
What does lifestyle have to do with You and your eyes?
A lot more than we think!

Lifestyle medicine has been practiced by pioneering physicians for the past 4-5 decades. Many of them have been demonstrating through patient care that lifestyle can reverse heart disease, reverse diabetes, reverse diabetic retinopathy, reverse autoimmune disease, Alzheimer's, and the list goes on. The goal of this lecture is to:

1. Identify the systemic biomarkers commonly found in the systemic diseases that are now being found in the secondary ocular diseases.

2. To show current research that demonstrates the efficacy of lifestyle on the pathogenesis of some of the more common diseases we see in our practices. We can reduce the biomarkers with changes in diet, exercise, and other daily choices in lifestyle management.

3. To share personal experience as to how disciplined adherence to diet and exercise has improved biomarkers and sense of well being.

4. Share how physician health behaviors affect the success of patient acceptance and compliance for prescribed lifestyle change.

More Than 97% of Americans Guilty of Unhealthy Lifestyle, Study Says

"Do you get a moderate amount of exercise, eat right, keep from piling on fat, and avoid smoking? Congratulations, you're among the 2.7% of Americans who do so, according to this study."

Health.com March 23, 2016

“The doctor of the future will give no medicine, but will instruct his patient in the care of the human frame, in diet and in the cause and prevention of disease….”

Author: Thomas Edison

Genesis 1:28-31 (NIV)

28 God blessed them and said to them,
“Be fruitful and increase in number; fill the
earth and ***subdue it. Rule*** over the fish in
the sea and the birds in the sky and over
every living creature that moves on the
ground.”

29 Then God said, “I give you every seed-
bearing plant on the face of the whole
earth and every tree that has fruit with
seed in it. They will be yours for food. 30
And to all the beasts of the earth and all
the birds in the sky and all the creatures
that move along the ground—everything
that has the breath of life in it—I give every
green plant for food.” And it was so.

Optometrists eye bigger role in managing chronic conditions

By Andis Robeznieks | June 16, 2015

Optometrists are working more closely with physicians and insurers to identify patients' chronic conditions and make sure those patients receive appropriate medical care. They want to demonstrate that they have the training and skills to do more than just fit people for glasses and contact lenses.

ModernHealthcare.com

Age-Related Macular Degeneration and the incidence of Cardiovascular Disease: A Systematic Review and Meta-Analysis

This study demonstrated that early AMD and late AMD were independent predictors of future Cardiovascular Disease. Late AMD had statistically higher probability of Cardiovasular Disease.

“Clinically, our study implies that an increase in cross-disciplinary awareness among, ophthalmologists, optometrists, cardiologists, and other physicians of the link between these 2 diseases could have beneficial health consequences for patients.”

PLOS ONE March 2014, Vol. 9, Issue 3

Heart Disease and Macular Degeneration

Biomarkers = hsCRP = marker for systemic inflammation
Hypercholesterolemia
Endothelin 1 = potent vasoconstrictor

Genetic Biomarkers = Apolipoprotein B48
Apolipoprotein B100
Apolipoprotein E2

Apolipoprotein E Gene Associations in Age-related Macular Degeneration

The Melbourne Collaborative Cohort Study.

A large study demonstrates that apolipoprotein E2 had a statistically significant association to AMD and differed by smoking status.

American Journal of Epidemiology 2012;175(6):511-518

Genetic Association of Apolipoprotein E with Age Related macular Degeneration

The results show that the ApoE polymorphism is significantly associated with the risk of AMD and that apoE is expressed in lesions that characterize AMD. A decreased risk of AMD was associated with the E4 allele, whereas an increased risk was associated with the E2 allele.

Am. J. Hum. Genet. 63:200-206, 1998

C-Reactive Protein and the Incidence of Macular Degeneration
Pooled Analysis of 5 Cohorts

This analysis of 5 prospective case-control studies provide further evidence that a single measurement of hsCRP more than 3 mg/L predicts an increased risk of developing AMD over many years. After matching for age and controlling for smoking, individuals with baseline hsCRP levels more than 3mg/L had a 50% increased risk of incident AMD and a nearly 2-fold increased risk of neovascular AMD.

Jama (2013) Opthalmology 131 (No. 4) (507-513)

Involvement of a gut–retina axis in protection against dietary glycemia-induced age-related macular degeneration

"Food is medicine, and diet impacts the risk for and progression of age-related macular degeneration AMD, but we have few clues as to why. We found that wild-type mice fed a high-glycemic-index diet similar in composition to the Western diet developed a disease state that resembles dry AMD. To gain insight into the mechanism, we used LC-MS– and NMR-based metabolomics to discover diet-, metabolic-, and AMD-associated phenotypes. These studies revealed changes in the gut microbiota that altered the production of metabolites that protected against AMD, including serotonin***. Changing the diet to a low-glycemic-index diet, even late in life, arrested the development of AMD, offering dietary interventions for AMD."***

In conclusion, our study reinforces the importance of consuming LG diets, specifically diets with a lower GI, as an effective and attainable way to maintain lower glucose levels and to avoid or to treat early AMD.

PNAS = Proceedings of the National Academy of Sciences of the USA
Edited by Catherine Bowes Rickman, Duke University Medical Center, Durham, NC (Feb 20, 2017)

Apolipoprotein B in Cholesterol-Containing Drusen and Basal Deposits of Human Eyes with Age Related Maculopathy

"In this study, RPE contained apo B and apo E MRNA and protein. Finding cholesterol and apo B in sub-RPE deposits links ARM with important molecules and mechanisms in atherosclerosis initiation and progression. "

"The source of lipids and mechanisms of deposition are unknown. Analyses of Bruchs Membrane, choroid lipid composition have implicated both local cells and plasma."

"Placing apoB in the principal lesions of ARM is significant because this molecule has a well-documented role in disease initiation and progression of cardiovascular disease. "

American Journal of Pathology, Vol. 162, No. 2, Feb 2003

Exercise in one study was found to effectively reduce plasma small dense LDL particles via a lowering of apolipoprotein B.

Journal of Internal Medicine 262; 235-243, 2007

How Exercise Can Influence Macular Degeneration

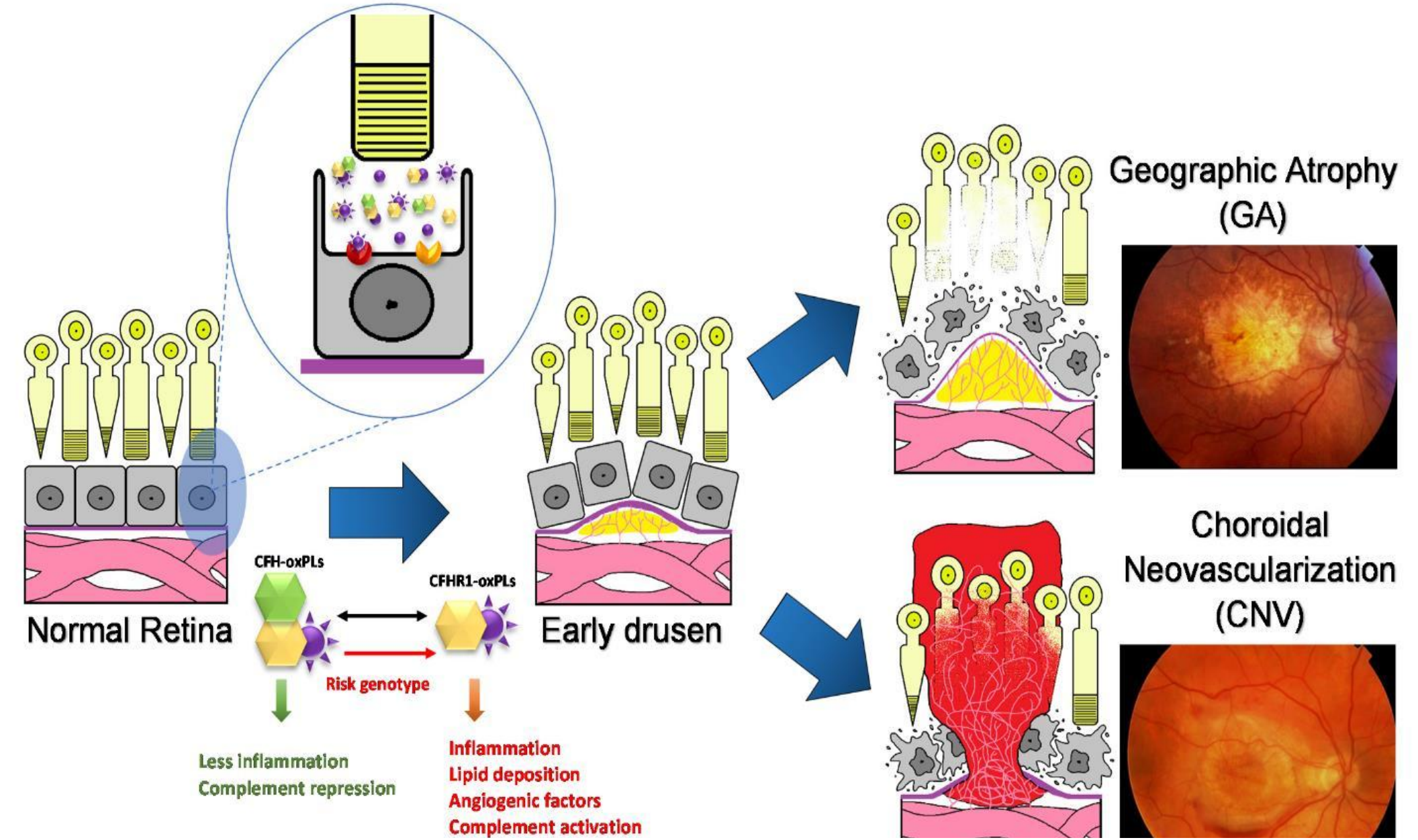
The Department of Ophthalmology and Visual Sciences, at the University of Wisconsin, Madison, did a study called Healthy Lifestyles Related to Subsequent Prevalence of Age-Related Macular Degeneration. The study looked at the relationship between diet, smoking and physical activity as it related to the prevalence of age related macular degeneration. One of the conclusions from this study is, “Women in the highest quintile compared with those in the lowest quintile for physical activity (in metabolic energy task hours per week) had 54% lower odds for early AMD.”

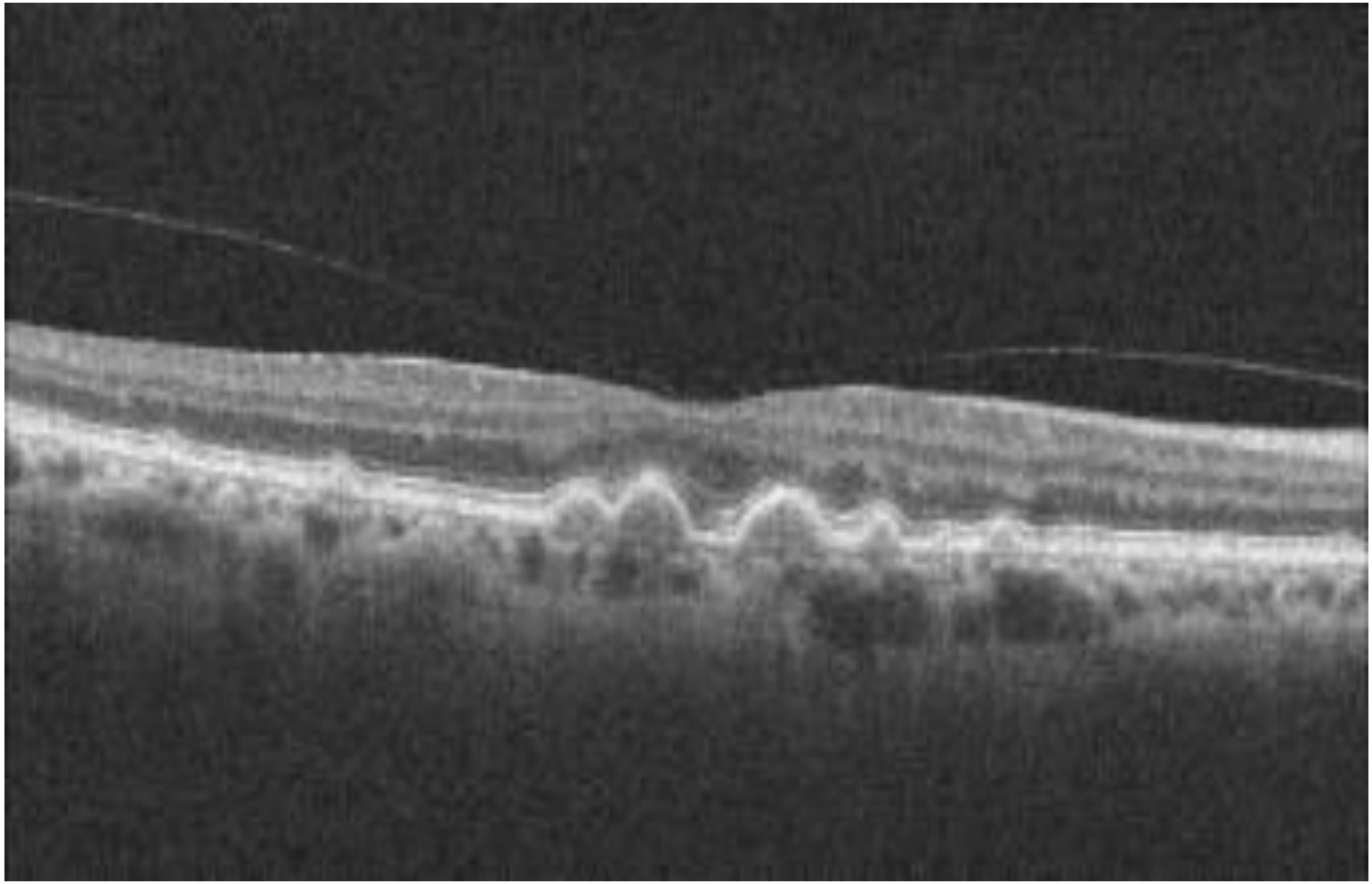
The Beaver Dam Study reveal that increased walking of more than 12 blocks daily decreased the incidence of exudative AMD by 30% over 15 years.

Endothelin-1 and Nitric Oxide Levels in Exudative Age-Related Macular Degeneration

Conclusion: Increased concentrations of ET-1 and reduced levels of NO in the plasma may suggest an imbalance between vasoconstrictor and vasodilator agents, respectively, as a reflection of endothelial dysfunction in the pathogenesis of AMD. These findings may also imply the role of vasoconstriction in exudative AMD.

J Ophthalmic Vis Res 2015; 10 (2): 151-154


Normal Retina
CFH-oxPLs
CFHR1-oxPLs
Risk genotype
Less inflammation
Complement repression
Early drusen
Inflammation
Lipid deposition
Angiogenic factors
Complement activation
Geographic Atrophy
(GA)
Choroidal
Neovascularization
(CNV)




Normal
Distortion
Blur
Scotoma

Diabetes in the United States

22 million diagnosed
8 million undiagnosed

84 million pre-diabetes.

INSULIN RESISTANCE

Insulin resistance is a pathological condition in which cells fail to respond normally to the hormone insulin. The body produces insulin when glucose starts to be released into the bloodstream from the digestion of carbohydrates (primarily) in the diet. Under normal conditions of insulin reactivity, this insulin response triggers glucose being taken into body cells, to be used for energy, and inhibits the body from using fat for energy, thereby causing the concentration of glucose in the blood to decrease as a result, staying within the normal range even when a large amount of carbohydrates is consumed. During insulin resistance, however, excess glucose is not sufficiently absorbed by cells even in the presence of insulin, thereby causing an increase in the level of blood sugar.

Wikipedia

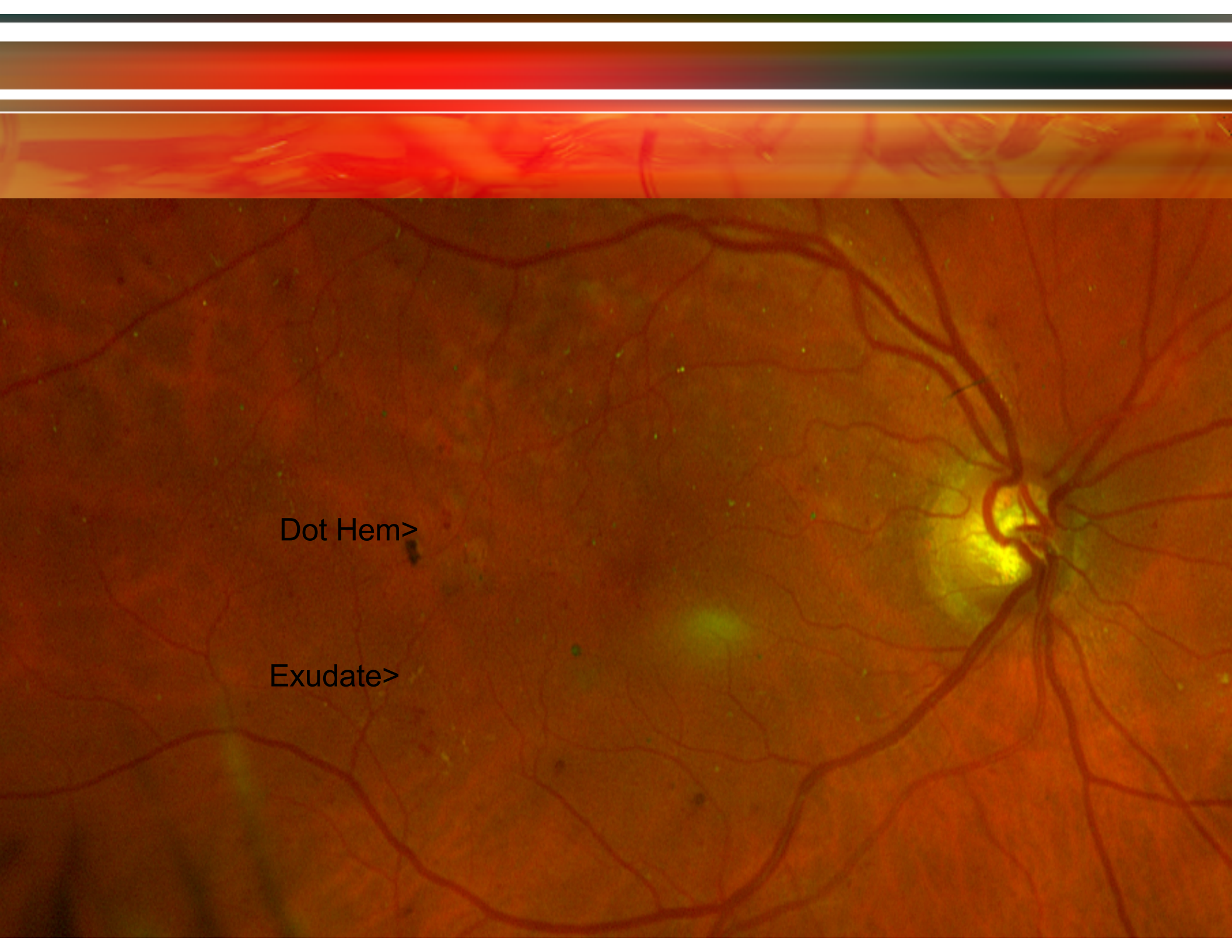
Insulin Resistance Associated Morbidities

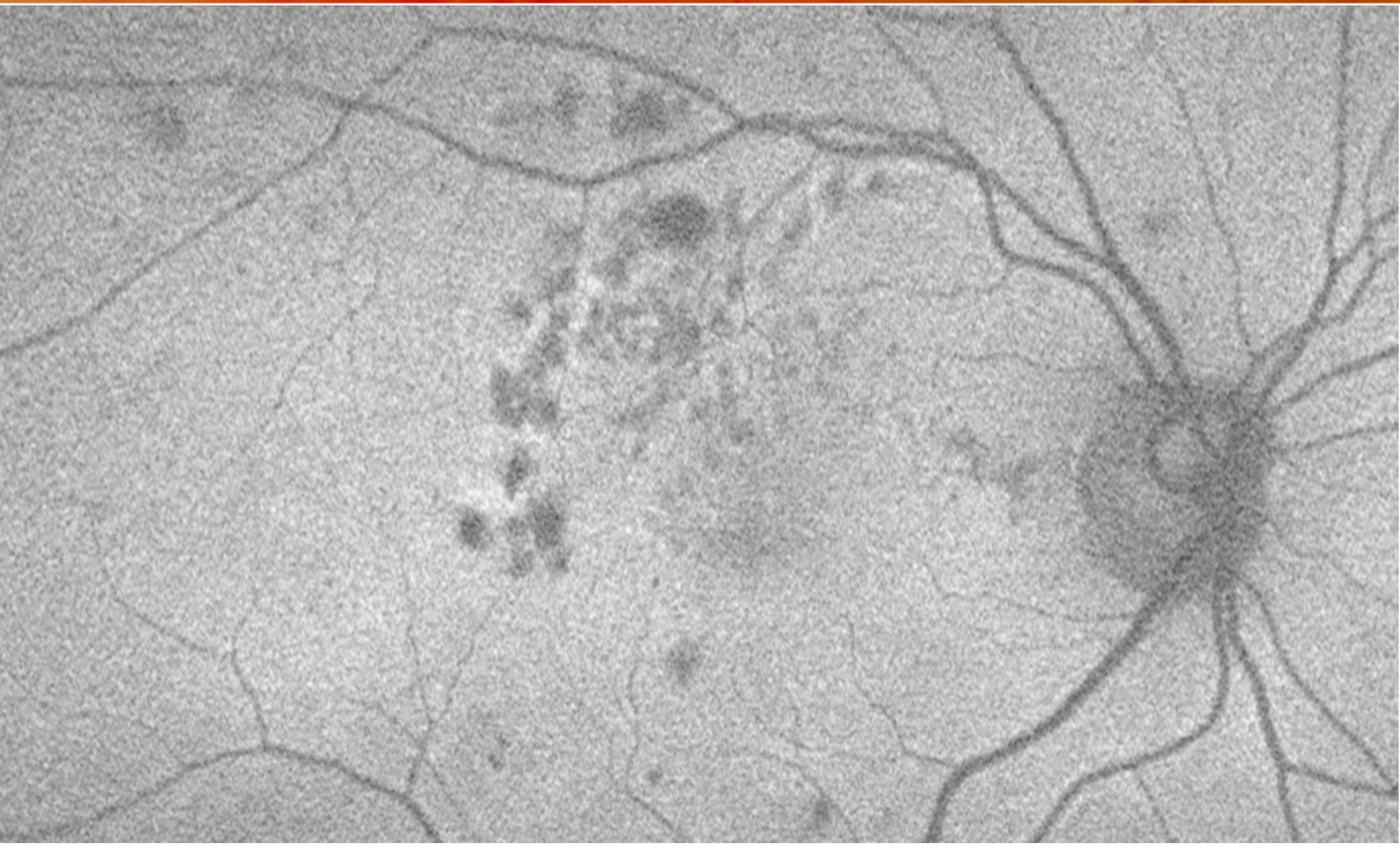
Hypertension
Hyperlipidemia
Hyperuricemia
Metabolic Syndrome

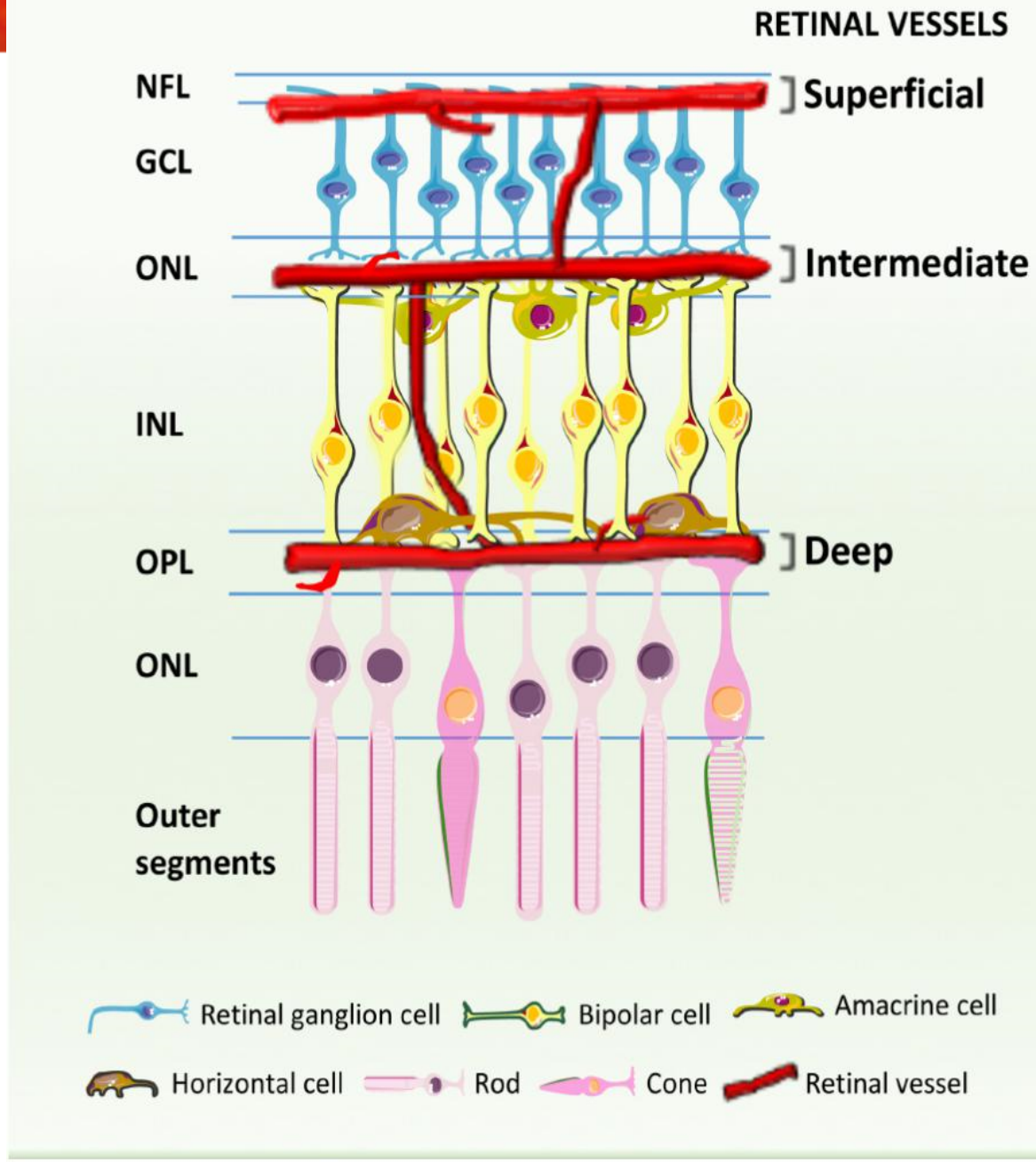
1 increased BP (greater than 130/85 mmHg)
2 high blood sugar levels (insulin resistance)
3 excess fat around the waist
4 high triglyceride levels
5 low levels of good cholesterol, or HDL

3 or more = Met Syndrome

Obesity
Kidney Disease
Cardiovascular Disease
Alzheimer's Disease
Glaucoma
Parkinson's Disease
Pre-Diabetes
Retinopathy
AMD


Dot Hem>
Exudate>



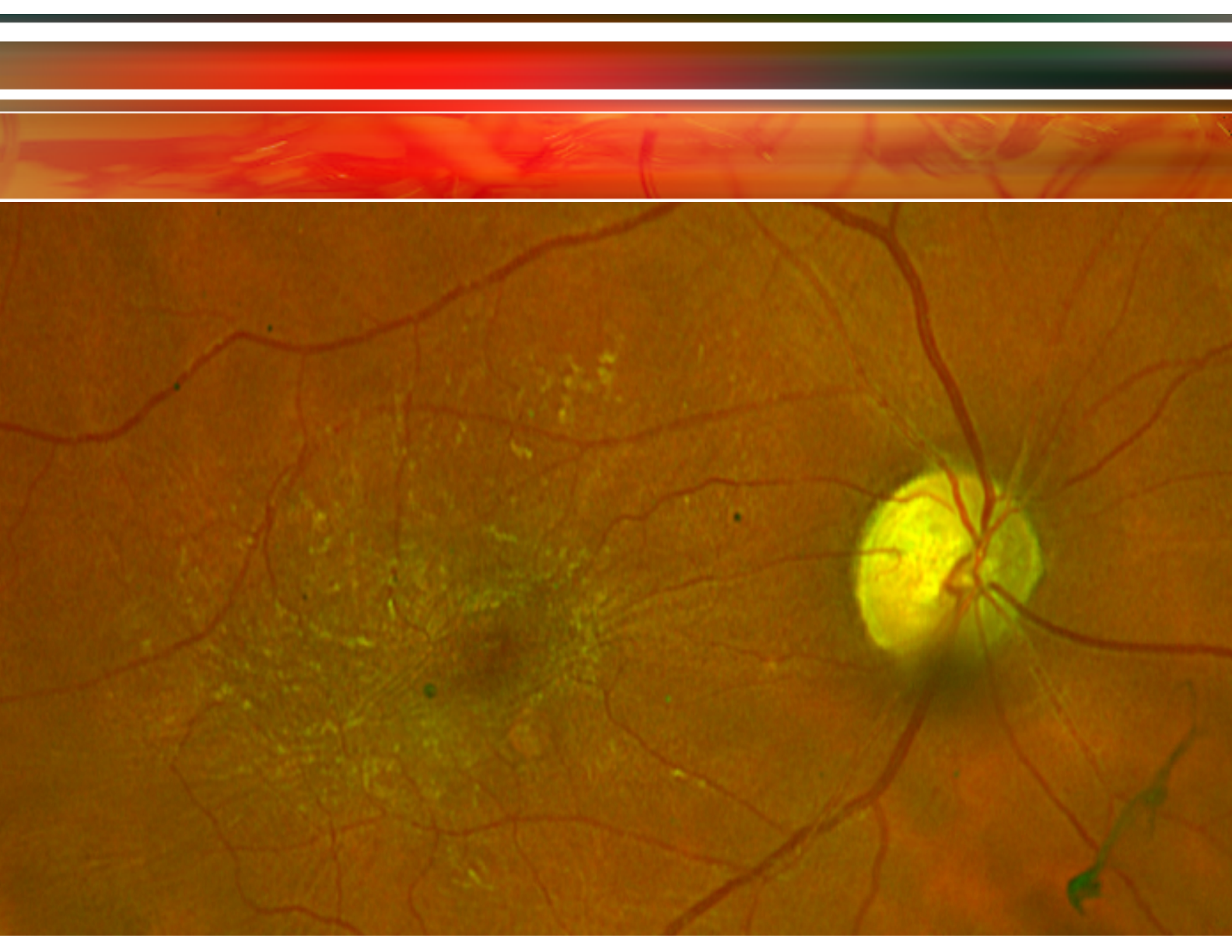

RETINAL VESSELS
NFL
GCL
ONL
INL
OPL
ONL
Outer segments
Superficial
Intermediate
Deep
Retinal ganglion cell
Bipolar cell
Amacrine cell
Horizontal cell
Rod
Cone
Retinal vessel

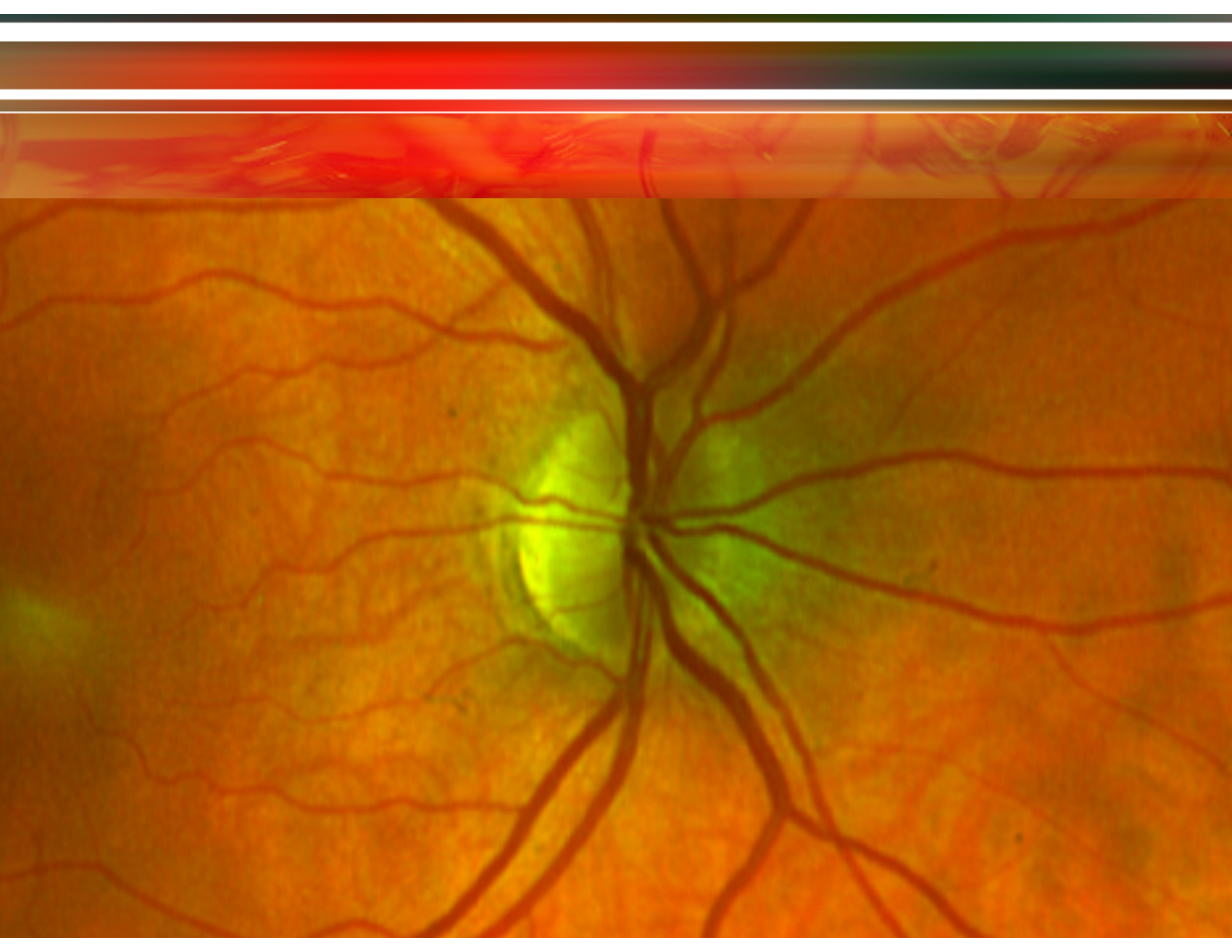
The Eye and the Heart

"***Systemic cardiovascular diseases like arterial hypertension, coronary heart disease, or diabetes mellitus, as well as obesity are all associated with structural vascular changes in the retina.*** These include narrowing of arterioles, dilatation of veins and a decrease in the AV ratio."

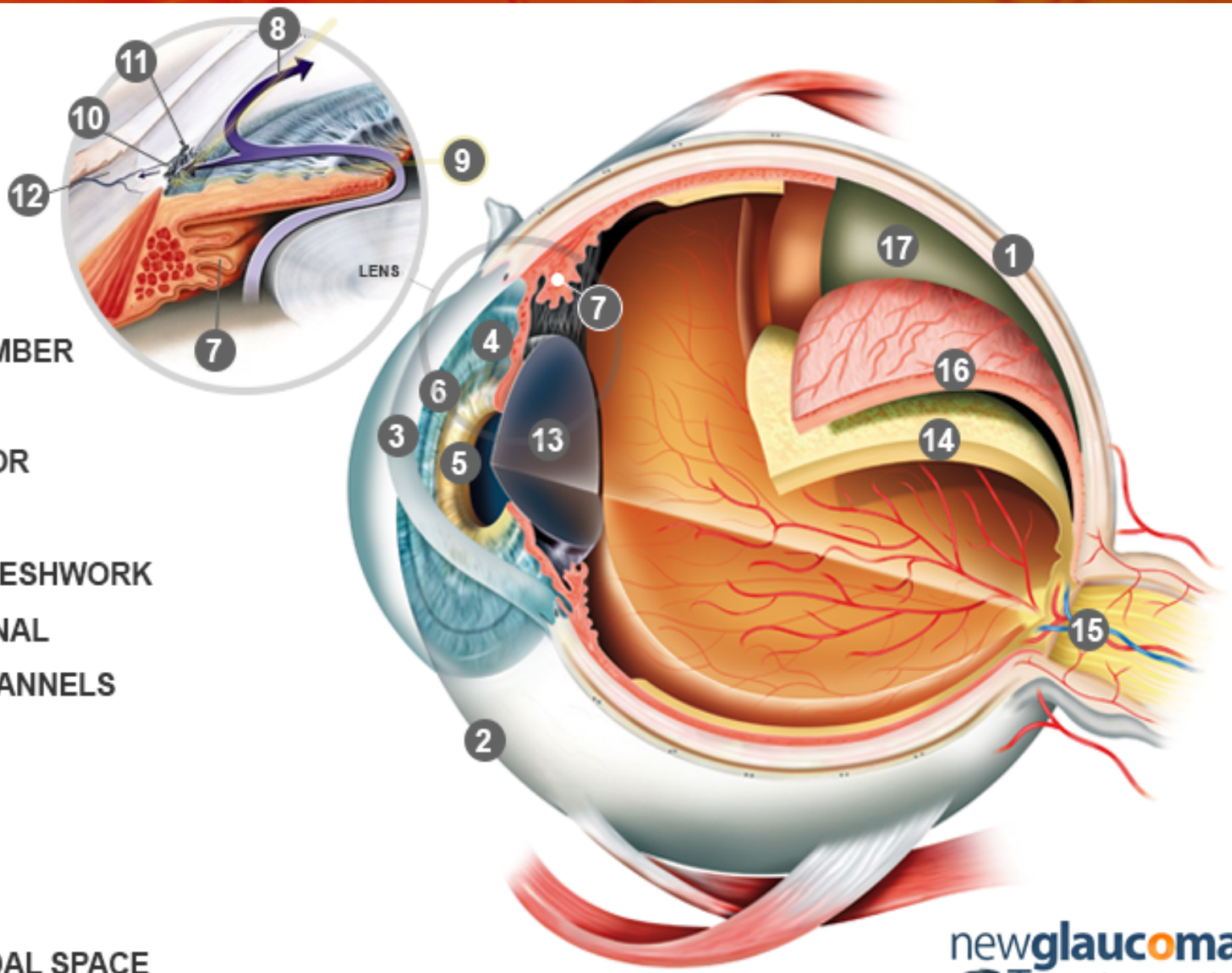
European Heart Journal (2013) 34. 1270-1278


Arteriosclerotic changes noted in the posterior pole >





1. SCLERA
2. CONJUNCTIVA
3. CORNEA
4. IRIS
5. PUPIL
6. ANTERIOR CHAMBER
7. CILIARY BODY
8. AQUEOUS HUMOR
9. ANGLE
10. TRABECULAR MESHWORK
11. SCHLEMM'S CANAL
12. COLLECTOR CHANNELS
13. LENS
14. RETINA
15. OPTIC NERVE
16. CHOROID
17. SUPRACHOROIDAL SPACE



newglaucoma Treatments

Is Glaucoma a Neurodegeneration caused by Central Insulin Resistance: Diabetes Type 4?

Insulin has been found to be important in the production of nitric oxide (NO) by trabecular meshwork cells. ***The NO is important in aqueous outflow regulation and has been reported to increase outflow. This means insulin resistance may cause elevation in IOP leading to ocular hypertension and POAG, and insulin based therapy may have a role in play in lowering IOP through enhancement of aqueous outflow***.

Mitochondrial dysfunction leading to oxidative stress lies at the center stage of glaucomatous damage and insulin is required for healthy functioning of the mitochondria. An increase in IOP leads to mitochondrial dysfunction, and this in turn leads to aberrant insulin signaling, which creates a vicious self-perpetuating cycle with serious damage to mitochondrial functions and increase in oxidative injury to retinal ganglion cells.
Evidence exists that insulin resistance can lead to impaired RGC function and trigger apoptosis and cell death.

Journal of Current Glaucoma Practice, Sep-Dec 2017;11(3):77-79

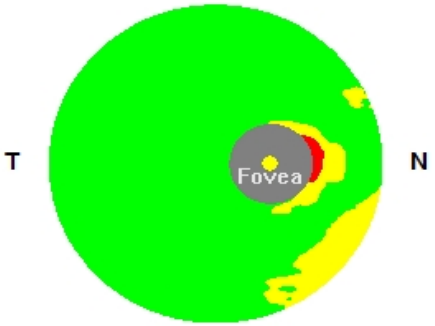
Nerve Fiber ONH/GCC OU Report

Exam Date:2018-01-15

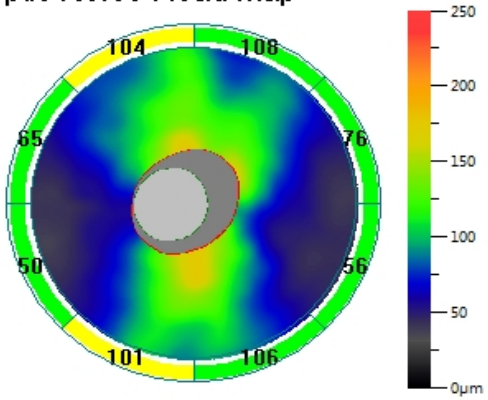
Right / OD

Exam Time: 13:57:15 | Good 72 | Scan Quality Index | Good 71 | Exam Time: 13:57:41

NDB Reference



Optic Nerve Head Map

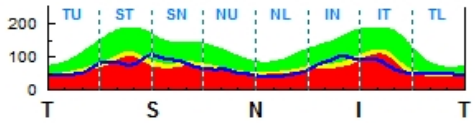


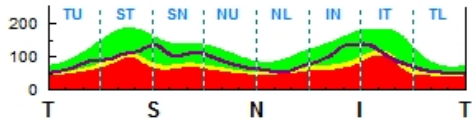
RNFL Summary Parameters

RNFL Analysis (µm)	OD	OS	Inter Eye Diff
Avg RNFL Thickness	83	62	21
Avg Superior RNFL	88	65	23
Avg Inferior RNFL	78	60	18
Intra Eye Diff (S-I)	10	5	N/A

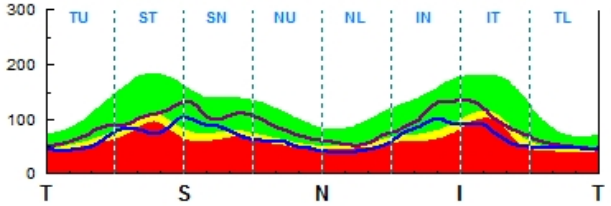
ONH Analysis	OD	OS	Inter Eye Diff
Area C/D	0.49	0.71	-0.22
V. C/D	0.71	0.91	-0.20
H. C/D	0.69	0.89	-0.20
Rim Area (mm^2)	1.04	0.71	0.33
Disc Area (mm^2)	2.04	2.47	-0.43
Cup Vol (mm^3)	0.207	0.484	-0.277

Left / OS





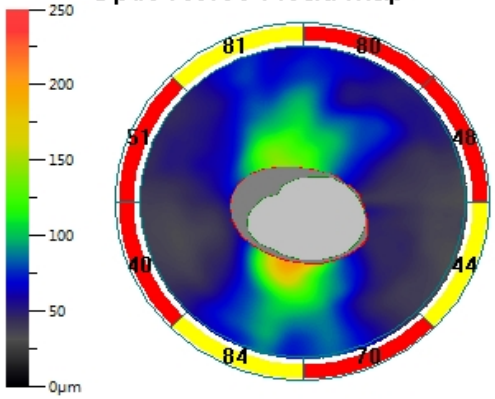
TSNIT NDB Reference



Within Normal
Borderline
Outside Normal

OD
OS

Optic Nerve Head Map



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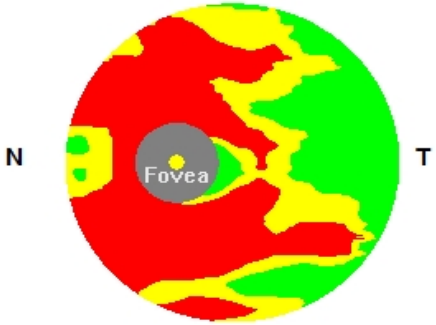


GCC Summary Parameters

GCC Avg (µm)	OD	OS	Inter Eye Diff
Total	87	73	14
Superior	88	74	14
Inferior	87	73	14
Intra Eye Diff (S-I)	1	1	N/A
FLV (%)	1.241	6.193	-4.952
GLV (%)	6.725	20.708	-13.983

Exam Time: 13:59:01 | Good 60 | Scan Quality Index | Good 68 | Exam Time: 13:58:48

Print | Change Analysis | OU Report

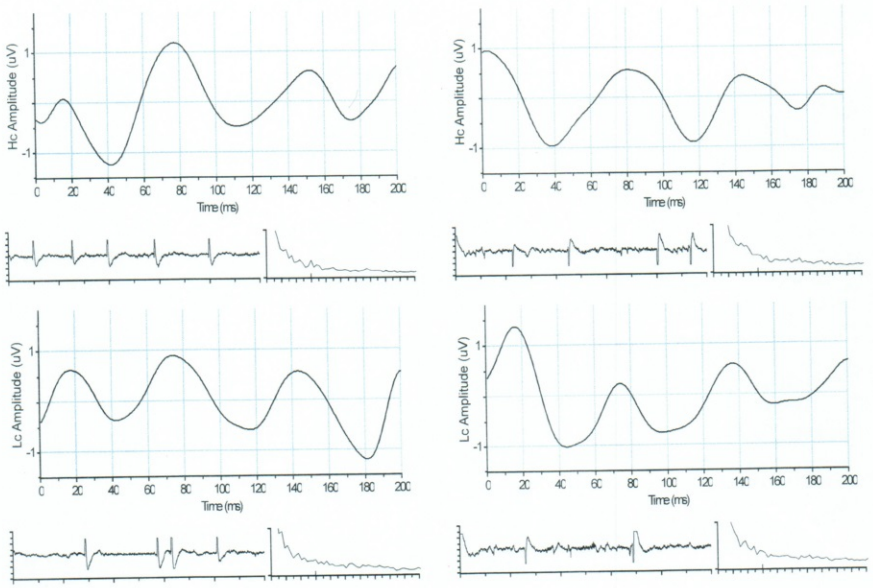
optovue

DIOPSYS® NOVA-ERG
CONTRAST SENSITIVITY ELECTRORETINOGRAPHY

Last Name: [redacted]	DOB:	12/7/1945	
First Name: Maria	Age:	70	
Patient ID:	Gender:	Female	
Exam Date: 2016-09-19	OD:	+3.50 -1.00 x180	BCVA: 20/20
Exam Time: 02:02:16 PM	OS:	+3.25 -0.75 x5	BCVA: 20/20

Signal Quality:
123dBμV 60Hz noise

OD **OS**



Parameter	OD Hc	OD Lc	OS Hc	OS Lc
Magnitude (uV)	1.08	0.99	1.08	1.14
MagnitudeD	0.74	0.78	0.69	0.71
MagD/Mag Ratio	0.69	0.78	0.64	0.62
SNR (dB)	4.1	1.7	0.4	0.4
Artifacts	2	2	2	2

Operator: Brown,Jennifer

Todd Lang, OD
Bayside Eye - 9476

Comments: - Grating Size: 64

Signature:

(39,36,32,32)

Diagnosis is doctor's responsibility. PERG recorded using skin electrodes.

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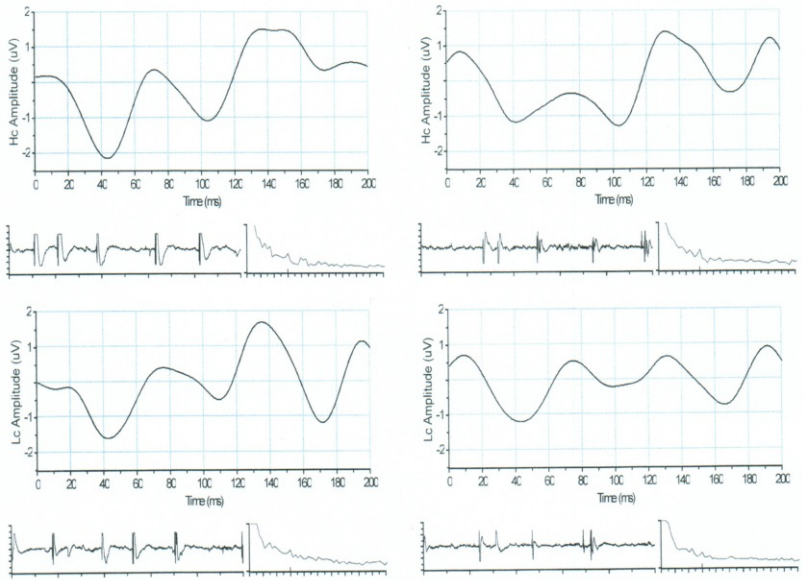
DIOPSYS ERG
ELECTRORETINOGRAPHY
CONTRAST SENSITIVITY

Last Name: [redacted]	DOB:	12/7/1945	
First Name: Maria	Age:	71	
Patient ID:	Gender:	Female	
Exam Date: 2017-03-20	OD: +3.00 -1.25 x178	BCVA:	20/20
Exam Time: 02:13:47 PM	OS: +3.25 -1.00 x175	BCVA:	20/20

OD

Signal Quality
99 dBuV | 95 dBuV

OS



Parameter	OD Hc	OD Lc	OS Hc	OS Lc
Magnitude (uV)	1.22 (1.17)	1.33 (1.18)	1.34 (1.14)	0.97 (1.08)
MagnitudeD	0.95 (0.90)	1.04 (0.94)	0.92 (0.72)	0.72 (0.75)
MagD/Mag Ratio	0.78 (0.77)	0.78 (0.80)	0.69 (0.63)	0.74 (0.69)
SNR (dB)	3.1	2.5	3.7	2.3
Artifacts	6	3	3	1

Operator: Brown.Jennifer

Todd Lang, OD
Bayside Eye - 9476

Comments: - Grating Size: 64

Signature:

Diagnosis is doctor's responsibility. PERG recorded using Diopsys proprietary lid electrodes.
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(12,9,11,7)

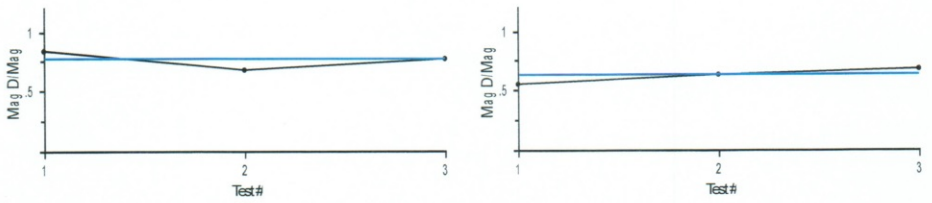
DIOPSYS ERG
ELECTRORETINOGRAPHY
CONTRAST SENSITIVITY

Last Name: [redacted]	DOB:	12/7/1945	
First Name: Maria	Age:	71	
Patient ID:	Gender:	Female	

Trend Report

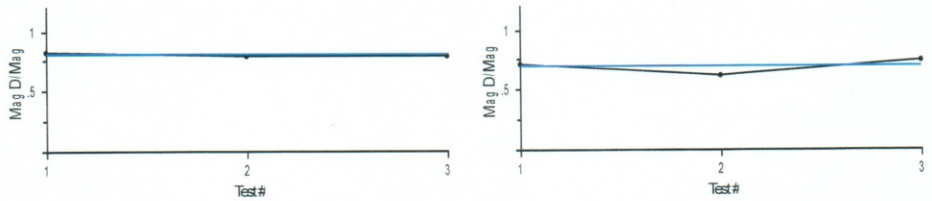
OD Hc

OS Hc



OD Lc

OS Lc



Baseline Average

Base Line Test Dates and Times:

12/8/2015 - 2:30:28 : ODLc, ODHc, OSLc, OSHc
9/19/2016 - 2:02:16 : ODLc, ODHc, OSLc, OSHc
3/20/2017 - 2:13:47 : ODLc, ODHc, OSLc, OSHc

Operator: Brown.Jennifer

Todd Lang, OD
Bayside Eye - 9476

Comments: - Grating Size: 64

Signature:

Diagnosis is doctor's responsibility. PERG recorded using Diopsys proprietary lid electrodes.
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(12,9,11,7)

SINGLE FIELD ANALYSIS - GPA

NAME: [redacted],MARIA
ID: 1945.0430.43C1.885D.69CE.1608

EYE: RIGHT
DOB: 04-30-1945

CENTRAL 24-2 THRESHOLD TEST

FIXATION MONITOR: BLIND SPOT
FIXATION TARGET: CENTRAL
FIXATION LOSSES: 0/10
FALSE POS ERRORS: 0 %
FALSE NEG ERRORS: 0 %
TEST DURATION: 03:13

STIMULUS: III, WHITE
BACKGROUND: 31.5 ASB
STRATEGY: SITA-FAST

PUPIL DIAMETER:
VISUAL ACUITY:
RX: +5.00 OS DC X

DATE: 07-12-2018
TIME: 3:09 PM
AGE: 73

FOVEA: OFF

GHT: OUTSIDE NORMAL LIMITS
VFI 99%
MD -1.14 DB
PSD 1.78 DB P (10%

GPA

NO PROGRESSION DETECTED

SEE GPA PRINTOUT FOR COMPLETE ANALYSIS

BASELINE EXAMS:
11-18-2013 06-09-2014
PREVIOUS FOLLOW-UP EXAMS:
04-05-2016 06-19-2017

Δ P (5% DETERIORATION
▲ P (5% (2 CONSECUTIVE)
▲ P (5% (3+ CONSECUTIVE)
X OUT OF RANGE

TOTAL DEVIATION

PATTERN DEVIATION

:: (5%
▒ (2%
▒ (1%
■ (0.5%

BAYSIDE EYE CENTER
314 N. TAMIAMI TRAIL
PUNTA GORDA, FL 33950
941-637-0425

© 2010 CARL ZEISS MEDITEC
HFA II 745-5571-5.0

SINGLE FIELD ANALYSIS - GPA

NAME: [redacted],MARIA
ID: 1945.0430.43C1.885D.69CE.1608

EYE: LEFT
DOB: 04-30-1945

CENTRAL 24-2 THRESHOLD TEST

FIXATION MONITOR: GAZE/BLIND SPOT
FIXATION TARGET: CENTRAL
FIXATION LOSSES: 0/11
FALSE POS ERRORS: 3 %
FALSE NEG ERRORS: 11 %
TEST DURATION: 03:45

STIMULUS: III, WHITE
BACKGROUND: 31.5 ASB
STRATEGY: SITA-FAST

PUPIL DIAMETER:
VISUAL ACUITY:
RX: +5.00 OS DC X

DATE: 07-12-2018
TIME: 3:14 PM
AGE: 73

FOVEA: OFF

GHT: WITHIN NORMAL LIMITS
VFI 97%
MD -3.27 DB P (1%
PSD 2.31 DB P (2%

GPA

NO PROGRESSION DETECTED

SEE GPA PRINTOUT FOR COMPLETE ANALYSIS

BASELINE EXAMS:
11-18-2013 06-09-2014
PREVIOUS FOLLOW-UP EXAMS:
04-05-2016 06-19-2017

Δ P (5% DETERIORATION
▲ P (5% (2 CONSECUTIVE)
▲ P (5% (3+ CONSECUTIVE)
X OUT OF RANGE

TOTAL DEVIATION

PATTERN DEVIATION

:: (5%
▒ (2%
▒ (1%
■ (0.5%

BAYSIDE EYE CENTER
314 N. TAMIAMI TRAIL
PUNTA GORDA, FL 33950
941-637-0425

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HFA II 745-5571-5.0

Name: [redacted] MARIA
From Dept.: Neurology Dept.
Exam Date: 08-31-2018,08:59:01
Referring Physician. Dr: Lang

Gender: Female
D.O.B: 04-30-1945
Technician: Dylan Roberts

This is a 73 year old female being evaluated because of symptoms relatable to VBI.

Technical Result:

Pulsed-Doppler mean velocities (cm/sec) and the Gosling pulsatility indices for each vessel insonated from the temporal, orbital, and sub-occipital windows. Vasomotor Reactivity is the percentage increase in mean flow velocity following a 20-30 second breath-holding maneuver (BH).

(In the table, the unit of PK, MN and E.D. is cm/s, Depth's unit is mm, others have no unit.)

Vessel	DEPTH	PK	MN	E.D.	P.I.	R.I.	SD	Direction
RACA	62	43	24	15	1.15	0.65	2.88	Backward
RPCA	67	23	12	7	**1.27**	0.69	3.21	Toward
LACA	62	42	23	14	**1.25**	0.68	3.14	Backward
LPCA	67	21	12	7	1.16	0.65	2.89	Toward
RVA	62	26	15	9	1.17	0.66	2.92	Backward
LVA	62	26	15	9	1.13	0.64	2.80	Backward
RICA	54	54	28	15	**1.43**	0.73	3.72	Backward
LICA	54	53	25	10	**1.46**	0.74	5.26	Backward
LOA	50	40	21	11	1.38	0.72	3.57	Toward
ROA	50	38	21	13	1.19	0.66	2.97	Toward
RSIPH	62	70	38	22	**1.26**	0.68	3.17	Toward
LSIPH	62	61	31	15	**1.49**	0.75	3.95	Toward
RMCA1	54	52	29	17	**1.20**	0.67	3.00	Backward
RMCA BH	54	60	38	27	0.88	0.56	2.25	Backward
RMCA2	56	53	29	17	**1.28**	0.69	3.23	Backward
RMCA3	58	56	32	20	1.16	0.65	2.88	Backward
EMBOLI	54	54	29	17	1.26	0.69	3.18	Backward
LMCA1	54	51	27	15	**1.33**	0.70	3.38	Backward
LMCA2	56	52	28	16	**1.27**	0.69	3.21	Backward
LMCA3	58	54	28	15	**1.36**	0.71	3.49	Backward
RECA	54	53	29	17	1.22	0.67	3.07	Backward
RCCA	15	35	18	9	**1.47**	0.74	3.88	Toward
LECA	54	51	23	9	1.86	0.83	5.91	Backward
LCCA	15	39	21	12	**1.25**	0.68	3.15	Toward
BA1	80	53	28	16	**1.29**	0.69	3.26	Backward

EYECUITY
Going Beyond Eye Care

4167 Eagle Watch Blvd. Palm Harbor, Fl. 34684

93886 TRANSCRANIAL

TCD uses pulse wave Doppler technology to record blood flow velocities in the Anterior, Middle, and Posterior Cerebral Arteries. TCD is used to aid in the diagnosis of emboli, stenosis, and vasospasm.

This study confirms the patency of the major basal intracranial arteries in the Circle of Willis.

There is no evidence of significant intracranial stenosis or occlusive disease. TCD is not sensitive for tumors, aneurysms, and small AVM's.

-Abnormal RI (resistance indices) values are noted in the left Ophthalmic Artery. An RI> 0.71 in the OA's is suggestive of glaucomatous visual field progression.

-Borderline elevated pulsatility index values are noted as above normal resistance.

-Recommend follow up TCD in 6 months

93892 EMBOLI

Transcranial Doppler monitoring of the right Middle Cerebral Artery was performed. No embolic HITS (High Intensity Transient Signals) were identified.

93880 EXTRACRANIAL

The bilateral Extracranial Carotid Artery demonstrates normal directed flow and there is no evidence of significant stenosis or vasospasm.

Right Lindegaard Ratio = 1.03 **Left Lindegaard Ratio = 1.08**

93890 VASOMOTOR REACTIVITY

Testing showed normal vasodilator reactivity in the right Middle Cerebral Artery.

Breath Hold Index = 1.24

Mark J. Lodespoto, M.D.
Electronically Signed
Diplomate in Radiology
Board Certified Neuroradiologist
Date: Sept 05, 2018 at 8:08am

Latanoprostene bunod ophthalmic solution 0.024% for IOP lowering in glaucoma and ocular hypertension

1. LBN is a novel NO-donating prostaglandin F2α analog with a dual mechanism of action for lowering IOP
2. It targets AqH outflow through both the TM/SC and the uveoscleral pathways.

3. Dosed once daily in the evening = better than either latanoprost 0.005%

4. Similar SIDE EFFECT profile to latanoprost

The Effects of Physical Exercises on Ocular Physiology: A Review

Physical exercises increase perfusion pressure up to 190% baseline and also increase choroidal blood flow up to 140%.

Majority of patients show a better ocular physiological function due to sports and sports are thus considered essential for preventing ocular diseases!

J Glaucoma. 2016 Oct;25(10):3843-e849

Endothelin-1, aging, and hypertension

"Several studies have shown that aerobic exercise training improves endothelium-dependent vasodilation in healthy older adults as well as patients with hypertension. For example, 12 weeks of moderate aerobic exercise training have been shown to reverse the age-related loss in endothelial vasodilator function in previously sedentary men."

Curr Opin Cardiol. 2008 july;23(4):350-355

Can Exercise Lower Eye Pressure?

“Aerobic exercise is known to lower intraocular pressure which we know protects retinal ganglion cells,” says Harry A. Quigley, MD, professor and director of glaucoma services at the Wilmer Eye Institute at Johns Hopkins. “And short term studies show it may improve blood flow to the retina and optic nerve as well.”

IOP can be lowered by exercise that raises the pulse just 20-25% 20 minutes a minimum of 4 times per week.

Glaucoma Research Foundation
Glaucoma.org

A legume-based hypocaloric diet reduces pro-inflammatory status and improves metabolic features in overweight/obese subjects

The consumption of legumes (4 servings/week) within a hypocaloric diet resulted in a specific reduction in pro-inflammatory markers, such as CRP and C3 and a clinically significant improvement of some metabolic features (lipid profile and BP) in overweight/ obese subjects

European Journal of Nutrition
February 2011, Volume 50, Issue 1, pp 61–69

A plant-based diet for the prevention and treatment of type 2 Diabetes

Plant-based diets tend to be low in saturated fat, advanced glycation endproducts, nitrosamines, and heme iron dietary elements that have been associated with insulin resistance in epidemiologic and metabolic studies. Saturated fat, which is found primarily in animal-based foods, contributes to lipotoxicity, a phenomenon in which toxic fat metabolites (e.g., species of diacylglycerol and ceramide) accumulate in hepatic and skeletal muscle cells, impairing insulin signaling and thus decreasing glucose uptake.[116–119] Saturated fat has been associated with oxidative stress, mitochondrial dysfunction, and insulin resistance in numerous metabolic and epidemiologic studies as well.[42–44,98,100,120] In addition, diets high in saturated fat are associated with a predominantly gram-negative, lipopolysaccharide-rich gut microbial pattern, which also leads to insulin resistance and inflammation.[118] A plant-based diet has been shown to reduce visceral fat and improve markers of oxidative stress more than a conventional diet in individuals with type 2 diabetes.[121]

Journal of Geriatric Cardiology (2017) 14: 342□354

Effects of Plant-based Diets on Plasma Lipids

Vegetarian diets have been associated with:

1. Lower blood pressure,
2. Lower body weight and BMI
3. Lower C Reactive Protein
4. Lower blood concentrations of inflammatory markers
5. Improved insulin sensitivity, and better glycemic control in diabetics."

Researchers concluded that plant-based dietary interventions are effective in lowering plasma cholesterol concentrations.

Am J Cardiol 2009;104:947-956

The Effect of a Vegan versus AHA Diet in Coronary Artery Disease (EVADE CAD) trial: study design and rationale.

This study is the first to comprehensively assess multiple indices of inflammation and glucometabolic profile in a rigorously conducted randomized trial of 100 patients with CAD on a vegan versus AHA-recommended diet.

"Conclusion: A vegan diet significantly reduced systemic inflammation, as evidenced by hsCRP, in patients with CAD on guideline-directed medical therapy, while an AHA diet did not. This is the first rigorous study to comprehensively assess multiple indices of cardiovascular risk between a vegan and AHA diet."

Contemp Clin Trials Commun. 2017 Dec;8:90-98. TRIAL# = NCT02135939

2009

Personal Health History

Weight = 219
BMI = 33
HA1c = 5.7
TG = 319

3 Cheese enchilada dish Beans/Rice 2-3 times per week.
3 Egg Cheese and veggie omelette on weekends
Breakfast usually a banana and donuts or granola bar
Ate out most of the time

Most afternoons required power nap at the office.
Weight lifting only maybe once per week.
No aerobic exercise.

2018

Personal Health History continued

Weight = 170
BMI = 26
HA1c = 4.7

TG = 115

Oatmeal with nuts and 2-3 fruits for breakfast
salad, veggie wrap and/or legumes for lunch
Smoothie with frozen spinach, strawberry, blueberry, Almond Milk, vegan protein powder

Weight lifting twice weekly
180 minutes of moderate aerobic exercise
NO naps in the afternoons.

How do we motivate our patients to live differently?

We need to look in the mirror! Studies show that patients look to their doctors for advice and leadership. Studies also show that patients don't follow our advice if we don't practice what we preach!

I would like to challenge you. If/when you make the commitment to follow these lifestyle principles and if you do them for long enough, you will feel the positive benefits of these choices. You will then become an inspiring, enthusiastic ambassador and leader for a lifestyle that is invigorating! You will be better equipped for every aspect of your life! We need to help show our patients what life can be like!

We don't have enough time to discuss this with patients so we need to develop new and more effective ways to communicate the importance of lifestyle to our patients.
We have run out of time. If any of you would like to discuss what those new and effective ways are, please feel free to talk to me afterwards.
Thank you for the opportunity to share with you today.

Email: dr.lang@baysideeyecentre.com