

PAULA R NEWSOME, OD, MS, FAAO, FAARM, CHC


A PRACTICAL PERSPECTIVE FOR PATIENTS WITH DIABETES

September 28, 2023
COPE 86436-SD

1

FINANCIAL DISCLOSURES

- Dr. Newsome has no relevant financial interests with this presentation.



"This affiliation will not affect the content of this presentation"

2

TODAY'S GOALS

- Using case presentations, we will discuss the role of the OD in identifying patients suspicious for pre diabetes and with diabetes and how we can impact their QOL
- Using case presentations and the AOA standards of care, we will discuss the role of the OD in the management of patients with diabetes to minimize ocular complications for their developing complications
- Using case presentations and the AOA standards of care, we will discuss the role of the OD with patients with diabetes who have visible ocular complications and how we may help them

3



Are you aware that...

- The US leads the world in lifestyle preventable chronic diseases
- Per the CDC, 6 out of 10 adults have a chronic disease
- 4 out of 10 have 2 or more chronic diseases


Wellness Essentials for Clinical Practice, 2022, content by OWNS



4

WHY YOU, WHY NOW?

- 46,000 optometrists in the US
- 18,000 OMDs in the US
- CDC cites that by 2050, 1 out of every 3 people will have diabetes



DIABETES IN THE U.S. A SNAPSHOT

DIABETES
37 million people have diabetes. That's about 1 in every 10 people. 1 in 6 people don't know they have it.

PREDIABETES
96 million Americans have prediabetes. That's about 1 in 3 people. More than 8 in 10 don't know they have it.



COST
\$227 Billion in direct medical costs from diabetes in 2019. That's up from \$175 billion in 2010. People with diabetes are at higher risk of premature health complications.

RISKS
Blindness, Kidney failure, Heart disease, Stroke, Loss of feet, Limb amputation.

5

WHY YOU?

- OD's spend more time with our patients than other providers Average 20 minutes
- Patients may follow our recommendations
- Some patient's entry point in to the health care system is with an optometrist
- The OD can detect subclinical diabetes induced ocular changes and thus can lead to early intervention and early disease detection

6

THE SO WHAT TEST?


- ▀ Demographics to include the number of optometrist in the US
- ▀ Demand
- ▀ Number of people with DM and perm

7

CASE 1: The Preacher's wife

- ▀ FINAL RX


Distance:	-0.75-0.75X90	W/2.50	20/20
Near:	-0.50-0.50X100		20/20
- ▀ Retina photos
- ▀ White light
- ▀ Red Free



8

Referred her to primary care for a DM evaluation

- ▀ She was diagnosed
- ▀ Role of the OD in this case was not to just do a refraction and give her the new Rx.
- ▀ Instead because of the significant shift, I sent her out for an evaluation. We did this after we did check her blood sugar in office.




9

CASE 1: The Preacher's wife

- ▀ BJ is a 67 yofb. Her husband is the Pastor at a very large church in Charlotte. Her sisters have diabetes but she denies a positive history.
- ▀ Rest of history was unremarkable with the exception of hypertension which was supposed to be controlled with medications. BMI. 34
- ▀ Her presenting Rx

OD:	+0.50-0.75X090 with 2.50 add 20/50
OS:	+0.75-0.50X100 with 2.50 add 20/50
- ▀ IOP. 10/10mmHg at 8:39 am
- ▀ BP. 149/90/76 on the RAS at 8:20 am
- ▀ Entering VA 20/80 in each eye



10

PER THE AOA STANDARDS OF CARE

CONDUCT A DIABETES RISK ASSESSMENT TEST

Perform hemoglobin (Hb) using a glucometer (FG) or fasting plasma glucose (FPG) test

Persons with glucose ≥ 126 mg/dL and symptoms of hyperglycemia should make an urgent referral to their primary care physician.

Persons with glucose ≥ 200 mg/dL, who are asymptomatic should be referred to their primary care physician ASAP.

A1C $\geq 6.5\%$, random plasma glucose or FPG $141-199$ mg/dL, or FPG 110 mg/dL.

Refer to patient's primary care physician for further evaluation and management.

A1C $\geq 6.5\%$, FPG $130-139$ mg/dL, and/or FPG ≥ 140 mg/dL are normal, but may be associated with other problems.

Eye Care of the Patient with Diabetes Mellitus
Second Edition

AMERICAN OPTOMETRIC ASSOCIATION

11

CDC ADA RISK ASSESSMENT FOR PRE-DIABETES

CDC Centers for Disease Control and Prevention
2022 2023 Living Well. Moving Better.™

Prediabetes

YOUR SCORE: 4 of 10 (LOW RISK FOR PREDIABETES)
How Well Did You Score?

Based on your results, you're at low risk for prediabetes. Keep up the good work! These healthy habits will help keep your risk low.

- ✓ Get at least 150 minutes of physical activity a week.
- ✓ Keep your weight in a healthy range.
- ✓ Eat healthy foods, including lots of fruits and veggies.
- ✓ Drink more water and fewer sugary drinks.
- ✓ Don't smoke.

About the risk test:
Invite friends and family to take the risk test.
Take Again

Could You Have Prediabetes?
TAKE THE TEST

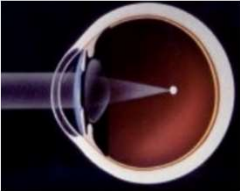
Print a copy of this test to take later.
About the Prediabetes Risk Test
in english

CDC American Diabetes Association

12

MYOPIC SHIFT


- ▬ Increase in blood sugar level
- ▬ Hyperglycemia
- ▬ Increase in osmotic pressure of crystalline lens
- ▬ Increase in refractive index of lens



13

MYOPIC SHIFT

- In persons with poorly controlled diabetes, or with undiagnosed diabetes or cataracts.
- Don't forget that amplitudes of accommodation are also reduced in persons with diabetes
- Duke Elder cited this and said it was due to the osmotic forces in the lens.
- Myopia Profile. November 30, 2021.



14

OCULAR COMPLICATIONS OF DIABETES

Refractive changes are caused by fluctuating glucose and sorbitol levels in the body that change the tonicity of the crystalline lens, causing it to shrink or swell

Common corneal dysfunctions associated with diabetes include decreased wound healing, stromal edema, reduced corneal sensitivity and an altered basement membrane and these abnormalities affect up to 70% of the people with diabetes

Cataracts are more common in people with diabetes and occur at an earlier age

Glaucoma is 2x more common in people with diabetes

Retinal neurodegeneration is an early event in the pathogenesis of diabetic retinopathy and is characterized by increased apoptosis of retinal ganglion cells, glial cells and photoreceptors

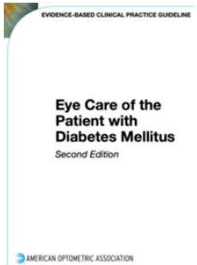
Diabetic retinopathy is a vasculopathy affecting the blood microcirculation of the retina

Vieira-Potter VJ, Karamichos D, Lee DJ. Ocular Complications of Diabetes and Therapeutic Approaches. *Biomed Res Int*. 2016;2016:3801570. doi:10.1155/2016/3801570

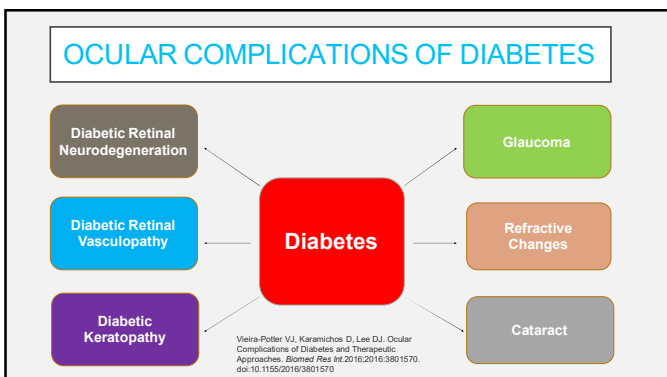
15

LESSON

- ▬ You may be the first to diagnose or recognize that a patient may have diabetes even before they receive a diagnosis of diabetes
- ▬ Familiarize yourself with ocular complications of DM
- ▬ If you are not familiar with the AOA Standards of Care, you should minimum to be familiar with the 2 flow charts.



16



17

CASE 2: JL. BURNING MONEY

Patient showed up in our office-
JL

JL presented with sharp pains in her eyes in the mornings

She also stated that she could not see out of her current RX



18

MORE JL INFORMATION

- Final Rx in APRIL 2020
OD: -1.75-.75X070
OS: -1.25-.75X065
- Next Rx in MAY 2020
OD: -1.50-.75X070
OS: -1.25-.50X065
- Final Rx September 9, 2020
- -1.50-.75X085 od, -1.25-.75X080 os



19

MORE ON PATIENT JL

- Her BP on the RAS was 164/103 with a pulse of 76
- Her height was 68 inches, weight 340 with a BMI of 51.7
- Cupping was asymmetric OD .6/.65 OS .8/.85
 - IOP at 9:13am is 15/16
- Denies history of diabetes or pre-diabetes
- Entering Rx:
OD: -1.25 -.75X076 20/30
OS: -1.00-.75X067. 20/40

20

MORE ON JL

- Patient came in 3 more times
- We remade her glasses with her EyeMed insurance
- They billed me \$620
- She denied a history of Diabetes on all three occasions



21


IN ADDITION SHE WAS A GLAUCOMA SUSPECT

- Optos photo

22

WHEN PATIENTS PRESENT WITH WHAT APPEARS TO BE METABOLIC SYNDROME

Believe them!



Need 3 of 5 Risk Factors for Diagnosis

1. **Large waistline**
 - Above 40 inches for men
 - Above 35 inches for women
2. **High triglyceride level**
 - Above 150
3. **High blood pressure**
4. **Low HDL cholesterol level**
 - Below 50
5. **High fasting blood sugar**

Metabolic syndrome increases the risk of developing diabetes, heart disease, and having a stroke!

23


LESSON

- Instead of burning money, make sure that you check blood sugar in office if you suspect metabolic syndrome

24

CASE 3 - EW 45 YOM


- When asked about his blood sugar, he reported that his blood sugar was 140.
- After further probing, we found out that the 140 was from several days prior and that was a fasting blood sugar
- Fasting blood sugars should be 80-130
- When we checked in the office, his blood sugar was 230



25

What would you do next?


- Reschedule him for another visit.
- Do a dilated eye exam with some additional testing
- Send him to an OMD
- Nothing do a refractive visit



26

WE DID A


- A glucometer reading in office is most appropriate on a patient with diabetes who wants a refractive exam
- If the blood sugar reading is over 180, then the patient will have sorbitol increase in the lens and will be experiencing myopic shift
- Also consider having the patient back for a comprehensive diabetic evaluation to include color, OCT, OCTA, ferg, wf photos, VF



27

ESTABLISHED OR NEW PATIENT - PWD

- Protocol in our office for patients who are coming for a refractive visit:
- Check blood sugar Glucometer or HbA1C
- Number we look for is 180-200
- We have the patient sign a consent form releasing us from liability for a fluctuating Rx
- On our patients who are coming in for a comprehensive diabetes evaluation, we do not test blood sugar



28

<h4>Clinical Criteria Required To Prediabetes</h4> <ul style="list-style-type: none"> Fasting Blood Glucose Test <ul style="list-style-type: none"> • Blood glucose measurement of 100 or above Hemoglobin A1c Test <ul style="list-style-type: none"> • Average blood glucose over the preceding 3 months • 5.7 – 6.4 indicates prediabetes or hyperinsulinemia Oral Glucose Tolerance Test <ul style="list-style-type: none"> • Patient drinks a 75g loading dose of sugar water – wait 2 hours • Blood glucose above 140 is diagnostic for prediabetes 	<h4>Clinical Criteria to Diagnose Diabetes</h4> <ul style="list-style-type: none"> Fasting blood glucose test <ul style="list-style-type: none"> • Blood glucose of 126 or above on two occasions Hemoglobin A1c test <ul style="list-style-type: none"> • Average blood glucose measurement over the preceding 3 months • 6.5 or above Oral glucose tolerance test <ul style="list-style-type: none"> • Patient drinks a 75g loading dose of sugar water – wait 2 hours • Blood glucose measurement above 200 is diagnostic for diabetes <p>In most patients, the earliest sign of diabetes is profound insulin resistance</p>
---	--

29

DISEASE PROMOTING

- Increased intake of linoleic acid
- Low intake of vitamins and minerals
- Dysbiosis- intestinal overgrowth of yeast, harmful bacteria
- Use of synthetic drugs to suppress symptoms of poor health
- Dysfunctional relationships
- Sedentary lifestyle
- Obesity
- Smoking
- Frequent exposure to toxins, chemicals
- Insufficient protein
- Diet high in simple carbohydrates
- Use of disease promoting beverages

Notes from AARM, Microbiome

30

HEALTH PROMOTING

- Optimal vitamin D status
- Beneficial GI flora
- Pro-active healthcare
- Healthy and supportive relationships
- Healthy work environment that promotes collaboration and creativity





Notes-AARM

31

31

WHAT CAN YOU DO

What can the patient do?

Modifiable risk factors in diabetes

- Physical inactivity
- High Body fat or body weight
- High blood pressure
- High cholesterol

Non-modifiable risk factors in diabetes

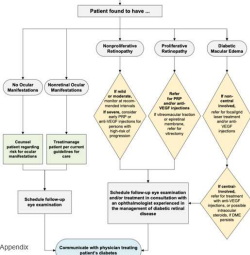
- History of gestational diabetes
- Race/Ethnicity
- Age over 45 years
- Family history of diabetes

32

32

OPTOMETRIC MANAGEMENT OF THE PATIENT DIAGNOSED WITH DIABETES MELLITUS: A FLOWCHART

AMERICAN OPTOMETRIC ASSOCIATION



Appendix: Communicate with physician treating patient's diabetes.


AOA, 2019. Eye care of the patient with diabetes mellitus. AOA.org, Appendix

33

33

RISK FACTOR FOR DR

- Duration of Diabetes
- Chronic hyperglycemia, nephropathy, hypertension, dyslipidemia
- Once DR is present, duration of diabetes is less important than glycemic control



34

34

PREVALENCE OF DR

- Most frequent cause of new blindness among adults developed countries
- Present in 26.4% of people with diabetes in United States (9.6 million)
- Prevalence of vision-threatening DR is 5.1% (5.8 million)
- 73% of people with DR are unaware of their condition. Compared with White individuals, Black and Hispanic individuals were more likely (OR, 1.2 and 2.66 respectively) to be unaware of DR
- Diabetes develops earlier and carries higher incidence of complications in people from racial and ethnic minority groups

ADA. Diabetes Care 2021;44(Suppl. 1):S151-S167. Flaxell et al. Ophthalmol 2019. doi:10.1016/j.ophtha.2019.09.025. Gibson. Am J Prevent Med 2012. doi:10.1016/j.amepre.2012.02.025. Lundstrom EA. JAMA Ophthalmol 2023

35

35

DIABETIC RETINOPATHY IS A NEUROVASCULAR DISORDER

RETINAL VASCULOPATHY

- Capillary nonperfusion
- Capillary remodeling
- Microaneurysms / IRMAs
- Exudates / cotton wool spots
- Venous beading
- Retinal hemorrhages
- Retinal edema
- Retinal ischemia
- Neovascularization

RETINAL NEURODEGENERATION

- Reduced thickness of the inner retinal layers
- Reduced thickness of the nerve fiber layer
- Loss of ganglion cells
- Loss of photoreceptors

36

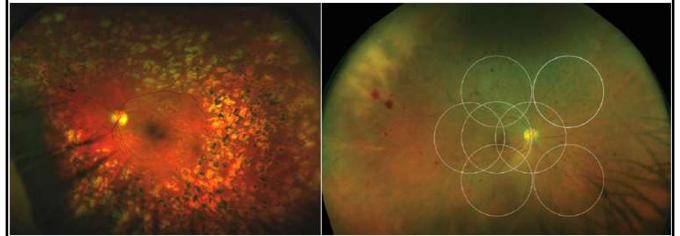
36

PWD PRESENTING FOR A DIABETIC EVALUATION

- Wide field photos 92250
- IOP. 92100 over 3 hours
- OCT 92133,92134
- OCT-A
- Color Vision 92283
- Ferg 92273
- Pupils
- Visual Fields 92083
- VEP 95930

37

WHY WIDE FIELD?



38

DON'T LET THE WHITE LIGHT FOOL YA

- Don't just look at the eye grounds with just white light
- Use the Red Free Filter to see micros especially in the macula on direct observation
- Either with the Slit Lamp or with the ophthalmoscope

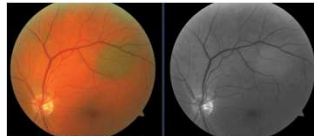


Fig. 1. A choroidal nevus is seen superior-temporal to the optic nerve (left). Choroidal lesions disappear or become much lighter with use of the red-free filter as blood vessels appear black against the uniformly dark background caused by the retinal pigment epithelium (right). Click image to enlarge.

39

COLOR VISION

- 92283
- D-15 or Color Dx
- Reimbursable
- Blue-Yellow or Tritan Defects are signs of early DR
- Red-Green are more pathognomonic for glaucoma



40

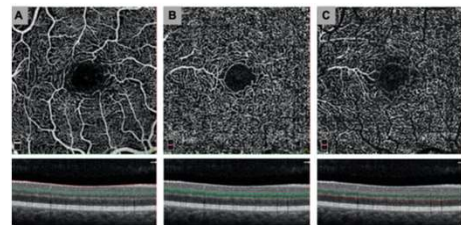
PUPILS-EYEKINETIX



41

OCT A

- You can see areas of non perfusion
- You can see micros



42

VEP

- This assesses how long it takes for information to get from the outside world to our occipital cortex.
- Amplitude-How strong the signal is getting there
- Frequency-How long it takes for the signal to get to Processing center

43

FLICKER ERG

- 92773
- Measuring Amacrine Cells
- Will see changes here before you see them on VF
- Looking at both the time and the signal strength

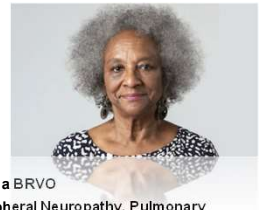
44

DO YOU KNOW WHAT THE STATISTIC IS BETWEEN GLAUCOMA AND DIABETES

- What percentage of people with diabetes develop glaucoma?
- Perfusion Issue.
- 40%
- Check IOP
- Check GCC and ONscans on OCT

45

CASE 4 - PWD AND DR



- 68 yobf
- Presented with Diabetes
- Presented with Glaucoma
- Presented with no sight in the OS secondary to a BRVO
- Anxiety, Depression, Gout, Heart Disease, Peripheral Neuropathy, Pulmonary Insufficiency
- Presented with eyes feeling dry, gritty, sandy, BRVO in th OS, Blurred vision at night, seeing a half white star burst in from of her vision
- Seems like she is seeing a cloud over her vision
- She wanted someone to be more active with her care

46

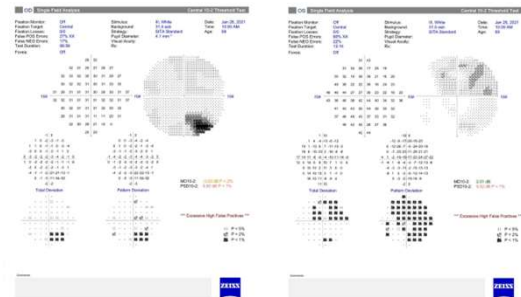
JK

- Optos photos

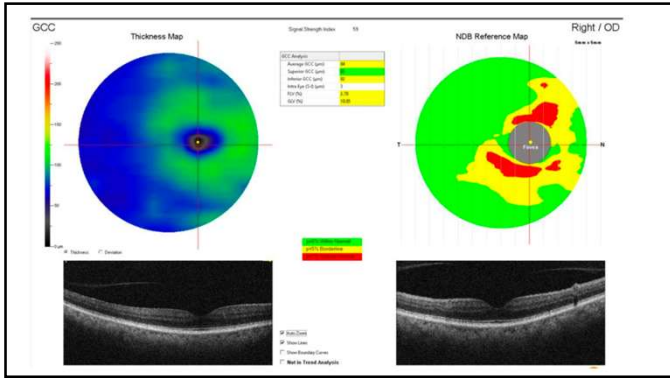


47

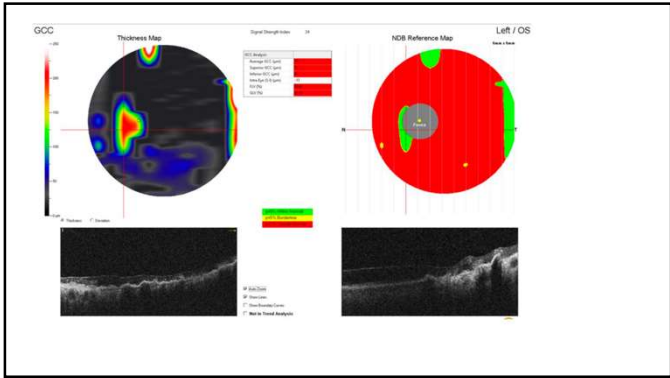
VISUAL FIELDS



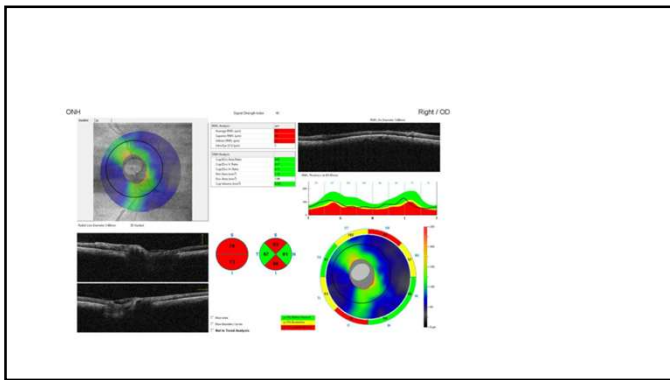
48



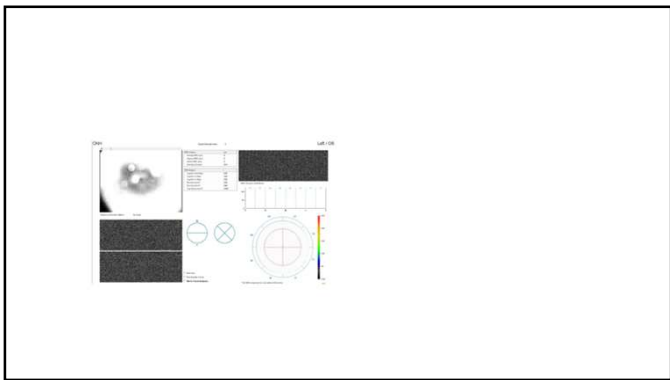
49



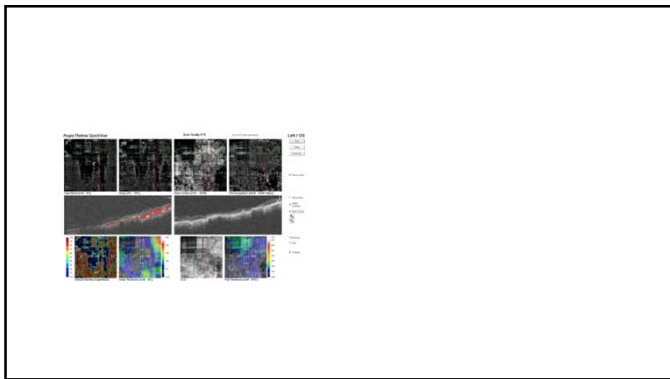
50



51



52

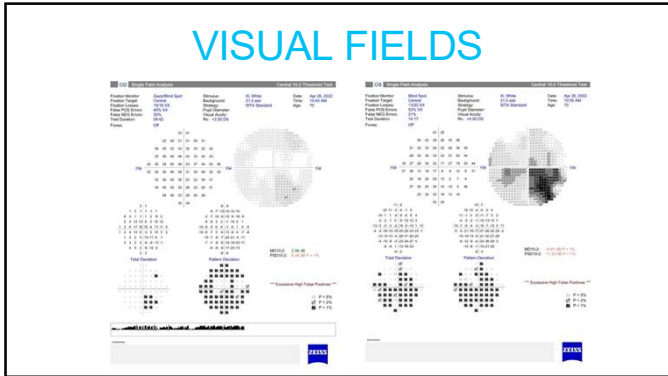


53

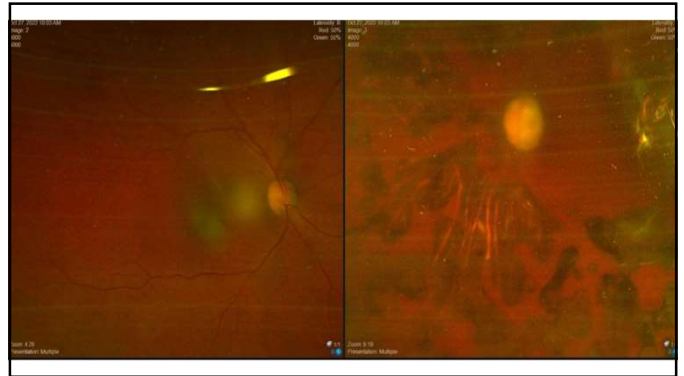
JK FOLLOW UP

- 2022, she had her left foot amputated
- She became more depressed and increasingly despondent

54



55



56

TODAY'S GOALS

- Using case presentations, we will discuss the role of the OD in identifying patients suspicious for pre diabetes and with diabetes and how we can impact their QOL
- Using case presentations and the AOA standards of care, we will discuss the role of the OD in the management of patients with diabetes to minimize ocular complications for their developing complications
- Using case presentations and the AOA standards of care, we will discuss the role of the OD with patients with diabetes who have visible ocular complications and how we may help them

57

QUESTIONS?

- drprnewsome@gmail.com

A portrait of a woman with braided hair, wearing a blue and yellow jacket, smiling at the camera.

58