

University of Vermont

ScholarWorks @ UVM

---

Family Medicine Clerkship Student Projects

Larner College of Medicine

---

2019

## Retinopathy Screening: Assessing Knowledge & Educating Diabetic Patients in Caledonia County, Vermont

Ian J. McClain

*University of Vermont College of Medicine*

Follow this and additional works at: <https://scholarworks.uvm.edu/fmclerk>



Part of the [Medical Education Commons](#), and the [Primary Care Commons](#)

---

### Recommended Citation

McClain, Ian J., "Retinopathy Screening: Assessing Knowledge & Educating Diabetic Patients in Caledonia County, Vermont" (2019). *Family Medicine Clerkship Student Projects*. 519.

<https://scholarworks.uvm.edu/fmclerk/519>

This Book is brought to you for free and open access by the Larner College of Medicine at ScholarWorks @ UVM. It has been accepted for inclusion in Family Medicine Clerkship Student Projects by an authorized administrator of ScholarWorks @ UVM. For more information, please contact [donna.omalley@uvm.edu](mailto:donna.omalley@uvm.edu).



The University of Vermont  

---

LARNER COLLEGE OF MEDICINE

Retinopathy Screening: Assessing Knowledge & Educating Diabetic Patients in  
Caledonia County, Vermont

Lyndonville, VT August–September 2019

Ian McClain, Class of 2021  
Mentor: Dr. Joyce Dobbertin, MD

# Problem Identification

- Diabetic retinopathy is the most common cause of severe vision loss in US Adults<sup>1</sup>
- Approximately 90% of patients with diabetes receive healthcare services in a primary care setting<sup>2</sup>
- It is estimated that less than 50% of patients with diabetes consistently receive recommended annual eye exams<sup>3</sup>
- The risk of blindness can be significantly reduced when diabetic retinopathy is diagnosed early and treated promptly<sup>1</sup>

# Public Health Cost

- Diabetic retinopathy and associated vision loss is a significant public health burden in the United States<sup>4</sup>
- Diabetes related blindness is estimated to cost more than \$500 million annually<sup>4</sup>
- Diabetic patients in rural communities may face additional barriers towards receiving recommended eye care as these communities generally have lower incomes, lower insurance rates and older populations<sup>5</sup>
- Caledonia County, VT has a lower than average median household income and higher than average obesity rate, and faces more diabetes-related deaths than VT as a whole<sup>6</sup>



# Community Perspective

“Monitoring eye disease and ensuring that patients with diabetes have annual eye exams is a weakness in our practice.

Coordinating care with surrounding providers who do not use our EHR is difficult and this is compounded by the fact many patient’s have a difficult time making a connection between their diabetes and eye disease”

-Dr. Mitchell Sullivan, MD, Northern Vermont Regional Hospital Corner-Medical

“The patients we see with diabetes aren’t always able to understand that although their vision is good now, it may not always be this way. It is extremely important they know the importance of continuing good diabetes care and continuing eye exams, even if they are not experiencing problems with their vision at the present time.”

-Dr. Karena Shippee, OD, Shippee Family Eye Care, Saint Johnsbury



# Intervention & Methodology

- A 1-page, 8-question, multiple choice quiz was developed with the help of Dr. Joyce Dobbertin, MD and Dr. Mitchell Sullivan, MD, using patient friendly language
- The quiz assessed basic understanding of the relationship between diabetes, hypertension and eye disease as well as current screening recommendations for diabetics
- The reverse-side of the quiz highlighted correct answers and provided simple explanations for each of the 8 questions
- The quiz was administered in person by Ian McClain, MS3, with further explanations provided if the patient had additional questions



1. Is there a relationship between diabetes and eye disease?
  - a. Yes
  - b. No
  - c. Unsure
2. Can high blood pressure (hypertension) cause eye disease?
  - a. Yes
  - b. No
  - c. Unsure
3. Can diabetes lead to blindness?
  - a. Yes
  - b. No
  - c. Unsure
4. Do you need to be screened for eye disease if your vision is normal?
  - a. Yes
  - b. No
  - c. Unsure
5. Can good control of your diabetes prevent eye disease?
  - a. Yes
  - b. No
  - c. Unsure
6. How frequently should a person with diabetes undergo an eye checkup?
  - a. Every 6 months
  - b. Annually
  - c. Every 2 years
  - d. Only when vision is affected
7. When you are first told you have diabetes, you should have an eye examination:
  - a. At the time you are told you have diabetes
  - b. 5 years after you are told you have diabetes
  - c. Only if your vision is affected
8. Have your eyes been checked by an eye doctor within the past year?
  - a. Yes
  - b. No

### 1. Is there a relationship between diabetes and eye disease?

**(a.) Yes!** The high blood sugar seen in diabetes can damage the blood vessels in the eye and cause them to become blocked or leaky. These changes can lead to permanent damage of the retina (the light-sensitive back component of the eye that is responsible for vision) called "diabetic retinopathy."

### 2. Can high blood pressure (hypertension) cause eye disease?

**(a.) Yes!** Like high blood sugar, high blood pressure can damage the blood vessels of the eye resulting in vision loss. Having both diabetes and high blood pressure increases this risk even further and can accelerate vision loss. It is very important to control both high blood sugar and high blood pressure if you have diabetes.

### 3. Can diabetes lead to blindness?

**(a.) Yes!** Diabetes is the leading cause of blindness in adults in the United States; however, it is important to recognize that this disease can be prevented or slowed if you receive early diagnosis and proper treatment.

### 4. Do you need to be screened for eye disease if your vision is normal?

**(a.) Yes!** Diabetes can cause damage to the eye before symptoms of vision loss develop. For this reason, it is important to be screened even if you don't have symptoms suggestive of vision loss (blurry vision, decrease visual acuity, flashes/floaters, impaired color vision, etc.).

### 5. Can good control of your diabetes prevent eye disease?

**(a.) Yes!** Good control of diabetes as evidence by a reduction in hemoglobin A1c can significantly slow or prevent the progression of diabetic eye disease. Studies suggest that a 1% drop in hemoglobin A1c can reduce the progression of diabetic eye disease by ~40%!

### 6. How frequently should a person with diabetes undergo an eye checkup?

The American Academy of Ophthalmology recommend that individuals with type II diabetes have **(b.) annual** eye examinations or as recommended by your eye doctor.

### 7. When you have diabetes at the first time, you must screen your eye:

Patients with type I diabetes mellitus should have an eye exam beginning 5 years after their diagnosis while patients with type II diabetes mellitus should have an eye exam **(a.) at the time of diagnosis**. This is because ~20% of patients with diabetes will have some degree of diabetic eye disease at the time of diagnosis.

### 8. Have your eyes been checked by an eye doctor within the past year?

If you have type II diabetes mellitus, it is recommended that you have an annual eye exam with an eye doctor (optometrist [OD] or Ophthalmologist [MD/DO]). Please let us know if you need help finding an eye doctor near you.



# Results

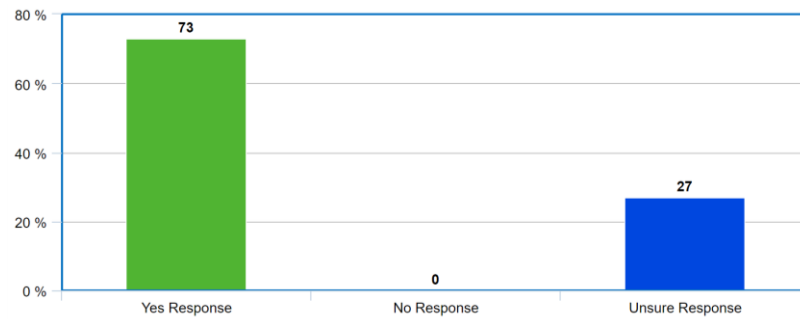
- 73% of patients surveyed responded “yes” when asked if there is a relationship between diabetes mellitus and eye disease
- 64% of patients surveyed responded “yes” when asked if good control of diabetes can prevent eye disease
- Only 45% of patients surveyed correctly identified the need for screening “at the time” of initial diabetes diagnosis
- 64% of patients surveyed responded “no” when asked if high blood pressure can cause eye disease
- Only 45% of patients surveyed responded “yes” when asked if they have had a formal diabetic eye exam within the past year



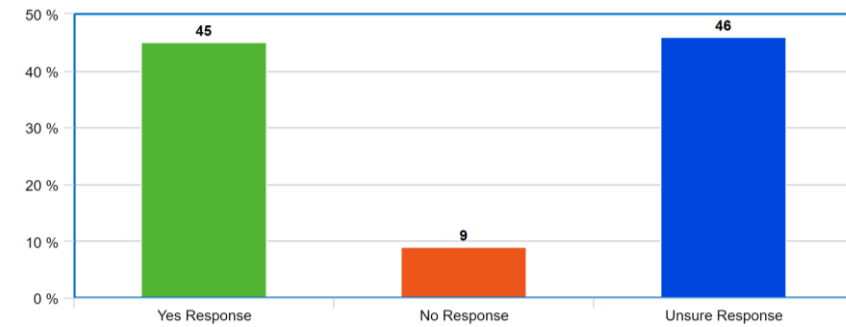


# Results 1A

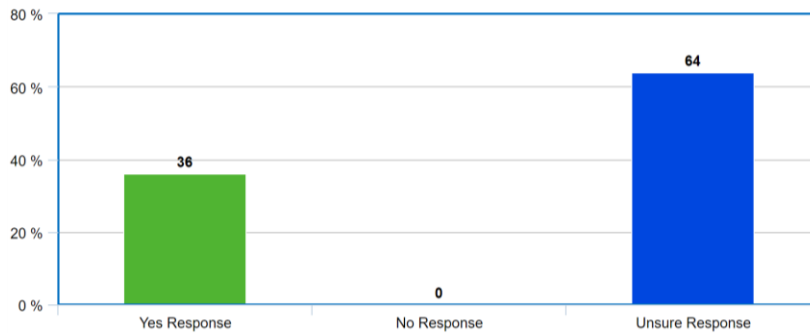
Is there a relationship between diabetes and eye disease?



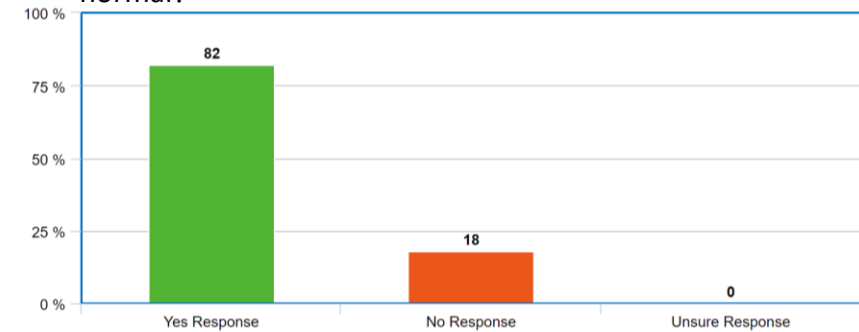
Can diabetes lead to blindness?



Can high blood pressure (hypertension) cause eye disease?

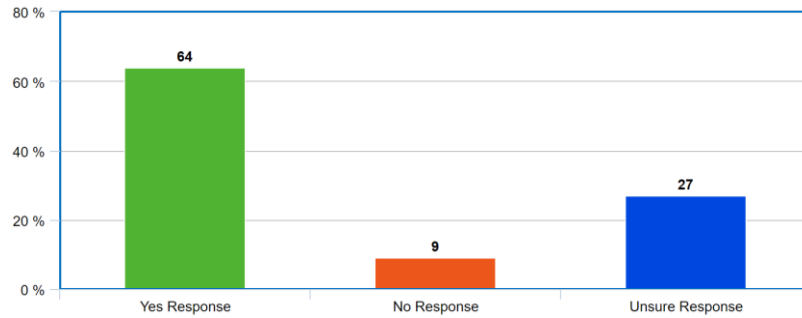


Do you need to be screened for eye disease if your vision is normal?

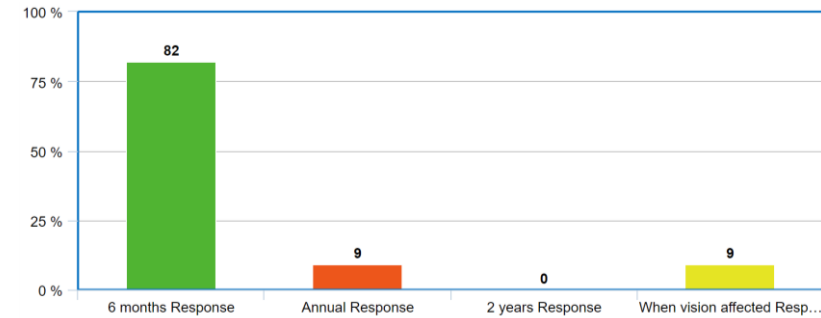


# Results 1B

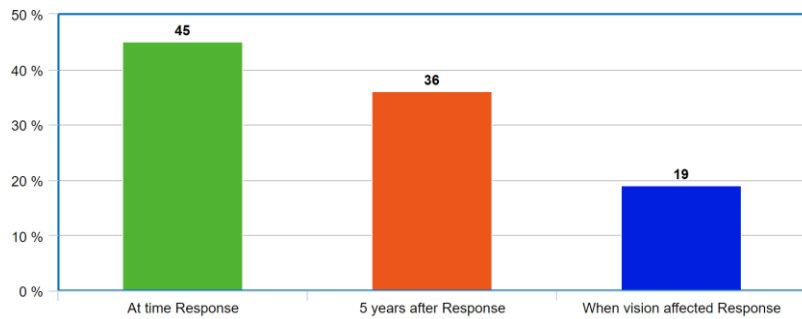
Can good control of your diabetes prevent eye disease?



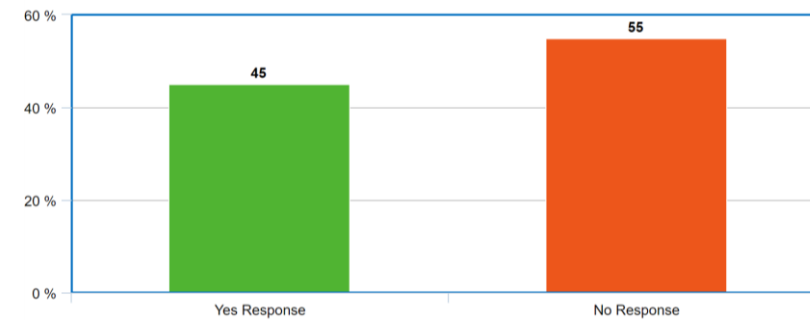
How frequently should a person with diabetes undergo an eye checkup?



When you are first told you have diabetes, you should have an eye examination:



Have your eyes been screened by an eye doctor within the past year?



# Evaluating Effectiveness & Limitations

## Evaluating effectiveness:

- A repeat quiz administered during the patient's next appointment would allow assessment of knowledge gain/retention
- Determining adherence to recommended eye appointments both before and after quiz administration would be a useful metric to determine overall effectiveness of educational material

## Limitations:

- The sample size was low and a total of 11 quizzes were fully completed
- Only patients at NVRH Corner Medical were quizzed, limiting generalizability across Caledonia County
- We were unable to assess effectiveness of survey with follow up quizzes, although this is a future direction



# Future Interventions

- Informational quizzes should be provided to clinics across Caledonia County, not simply limited to NVRH Corner Medical
- A higher number of data points should be obtained, perhaps by providing quizzes in waiting rooms instead of 1:1 administration
- Patients with diabetes should be reminded of the importance of routine eye exams and providers should ensure their patients have a basic understanding of diabetes and hypertension-related eye disease
- Assessing barriers providers themselves face towards educating diabetic patients about eye disease and other microvascular complications of diabetes would be a useful future direction



# References

- (1) American Academy of Ophthalmology Retina Preferred Practice Pattern Panel: Diabetic Retinopathy Preferred Practice Pattern. AAO. San Francisco, 2014
- (2) Davidson JA. The increasing role of primary care physicians in caring for patients with type 2 diabetes mellitus. *Mayo Clin Proc* 2010;85(12 Suppl):S3–S4
- (3) Liu Y, Zupan NJ, Swearingen R, et al Identification of barriers, facilitators and system-based implementation strategies to increase teleophthalmology use for diabetic eye screening in a rural US primary care clinic: a qualitative study *BMJ Open* 2019
- (4) Javitt JC, Aiello LP, Chiang Y, Ferris FL III, Canner JK, Greenfield S. Preventive eye care in people with diabetes is cost-saving to the federal government: implications for health-care reform. *Diabetes Care*. 1994;
- (5) Gibson DM. Estimates of the Percentage of US Adults With Diabetes Who Could Be Screened for Diabetic Retinopathy in Primary Care Settings. *JAMA Ophthalmol*. Published online January 31, 2019;137(4):440–444. doi:10.1001/jamaophthalmol.2018
- (6) Vermont County Profiles For Health Professions Students and Residents 2015. Caledonia County, VT. [Vtahec.org](http://Vtahec.org).





The University of Vermont

---

LARNER COLLEGE OF MEDICINE