a retinal tear from a PVD are given
- what is an anterior vitreal detachment?
- what is a posterior vitreal detachment?

-a diagram of scleral depression is shown

- what your role is in ruling out a retinal tear and what you need to do during an exam

Patient example of hemorrhage from a PVD X 2
Patient example of retinal detachment with photo
Photo of beginning RRD associated with lattice degeneration
Photo of horseshoe tear

- the risk factors for the development of a retinal detachment during a PVD are given
- the importance of the timing of the follow up is discussed

-diagram of pneumatic retinopexy is shown

L.8. Diabetes:

-type 1 and type 2 diabetes is reviewed

-diagram of normal foveal avascular zone is shown

- diagram of an enlarged FAZ from vein occlusions X 2

-a diagram of leakage in the retina with a corresponding OCT photo

-NVD and NVE is described

Photo of NVD X 3

Patient example of BDR X 1 Photo of NVI X 2

-a tractional retinal detachment (TRD) is described

Photo of TRD is shown with fibrosing bands

-what your main job is as a medical optometrists

- the 3 conditions associated with visual loss from diabetic retinopathy

Photo of IVFA and macular ischemia X 2 on IVFA

Photo of macular ischemia in BRVO X 2 on IVFA

Photo of ischemia in CRVO on IVFA

Photo of CME on IVFA

- the order of increasing severity of diabetic retinopathy from the DRS study

-IVFA photo of IRMA

- a brief summary of the ETDRS study of diabetic retinopathy is given

-the 4-2-1 rule and high risk non-proliferative diabetic retinopathy

- what clinically significant macular edema is and why the treatment of it is changing

-a diagram showing what micro-aneurysms look like

-a diagram showing what hard exudates look like

-a diagram showing what macular edema looks like

-a diagram showing what a focal macular laser treatment (FML) looks like

Patient example of microburst FML

- what a large population survey found for the chances of developing various types of retinopathy based on the number of years of having diabetes
- what the DCCT study showed as far as the risk of diabetic retinopathy development and blood sugar control

Diagram of graph showing mean glucose levels versus the A1C levels

- when to do pan retinal photocoagulation and why
 - a diagram of pre-retinal hemorrhage
 - a diagram of PRP is shown
 - a diagram of what PRP looks like in the retina

Photo of pre-retinal hemorrhage

- what else can look like diabetic retinopathy?
- what else can cause proliferative changes in the retina?

Photo of sarcoid sheathing is shown

L.9. Uveitis:

- definition of the 3 types of uveitis
- the importance of uveitis within 7 days of intra ocular surgery is explained
- what we treat in uveitis and what we do not treat
- the mnemonic for iritis is explained

Photo of fine KP's

Photo of mutton fat (large) KP's

- the mnemonic for HLA B27 diseases and work up is given
- the mnemonic for posterior uveitis and work up is given

Photo of active toxoplasmosis

Patient example of congenital toxoplasmosis scarring

- what additional disease is present in pars planitis
- the reason why brand name pred forte is used and not generic, my approach to getting the inflammation under control quickly, and how to approach use of pred forte in a steroid responder is explained

L.10. Keratoconus:

- when do you suspect keratoconus during an eye exam
- how you diagnose keratoconus
- what treatment options in contact lenses is probably the best currently is explained

L.11. Thyroid eye disease (TED):

- what is the problem in TED?
- what condition presents similarly to an acute TED episode and how do you differentiate between the two?
 - photo of TED on an MRI showing sparing of the tendons
- what is scleral show and what other conditions have scleral show?

Photo of exophthalmos with scleral show X 2

- what parameters are normal in a hertel exophthalmometer?
- the importance of not smoking is given
- what do you do every year for a patient with TED?

L.12. Corneal foreign body:

- how to take a corneal FB out is explained

Photo of corneal metallic foreign body

Photo of FB beneath upper lid

L.13. Red eye:

- what is Abelson's triad?
- what contact lens sterile infiltrates are and how you treat them is explained

Patient example of SEI in cornea from SCL's X 2

Photo of sterile infiltrates in a cornea

Patient example of deep corneal neovascularization

Patient example of ghost vessels in cornea

Patient example of torn SCL in corner of conjunctival sac

- the importance of dosing in corneal ulcers is explained
- which corneal ulcers do you treat and which do you send out?

Patient example of corneal ulcer X 2
Photo of acanthamoeba corneal ulcer
Photo of fungus corneal ulcer

- why don't we culture most corneal ulcers?
- which ulcers do you not treat with antibiotics and what do you do with those patients?
- the steroids for corneal ulcer trial results are explained
- how meibomianitis can also cause red eyes

Photo of acne rosacea
Photo of staph infection of the lid causing a red eye
Patient example of meibomianitis and blepharitis

- viral conjunctivitis causing red eyes
- herpes simplex and how do you treat it?

Patient example of corneal dendrite in a HSV keratitis
Photo of corneal dendrites
Photo of eyelid skin herpes simplex infection X 2
Photo of HZV X 4

- epidemic kerato conjunctivitis (EKC) and why it is a very serious disease
 - what can you do to significantly reduce the morbidity of EKC?

Photo of SEIs in EKC

- iritis is also in the red differential diagnosis
- allergic conjunctivitis and how do you treat it?
- bacterial conjunctivitis and why both eyes are treated when only one eye seems to have it
- episcleritis as a catch-all for what is left and how it is supposed to respond to generic PF to confirm the diagnosis

Photo of superior limbic conjunctivitis

L. 14. Retinal conditions:

- the prevalence of lattice degeneration and the risk of it turning into a retinal detachment is given

Photo of beginning RRD associated with lattice degeneration

Photo of laser retinopexy for peripheral retinal tear

- age related macular degeneration (ARMD) is defined

- the two types of ARMD is defined
- the major risk factors for the development of wet ARMD are given
- what your main job is and the treatment of patients with ARMD is reviewed
- the 3 stages of ARMD are given

Photo of drusen used to define sizes in AREDS 1 study

Patient examples of mild dry ARMD X 2

Patient examples of moderate dry ARMD

Patient examples of severe dry ARMD

Photo of severe dry ARMD

Photo of intra vitreal injection

Patient example of wet ARMD status post intra vitreal leucentis

- the AREDS 1 study results are reviewed
- the AREDS 2 study results are given and the reason for the second study are outlined
- the treatment of ARMD is reviewed
- what test has replaced IVFA for the diagnosis of wet ARMD?
- central serous chorioretinopathy (CSR) and who gets it
- what are the results of the laser for CSR study?

Patient example of acute CSR X 4

- what two common retinal conditions are caused by abnormal vitreal attachments?
- at what point do you refer a patient with a macular hole for surgery?

Patient example of macular hole X 2

Patient example of epiretinal membrane X 8

- color vision testing and the D-15 test

-diagram of the scoring card for the D -15 test

-various retinal conditions

Patient example of first diagnosis of retinitis pigmentosa
Patient example of flecked retinal syndrome
Patient example of deposits outside of the macula X 3
Patient example of Roth spot of patient on interferon
Patient example of lacquer cracks of the retina in a myope
Patient example of coloboma in a low myope
Patient example of a retinal macro aneurysm X 2

L. 15. Lumps, bumps and lesions

Growths outside the globe fall into two main categories

-1. Conjunctival lesions

- non-pigmented lesions

-the 4 signs of malignancy

Photo of conjunctival squamous cell carcinoma
Photo of conjunctival lymphoma X 3
Patient example of conjunctival lymphoid hyperplasia
Photo of CIN X 3
Photo of conjunctival inclusion cyst
Photo of conjunctival squamous papilloma
Photo of conjunctival tumor
Photo of cornea CIN

-pigmented lesions

-pigmented lesions in darkly pigmented people are usually benign, while those occurring in fair complexion people are a concern for potential malignancy

-PAM and BAM is reviewed

Photo of BAM X 2
Photo of PAM X 2

-which sized PAM is a concern for malignancy?

-when do you refer for biopsy?

Patient example of conjunctival nevus X 2
Photo of conjunctival nevus
Photo of conjunctival melanoma X 3

-nevus of ota in which patients is a concern for malignancy?

2. Eyelid lesions

-papillomas, xanthelasma, and cysts

Patient example of mulberry benign lesion X 3

Photo of molluscum contagiosum X 3

Photo of mili in eyelid

-2 important signs of malignancy

-what is the most common eyelid cancer?

-basal cell carcinoma, squamous cell, keratoacanthoma

-what signs do you look for to increase your concern for malignancy?

Patient example of basal cell carcinoma

Patient example of basal cell carcinoma

Photo of basal cell X 4

Photo of squamous cell eye carcinoma of eyelid

Photo of keratoacanthoma X 2

-how a Z-plasty is done

-what a Mohs surgeon is and why it is important

Photo of asteroid hyalosis

Photo of choroidal rupture

EXAMPLES OF GLAUCOMA DIAGNOSIS AND TREATMENT

Many examples of missed diagnosis, bad first time diagnosed and how to control high IOP patients, presented as time permits