


Urgency of Retinal Referrals

Dr. Sherrol Reynolds

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WELCOME!




Host: Dr. Jennifer Stewart





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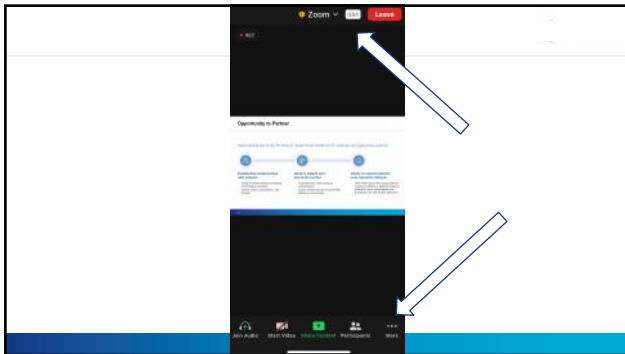


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- For each hour of CE units, attendees must be online for a minimum of 50 minutes
- For a COPE certificate, please fill out the survey link in the chat. Also, the survey link will appear when the webinar ends.
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- **CE certificates will be emailed within 4 weeks**
- Ask questions using the **zoom on-screen floating panel**

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Speaker Bio –

Dr. Sherrol A. Reynolds is a graduate of the University of Florida and Nova Southeastern University College of Optometry. She is an Associate Professor of Optometry at Nova Southeastern University College of Optometry and the director of the Retina Clinic. She is a Fellow in the American Academy of Optometry and the Optometric Retina Society.

She served as president of the National Optometric Association (NOA) from 2017-2021 and currently serves as past president. She was awarded the National Optometric Association Optometrist of the Year in 2013. She is the recipient of the 2021 Women in Optometry Leadership award and the American Optometric Association (AOA) 2021 President's Award.

She is a planning group member of the National Eye Institute (NEI) National Eye Health Education Program (NEHEP) and currently co-chair the Eye Health, My Health: Eye Health for African Americans. She participated in numerous events addressing diversity, inclusion, and equity (DEI) in the profession, including the SUNY Race in Optometry panel series. She also served as a member of the Prevent Blindness scientific committee, served as chair of the Florida Optometric Association Healthy Eye Healthy People committee, Women in Optometry Board member, and a monthly columnist for the Optometric Management Journal Retina column.

Dr. Reynolds was the only optometrist who contributed to the 2022 American Diabetes Association (ADA) Compendia that provided health care professionals with up-to-date information and best practices for treating diabetes and related complications.

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All financial relationships have been mitigated.

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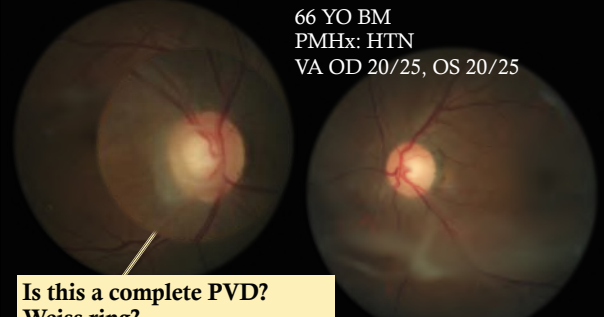
Disclosures

- Dr. Sherrol A. Reynolds
- American Diabetes Association (ADA), Allergan, VSP, and Iveric Bio

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- Learning Objectives:**
1. Discuss essential tools in examination of retina for assessment leading to a proper diagnosis of conditions requiring urgent referrals.
 2. Appreciate the latest technologies in early diagnosis including multi-modal imaging with OCT, angiography (OCTA), enhance-depth imaging (EDI), and ultra-widefield imaging).
 3. Discuss the clinical course and expected outcomes for commonly encountered retinal conditions that require urgent referrals.
 4. Review management strategies and preferred practice guidelines for commonly encountered retina disease that require urgent referral

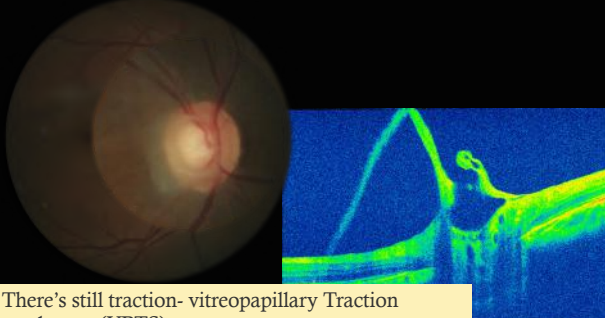
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66 YO BM
PMHx: HTN
VA OD 20/25, OS 20/25

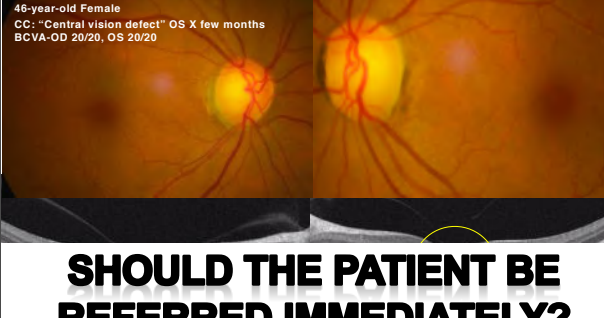
**Is this a complete PVD?
Weiss ring?**

10



There's still traction- vitreopapillary Traction syndrome (VPTS)

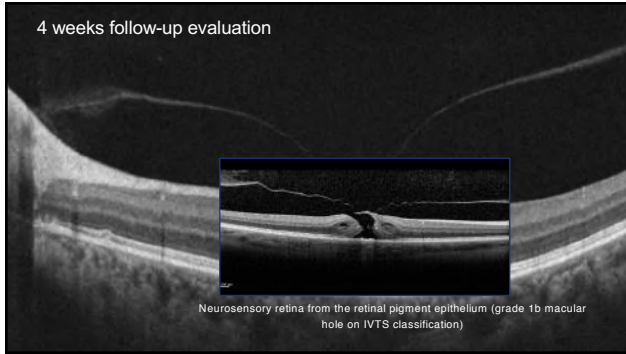
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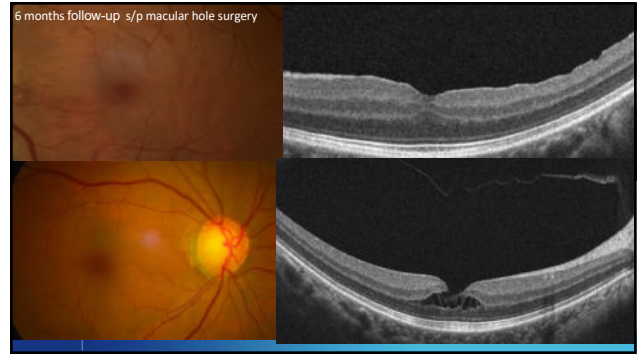
46-year-old Female
CC: "Central vision defect" OS X few months
BCVA-OD 20/20, OS 20/20

SHOULD THE PATIENT BE REFERRED IMMEDIATELY?

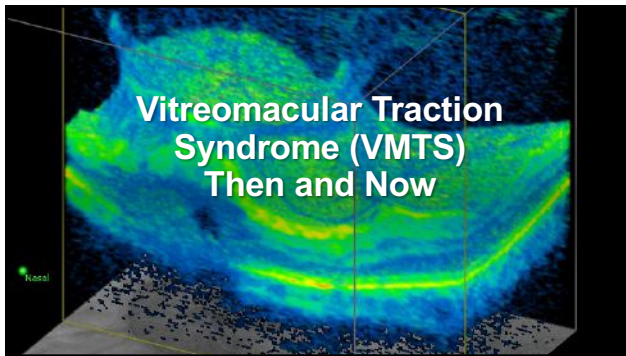
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| Entity | OCT based definition | Additional features | Symptoms | Corresponds to full thickness macular hole (FTMH) stage |
|------------------------------|--|---|-----------------------------|--|
| Vitreomacular adhesion (VMA) | The following must be present on at least one OCT B-scan image: (I) Partial vitreous detachment as indicated by elevation of cortical vitreous above the retinal surface in the perifoveal area (II) Persistent vitreous attachment to the macula within a 3-mm radius from the center of the fovea (III) Acute angle between posterior hyaloid and inner retinal surface (IV) Absence of changes in foveal contour or retinal morphology | | None | Stage 0 (Other eye should have full thickness macular hole) |
| Vitreomacular traction (VMT) | The following must be present on at least one OCT B-scan image: (I) Partial vitreous detachment as indicated by elevation of cortical vitreous above the retinal surface in the perifoveal area (II) Persistent vitreous attachment to the macula within a 3-mm radius from the center of the fovea (III) Acute angle between posterior hyaloid and inner retinal surface (IV) Presence of changes in foveal contour or retinal morphology (V) Distortion of foveal surface, i.e. retinal structural changes such as pseudocyst formation, elevation of fovea from the retinal pigment epithelium (RPE), or a combination of any of these three features (VI) Absence of full thickness interruption of all retinal layers | Foveal pseudocyst, macular thickening, retinal capillary leakage (typically related VMT alone does not cause leak on fluorescein angiography), macular schisis, cystoid macular edema, central serous chorioretinopathy | Reduced or distorted vision | Stage 1 (VMT only), i.e. depending macular hole OR Stage 2 (VMT with small residual FTMH) OR Stage 3* (VMT with medium/large FTMH) |

The International Vitreomacular Traction Study Group. Classification of Vitreomacular Adhesion, Traction, and Macular Hole. Ophthalmology. 2013; 120(12):2611-2619

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Vitreomacular Traction Study (IVTS) Group (Duker, 2013)

| | |
|------------------------------|--|
| Vitreomacular adhesion (VMA) | (I) Focal: Width of attachment <1500 μm (II) Broad: Width of attachment >1500 μm (III) Concurrent: Associated with other macular abnormalities (e.g. age-related macular degeneration, retinal vein occlusion, diabetic macular edema) (IV) Isolated: Not associated with other macular abnormalities |
| Vitreomacular traction (VMT) | (I) Focal: Width of attachment <1500 μm (II) Broad: Width of attachment >1500 μm (III) Concurrent: Associated with other macular abnormalities (e.g. age-related macular degeneration, retinal vein occlusion, diabetic macular edema) (IV) Isolated: Not associated with other macular abnormalities |

Focal VMT or V shaped

J-shaped VMT

Ophthalmology 2013; Dec; 120(12): 2611-9

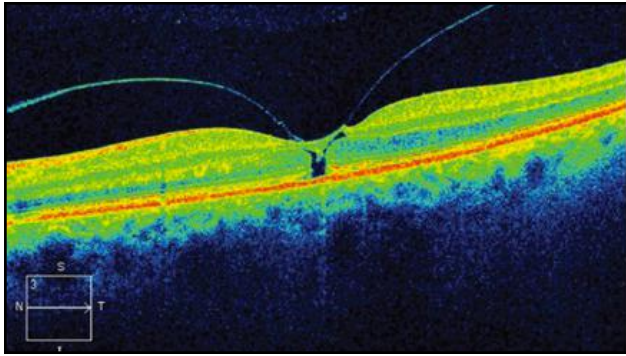
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Predictors of Vitreomacular Traction Release

- VMT- Classified by the degree of **inner-only** versus **both inner and outer** retinal involvement
- Spontaneous resolution
- 10–32% of VMT with only inner retinal distortion are more likely to have spontaneous resolution of traction compared with those who had both inner and outer retinal distortions.

Clinical course of vitreomacular traction managed initially by observation. Ophthalmic Surg Laser Imaging Retina 2011; 40(10):171-176


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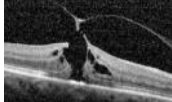
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VMT/ Macular Hole
"Urgency" and "Emergency"


Macular Hole 2023: Classified by size



Small ≤ 250µm



Medium >250- 399 µm



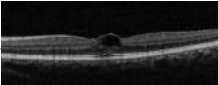
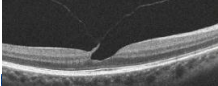
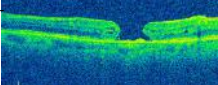
Large > 400µm

Cause -- primary or secondary/ Presence of absence of VMT

The International Vitreomacular Traction Study Group Classification of Vitreomacular Adhesion, Traction, and Macular Hole. Ophthalmology. 2013;120(12);

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Macular Hole 2023
Three stages of a macular hole

- Stage 1-Foveal detachments-----
- Stage 2- Partial-thickness holes-----
- Stage 3- Full-thickness holes -----

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Table 1 Classification in Idiopathic Macular Holes


| Stage in Common Use for Full-Thickness MH | Gas-Based Classification | IVTS Classification |
|---|---|---|
| 0 | Previous MH with no foveal architecture changes and VMA in the fellow eye | VMA |
| 1 | Impending macular hole with foveal architecture change | VMT without MH |
| 2 | MH with preexisting VMA | Small-sized or medium-sized MH with VMT |
| 3 | ≥ 400 µm MH without VMA | Medium-sized or Large-sized MH with VMT |
| 4 | MH with complete vitreous separation | Any sized MH without VMT |

***** small or medium Macular Hole needs referral within 72 hours to retinal specialist**
******Closure rates ~90% in small and medium macular holes, whereas large and chronic macular holes have lower and more variable rates of closure.**

The International Vitreomacular Traction Study Group Classification of Vitreomacular Adhesion, Traction, and Macular Hole. Ophthalmology. 2013;120(12);

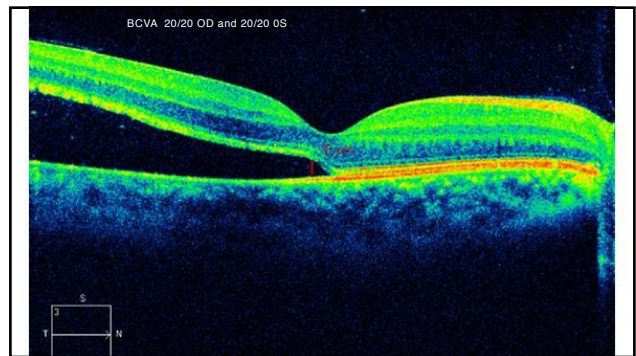
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52 yo BM c/o loss of vision OD X 2 days. Reported experiencing flashing of light /floaters X 3 weeks prior



IS THE FOVEA OFF OR ON?

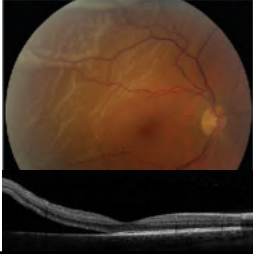
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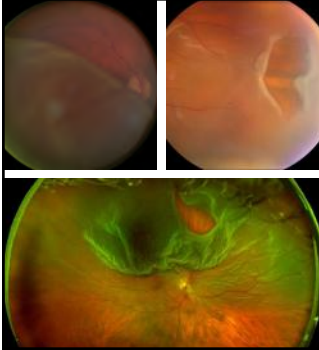
Retinal detachment "Urgency" and "Emergency"

Macula-on vs. Macula-off: The most important factor



- Same-day referral**
 - Surgery should be performed within 24 hours.
 - Leads to excellent anatomic and visual outcomes

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Risk Factors for progression of macula on to macula-off

Progression of retinal detachment occurs due to the forces on the retina by the ocular and head movements, and gravity.

- Superior-especially superotemporal retinal detachments
- Bullous retinal detachment
- Subretinal fluid within 1 disc diameter of the fovea,
- Larger or giant retinal tears,
- Liquified vitreous (old age)
- Equatorial tears have a greater chance of progression than tears at the ora serreta

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Surgical intervention for Macula-off RD Paradigm Shift

- 7-to-10-day window was considered standard practice for macula-off rhegmatogenous retinal detachment (RRD)
- Recent studies- growing evidence that earlier interventions within 72 hours (1-3 days) may be associated with improved visual outcomes

Lee CS, Shaver K, Yun SH, et al. Comparison of the visual outcome between macula-on and macula-off rhegmatogenous retinal detachment based on the duration of macular detachment. BMJ Open Ophthalmology 2021;5

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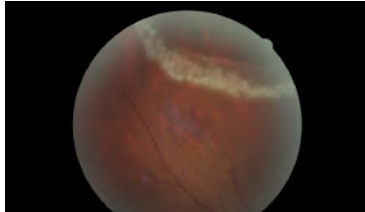
Ominous Vitreous Clinical Signs

- Pigment (Shafer's sign)**
 - Tobacco Dust
- Hemorrhage**
 - Vitreous hemorrhage has been reported to occur in 6% to 18% of symptomatic PVDs
- Inflammatory cells**
 - Pars planitis
 - Chorioretinitis
 - AC spillover



EyeRounds.org

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Retinal detachment Management

Depending on the extent of retinal detachment and location of retinal breaks, management can be:

- Laser barrage/ delimiting laser photocoagulation
- Pneumatic retinopexy
- Scleral buckle
- Vitrectomy

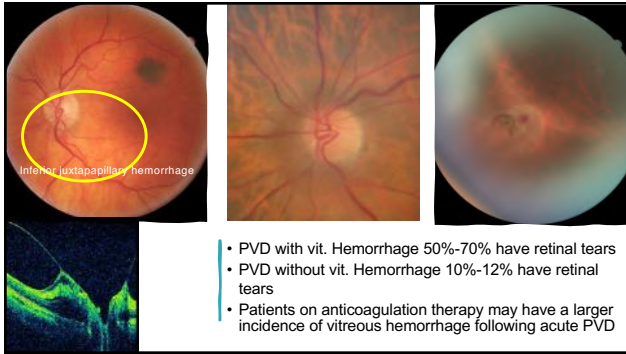
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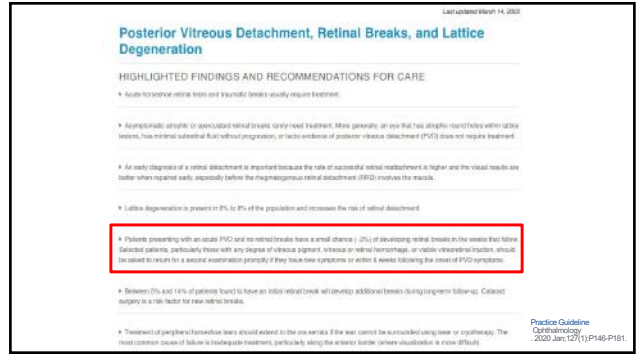
Posterior Vitreous Detachment (PVD)

- Assume there is a tear
- If there is no tear or not sure, refer immediately
 - Timely referral 1-3 Days**
- If no tear, re-evaluate in 3-6 weeks

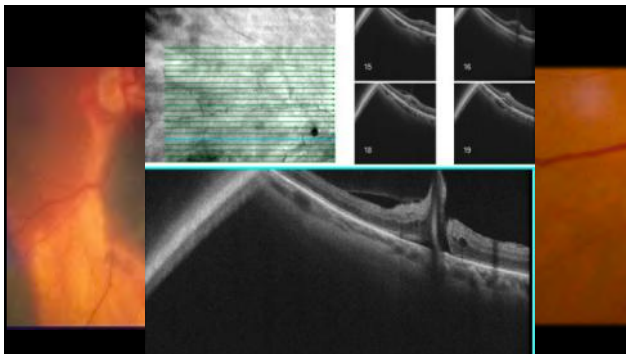
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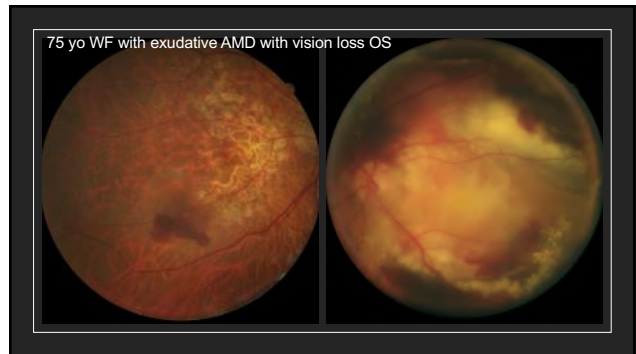
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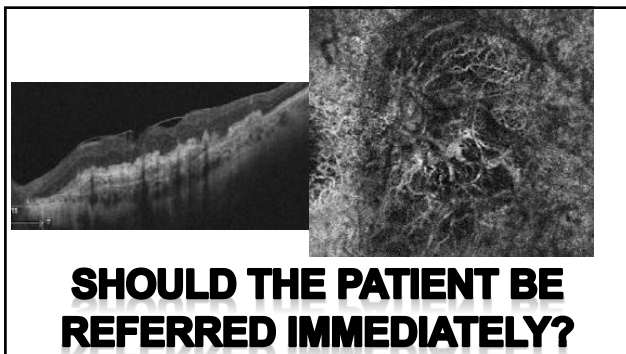
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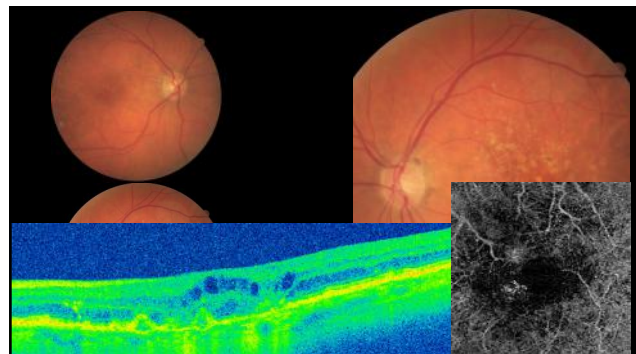
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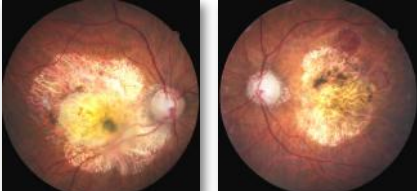
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Choroidal Neovascular Membrane (CNVM) decision "Urgency" and "Emergency"

- If suspect CNV
- Refer to retinal specialist within 72 hours
 - CNVM can grow 5-10 microns/day




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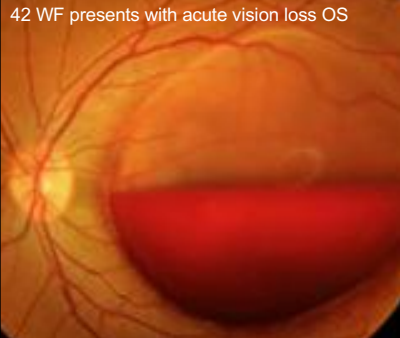

Current ARMD Options

- Macular Photocoagulation – used Rarely – "Extra-Macular lesions"
- Photodynamic therapy – used Rarely – PCV, chronic leaking growing lesions with scars
- Macugen – used "maybe never" very ineffective but still available
- Avastin – used with step therapy and for cost reasons
- Lucentis
- Eylea
- Beovu – used rarely – unresponsive CNV
- Vabysmo - increasing usage due to improved duration and efficacy
- Susvimo –rarely used – new technology – few trained surgeons
- Biosimilar Lucentis – usage will start soon and be dictated by insurance



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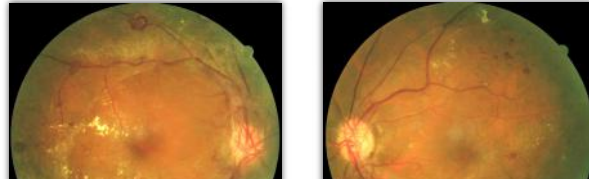
42 WF presents with acute vision loss OS

Complete blood re-absorbance
VA resolution

40

55 yo BM c/o Blurry vision OU X few months
BCVA: OD 20/50 (NIPH), OS 20/30
AIC:11



SHOULD THE PATIENT BE REFERRED IMMEDIATELY?

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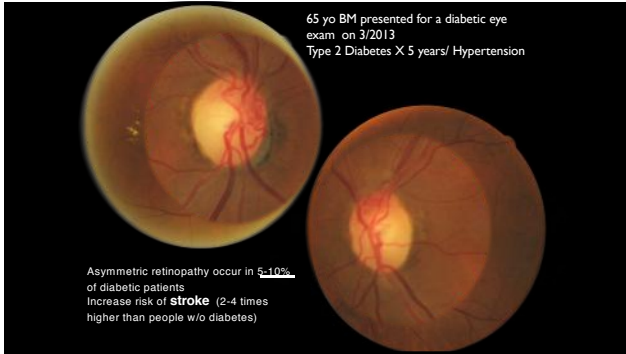
High Risk Characteristics (HRCs)



- (1) Neovascularization within 1 disc diameter of the optic disc (NVD) 1/4-1/3 disc area in size or larger
- (2) Any NVD associated with preretinal or vitreous hemorrhage.
- (3) Neovascularization elsewhere (NVE) associated with preretinal or vitreous hemorrhage.



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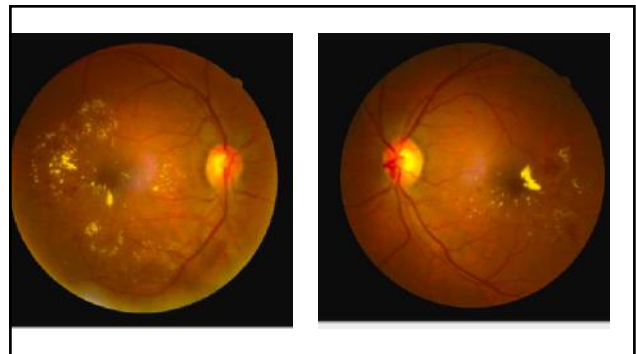
| Disease Severity | Definition | Management | Natural History |
|--------------------------|---|---|--|
| No retinopathy | Diabetic retinopathy absent | 12 months | |
| Mild NPDR | MA only | 12 months | 5% risk of progression to proliferative diabetic retinopathy (PDR) within one year. |
| Moderate NPDR | MA plus, exudates, cotton wool spots, retinal hemorrhages, intraretinal microvascular abnormality, venous beading | Three to six months *Depends on severity of signs, stability, systemic factors, and patient's glycemic control | up to 27% risk of progression to proliferative diabetic retinopathy (PDR) within one year. |
| Severe NPDR (4-2-1) rule | Severe retinal hemorrhages in four quadrants, or venous beading in at least two quadrants, or moderately severe intraretinal microvascular abnormality in at least one quadrant | Two to three months | Proliferative diabetic retinopathy in up to 50% within a year |

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Proliferative Diabetic Retinopathy "Urgency" and "Emergency"

| PDR | Neovascularization Vitreous Hemorrhage | Retina referral within one week |
|-----|--|---|
| | High Risk: 1. NVD > 1/4 to 1/3 disc area 2. Any NVD associated with vitreous or preretinal hemorrhage 3. Any NVE associated with vitreous or preretinal hemorrhage | Retina referral within one day to two days |

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Diabetic Macular Edema (DME)

No DME

- No retinal thickening or hard exudates in the macula

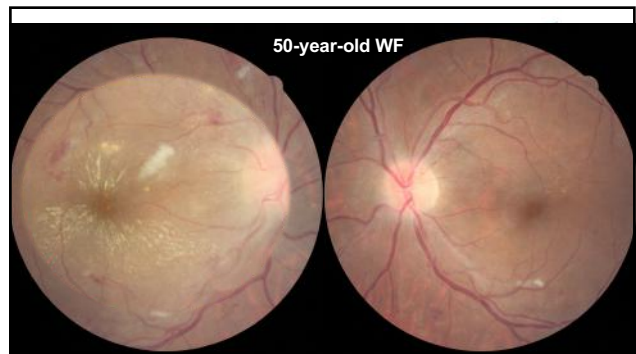
Center-Involved DME (CI-DME)

- Retinal thickening in the macula that involves the central subfield zone that is 1 mm in diameter
- Central subfield thickening (CST) $\geq 305 \mu\text{m}$ in women and $\geq 320 \mu\text{m}$ in men by optical coherence tomography (OCT)
- Retina referral within one week to two weeks**

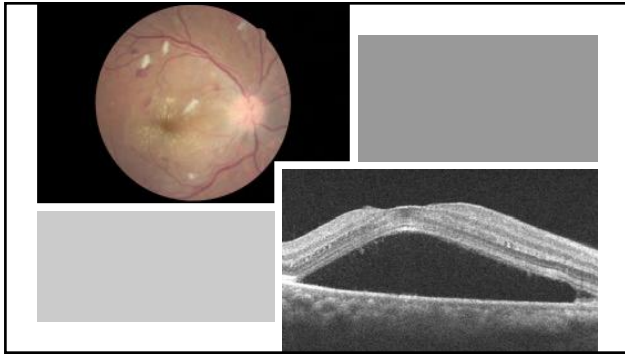
Non-center Involved DME (non CI-DME)

- Retinal thickening in the macula that does not involve the central subfield zone that is 1mm in diameter
- Monitor closely. Retina within three months.

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This slide features an ECG tracing at the top showing a regular rhythm. Below it is a clinical decision flowchart. A red box on the left contains the text "More Information". A red box on the right contains "BP in office 195/120mmHg". Two teal boxes are connected to the red box by a bracket: "What's the Dx?" and "How should condition be managed?".

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Hypertensive Crisis

Urgency

- Severe Hypertension (> stage2)
- + **NO** End Organ Damage
- Usually due to under-controlled HTN

Emergency

- Severe Hypertension
- Severely elevated BP ($\geq 180/120$ mmHg)
- + **End Organ Damage**

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Hypertensive Urgency

Goal: Reduce BP over several hours to day

- Elderly at high risk of ischemia from rapid reduction of BP, therefore slower reduction in BP in this patient population

Treatment

- Initiate medication
- Increase dose of existing medication or add another medication
- Re-institute medication(s) in non-compliant patients

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Hypertensive Emergency

Medical Emergency

Goal: Lower Diastolic BP to approximately 100-105 over 2-6 hours

- Anti-hypertensive agents (IV drip) for and admission to ICU
- Maximum initial fall not to exceed 25%
- More aggressive decrease (abrupt drop in BP) can lead insufficient perfusion pressures and organ damage
- Ischemic stroke and myocardial ischemia

Treatment

- If focal neurological symptoms present, obtain MRI to r/o acute stroke (rapid BP correction contraindicated)
- **The mortality rate is 50% at 2 months and 90% at one year if untreated**

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Retinal Vein Occlusion (RVO)

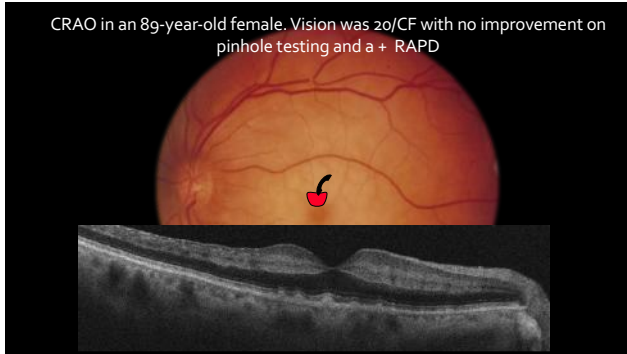
Non-Ischemic CVRO

- Better vision and prognosis for spontaneous visual improvement
- 14% convert to ischemic within 4 months
- 1/3 with NVI / NVA

Ischemic CRVO

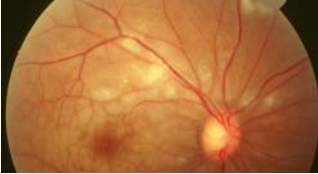
- Vision often < 20/200
- +APD
- Greater VF deficits
- Widespread capillary non-perfusion on FA (> 10 DD)
- NVG
 - As high as 60% vs 5% Nonischemic
 - "the three-month glaucoma"
- <10% developed retinal neovascularization

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CRAO MANAGEMENT 2023 EMERGENT STROKE EVALUATION



Acute, symptomatic OAO, CRAO, or BRAO from embolic etiologies should prompt an **immediate referral** to the nearest stroke referral center for prompt assessment for consideration of an acute intervention.

Transient ischemic attack often warning of a stroke

Retinal and Ophthalmic Artery Occlusions Preferred Practice Pattern®. Ophthalmology. 2023; 132(2):226-237

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Diffusion-weighted MRI for evaluation of acute stroke

MRI and Acute Stroke

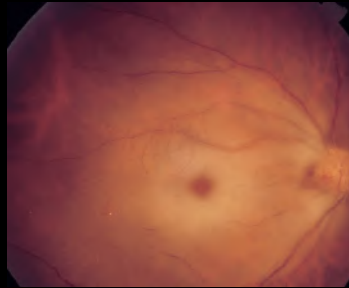
T2-wt.

DWI

Diffusion-weighted imaging (DWI) is a form of MR imaging based upon measuring the random Brownian motion of water molecules within a voxel of tissue. In general simplified terms, highly cellular tissues or those with cellular swelling exhibit lower diffusion coefficients. Diffusion is particularly useful in tumor characterization and cerebral ischemia.

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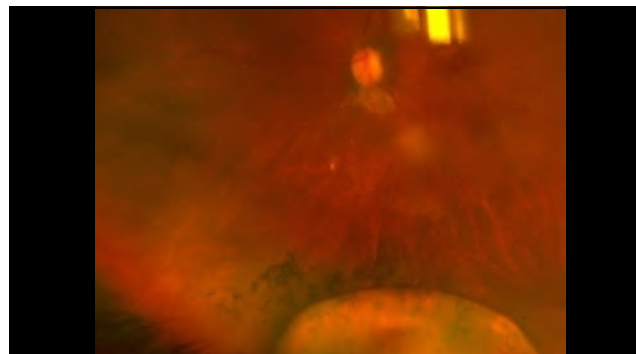
Giant Cell Arteritis- GCA




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Post- Surgical Retinal Emergencies

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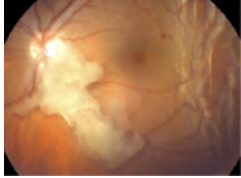


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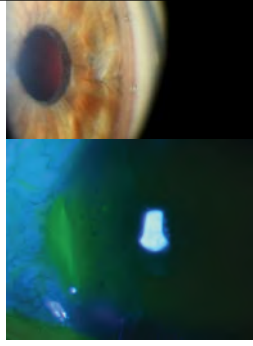
Retained visco-elastic material

Visco-elastic material (Healon)

- Must be COMPLETELY removed before finalizing surgery
- Material can clog the angle and TM causing acute spike in IOP with pain, nausea and vomiting



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Presence of choroidal effusions

- Wound leak
 - + Seidel test
- Low IOP
- Decreased vision
- Shallow anterior chamber

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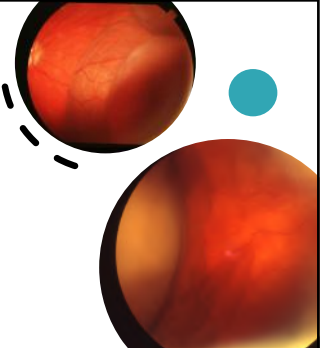
Choroidal Effusion

Immediate use of cycloplegics and topical steroids to restore normal vascular permeability

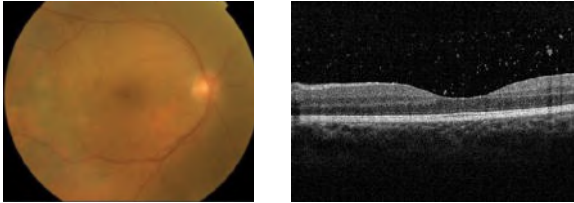
Treat any leak

Surgical intervention with fluid drainage indicated when Lens-cornea touch. **Operate within 12 hours**

Kissing choroidals- urgent referral to surgeon



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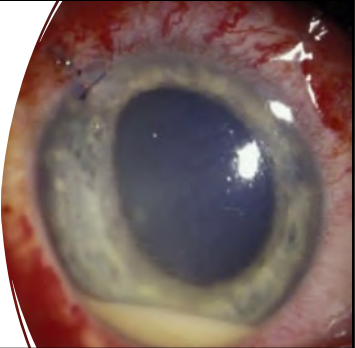


65-year-old with blurred vision after cataract surgery


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Exogenous or Endogenous Endophthalmitis

- Exogenous-
- Endogenous
 - Bacterial or fungal endogenous chorioretinitis +/- vitritis
- Immediate referral
- Control Inflammation



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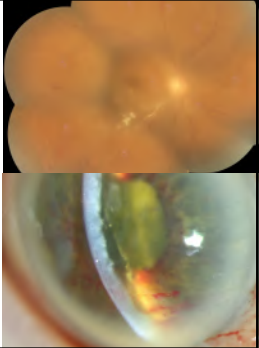
Intravitreal injections

- Vitreous Floaters
- Increase IOP
- Inflammation
- Retinal detachment
- Endophthalmitis

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Beovu Problems

- Approved Oct 2019
- FDA update warning June 2020
- Multiple ongoing studies halted
- 4% patients treated beyond 3 doses
- Intraocular inflammation
- Retinal Vasculitis
- Retinal Vascular Occlusion
- Blindness

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FDA approval October 2021

- Permanent, refillable intraocular implant
- Customized formulation of ranibizumab
- Implant surgically placed at the pars plana
- Refills performed in office

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10.20.2022

Genentech Voluntarily Recalls Susvimo Ocular Implant for Wet AMD

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Roche and Genentech announced a voluntary recall of the Susvimo (ranibizumab injection) ocular implant for wet AMD, citing a manufacturing problem with the device. In addition, the companies announced that new implantations, including in ongoing global clinical trials, have been paused.

The voluntary recall, which comes a year after FDA approval, is based on recent testing of its commercial supply in which Susvimo implants were exposed to repeated puncturing with a needle. The results showed that some implants did not perform to the company's standards," according to a Genentech statement.

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Conclusion


True Emergencies: SAME-DAY REFERRAL

- Macular-on/ Superior Retinal Detachment (RD)
- Endophthalmitis
- Malignant HTN
- CRAO

Timely Referral for most Retinal Urgencies

- 1-3 Days

Important to also consider the patient's perception (right or wrong) and feelings)




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If you have any questions, you may send an email to: Sherrolrey@gmail.com

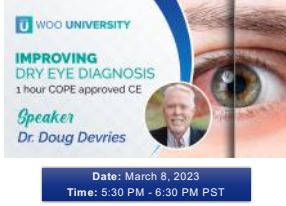
Thank You!


Sherrol A. Reynolds OD, FFAO



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 Thank you! Please join us for our next COPE events

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