

Medicine and Nutrition: Collaboration to Combat Disease

Lori Vollmer, O.D., M.S., FAAO
Robert T. Hasty, D.O., FACOI, FACP

Dr. Lori Vollmer Disclosures

No financial interest in any of the products or research presented.

Dr. Robert Hasty Disclosures

No financial interest in any of the products or research presented.

What difference can I make as an Optometrist?

How can I incorporate this into my practice?

The Optometrists' Role

- **Team approach** for patient health
- **Repetitive** message
- **Preventative** health care
- **Prevention** of vision loss



Ocular Conditions and Lifestyle

Hypertensive retinopathy

Diabetic retinopathy

Macular Degeneration

Cataract

Glaucoma?

Dry Eye Syndrome

Sleep apnea

Other Retinopathies (anemia)

Case 1

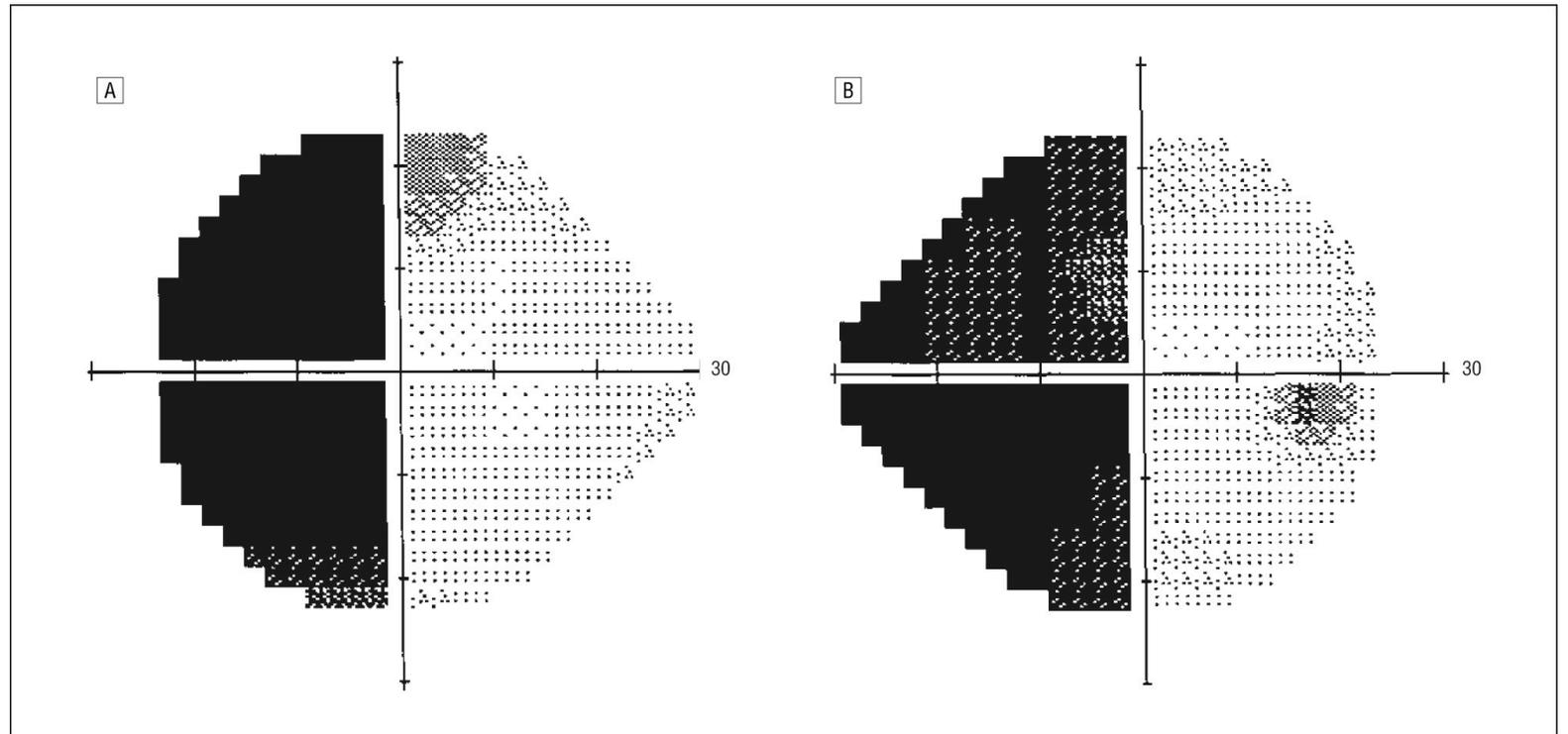
- 49-year old female
- Referred by primary physician for diabetes
- PMHx: Diabetes, hypertension, 2 strokes, high cholesterol
- **Medications: Atorvastatin 10 mg (Lipitor), Lisinopril 20 mg, Metformin 500 mg BID, Plavix 75 mg, Xarelto 20 mg, women's multivitamin gummies 200 mcg**

Case 1

- Social: Non-smoker, drinks 3 glasses wine per night
- **BP 145/90 RAS**
- Height 5'6" (167.64 cm) Weight 215 lb. (97.5 kg) **BMI 34.7**
- **FBS 273**, A1C unknown
- Other: Does not like taking medications, **poor compliance with follow-up visits.**

Case 1

- BCVA 20/25 OD, OS
- IOP 13, 15 mm Hg OD, OS
- Visual field:





Diagnoses

- Type 2 diabetes mellitus uncontrolled with ophthalmic complications
- Moderate to severe non-proliferative diabetic retinopathy (NPDR) OU without macular edema
- Hypertensive retinopathy
- Left homonymous hemianopsia secondary to stroke
- Hyperlipidemia, unspecified
- Obese due to excess calories with BMI 34.7

What is the ocular management for this patient?

What are the medication considerations?

What are the nutritional and lifestyle considerations?

Managing Diabetic Retinopathy in 2021

- Ranibizumab's indication expanded in 2017 to include all NPDR and PDR with OR without DME.
- Diabetic Retinopathy Clinical Research Network's (DRCR.net) **Protocol S Study**
- Primary objective to compare safety and efficacy of PRP to ranibizumab 0.5 mg for PDR
- Ranibizumab was **non-inferior to PRP** with a non-inferiority limit of five letters.
- Superior vision outcomes with ranibizumab in eyes with PDR and central DME at baseline (better VA than with PRP)

Protocol S

- WITHOUT DME
 - **37.8%** had a **2-step or better** improvement in retinopathy
 - **28.4%** had a **3-step or better** improvement at **2 years**
- WITH DME
 - **58.5%** had a **2-step or better** improvement in retinopathy
 - **31.7%** had a **3-step or better** improvement at **2 years**

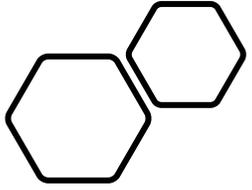
Diabetic Retinopathy Severity Scale (DRSS)

PANORAMA

- Expanded indication by FDA for aflibercept (Eylea, Regeneron) to treat all stages of diabetic retinopathy.
- Evaluated high-risk NPDR eyes without macular edema.
- Aflibercept improved the Diabetic Retinopathy Severity Scale (DRSS) score, sight-threatening complications, the development of PDR, and the development of center-involved DME.
- Aflibercept may be dosed every 8 weeks following five initial monthly injections, or every 4 weeks.

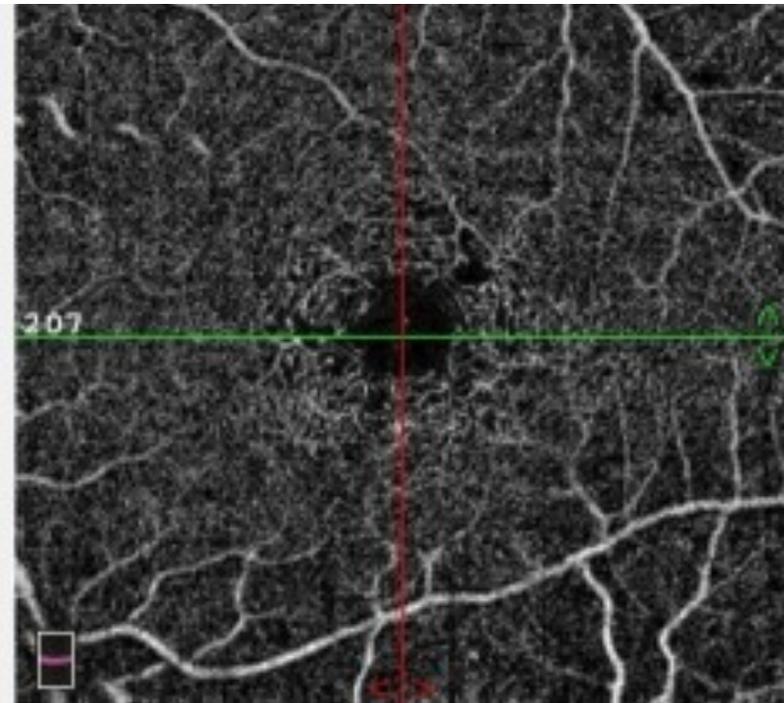
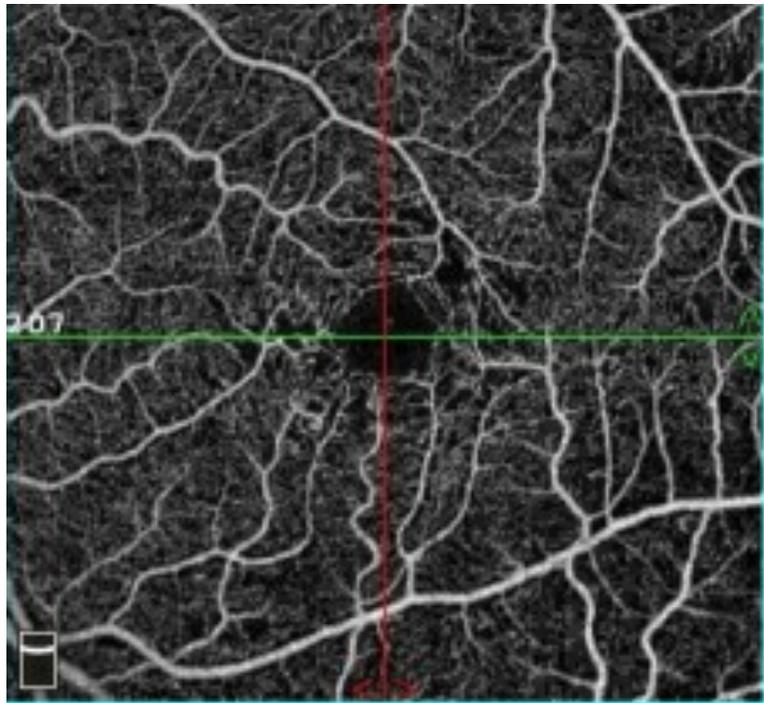
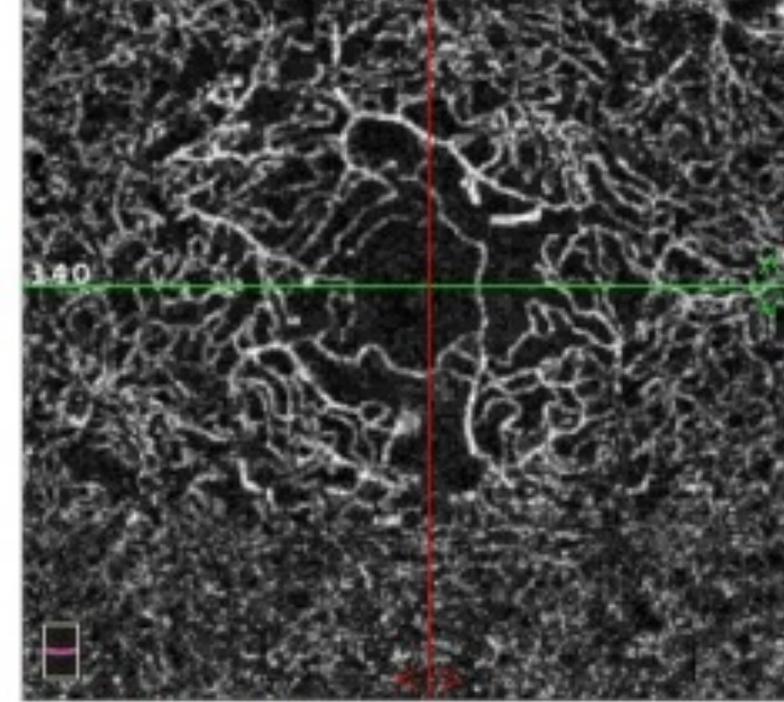
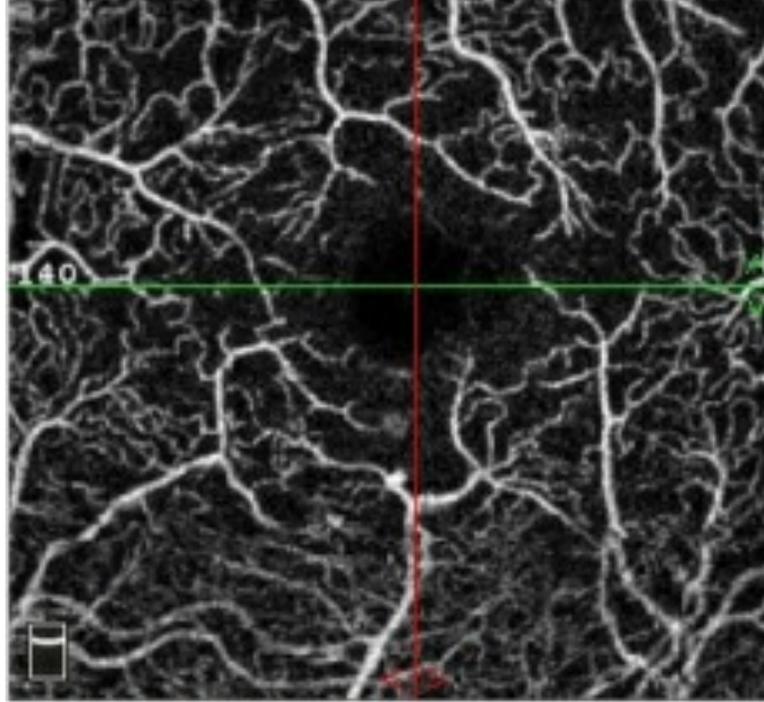
Does this change how we manage diabetic retinopathy patients as an optometrist?

Is this patient a candidate for intravitreal injections?



OCTA

- Quantitative features
- Early changes in the perifoveal microvasculature
 - Can be identified before clinically apparent retinopathy
- Identification of neovascularization
- OCT vs. IVFA
- IRMA vs. NEO
- Widespread ischemia ?



Long-Term Monitoring

- F/U frequency dictated by baseline stage of retinopathy.
- Only 5% of patients with **mild NPDR** progress to PDR in 1 year without follow-up care, monitoring these patients every 6-12 months is appropriate.
- Up to 27% of patients with **moderate NPDR** progress to PDR in 1 year and these patients should be seen every 4 to 8 months.
- More than 50% with severe NPDR progress to PDR in 1 year without F/U care and 75% develop high-risk characteristics within 5 years; follow-up care every 2 to 3 months to ensure prompt recognition and treatment.
- Any stage associated with DME should be treated promptly with laser and observed closely (every 1-2 mos.)

What are the medication considerations?

Medication Considerations

- Atorvastatin 10 mg (Lipitor)
- Lisinopril 20 mg
- Metformin 500 mg BID
- Plavix 75 mg
- Xarelto 20 mg
- Women's multivitamin gummies 200 mcg

What are the nutritional and lifestyle considerations?

BMI	Classification
< 18.5	underweight
18.5–24.9	normal weight
25.0–29.9	overweight
30.0–34.9	class I obesity
35.0–39.9	class II obesity
≥ 40.0	class III obesity

Obesity & Caloric Intake

- About 22 calories/kg/day for average weight maintenance
- About 3500 calories of excess intake equates to one pound of weight gain under normal metabolic conditions
- Exercise should be supportive/additive not the primary method of weight loss



Exercise



- Insulin action in muscle and liver can be modified by exercise
- Acute state: aerobic exercise increases muscle glucose uptake 5-fold
- After exercise:
 - Glucose uptake remains elevated up to 48 hours following prolonged bouts
 - Shorter bouts of exercise (high intensity) glucose uptake remains elevated for up to 24 hours
 - Low intensity 60 minutes enhances insulin action in obese, insulin resistant adults.

Mediterranean “Way”

- Primarily plant-based foods, such as fruits and vegetables, whole grains, legumes and nuts
- Replacing butter with healthy fats (olive oil and canola oil)
- Using herbs and spices instead of salt to flavor
- Limiting red meat to no more than a few times a month
- Eating fish and poultry at least twice a week
- Enjoying meals with family and friends
- Drinking red wine in moderation (resveratrol)
- Getting plenty of exercise



Recommendations

- Focus on quality of carbohydrate (GI/GL)
- Fructose in fruit results in better glycemic control compared to sucrose and starch without affecting triglycerides.
 - Obesity and diabetes rates were lower when total fructose intake was in the range of 25–40 g/d.
- Add fiber and whole grain

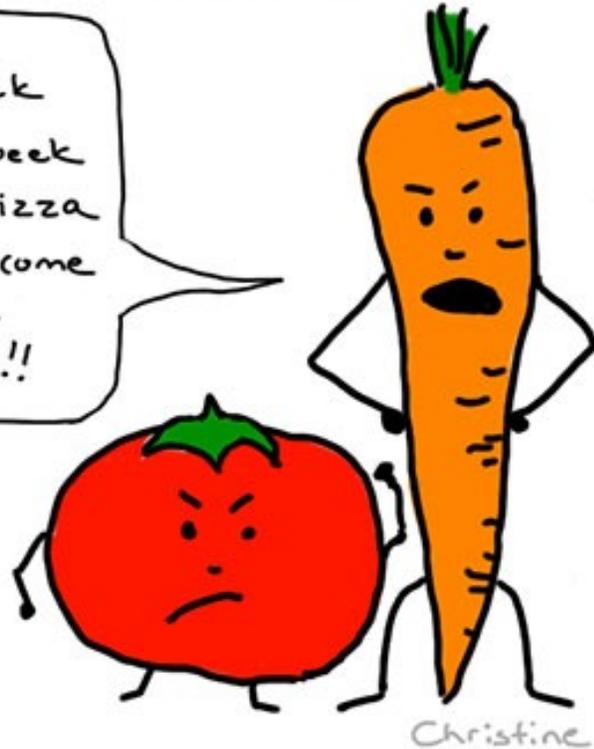


Mediterranean-style eating pattern largest improvement in A1C at 1 year.

Eat Your Veggies!

STEAMED VEGETABLES

Listen buddy, I've been stuck in this refrigerator over a week watching Chinese take out, pizza and cans of soda and beer come and go while I wither away! Why don't you just EAT ME!!



iredtoworry.com

- 2015–2020 *Dietary Guidelines for Americans* recommends 1.5–2 cups of fruits and 2–3 cups of vegetables per day.
- Recent data show low consumption
- Only 1 in 10 adults eat recommended amount of fruits or vegetables

Diabetes and Weight Loss

- Reducing energy intake while maintaining a healthful eating pattern
- **Seven to ten (7-10%) weight loss improvement in diabetic control**
- Modest weight loss correlates with clinical benefits; improved glycemic control, blood pressure and lipid profiles
- May be able to remove or reduce medications

Indications for Bariatric Surgery

- BMI > 40
- BMI > 35 with Comorbidities (e.g. DM, HTN)
- Consider for BMI > 30 with difficult to treat DM or metabolic syndrome
- Bariatric Surgery to result in at least 10% weight reduction and prevent long-term mortality benefits.

Points on Selected Diets

Diet	Indication
DASH	Hypertension
Low-Fat Dairy	Gout
Low Protein	Parkinson's
Ketogenic	Epilepsy
Mediterranean	Alzheimer's (prevention)

Moderate & Severe ETOH Intake

	Moderate	Heavy
Women	<7/week	>7/week
Men	<14/week	>14/week

Selected Vitamin & Supplement Points

- Multivitamins no "proven" benefit in most patients with (normal) good diet.
- Beta carotene increases risk of lung cancer in smokers.
- Vitamin E supplementation potentially increases cardiovascular events.
 - Increase total mortality, heart failure and hemorrhagic stroke.

Case 2: You're Normal?

35-year old female

Routine examination

CC: blurry vision at distance, lost specs 1 year ago

PMHx: HIV (unknown CD4 and viral load), ovarian cysts

Meds: Prezcofix, Descovy

FHx: Diabetes (mother)

Case 2 You're Normal?

- Social Hx: former smoker, alcohol occasionally, caffeine once daily
- **BP: 130/89**
- Height 5'5" (165 cm)
- Weight 252 lbs (115 kg)
- **BMI 41.9**

- BCVA 20/20 OD, OS
- IOP 15 OD, 16 OS
- Anterior segment normal
- Posterior segment normal – no retinopathy

Diagnoses

- HIV without retinopathy
- Class 3 severe obesity without serious co-morbidity with body mass of 40-44.9 in adult
- Elevated blood pressure in office (BP: 130/89)
- Family history diabetes (mother)

Ocular Management: Is there any?

A missed opportunity? 😞

Medication Considerations

- Prezcofix:
 - Protease inhibitor used with other HIV meds
 - Increase in triglycerides and cholesterol
 - Increased risk diabetes, liver injury
 - Increase in fat upper back and neck (buffalo hump) and trunk of body
- Descovy
 - Taken with other HIV meds
 - Nausea, changes in fat distribution, kidney problems, bone pain/thing/softening, increase cholesterol

What are the nutritional and lifestyle considerations?

<120^{mmHg}
— AND —
<80^{mmHg}

120-129^{mmHg}
— AND —
<80^{mmHg}

130-139^{mmHg}
— OR —
80-89^{mmHg}

NORMAL BLOOD PRESSURE

*Recommendations: Healthy lifestyle choices and yearly checks.

ELEVATED BLOOD PRESSURE

*Recommendations: Healthy lifestyle changes, reassessed in 3-6 months.

HIGH BLOOD PRESSURE / STAGE 1

*Recommendations: 10-year heart disease and stroke risk assessment. If less than 10% risk, lifestyle changes, reassessed in 3-6 months. If higher, lifestyle changes and medication with monthly follow-ups until BP controlled.

BMI Chart

WEIGHT lbs	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215
kg	45.5	47.7	50.0	52.3	54.5	56.8	59.1	61.4	63.6	65.9	68.2	70.5	72.7	75.0	77.3	79.5	81.8	84.1	86.4	88.6	90.9	93.2	95.5	97.7
HEIGHT in/cm	Underweight	Healthy					Overweight					Obese					Extremely obese							
5'0" - 152.4	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
5'1" - 154.9	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
5'2" - 157.4	18	19	20	21	22	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	
5'3" - 160.0	17	18	19	20	21	22	23	24	24	25	26	27	28	29	30	31	32	32	33	34	35	36	37	38
5'4" - 162.5	17	18	18	19	20	21	22	23	24	24	25	26	27	28	29	30	31	31	32	33	34	35	36	37
5'5" - 165.1	16	17	18	19	20	20	21	22	23	24	25	25	26	27	28	29	30	30	31	32	33	34	35	35
5'6" - 167.6	16	17	17	18	19	20	21	21	22	23	24	25	25	26	27	28	29	29	30	31	32	33	34	34
5'7" - 170.1	15	16	17	18	18	19	20	21	22	22	23	24	25	25	26	27	28	29	29	30	31	32	33	33
5'8" - 172.7	15	16	16	17	18	19	19	20	21	22	22	23	24	25	25	26	27	28	28	29	30	31	32	32
5'9" - 175.2	14	15	16	17	17	18	19	20	20	21	22	22	23	24	25	25	26	27	28	28	29	30	31	31
5'10" - 177.8	14	15	15	16	17	18	18	19	20	20	21	22	23	23	24	25	25	26	27	28	28	29	30	30
5'11" - 180.3	14	14	15	16	16	17	18	18	19	20	21	21	22	23	23	24	25	25	26	27	28	28	29	30
6'0" - 182.8	13	14	14	15	16	17	17	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27	28	29
6'1" - 185.4	13	13	14	15	15	16	17	17	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27	28
6'2" - 187.9	12	13	14	14	15	16	16	17	18	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27
6'3" - 190.5	12	13	13	14	15	15	16	16	17	18	18	19	20	20	21	21	22	23	23	24	25	25	26	26
6'4" - 193.0	12	12	13	14	14	15	15	16	17	17	18	18	19	20	20	21	22	22	23	23	24	25	25	26

HIV & Cardiovascular Disease

- HIV = approximately double the risk for CVD

Case 3: Swollen Nerves

- 21 year old female
- CC: blurry vision since she broke specs
- LEE: 3 years ago
- PMHx: unremarkable
- FHx: Diabetes (mother and grandmother)
- Meds: None (no birth control)

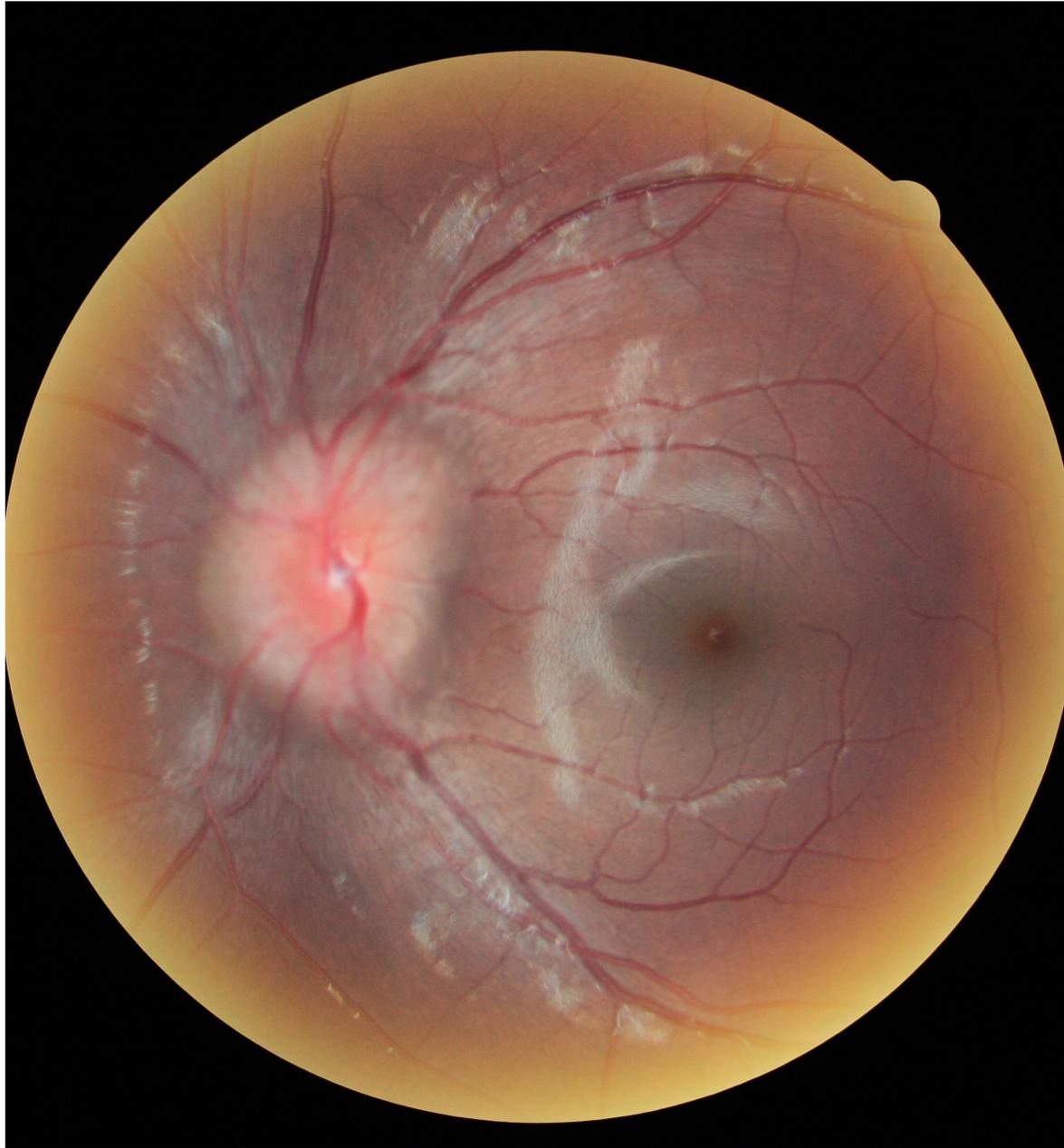
Case 3

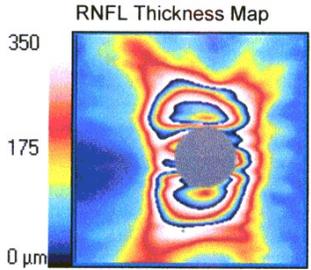
- Social Hx: No smoking, denies alcohol intake, caffeine occasionally
- BP 115/70
- POHx: Optic nerve swelling OU
 - Discovered at CEE 3 years earlier
 - Reports MRI was 'normal'
 - Lumbar puncture was performed and 'high' (no report available)
 - Rx's acetazolamide – D/C due to metallic taste in mouth
 - Educated on weight loss
 - Has not been seen since...

Case 3

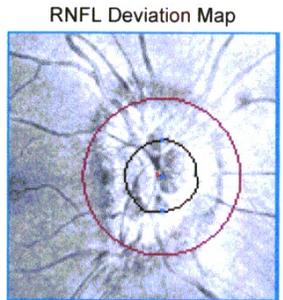
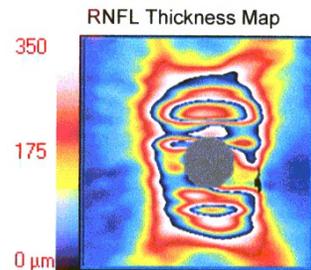
- Pt has gained 20 pounds in past 2 years
- Height 5'4" (164 cm)
- Weight 220 lbs. (99.8 kg)
- **BMI 37.8**





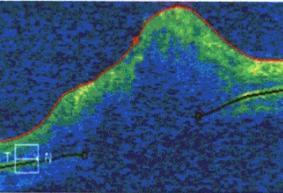


	OD	OS
Average RNFL Thickness	287 μm	354 μm
RNFL Symmetry	89%	
Rim Area	2.10 mm ²	1.69 mm ²
Disc Area	2.05 mm ²	1.42 mm ²
Average C/D Ratio	0.06	0.07
Vertical C/D Ratio	0.06	0.07
Cup Volume	0.000 mm ³	0.000 mm ³

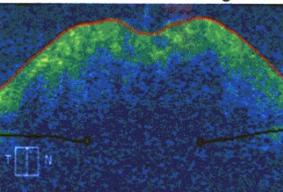


Disc Center(0.39,-0.18)mm

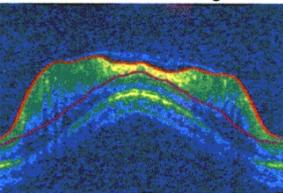
Extracted Horizontal Tomogram



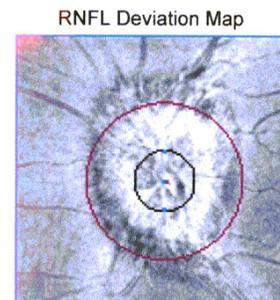
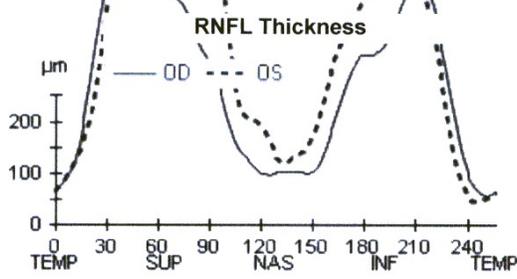
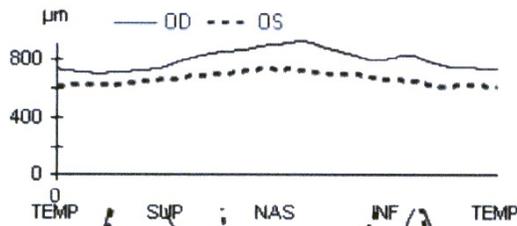
Extracted Vertical Tomogram



RNFL Circular Tomogram

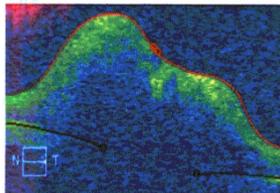


Neuro-retinal Rim Thickness

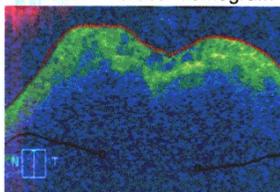


Disc Center(0.27,-0.21)mm

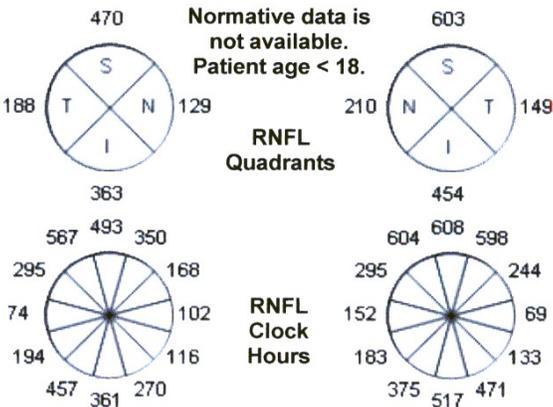
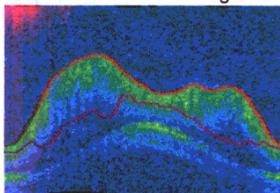
Extracted Horizontal Tomogram



Extracted Vertical Tomogram



RNFL Circular Tomogram



Central 24-2 Threshold Test

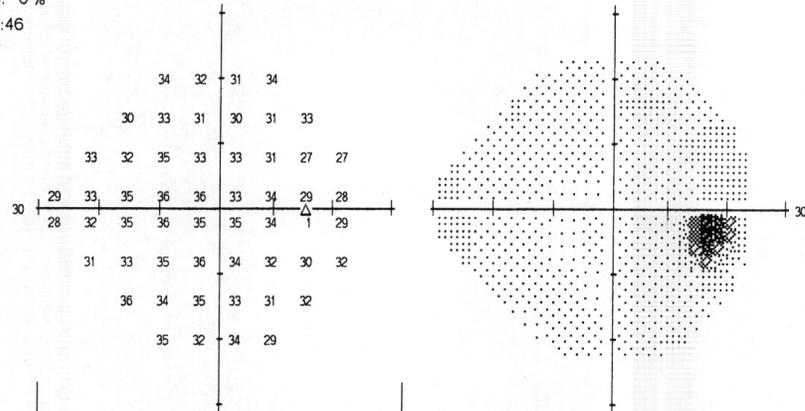
Fixation Monitor: Gaze/Blind Spot
 Fixation Target: Central
 Fixation Losses: 2/11
 False POS Errors: 13 %
 False NEG Errors: 0 %
 Test Duration: 02:46

Stimulus: Ill, White
 Background: 31.5 ASB
 Strategy: SITA-Fast

Pupil Diameter: 6.4 mm
 Visual Acuity:
 RX: +0.00 DS DC X

Date: 06-23-2015
 Time: 8:42 AM
 Age: 17

Fovea: OFF



4	2	1	4				
-1	0	-1	-2	0	2		
1	-1	1	0	-1	-2	-6	-5
-1	0	1	1	1	-1	0	-4
-2	0	1	1	0	0	0	-4
-1	0	1	1	0	-2	-3	-1
4	1	2	0	-2	-1		
4	1	2	-3				

2	0	0	2				
-3	-1	-3	-4	-2	0		
-1	-2	-1	-2	-2	-4	-7	-6
-3	-1	0	-1	-1	-3	-2	-6
-4	-2	0	-1	-2	-1	-2	-6
-2	-2	-1	0	-2	-3	-4	-2
2	-1	0	-2	-3	-2		
2	-1	0	-5				

GHT

Within normal limits

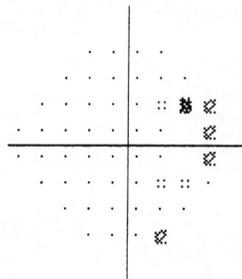
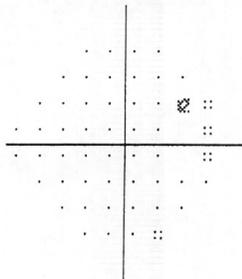
VFI 99%

MD -0.03 dB

PSD 1.95 dB P < 5%

Total Deviation

Pattern Deviation



:: < 5%
 ◻ < 2%
 ◻ < 1%
 ◻ < 0.5%

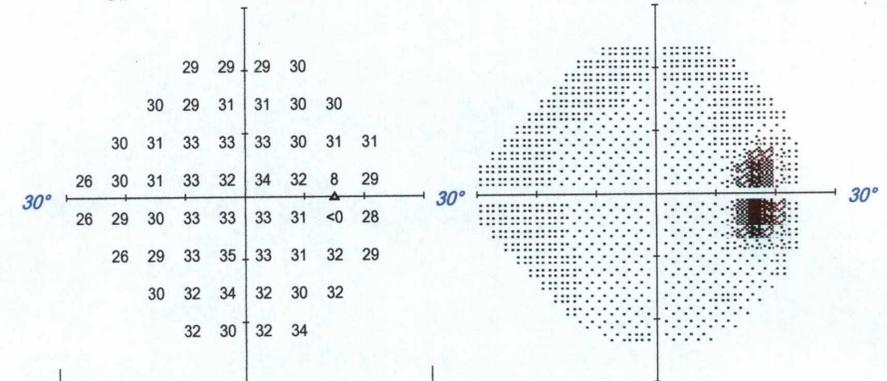
OD Single Field Analysis

Central 24-2 Threshold Test

Fixation Monitor: Gaze/Blind Spot
 Fixation Target: Central
 Fixation Losses: 3/10 XX
 False POS Errors: 0%
 False NEG Errors: 0%
 Test Duration: 02:57
 Fovea: Off

Stimulus: Ill, White
 Background: 31.5 asb
 Strategy: SITA Fast
 Pupil Diameter: 6.4 mm *
 Visual Acuity:
 Rx: +0.00 DS

Date: Sep 18, 2018
 Time: 11:20 AM
 Age: 21



-1	-1	0	0				
-2	-3	-1	-1	-1			
-2	-1	-1	-1	-3	-1	0	
-4	-2	-3	-1	-2	-1	-1	-3
-4	-3	-3	-1	-1	-1	-3	-4
-6	-4	0	0	-1	-2	-1	-3
-2	-1	1	-1	-2	-1		
0	-2	0	2				

-1	-1	0	0				
-1	-3	-1	-1	-1			
-1	-1	0	0	-1	-3	-1	0
-4	-2	-2	-1	-2	-1	-1	-3
-4	-3	-3	-1	-1	-1	-3	-4
-6	-3	0	1	-1	-2	-1	-3
-2	-1	1	-1	-2	0		
1	-2	0	2				

GHT: Within Normal Limits

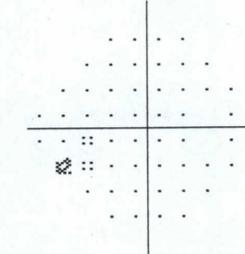
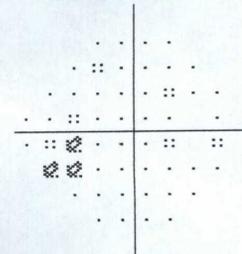
VFI: 99%

MD24-2: -1.59 dB P < 10%

PSD24-2: 1.41 dB

Total Deviation

Pattern Deviation



*** Low Test Reliability ***

:: P < 5%
 ◻ P < 2%
 ◻ P < 1%
 ◻ P < 0.5%

Central 24-2 Threshold Test

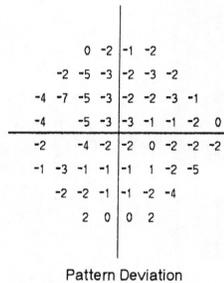
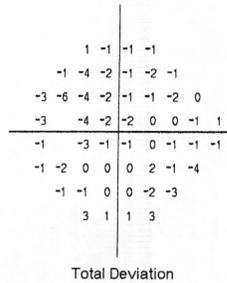
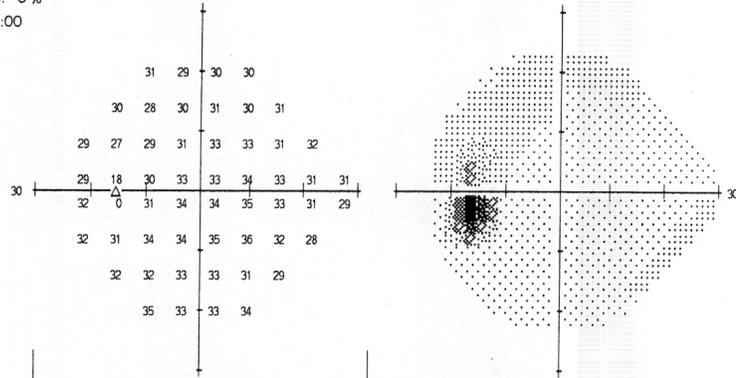
Fixation Monitor: Gaze/Blind Spot
 Fixation Target: Central
 Fixation Losses: 1/10
 False POS Errors: 6 %
 False NEG Errors: 0 %
 Test Duration: 03:00

Stimulus: III, White
 Background: 31.5 ASB
 Strategy: SITA-Fast

Pupil Diameter: 5.2 mm
 Visual Acuity:
 RX: +0.00 DS DC X

Date: 06-23-2015
 Time: 8:46 AM
 Age: 17

Fovea: OFF



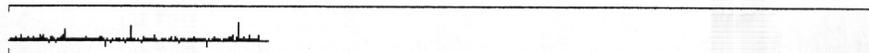
GHT
 Within normal limits

VFI 98%

MD -1.05 dB

PSD 1.72 dB P < 10%

:: < 5%
 ☒ < 2%
 ☒ < 1%
 ■ < 0.5%



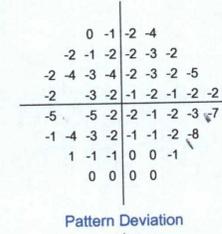
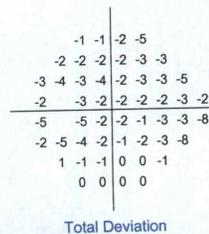
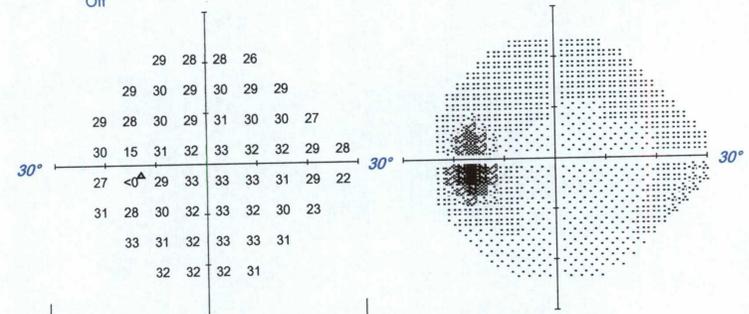
OS Single Field Analysis

Central 24-2 Threshold Test

Fixation Monitor: Gaze/Blind Spot
 Fixation Target: Central
 Fixation Losses: 0/10
 False POS Errors: 0%
 False NEG Errors: 0%
 Test Duration: 03:03
 Fovea: Off

Stimulus: III, White
 Background: 31.5 asb
 Strategy: SITA Fast
 Pupil Diameter: 6.0 mm *
 Visual Acuity:
 Rx: +0.00 DS

Date: Sep 18, 2018
 Time: 11:27 AM
 Age: 21



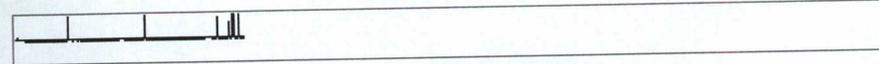
GHT: Borderline

VFI: 98%

MD24-2: -2.30 dB P < 5%

PSD24-2: 1.70 dB P < 10%

:: P < 5%
 ☒ P < 2%
 ☒ P < 1%
 ■ P < 0.5%



Comments



What is the ocular management for this patient?

Idiopathic Intracranial Hypertension (IIH)

- Elevated intracranial pressure of unknown cause predominantly in young women of childbearing age.
- Daily headache, pulse synchronous tinnitus, transient visual obscurations and papilledema with associated visual loss.

IIH

- Idiopathic Intracranial Hypertension Treatment Trial (IIHTT), multicenter, double-blind, randomized, placebo-controlled study
- Weight-reduction with low sodium diet PLUS acetazolamide VERSUS
- Diet with placebo in subjects with mild visual loss.
- Statistically significant improvements in visual field function, quality of life measures, papilledema grade and CSF pressure in the acetazolamide group.

IIIH

- Acetazolamide-plus-diet patients lost twice as much weight as placebo-plus-diet patients
- Treatment **failure was much less common** in the acetazolamide-plus-diet group compared to the placebo-plus-diet group
- Risk factors for treatment failure were presence of high-grade papilledema and lower ETDRS visual acuity measures at baseline.

What are the nutritional and lifestyle considerations?

Dietary Concerns

A thick yellow horizontal bar spans the width of the slide, with a vertical yellow bar extending downwards from its right end.

- Avoidance of excess sodium intake may reduce symptoms
 - Diet may be the “cure” but is not always easy
 - Refer to licensed dietician
- 
- A thin grey horizontal bar is located at the bottom of the slide.

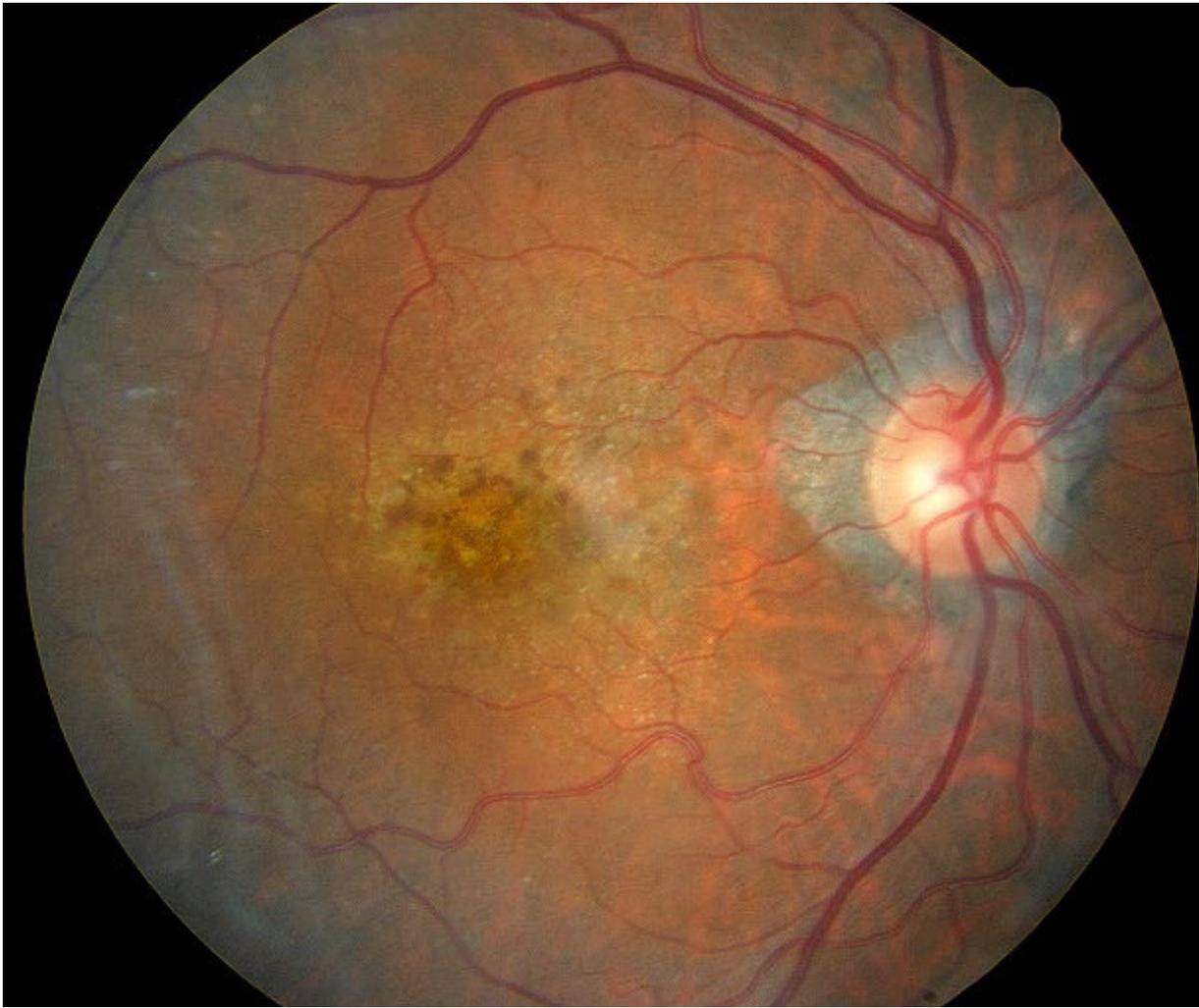
24 Hour Food Recall

- “I don’t need a dietician”
- 8:00 AM: salted peanuts (2 oz.) and water
- 12:30 PM: banana bread (2 slices) and water
- 4:00 PM: crackers from vending machine
- 8:30 PM: salt fish (cod) with ‘jerk’ seasoning and dumplings



Case 4

- 75-year old white female
- CC: Decreased distance and near vision in both eyes for several years.
- PMX: Hypertension, high cholesterol, arthritis, anemia
- **Medications: aspirin 81mg, atorvastatin 20 mg QD (Lipitor), Lisinopril 20 mg QD**
- Social: Past smoker 1 pack/day (quit 5 years ago), alcohol approx. 3 drinks/week.
- BP: 110/70
- Height: 5'3" (161.5 cm) Weight: 85 lb.(38.5 kg) **BMI: 15**
- Other: poor appetite, paucity of vegetable intake
- BCVA 20/50 OD, 20/100 OS



Diagnoses

H35.31 Intermediate dry macular degeneration OD

H35.3221 Advanced wet macular degeneration OS

D50.9 Anemia, unspecified

I10 Essential (primary) hypertension

E78.5 Hyperlipidemia, unspecified

R63.6 Underweight

What is the ocular management for this patient?

What medication considerations should be addressed?

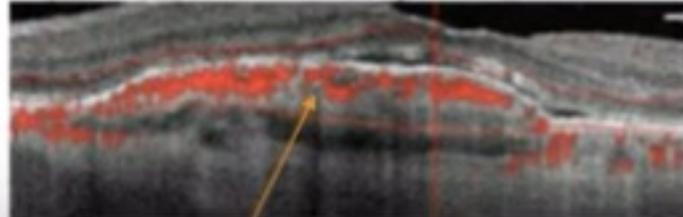
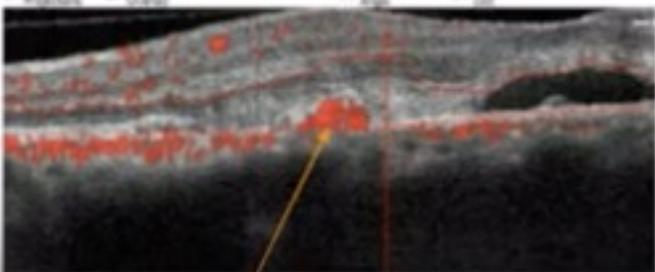
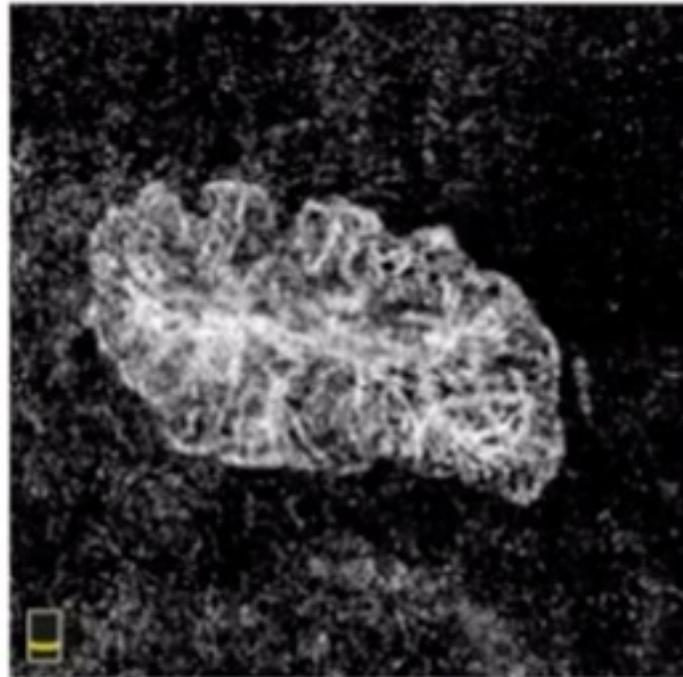
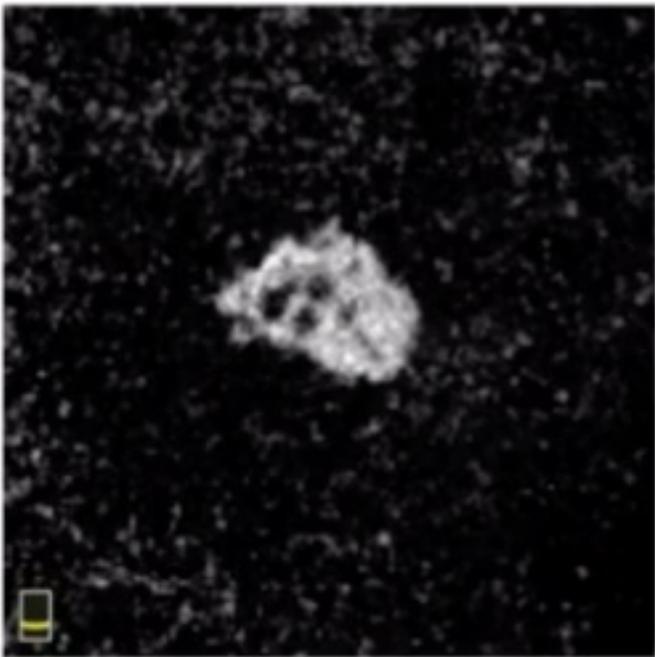
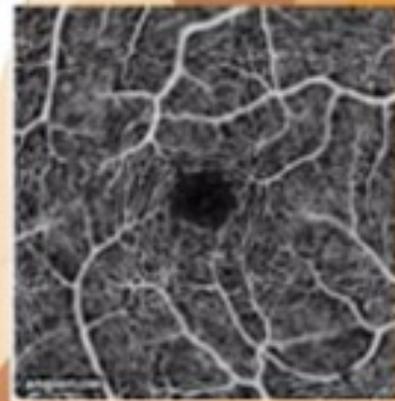
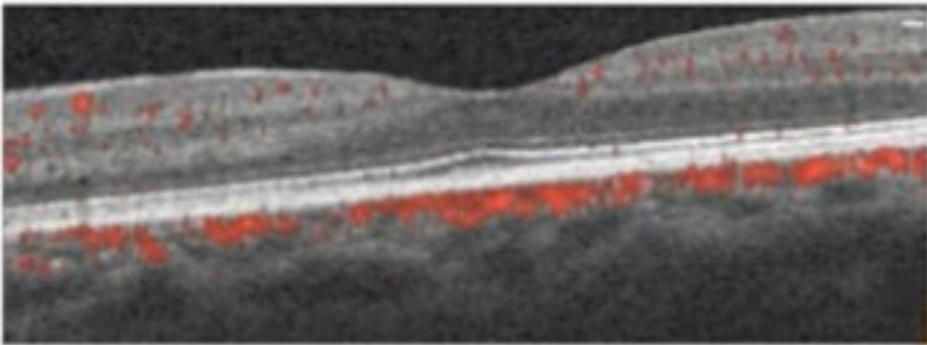
What are the dietary recommendations for this patient?

Ocular Considerations

- Elderly white female that is frail and underweight with a poor appetite
 - Should consider giant cell arteritis
 - CRP and ESR
 - ESR can be affected by Lipitor and produce a false negative
 - CRP would be the more sensitive test in this patient
- Urgent referral for management of wet AMD with anti-VEGF
- Follow with OCT and OCTA
- Home checking - Preferential Hyperacuity Perimetry (PHP)



scan



Medication Considerations

- Lisinopril can deplete zinc
- Atorvastatin 20 mg QD
 - May affect transport of carotenoids
 - May diminish Co-Q10

Nutritional and Dietary Considerations

- **Past history of smoking** - supplementation should not include beta carotene
- Consider genetic testing for AMD risk alleles
 - **High risk CFH may do worse with zinc supplementation**
- B-complex deficiency not uncommon with poor diet:
 - B-12 anemia may cause failure to thrive, frailty, anorexia/poor appetite and low weight.
- Diet likely consists of high sugar, which may increase inflammation
- Poor appetite may need nutritional meal replacements of high quality

Case 5

- 61-year old male
 - CC: Blurry vision OU
 - PMHx
 - Open heart surgery: 5 heart attacks'
 - Stage 2 renal failure
 - Hypertension
 - HIV (viral load "undetectable")
 - Fatty tumor abdomen
 - Sleep apnea
 - Social: Former smoker
 - Allergy: PCN
-
- MEDS:
 - Alprazolam
 - Gabapentin
 - Tylenol 3
 - Intelence
 - Isentress
 - Isosorbide monohydrate ER
 - Nifedical XL
 - Pantoprazole
 - Quinapril
 - Simvastatin
 - Toprol
 - Truvada

Case 5

- Height: 5'9" (175 cm)
- Weight: 260 lbs. (118 kg)
- BMI: 38.4
- BP: 130/90



Case 5

- BCVA 20/20 OD, OS
- Pupils: Normal
- CF: Full
- EOM's: Normal
- Adnexa: Prolapsed orbital fat OU
- SLE: Blepharitis, SPK OU, trace lens changes
- IOP: 17, 16 mm Hg OD,OS
- Fundus: Attenuated arterioles and crossing changes, C/D 0.25 OD, OS, NO hemorrhages or CWS

Diagnoses

- Stage 2 hypertensive retinopathy
- Diabetes without retinopathy
- HIV without retinopathy
- Class 2 severe obesity due to excess calories with serious co-morbidity and body mass index (BMI) of 38.0-38.9

Ocular Management?

Obesity, OSA & Resistant Hypertension

- Obesity closely related to OSA
 - Large neck circumference, abdominal effect on diaphragm
- Resistant hypertension and OSA
- Clues to OSA: snoring, apneic episodes noted by bed partner, frequent nocturnal urination, messy bed in am

Recommendations

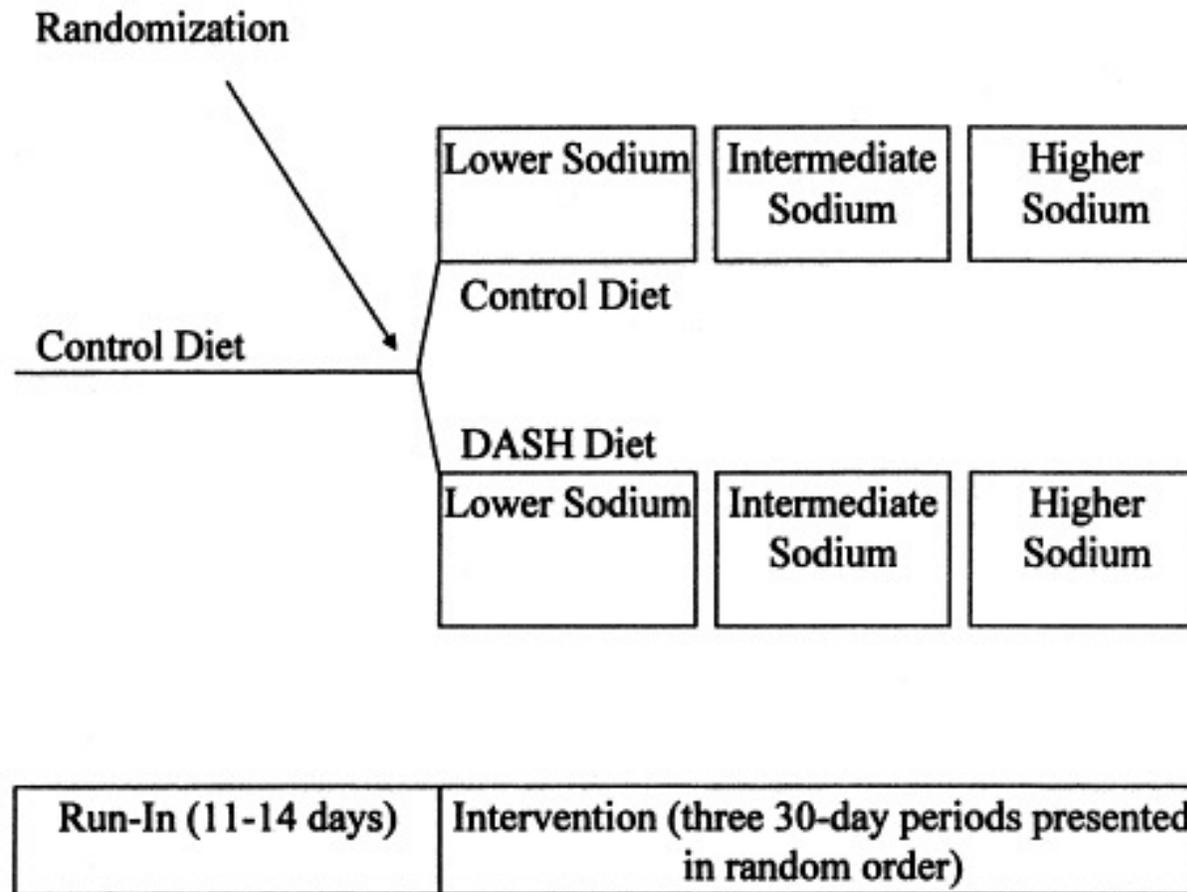
- “I’ve tried everything!”
- Counseling
- TLC Diet * (CVD and cholesterol)
- DASH Diet



Dietary Approaches to Stop Hypertension

- Requires no special foods but rather **daily and weekly nutritional goals**.
- Vegetables, fruits, and whole grains.
- Fat-free or low-fat dairy products, fish, poultry, beans, nuts, and vegetable oils
- Limiting foods high in saturated fat, (fatty meats, full-fat dairy products, and tropical oils such as coconut, palm kernel, and palm oils).
- Limiting sugar-sweetened beverages and sweets.

DASH Diet, Sodium Intake, and Blood Pressure (DASH-Sodium) Trial



DASH-Sodium Trial

- Control diet (typical of what many Americans eat) and the DASH diet
- DASH Diet - emphasizes fruits, vegetables, and low-fat dairy foods, whole grains, poultry, fish, and nuts, and reduced fats, lowering red meat intake, sweets, and sugar-containing beverages.
- 3 sodium levels are defined as higher (typical of current US consumption), intermediate (reflecting the upper limit of current US recommendations), and lower (reflecting potentially optimal levels).
- Three 30-day intervention feeding periods.

DASH-Sodium Trial

- Combination of reduced sodium intake AND DASH Diet lowered SBP throughout the range of pre and stage 1 hypertension with progressively greater reductions at higher levels of baseline SBP.
 - SBP reductions in adults with the highest levels of SBP (≥ 150 mm Hg) were greater.
- Reinforced importance of both sodium reduction and the DASH diet in this high-risk group.
- Blood pressure decreased with each reduction of sodium.
- **Conclusion: Reducing sodium intake AND following the DASH diet is more beneficial for lowering blood pressure than following the DASH diet alone or reducing sodium alone.**

Clinical Perspective

Chicken Noodle Soup			
Nutrition Facts			
Serving Size 1/2 cup (120 ml) condensed soup			
Servings Per Container about 2.5			
Amount Per Serving			
Calories	60	Calories from Fat	15
% Daily Value*			
Total Fat	1.5g		2%
Saturated Fat	0.5g		3%
Trans Fat	0g		
Cholesterol	15mg		
Sodium	890mg		37%
Total Carbohydrate	8g		3%
Dietary Fiber	1g		4%
Sugars	1g		
Protein	3g		
Vitamin A	4%	Calcium	0%
Vitamin C	0%	Iron	2%
*Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.			
	Calories	2000	2500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400m	2400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

2,225 mg



Sodium and HTN

- Salt-sensitive HTN attributable to genetic and environmental factors, renal function, and components of the metabolic syndrome.
- Salt sensitivity influences development of organ damage, even independently of BP levels and the occurrence of hypertension.
- Observational studies indicate that **salt sensitivity is associated with a higher rate of cardiovascular events and mortality.**

Co-Morbidities and CVD

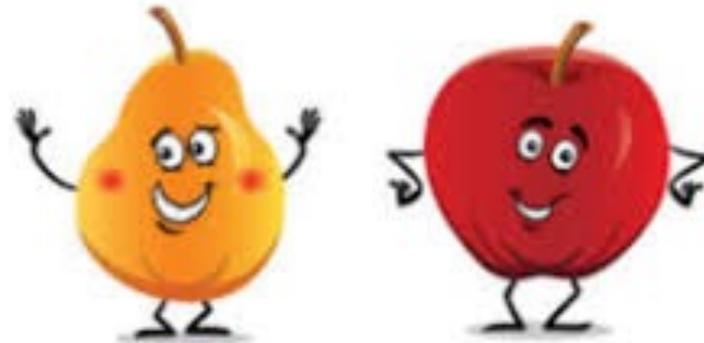
- Atherosclerosis is the underlying cause of myocardial infarction, transient ischemic attack

- Risk factors:

- **Central fat deposition** →

Responds to diet and exercise

- Family history
 - High blood cholesterol and HTN
 - Smoking
 - Physical inactivity
 - Diabetes



Cholesterol and Heart Disease?

Eggs
Cheese
Shellfish
Pasture-Raised Meat
Organ Meats
Sardines
Full-Fat Yogurt



Cholesterol Classifications

Total Cholesterol

Less than 200 mg/dL	Desirable
200–239 mg/dL	Borderline high
240 mg/dL and above	High

LDL Cholesterol

Less than 100 mg/dL	Optimal (ideal)
100–129 mg/dL	Near optimal/above optimal
130–159 mg/dL	Borderline high
160–189 mg/dL	High
190 mg/dL and above	Very high

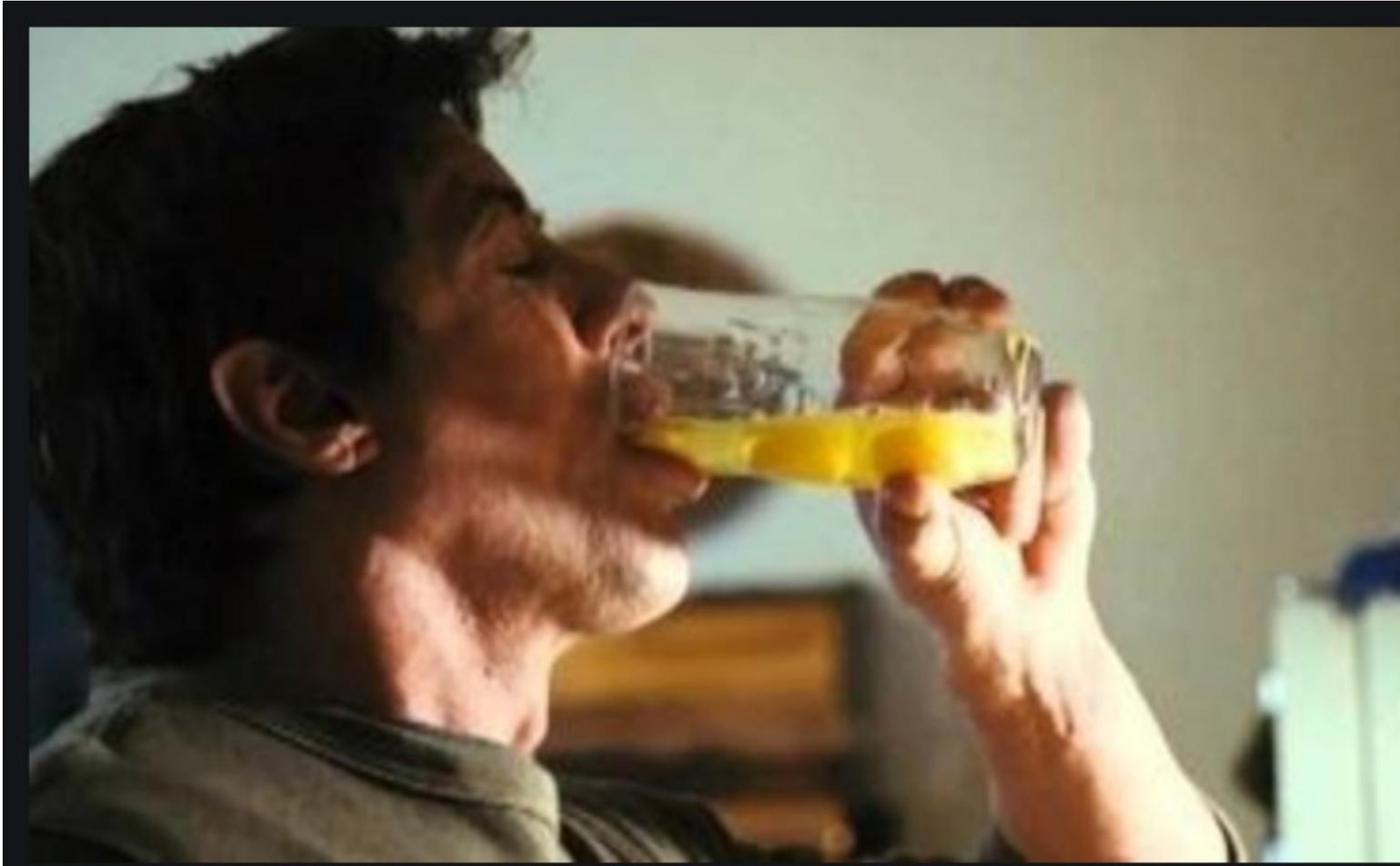
HDL Cholesterol

Less than 40 mg/dL	Major heart disease risk factor Gives some protection against heart disease
60 mg/dL and above	

Fried Food
Fatty Beef
Fast Food
Lard/Shortening
Processed Meats
Desserts



What About Eggs??



What's the RDI for cholesterol?

TLC Diet (Therapeutic Lifestyle Changes)

- The National Heart, Lung and Blood Institute
- Goal is to reduce risk of **heart disease**
- **Three parts: diet, exercise and weight control**
- Four categories of heart disease risk to set LDL goals and treatment steps.
 - Heart disease or diabetes: category I (highest risk)
 - Do not have either: risk category assessment with questionnaire.

If you have:	You are in category:	Your LDL goal level is:
Heart disease, diabetes, or a risk score more than 20%	I—High Risk	Less than 100 mg/dL
2 or more risk factors and risk score 10–20%	II—Next Highest Risk	Less than 130 mg/dL
2 or more risk factors and risk score less than 10%	III—Moderate Risk	Less than 130 mg/dL
0 or 1 risk factor	IV—Low-to-Moderate Risk	Less than 160 mg/dL

TLC Diet

- Less than 7 percent of daily calories from saturated fat
- Less than 200 mg a day of cholesterol
- 25–35% of daily calories from total fat (includes saturated fat)
- Diet options for more LDL lowering
 - 2 grams per day of plant stanols or sterols
 - 10–25 grams per day of soluble **fiber**
- Only enough calories to reach or maintain a healthy weight
- At least 30 minutes of a moderate- intensity physical activity every day of the week.

Physical Activity and CVD

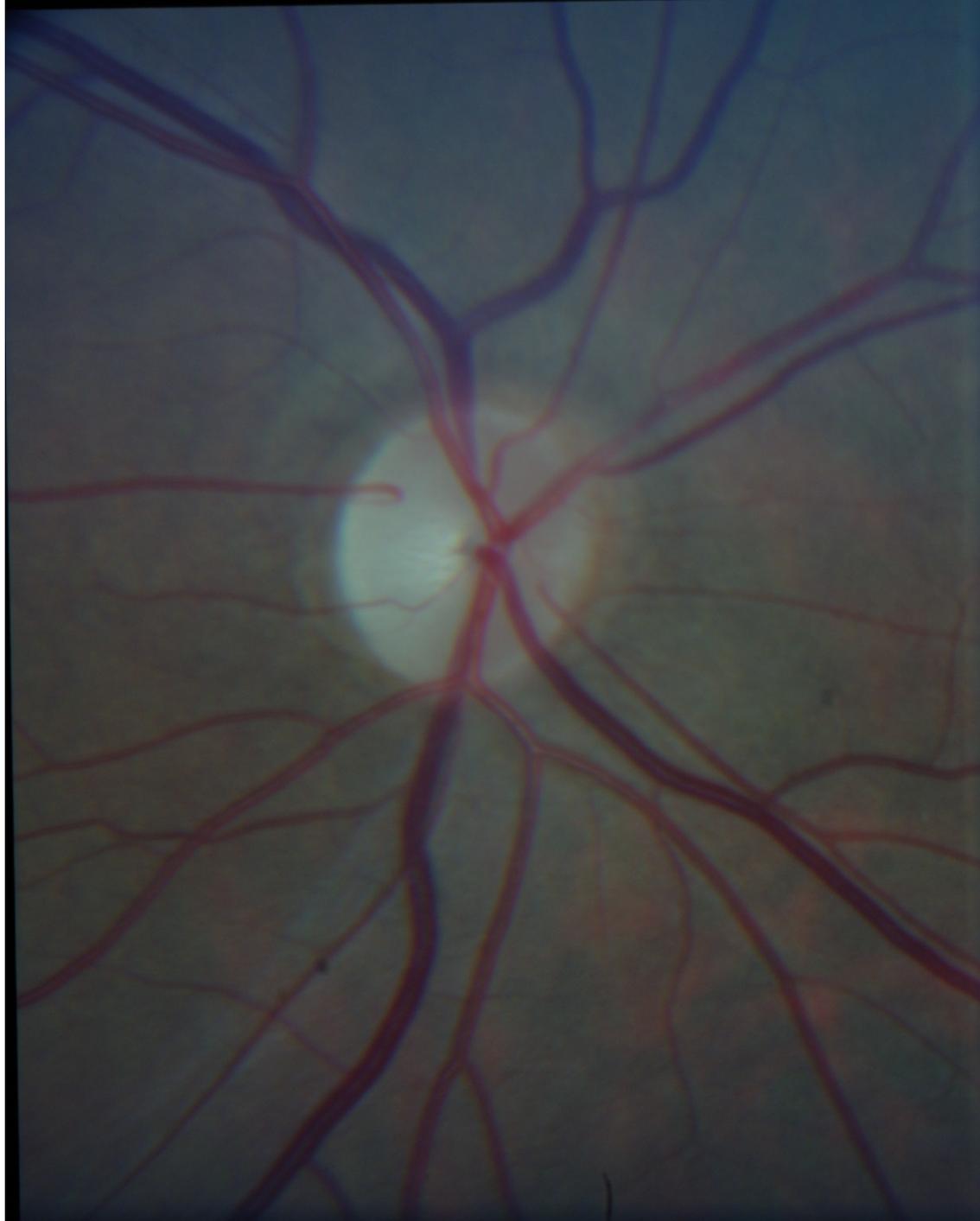
- Physically inactivity
 - Markedly elevated insulin resistance and heart rates in each BMI categories
 - Worse profiles HDL
 - Elevated systolic blood pressure
 - Elevated CRP
 - Significant elevation in risk across four physical activity/obesity groups
 - Insulin resistance affected by obesity
 - Significantly increased the risk of elevated heart rate in both non-obese and obese.

Case 6

- 46 year old white female
- CC: Unusual sensation of “pulling” in her eyes. Feels she has trouble seeing on the right side more than left. Physically she feels “bad” with weakness.
- PMX: Depression, anxiety, osteoporosis
- Medications: Calcium 500 + vitamin D 500 mg, cipro 500 mg BID, amitriptyline
- BP: 100/58 RAS, pulse 60
- Height: 5’6” Weight: 162 lb. (73.48 kg) BMI: 26.15
- Additional history: poor appetite, lack of concentration

Case 6

- Visual acuity: 20/20 OD, OS
- Pupils: +1 APD OD
- EOM: AD-duction deficit OS, AB-duction nystagmus and overshoot OD
- IOP: 15 mm Hg OD, 16 mm Hg OS
- Fundus: Diffuse optic nerve pallor OD, pink OS, vessels and peripheral fundus normal OU.
- OCT: Abnormal OD (reduced NFL and GCC), normal OS



Diagnoses

- H51.22 Left intranuclear ophthalmoplegia
- H47.2 Optic nerve pallor/atrophy OD
- R63.0 Loss of appetite

- **Multiple Sclerosis**

Most Recent Visit

- No change in ocular findings
- C/O nausea and occasionally vomiting
- Symptoms are worse with the summer heat
 - Wearing cool pack around her neck
- BP=95/60
- Pulse 57
- BMI same (26)



Diagnoses

G35 Multiple sclerosis

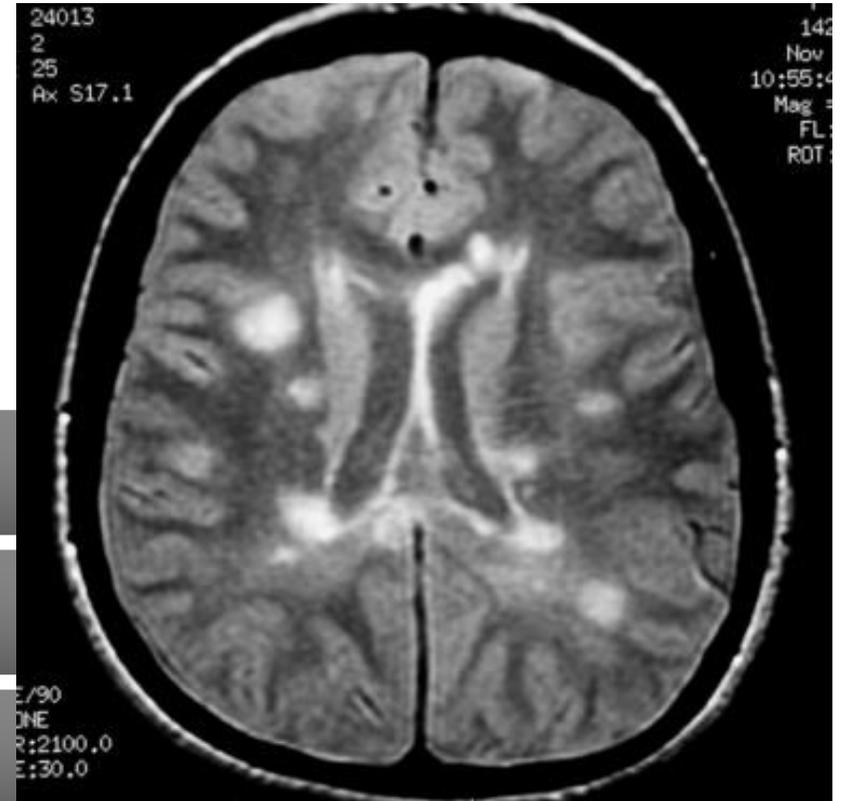
H51.22 Left intranuclear ophthalmoplegia

HN55.09 Nystagmus OU

H47.2 Optic nerve pallor/atrophy OD

R63.0 Loss of appetite

Any others?



What is the ocular management for this patient?

What are the dietary recommendations for this patient?

24 Hour Recall

- 15 grain bread – 2 slices
- Peanut butter - 1 TBS (Peter Pan)
- Smoothie (8 oz.) – mango, apple, lime, grapefruit, peaches, nectarine, ginger, ice
- Water 16 oz.

- Beef jerky - 4 pieces
- Water 6 oz.

- 15 grain bread – 2 slices
- Tuna ½ can
- Mayonnaise – 2 TBS
- Onion and celery - 1 TSP
- Macaroni and cheese (boxed Publix) – 1 cup
- Water -8 oz.



What's missing and needs to be added?

Diet and Multiple Sclerosis

- Lower sodium
- Increase/add lean **quality proteins**
- Increase/add **vegetables**
- Pre and probiotics help produce short chain fatty acids.
- **Probiotics** – the variety is most important rather than the number (of billions)
- Goal is to decrease the opportunistic and pathogenic organisms and increasing symbiotic organisms.
- Gut brain link to mental health and depression

Diet and Multiple Sclerosis

- Increase healthy **PUFA** full fats (avocado, flax, chia)
- Smoothies – decrease in motivation to cook and prepare food as disease progresses
- Add **fermented foods** yogurt or kefir (calcium, vitamin D, probiotics)
- **Vitamin D** deficiency associated with MS – perform serology to check levels. *
- **K2** found in dairy and directs **Ca²⁺** to go into bones rather than arteries. *
- Add **omega 3's** supplements