

OCULAR COMPLICATIONS FROM DIABETES

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Disclosures

- Affiliations
 - Illinois College of Optometry
 - Concorida University of WI
 - North Shore Eye Health and Wellness
 - Industry/Corporate - NONE

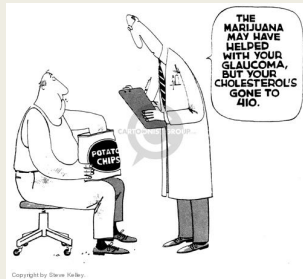


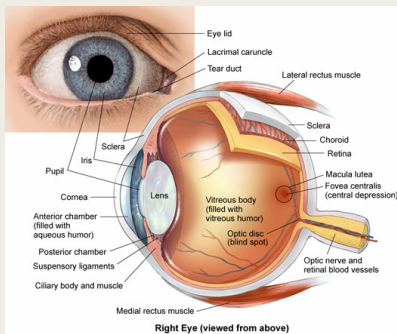
Course Objectives

- Review basic ocular anatomy
- Recognize common ocular complications from Diabetes
- Understand Proliferative vs Non Proliferative Disease
- Familiarize the ParaOptometric with follow up schedule and treatment paradigms for differing stages of disease
- Know how to take an appropriate diabetic case history



General Ocular Anatomy: 101





Posterior Segment

Vitreous Humor – semi solid substance, fills posterior chamber

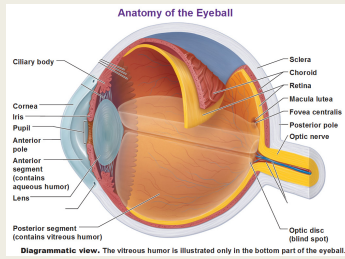
Retina – light sensing tissue

Choroid – vascular layer, between retina and sclera

Macula – portion of retina that represents central vision (best acuity)

Optic Nerve – bundle of retinal nerve fibers, sends information to brain

Central Retinal Artery/Vein/Saccades



Retina

10 Layers

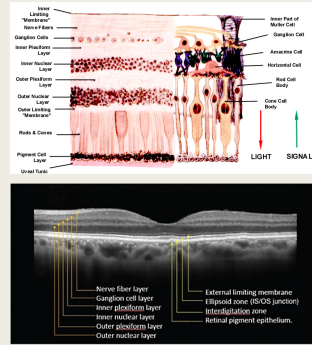
Backwards

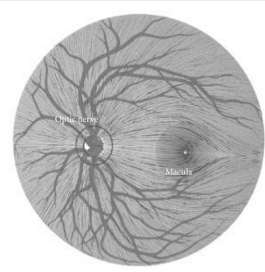
Photoreceptors

Rods

Cones

Axons = Retinal Nerve Fiber Layer

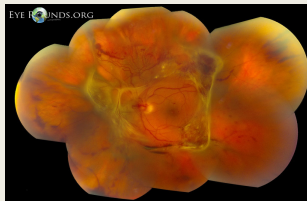




Tools of the Trade

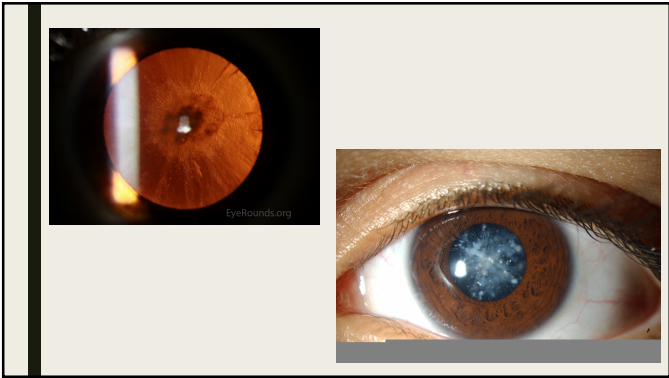


DIABETES AND THE EYE



Common Ocular Side effects of DM

- Refractive error shifts
 - Uncontrolled Blood Glucose levels = A1c 9% or greater
- Cataract development
- Secondary infections
- Glaucoma
- Diabetic retinopathy
 - 1st or 2nd leading cause of vision loss in US adults (battles with ARMD)
- Dilated eye exam required annually with all DM patients





Diabetic Retinopathy

Non Proliferative

- No new blood vessel growth
- Early stages, treatable

Proliferative

- New blood vessel growth
- Train is leaving the station
- Aggressive, severe sight implications

A microscopic image showing retinal cells. A prominent, elongated, and irregularly shaped cell with a blue nucleus and red cytoplasm is visible, surrounded by other cells with blue nuclei and red cytoplasm. This likely represents a cell involved in the neovascularization process.

Non Proliferative DM retinopathy

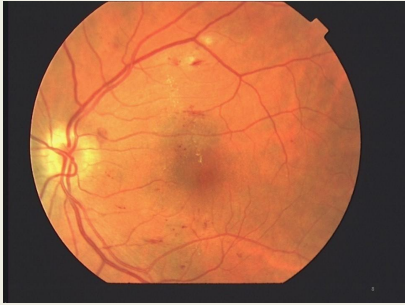
- Will be seen in nearly all DM cases – a matter of time
- Reversible or controllable
- Stages – direct follow up and additional care
- DFE to confirm stages
 - Mild – f/u q6-12 mos
 - Moderate – f/u q3-6 mos
 - Severe – f/u q1-3 mos
- Co-manage with PCP/endocrine to improve A1c control

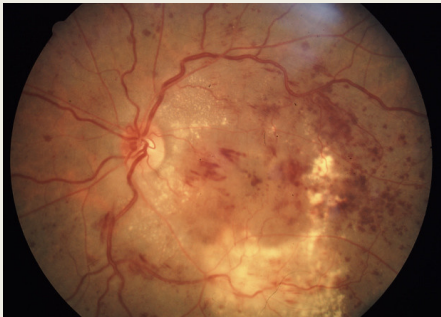
TABLE. Diagnosing Diabetic Retinopathy

DIABETIC RETINOPATHY LEVEL	RETINAL FINDINGS
Mild NPDR	MAs only
Moderate NPDR	At least one hemorrhage or MA, and/or at least one of the following: <ul style="list-style-type: none"> • Retinal hemorrhages • Hard exudates • Cotton wool spots • Venous beading
Severe NPDR	Any of the following but no signs of PDR (4-2-1 rule): <ul style="list-style-type: none"> • > 20 intraretinal hemorrhages in each of four quadrants • Definite venous beading in two or more quadrants • Prominent IRMA in one or more quadrants
PDR	One of either: <ul style="list-style-type: none"> • Neovascularization • Vitreous/preretinal hemorrhage

Abbreviations: IRMA, intraretinal microvascular abnormality; MA, microaneurysm; NPDR, nonproliferative diabetic retinopathy; PDR, proliferative diabetic retinopathy







Proliferative DM retinopathy

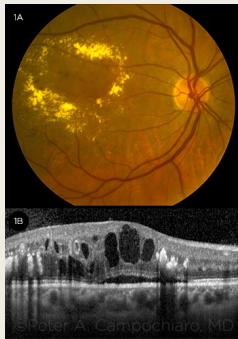
- Progression from NPDR***
- Neovascularization – ischemia, VEGF
 - Disc
 - Retina
 - Iris
- Needs surgical intervention
- Co-manage with PCP/endocrine to improve A1c control





Clinically Significant Macular Edema

- Leading cause of vision loss in diabetic population
- Can be found in proliferative and on proliferative disease states
 - Risk increases with level of disease
 - 3% of Mild NPDR, 40% of moderate to severe NPDR, 70% of Proliferative cases
- Blurs central vision

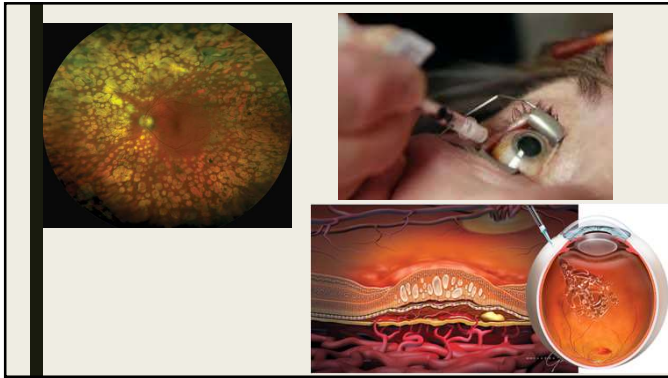


Treatment: NPDR

- ABCDEs – ETDRS findings
 - A1c – 6.5% or less
 - Blood Glucose control
 - Cholesterol control
 - Diet
 - Exercise
 - (no) Smoking
- Monitor closely with DFE, depending on level of disease state
- Identify progression of disease
- Identify and treat CSME

Treatment: PDR

- ABCDEs
- Monitor closely with DFE, depending on level of disease state
- Treat neovascularization
 - LASER – PRP, focal = kill metabolic demand
 - Anti-VEGF Injections (monthly, spacing out as able) – turn off the faucet
 - Avastin – generic, off label
 - Eylea
 - Lucentis
 - Treat complications from neo (glaucoma)
- Identify and treat CSME
- Treat RD if fibrosis



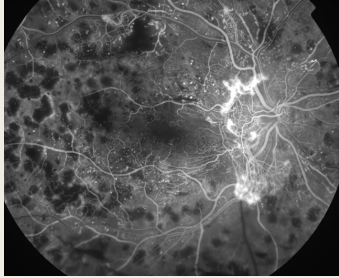
Treatment: CSME

- ABCDEs
- Monitor closely with DFE, depending on level of disease state
- Treat fluid
 - LASER - focal = kill metabolic demand
 - Anti-VEGF Injections (monthly, spacing out as able) - turn off the faucet
 - Steroid injections

Anti VEGF Injections

Drugs Available

- Avastin (generic)
- Lucentis (brand)
- Eylea (brand)
- General Dosing - series of 3 injections, q1mos for 3 mos, then spacing out additional 2 weeks until stable
- Monitored via OCT and FANG



Prevention – with each patient touch point

- Role of the ParaOptometric Assistant
 - Appropriate Case History
 - A1c
 - Blood sugar range
 - Length of time under treatment
 - Update medications
 - Review ABCDEs with all DM patients
 - Educate
 - Ensure appropriate follow up is scheduled
 - Don't let your patient fall through the cracks

Questions?

Thank you!
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