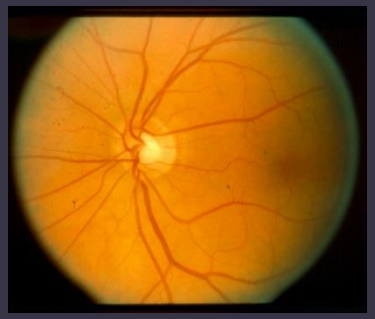


Ophthalmology in Primary Care:
Funduscopic exam

ACP Board Review Course
July 20-22, 2022

Joyce Wipf, MD, FACP

Funduscopic Pearls: *What do we really need to know in primary care?*

- Recognize normal
- Recognize papilledema
- Screen for glaucoma in primary care by hx and fundus exam
- Diabetes: ophthalmology f/u per guidelines or sooner if vision change

How to use the Funduscope

- Think of it as looking through a window, best view is up close
- Can wear your own glasses
- Examine pt's R eye with your R eye, and pt's L eye with your L eye
- Turn disc to +15 diopters and view from ~12 inches away, allows you to view orange "red" fundus reflex

How to use the Funduscope -- II

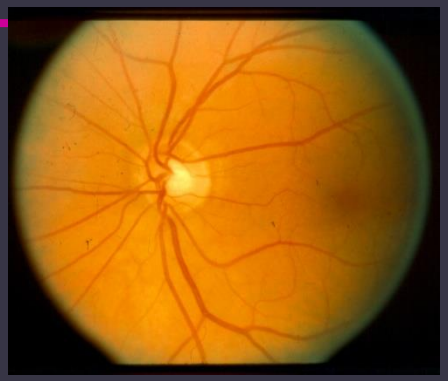
- Reduce to +10 diopters, move in closer
- Gradually dial down from +10 across 0 to –15 until disc comes into view
- Green filter helpful for viewing hemorrhages
- Look at macula last (tell pt to look into the light)

- Handheld direct ophthalmoscopes for better view without dilation

Case 1.

A 26 y.o. woman with obesity presents to the ED for evaluation of severe headache x 2 days. She has had headaches intermittently for years, worsening the past 6 months. She has had no vision loss but has mild photophobia when the headache is severe. She denies fever, resp sx, postnasal drip or facial pain.
Medications: OCP (oral contraceptive)

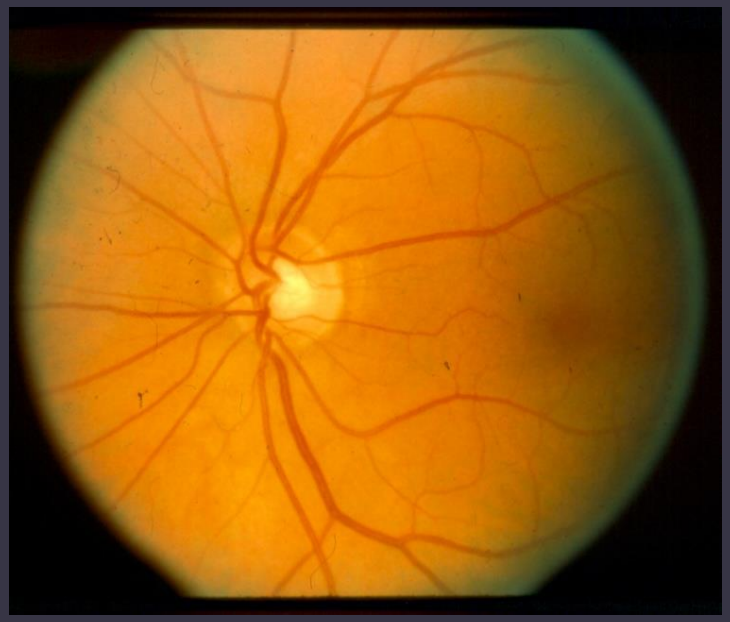
Exam:
BP 140/90, p 80
Skin neuro exam - non focal.
Fundus shown



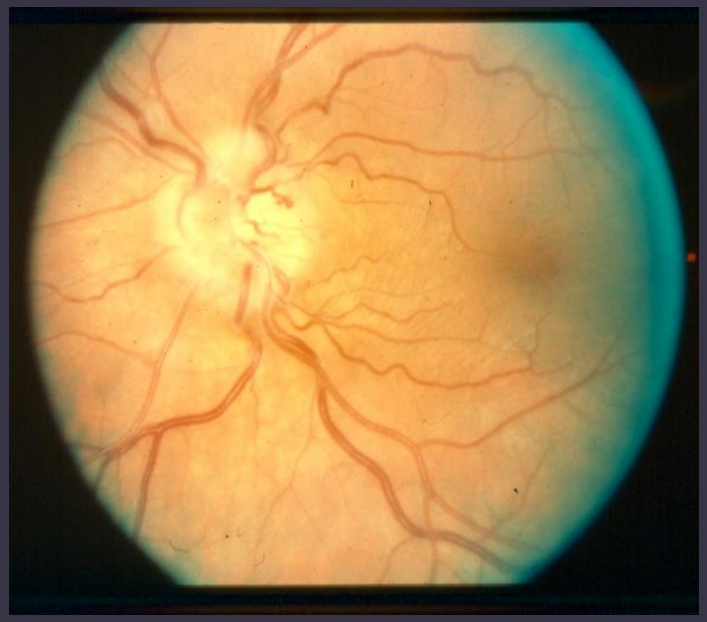
Case 1.
What is the most appropriate management of this patient?

A. Treat with analgesics, reassurance and follow-up with her primary provider if the headache persists
B. Obtain an MRI scan of the head to rule out tumor and multiple sclerosis
C. Obtain a CT scan to rule out subdural hematoma and tumor
D. Work up for pseudotumor cerebri
E. Obtain neurology consult

Normal Fundus



Papilledema



EXAMPLE of a Pseudotumor cerebri case

A 26 y.o. woman with obesity presents for evaluation of severe headaches for the past 6 months. She also reports short 15-30 second episodes of transient visual loss occurring several times a week. She has frequent nausea but no vomiting.

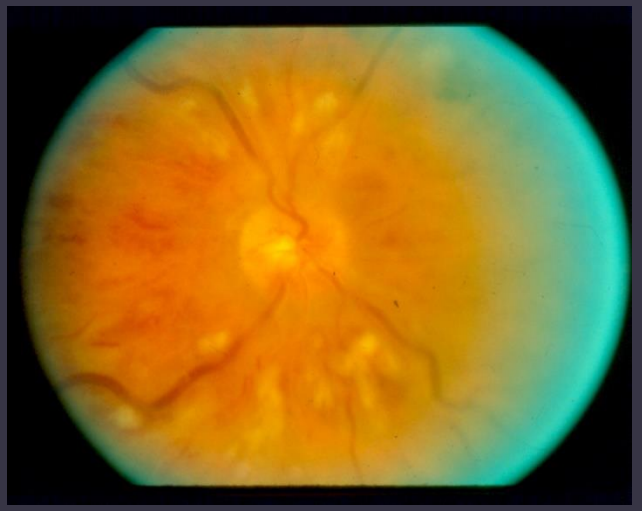
Exam:

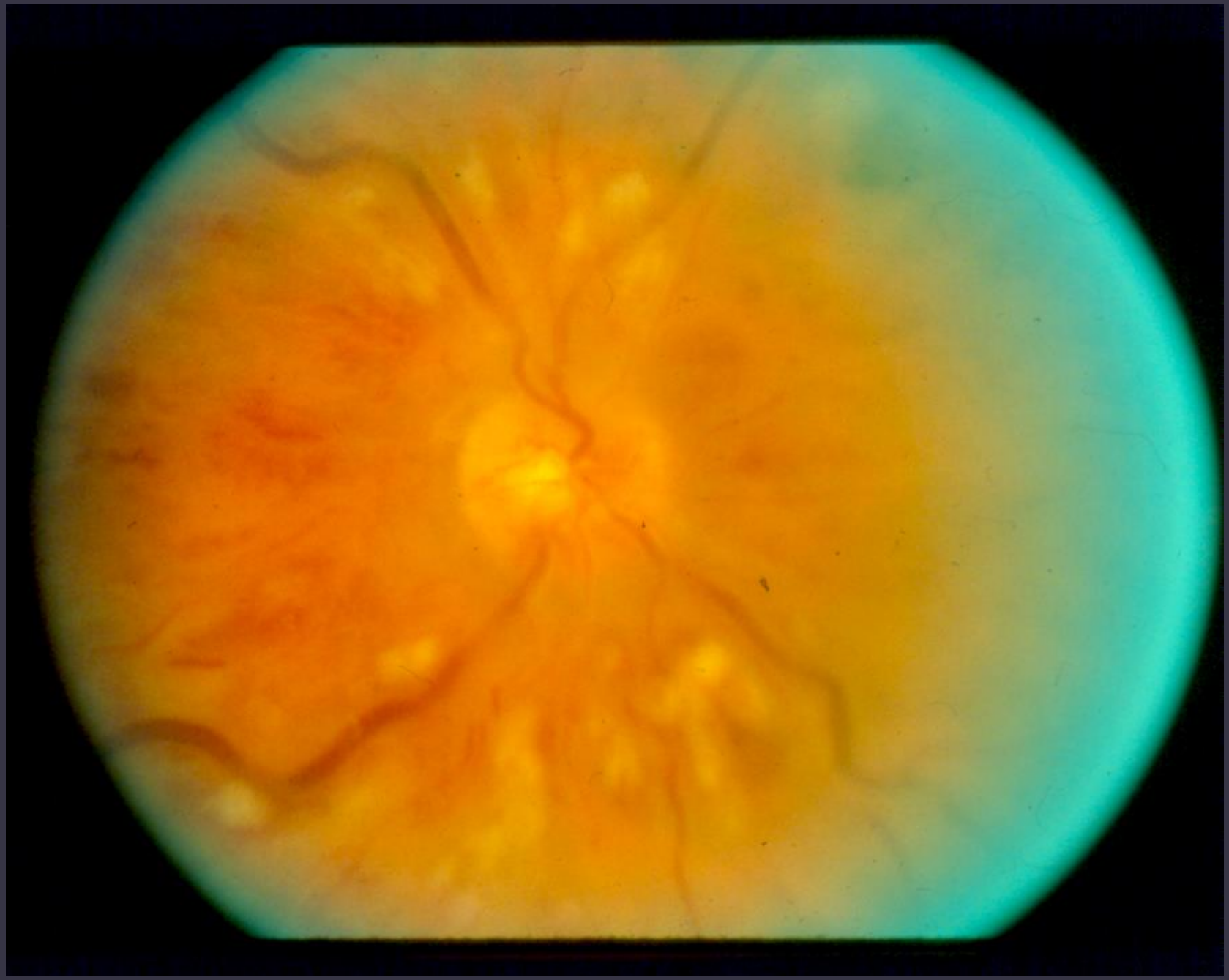
BP 140/90, p 80

Skin - acne, fundus shown, neurologic exam - non focal.

Medications:

Isotretinoin (*Accutane*)





Headaches in reproductive age women

Incidence of OCP associated HA ~ 600/100,000

Incidence of pseudotumor cerebri ~ 3.3/100,000
(general population: 0.9/100,000)

Case should have the classic presentation on boards!

Case 2.

You are evaluating a new patient who presents for transfer of care. She is a 68- year-old woman with HTN, hypothyroidism on replacement levothyroxine.

Family history:

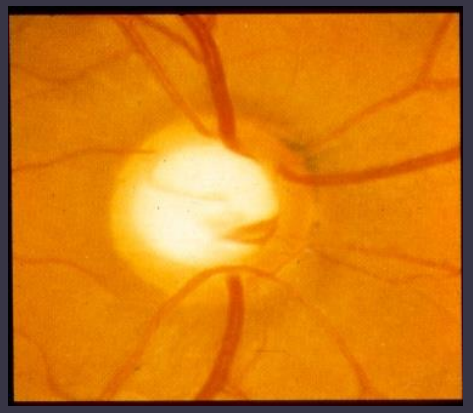
parent: glaucoma, legal blindness.

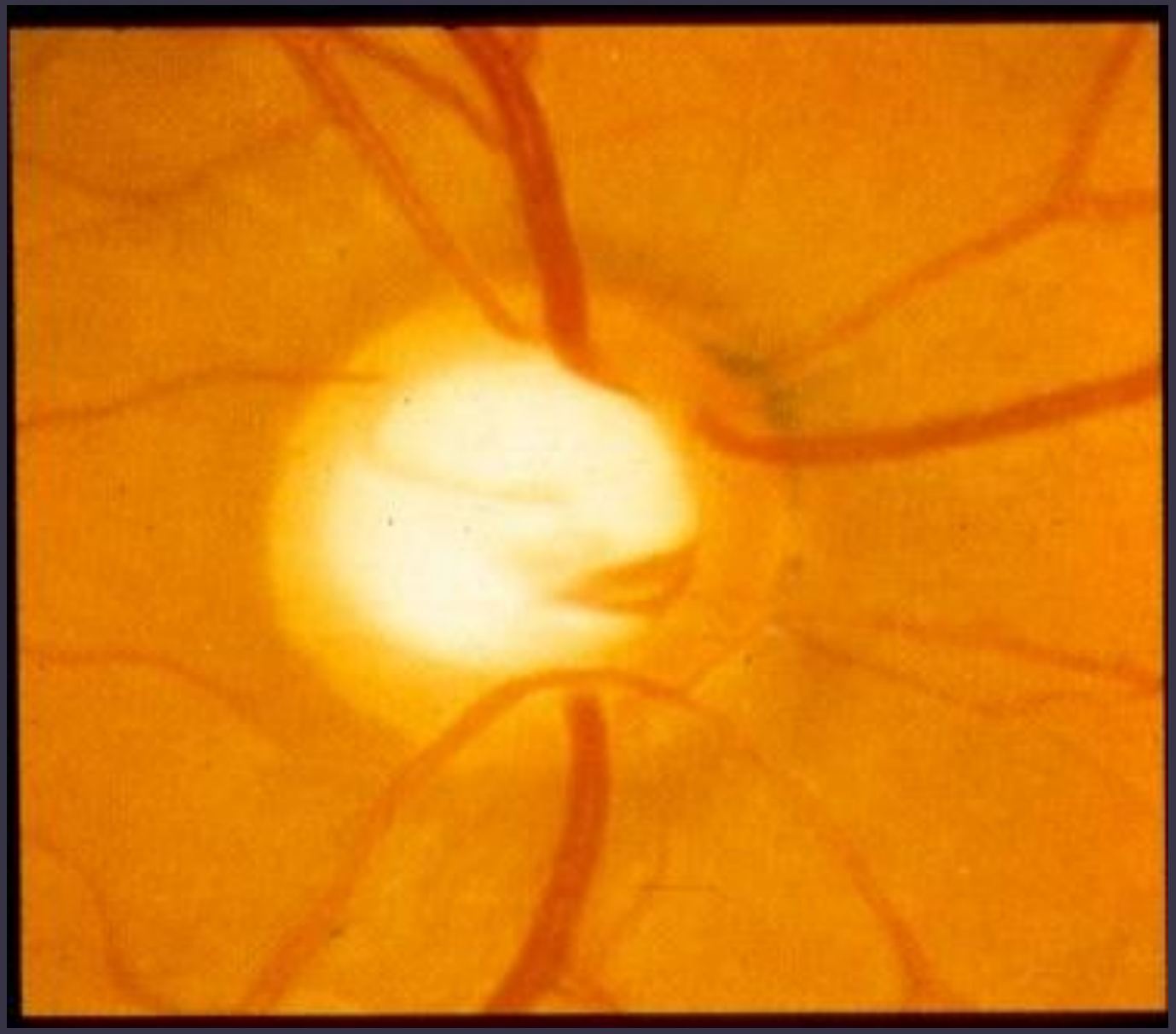
The patient self-identifies as African-American.

Exam:

Pt in NAD. BP 154/88, HR 82

Fundus: cup/disc ratio of 0.7 without disk hemorrhage.





Case 2.

Other than age, which of the following factors in this patient poses the highest risk for developing glaucoma?

A. Family history
B. Hypertension
C. African-American race
D. Hypothyroidism

Open Angle Glaucoma: Risk by race and ethnicity

- Overall incidence 1/50
- Prevalence of glaucoma:
  - Caucasians 2-3%
  - Blacks 12%
  - Hispanics 8%
  - Limited data other people of color, similar to Caucasian

Glaucoma Screening

Variable	Category	Weight*
Age	<50 yrs	0
	50-64 yrs	1
	65-75 yrs	2
	> 75 yrs	3
Race	Caucasian/ other	0
	African-American	3
+FH glaucoma	Negative or +non-1st deg	0
	Positive for parents	1
	Positive for siblings	2
Last complete eye exam	Within past 2 yrs	0
	>2 yrs ago	1

***Level of glaucoma risk by weighted score:**

High if ≥4; Moderate 3; Low risk ≥2

Glaucoma 2001 Am Acad Ophthal

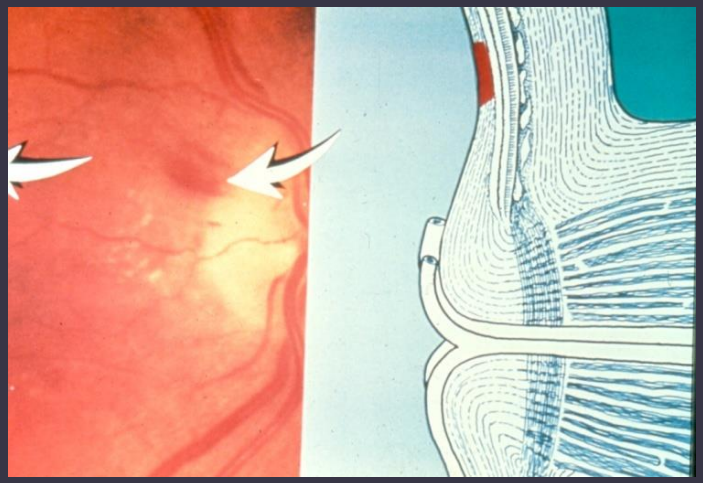
Glaucoma and IOP

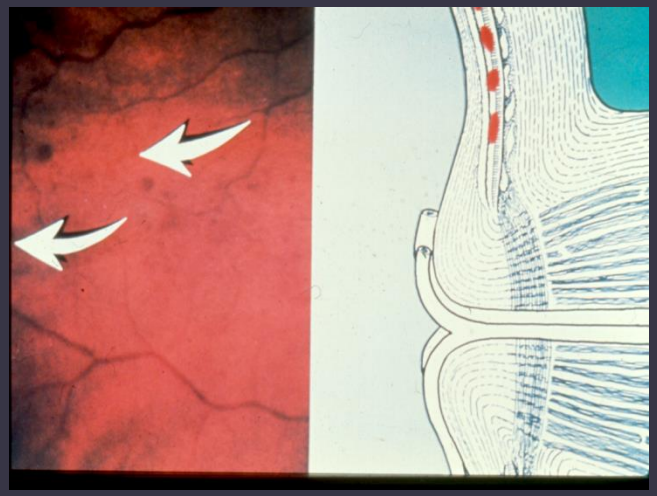
- Elevated IOP (>21mmHg) is a major risk factor for glaucoma, but a single IOP measurement is a poorly predictive screening test
- 50% of patients with undiagnosed glaucoma will have IOP<22 mmHg at time of screening-->dx missed
- >15% of all individuals with POAG will have IOP consistently <22mmHg
- Many with elevated IOP do not have and never will develop glaucoma
  - 1% of normal population: "intraocular HTN"
- Best combination to diagnose glaucoma:
  - Visual field testing
  - Optic disc cupping
  - IOP

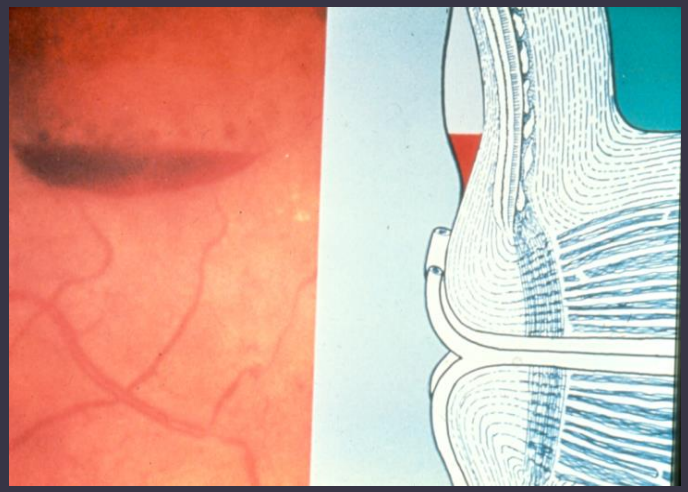
Glaucoma pearls

- Common!
- Varies by race and ethnicity
- Single IOP measure poorly predictive
- Exam of cup-disc ratio important
- Refer to ophthalmology based on risk factors and if suspect by fundus exam

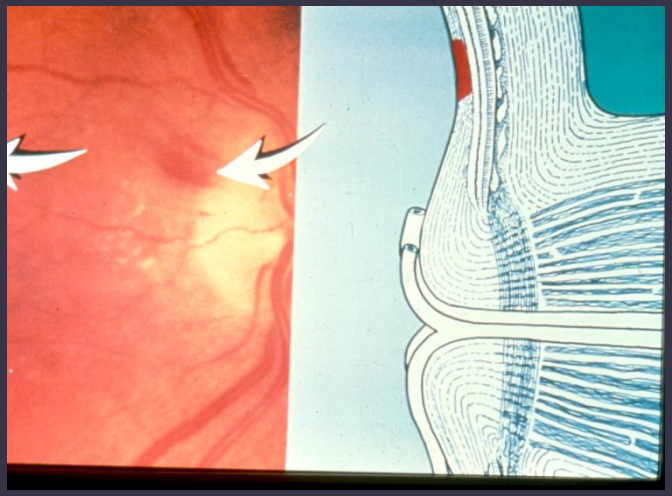
Retinal Hemorrhage



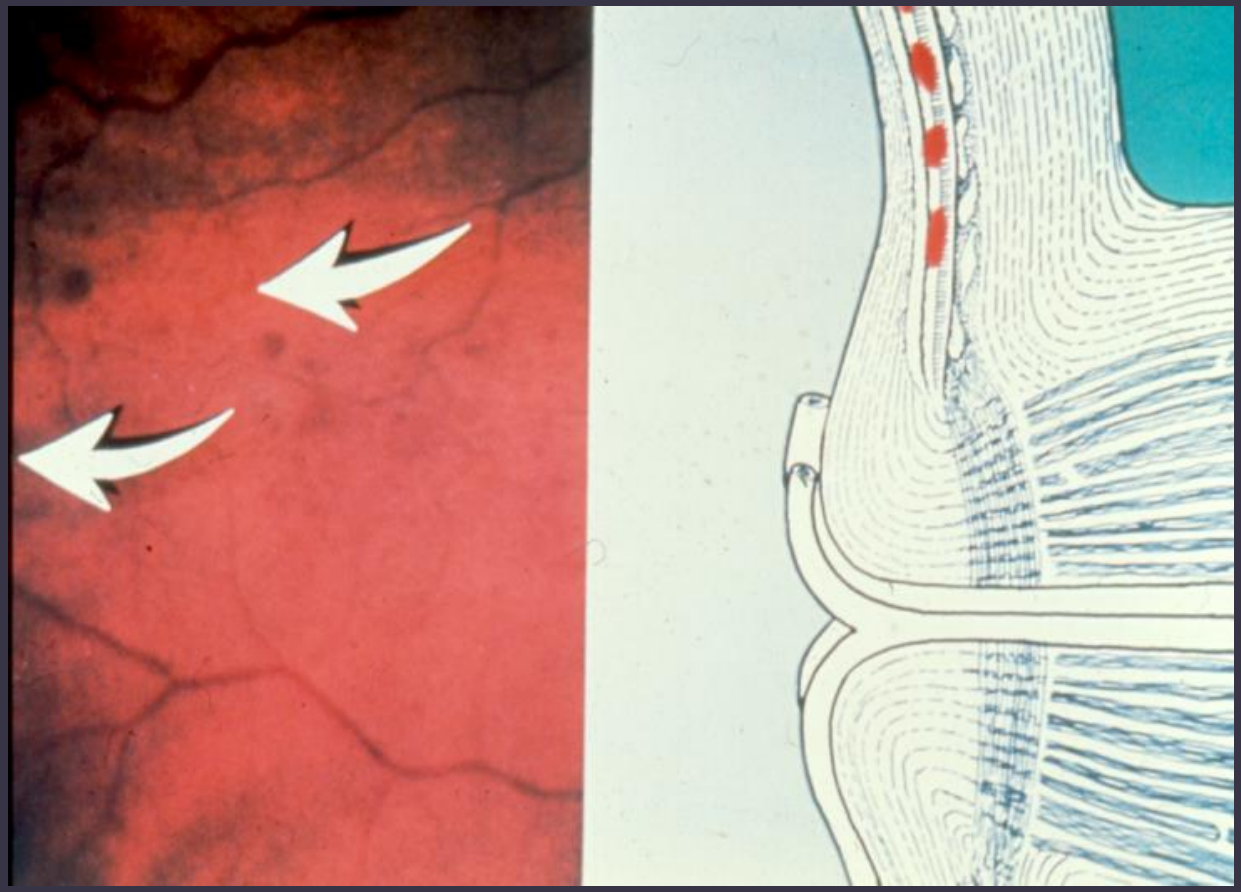




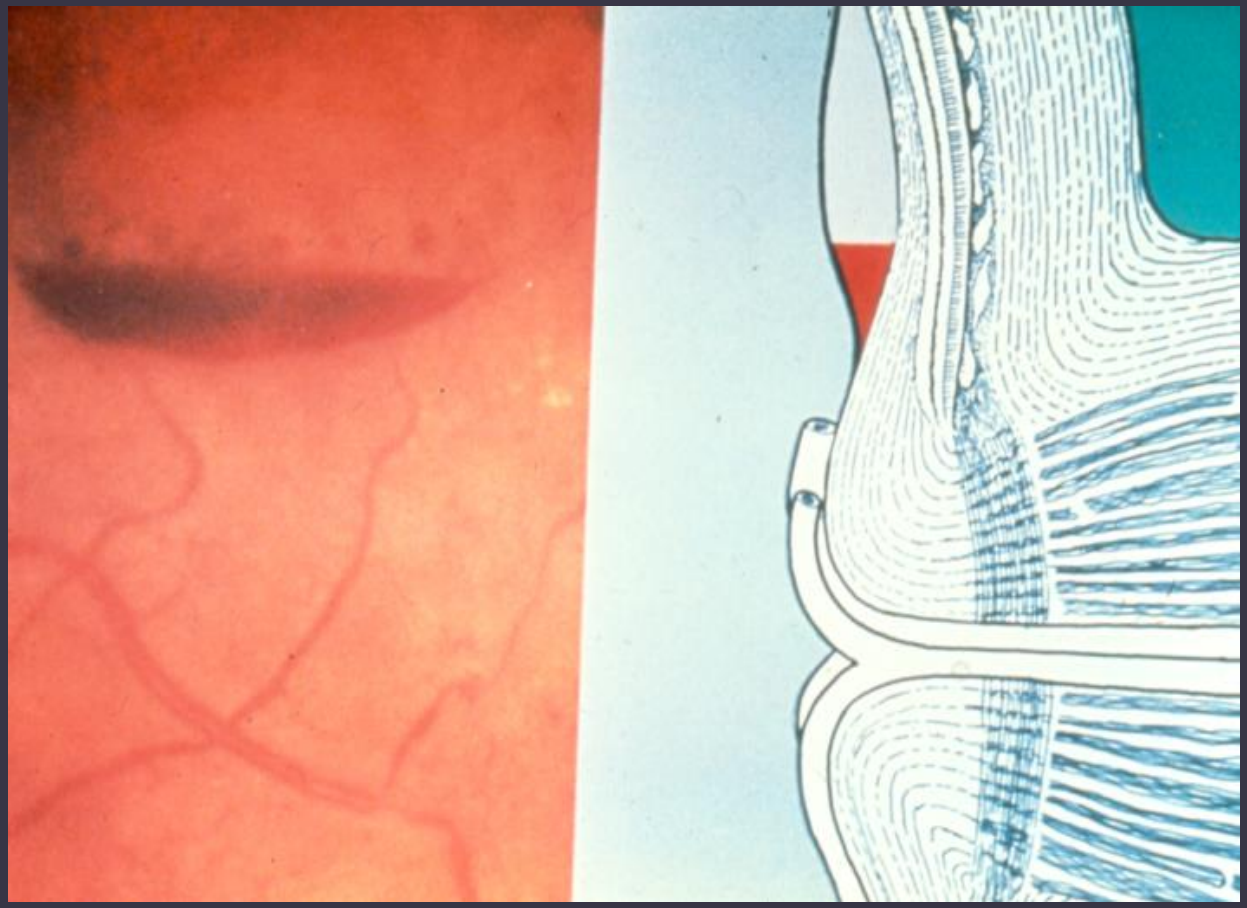
Retinal Hemorrhage: Flame
superficial nerve fiber layers



Retinal Hemorrhage: Dot-blot deeper in rods and cones



Retinal Hemorrhage Pre-retinal



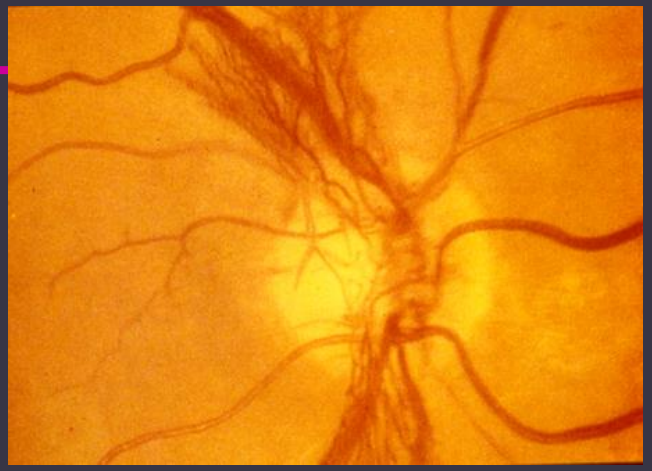
Retinal Hemorrhage

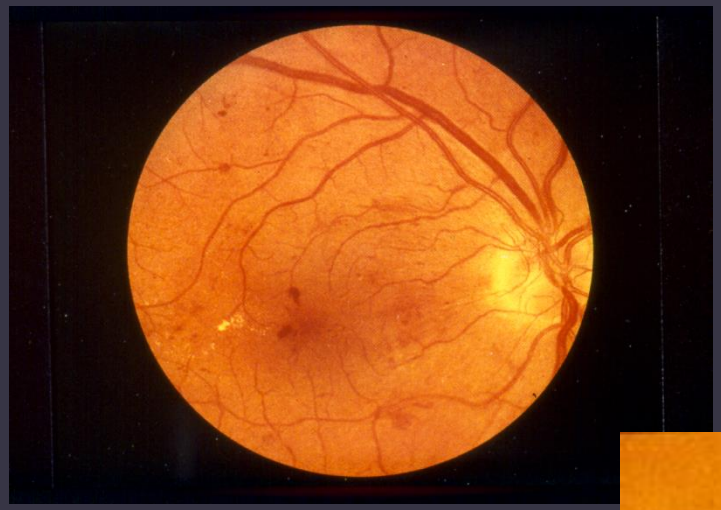
Retinal Hemorrhage
Roth spots (septic emboli)

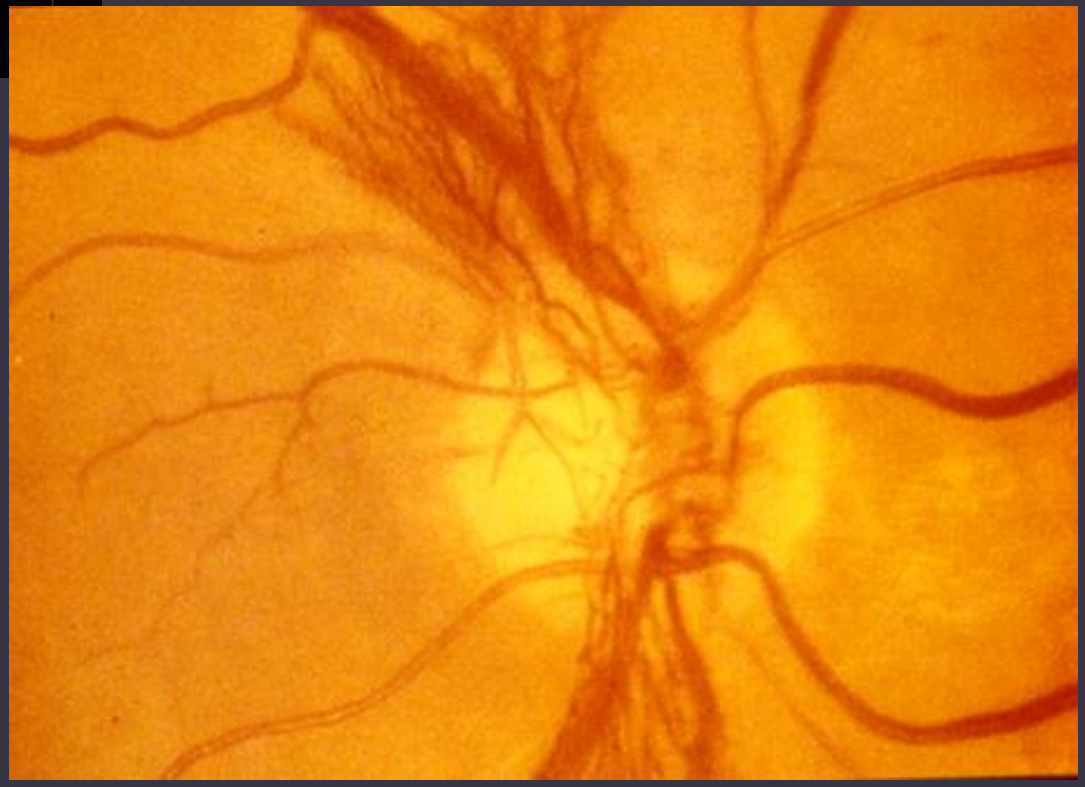
Case 3.

Your patient, a 56-year old man with Type II DM and HTN, comes in for routine f/u. He feels well but has noted decrease in vision without diplopia.
Exam: BP 174/104, P 72
Visual acuity 20/30 left, 20/50 right with usual lenses. EOM function is normal.

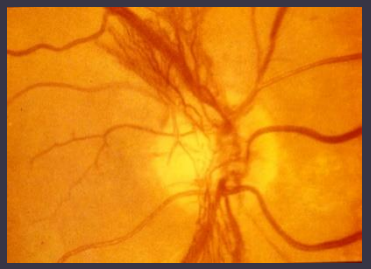
Funduscopic:







Case 3.
This patient should receive the following:



A. Immediate referral for laser therapy in the macular region (macular edema)

B. Immediate referral for laser therapy of new vessel disease (proliferative retinopathy)

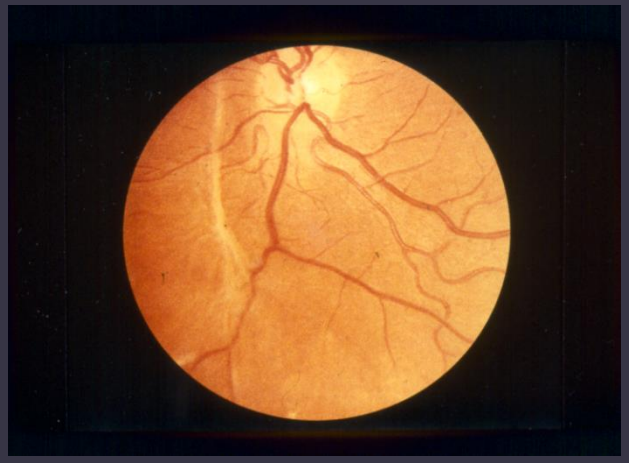
C. Routine ophthalmology referral within the next several months (background DR)

D. Aggressive BP control for existing hypertensive retinopathy

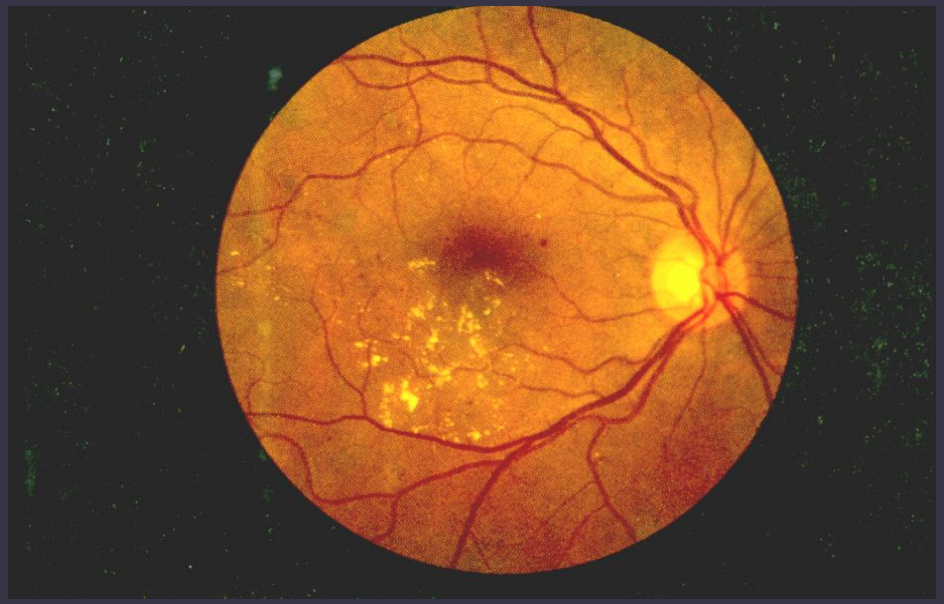
NONPROLIFERATIVE Retinopathy DM (Background)

- Increased capillary permeability
- Capillary closure and dilation
- Microaneurysms
- Arteriovenous shunt
- Dilated veins
- Hemorrhages (dot and blot, flame)

Proliferative Diabetic Retinopathy



Macular Edema



Case 4.
When should retinal screening start in patients with Type 1 Diabetes?

A. 3-5 years after diagnosis
B. 3-5 years after diagnosis once puberty
C. At diagnosis
D. None of the above

Referral to Ophthalmology

Diabetes Type 1:

Am Acad Ophthal: Annual screening beginning 5 yrs after onset of diabetes.

ADA: Annual screening beginning 3-5 years after diagnosis once the patient is 10 yrs or older.

Am Acad Ped: Initial exam 3-5 year after dx if older than 9 yrs, annually thereafter.

Practice Guideline: **SEPT 2014**

- Screening for Retinopathy in the Pediatric Patient with Type 1 Diabetes Mellitus - Reaffirmed 2014
- AAP, AAPOS and AAO Hoskins Center for Quality Eye Care

Case 5.
When should retinal screening start in patients with Type 2 Diabetes?

A. At diagnosis
B. 5 years after diagnosis
C. Once the provider sees retinopathy
D. None of the above

Referral to Ophthalmology II Adults

Diabetes Type 2 ADA position statements*

- Adults with type 1 diabetes should have an initial dilated and comprehensive eye examination by an ophthalmologist or optometrist within 5 years after onset of DM **B**
- Patients with type 2 DM should have an initial dilated and comprehensive eye examination by an ophthalmologist or optometrist at the time of diabetes diagnosis. **B**
- If there is no evidence of retinopathy for one or more annual eye exams, then exams every 2 years may be considered. If any level of diabetic retinopathy is present, subsequent dilated retinal examinations for patients with type 1 or type 2 diabetes should be repeated at least annually by an ophthalmologist or optometrist. If retinopathy is progressing or sight-threatening, then examinations will be required more frequently. **B**
- While retinal photography may serve as a screening tool for retinopathy, it is not a substitute for a comprehensive eye exam, which should be performed at least initially and at intervals thereafter as recommended by an eye care professional. **E**

Diabetes Care 2017 Mar; 40(3): 412-418

Diabetic Retinopathy: A Position Statement by the American Diabetes Association

- Optimize glycemic control to reduce the risk or slow the progression of diabetic retinopathy. **A**
- Optimize blood pressure and serum lipid control to reduce the risk or slow the progression of diabetic retinopathy. **A**

Referral in Pregnancy

Pregnancy:

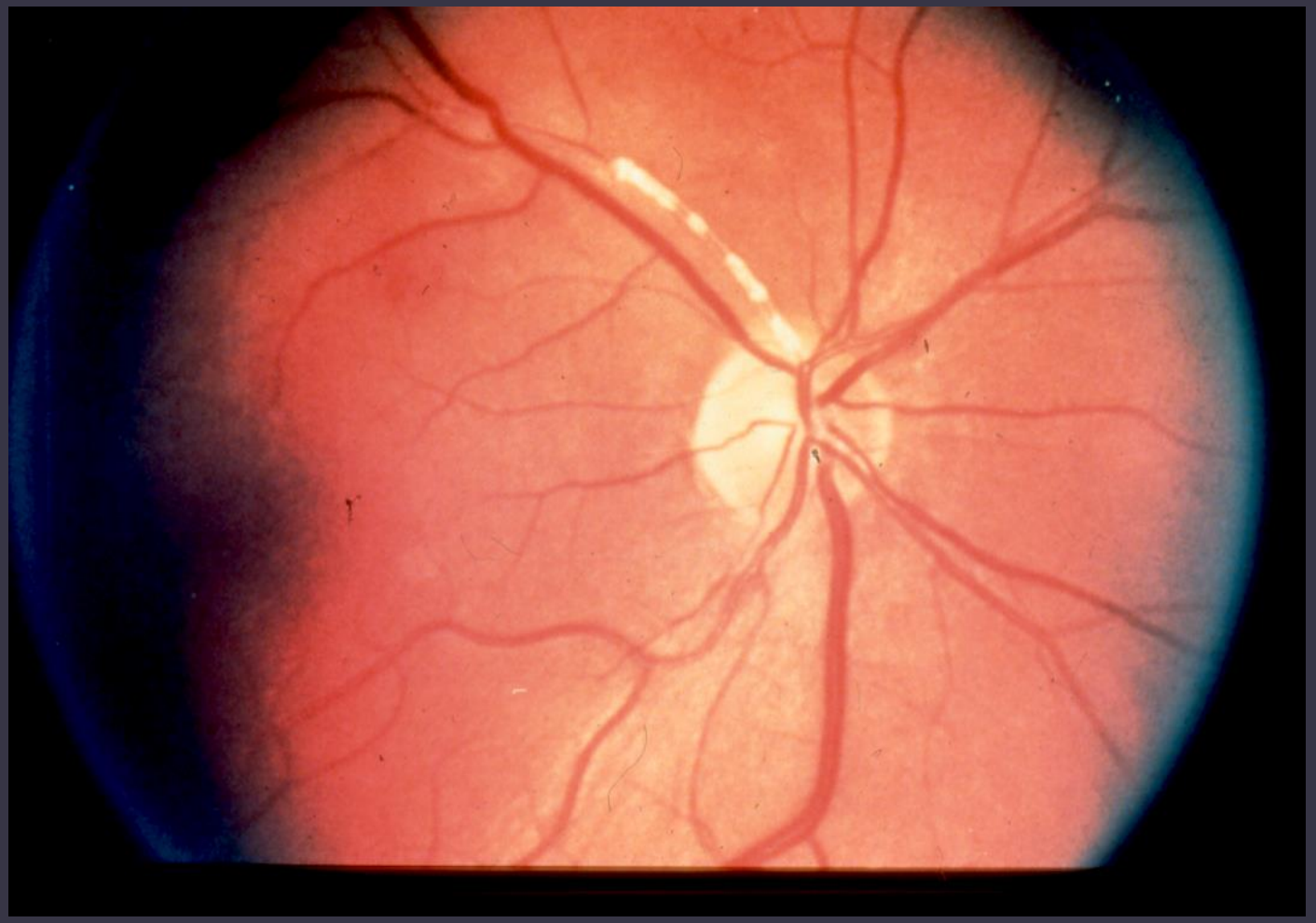
ADA, ACOG, UpToDate

- Women with preexisting type 1 or type 2 diabetes who are planning pregnancy or who have become pregnant should be counseled on the risk of development and/or progression of diabetic retinopathy. **B**
- Eye examinations should occur before pregnancy or in the first trimester in patients with preexisting type 1 or type 2 diabetes, and then these patients should be monitored every trimester and for 1 year postpartum as indicated by the degree of retinopathy. **B**

Diabetes Care guideline 2017

A-V nicking: HTN

Hollenhorst plaque

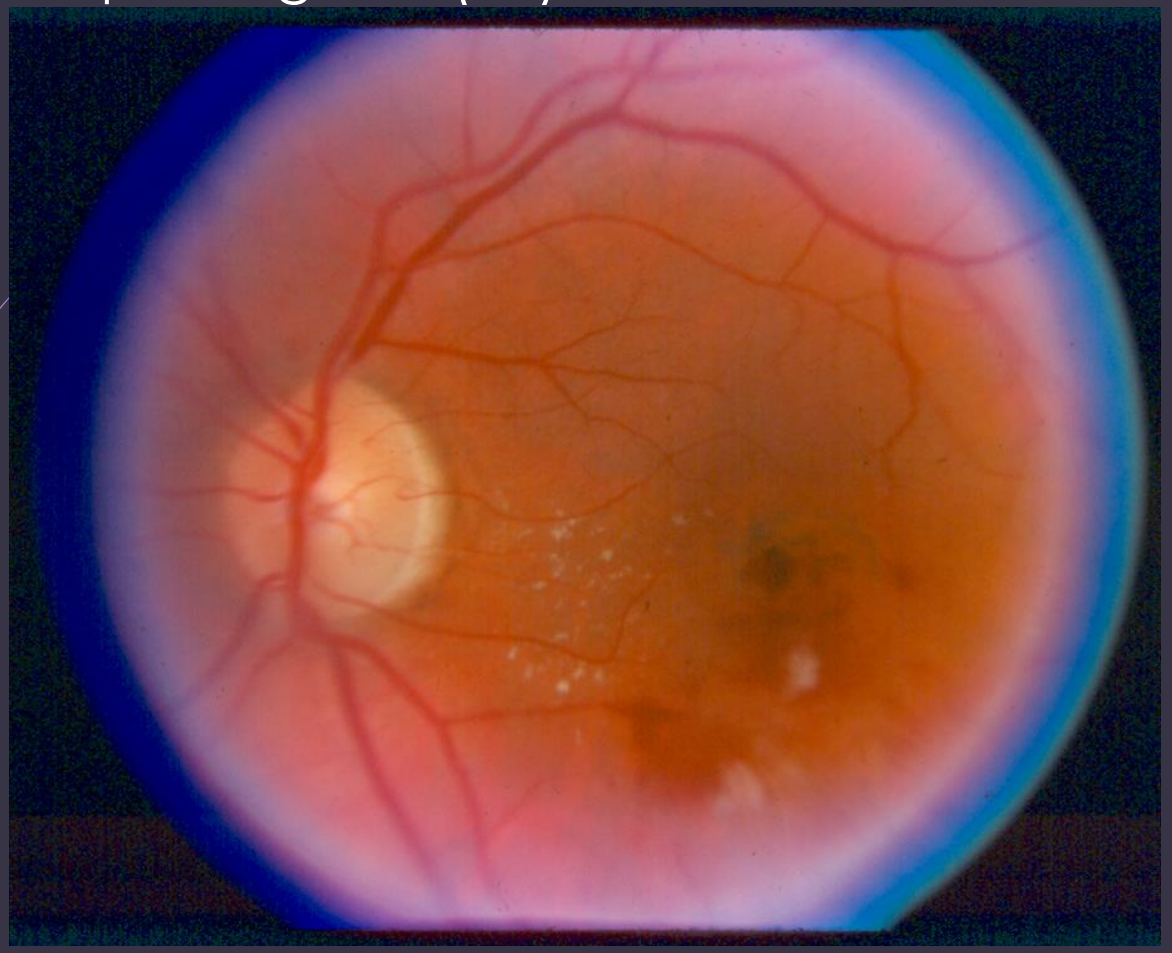


Cotton Wool Spots

Micro-ischemia of the nerve fiber layers

Macular degeneration

Most common cause of blindness in pts >age 65 (US)



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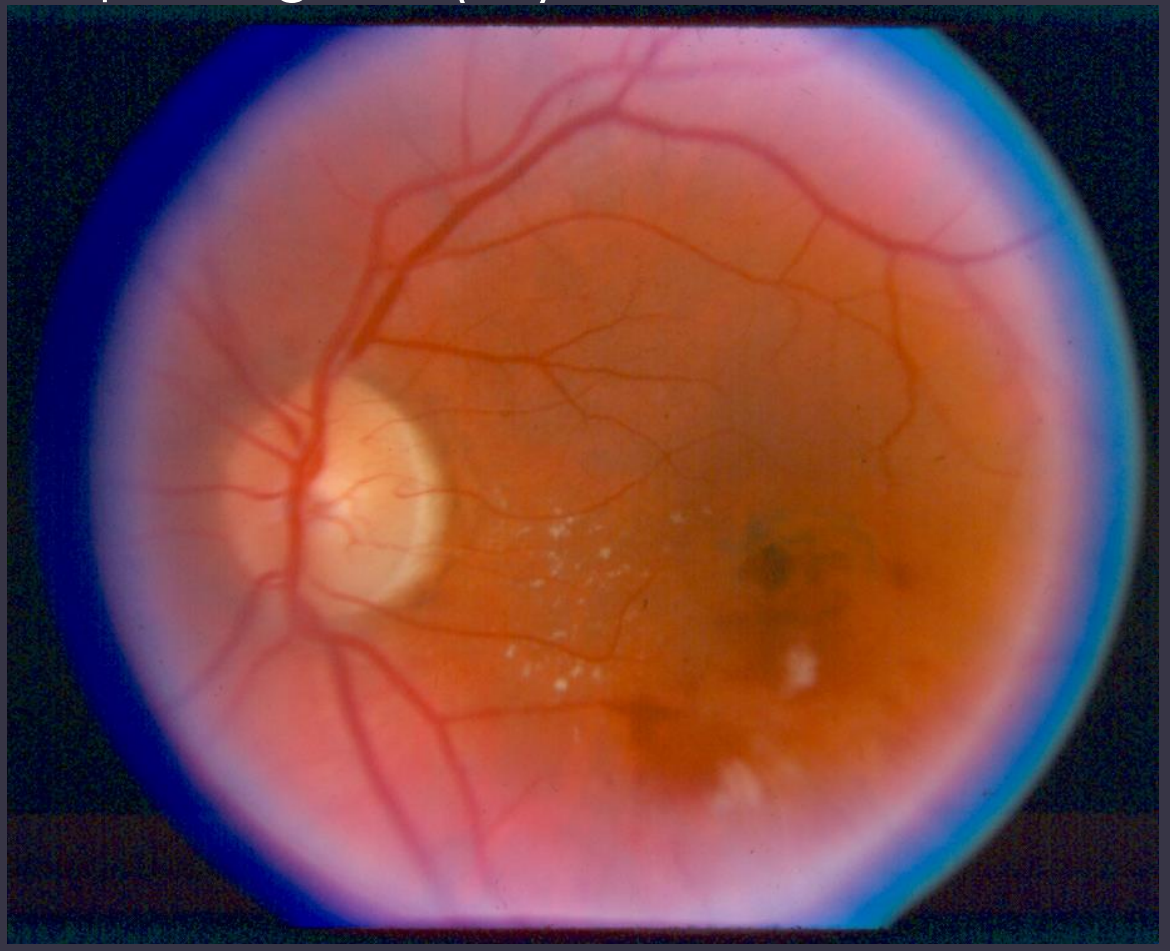


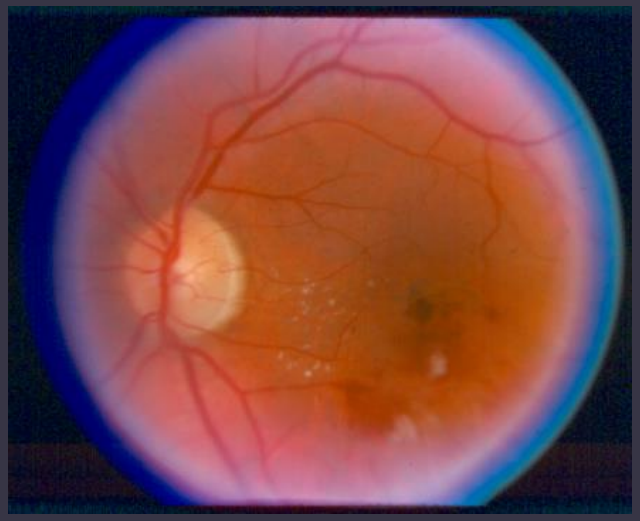
Nutritional Supplements and AMD (Age Related Macular Degeneration)

- Pts with no AMD or early AMD no benefit
- Intermediate AMD bilat or advanced AMD one eye reduced risk of severe vision loss by ~20% if they took combination of vitamins and zinc ("wet" AMD)
- No effect on development or progression of cataracts

  Ocuvite Preservision, Icaps AREDS brands
  National Eye Institute Study

  Avoid Beta Carotene in pt smokers or hx asbestos exposure

  (increased risk of lung cancer)



Case 6.

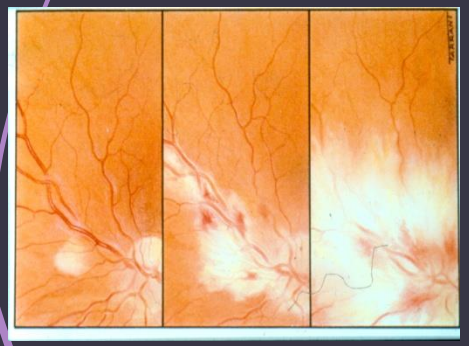
A 41 yr old male HIV+ (CD4 count 260) comes in for routine evaluation. He has had a few floaters, but no change in vision.

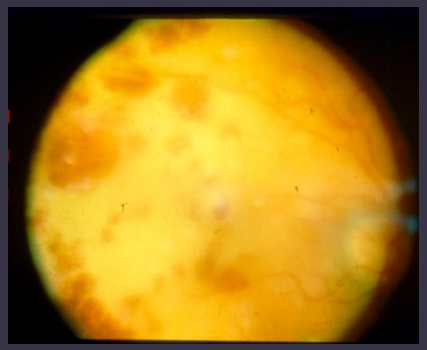
Most likely etiology for the funduscopic eye finding:

A. Cytomegalovirus Retinitis
B. Toxoplasmosis
C. Cryptococcus
D. HIV retinopathy

HIV and retinopathy

- Many patients have HIV have retinopathy with cotton wool spots
- CMV retinitis:
  - Occurs with advanced immunosuppression/ low CD4 counts (<50), early sx may be floaters
  - Uncommon since HAART/triple therapy
  - Association with retinal detachment





Summary
Referral to Ophthalmology

- Any sudden vision loss
- Visual impairment
  - Visual acuity 20/50 or worse and driving
  - Vision affecting function
- Greater than two Snellen lines difference on eye chart
- Glaucoma hx without recent check of IOP or funduscopic exam or risk factors
- HIV and vision change/floaters

Correct answers: Eye: Funduscopic

- Case 1 = A
- Case 2 = C
- Case 3 = B
- Case 4 = B
- Case 5 = A
- Case 6 = D