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# A Patient Centered Intervention to Promote Primary Care Based Screening for Diabetic Retinopathy

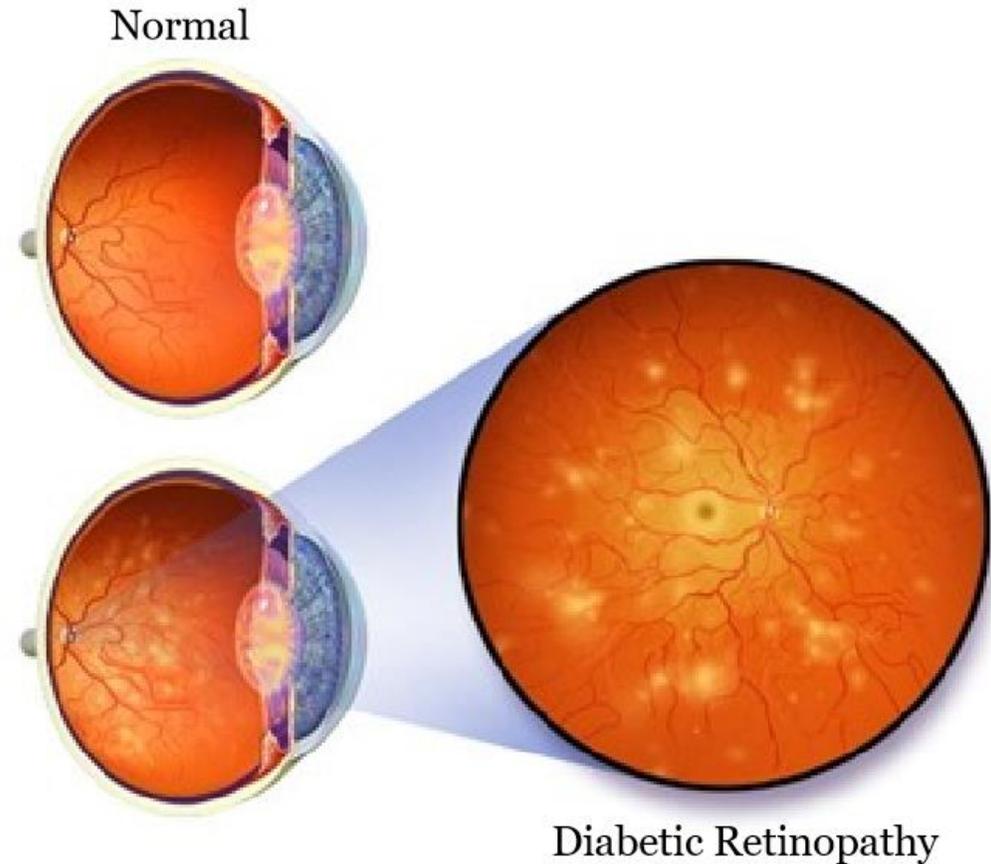
Will Earle

October 2018

Dr. Cornelius Ferreira MD and Kathy McCoy APRN

# What is Diabetic Retinopathy

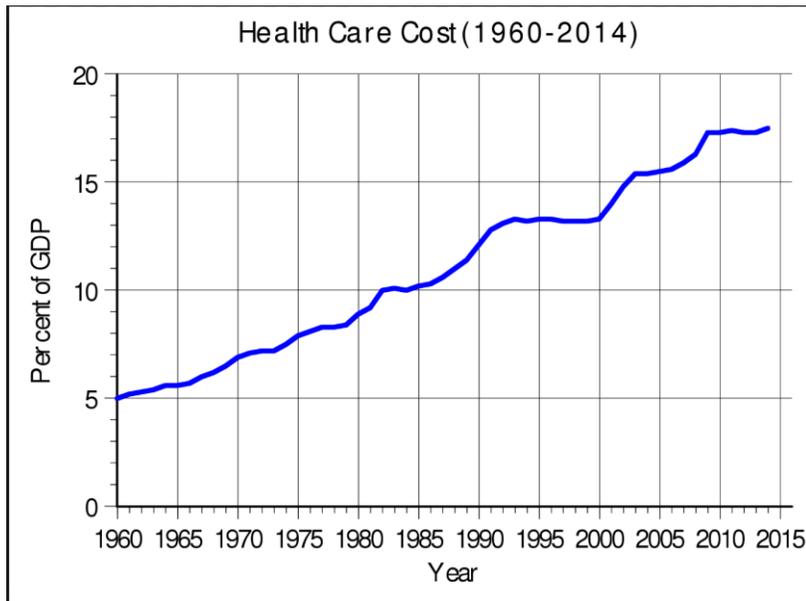
- ▶ Diabetic retinopathy is a disease that causes damage to the eyes as a result of chronic hyperglycemia. The disease is categorized into two types:
  - ▶ **Proliferative diabetic retinopathy** involves the pathologic proliferation of blood vessels in the eye which can cause preretinal and vitreous hemorrhage, fibrosis and retinal detachment
  - ▶ **Nonproliferative diabetic retinopathy** involves nerve-fiber infarcts, which cause cotton wool spots, microvascular abnormalities, and hard exudates
- ▶ Macular edema, defined by retinal thickening and swelling of the macula, can happen at any point in disease and also leads to vision loss<sup>1</sup>



# The Problem:

- ▶ Diabetic retinopathy is the leading cause of blindness in people age 25-74 in the world <sup>1</sup>
- ▶ It has an insidious onset, and when patient's become symptomatic, it's often too late to intervene
- ▶ On average only 60% of diabetic patient's receive an annual eye exam and in underserved areas that can drop to 25% <sup>2</sup>
- ▶ 2% of patient's with existing diabetic retinopathy with progress to blindness every year <sup>3</sup>
- ▶ The prevalence of vision loss from diabetes has risen by nearly 2/3 in the past 2 decades, in 2010 833,690 people were blind as a result of DR and 3.7 million were visually impaired <sup>4</sup>
- ▶ In the Western Connecticut Health Network (WCHN) only 32% of diabetic patient's have had a documented eye exam in the past year. <sup>3</sup>

# Economics



- ▶ Annual total cost of blindness per person is estimated to be \$18,670 <sup>5</sup>
- ▶ Annual direct cost of eye related care for a blind patient is approximately \$4443 <sup>6</sup>
- ▶ Total annual medical expenditure related to blindness in USA is \$8,102,000,000 <sup>7</sup>
- ▶ The cost of a community based diabetic screening is approximately \$116 <sup>8</sup>
- ▶ The cost of diabetic retinopathy referral was \$478 (24.4% of patients referred with diabetic retinopathy) <sup>8</sup>

# Community Perspective

- ▶ Dr. Ferreira of Brookfield Family Medicine (part of WCHN) had this to say:
  - ▶ “Historically our practice has not referred patients for diabetic eye exams. We’ve always educated patient’s about the importance of the exam and told them to see the eye doctor on their own. Unfortunately there is no way to verify if they went or not.”
  - ▶ This will change in January when his practice begins a new telemedicine screening program in which patients can get their screening done in the office using IRIS teleretinal technology. During this 5 minute exam the machine takes a detailed image of the patient’s retina and sends it to Ophthalmologists at the Mayo Clinic for analysis. Should signs of diabetic retinopathy be found, patients are then referred to ophthalmology.
  - ▶ Dr. Ferriera believes that the key to this screening program’s success will be educating patient’s about the dangers of diabetic retinopathy and the importance of screening.
- ▶ A Danbury CT Ophthalmologist commented that she believed doctors in her community were doing very well with referring patient’s for diabetic eye exams. She felt that the biggest barrier to care was lack of health insurance in patients under 65. She was enthusiastic about the new telemedicine screening at Brookfield Family Medicine, but cautioned that this screening was only part of the care necessary, and that in person screening for retinopathy is always superior.



Intelligent Retinal Imaging System (IRIS) Machine

# Intervention and Methodology

- ▶ A patient handout was created to educate patient's about diabetic retinopathy
- ▶ This handout emphasized the prevalence of diabetic retinopathy, the insidious onset of the disease and the importance of screening
- ▶ The handout also included details about the new telemedicine screening program at Brookfield Family Medicine, encouraging patients to learn more about and consider participating in the screening

ASK YOUR DOCTOR  
ABOUT A  
DIABETIC EYE EXAM TODAY

Reduce your risk of vision loss by  
95%



Images taken by IRIS

It only takes 5 minutes!

Covered by most insurances  
with only a small copay.

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important to us!**



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Western Connecticut  
Medical Group  
we know you well

**Diabetic  
Retinopathy**

Do you have Diabetes?



Get Your Screening Today

Brookfield Family Medicine  
Western Connecticut  
Medical Group  
we know you well



Diabetic Retinopathy  
is the  
#1 Cause of Blindness  
in people age 25-74

Most patients are completely  
symptom free until the  
advanced stages of the  
disease when it can be too  
late for effective treatment.

Symptoms can include:

- Blurred vision
- Spots of black lines in your  
vision
- Dark areas or cuts in visual  
field
- Vision loss

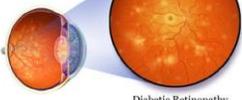
Unfortunately nearly 25% of patients  
with diabetes will develop this condition  
during their lifetime.

**HOW DIABETES  
AFFECTS THE EYES**

Diabetes can affect your eyes in two  
main ways:

- Diseased blood vessels grow too  
much, generating scar tissue in the  
back of the eye and causing vision  
loss
- Blood vessels become leaky,  
causing fluid to accumulate in the  
back of the eye and causing  
damage

Normal



Diabetic Retinopathy

**PREVENTION IS KEY**

Early screening can reduce  
your risk of vision loss by 95%

Screening is available right [here](#)  
[at this office](#) with the new IRIS  
machine.

The exam takes 5 minutes and  
is completely painless. The  
machine shown below takes a  
picture of your eye, which is  
then sent to ophthalmologists  
at the Mayo Clinic for analysis.



Our IRIS Machine: Takes a picture of your eye  
and can detect early changes caused by diabetes

# Results

- ▶ The patient education pamphlet was distributed to a few patients and preliminary responses included:
  - ▶ “This is very good...I knew eye exams were important, but I never realized why before...I’m going to the eye doctor now...My daughter needs to know about this...”
- ▶ Ideally this pamphlet will both serve to educate patients who were unaware of the dangers of diabetic retinopathy and encourage those already aware to get their annual screening
- ▶ The long term goal of this pamphlet is to inform and encourage patients to take advantage of the new, convenient and inexpensive primary care based diabetic retinopathy screening program at Brookfield Family Medicine

# Limitations

- ▶ This intervention was done in only one family medicine practice, so it was impossible to assess the effectiveness across a more diverse patient population
- ▶ Additionally given time constraints, only a few patients were able to see the pamphlets and provide feedback
- ▶ Furthermore longitudinal follow up to assess patient compliance with screening was also not possible given time constraints

# Future Directions

- ▶ A quality control study could be conducted in a longitudinal manner to assess whether patients were more inclined to get diabetic retinopathy screening after viewing the pamphlet
- ▶ This pamphlet could be made available in all 16 Western Connecticut Medical Group primary care practices, thus dramatically increasing its impact and potential sample size
- ▶ Further study opportunities are available with the advent of the primary care based teleretinal screening program in January

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