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2022

## Perceptions of Teleophthalmology

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### Recommended Citation

Kalra, Kisha, "Perceptions of Teleophthalmology" (2022). *Family Medicine Clerkship Student Projects*. 739.

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A close-up, high-resolution photograph of a human eye, focusing on the iris and pupil. The eye is looking slightly to the right. The lighting is soft, highlighting the texture of the eyelashes and the skin around the eye. The background is blurred, emphasizing the eye as the central subject.

# Perceptions of Teleophthalmology: Could it be the solution to eye care access?

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Colchester Family Practice, VT

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January 2022

Preceptor: Dr. Sean Maloney

# Problem Identification & Community Need

## Access to ophthalmologists in the area is increasingly difficult.

- Though there is a great need for eye care amongst patients in the community, being able to schedule appointments with an ophthalmologist in a relatively reasonable amount of time is an ongoing problem
- The need for ophthalmologic care seems to be greater than the availability of ophthalmologists in the area
- As a result, many patients have had to endure excessively long wait times, delay their eye care, travel to far destinations for appointments, or simply do not follow up for eye care at all. This understandably affects health outcomes and can significantly impact vision and ocular health.

## The Primary Care Physician's role

- Primary care physicians often work closely with ophthalmologists to coordinate care for their patients, provide referrals, and learn more about ocular pathologies
- Commonly encountered pathologies in the primary care setting include cataracts, diabetic retinopathy, glaucoma, and macular degeneration.
- These eye related pathologies are prevalent within an aging population. Therefore, streamlined, timely care is extremely important to saving vision
- The need for ophthalmologic exams, but limited availability, poses a significant problem for patients
- PCP's are often the physicians that patients have greatest access to, and see most frequently for their healthcare needs

# Public Health Cost

- **According to the CDC, each year 40,000 Americans become blind from Diabetic Retinopathy**
  - One person year of blindness has been estimated to be \$11,896
  - The cost of proper diabetic retinopathy screening has been estimated to be much below the public health cost of going blind
  - This indicates that proper screening for diabetic retinopathy and likely other eye pathologies would save significant health care costs and burden to society
- **According to one source regarding diabetic retinopathy,**
  - Going blind costs society about a total of \$1 million per person
  - Treatment of Diabetic Retinopathy costs about \$600 - \$1000 per year per person for management
  - This makes treating Diabetic Retinopathy with proper follow up a better use of health care dollars than accommodating blindness
- **According to a 2007 Prevent Blindness America (PBA) report, subsequently updated in 2012**
  - Total economic impact of chronic eye pathology: \$35.4 billion/ year
    - \$16.2 billion direct medical cost, \$11.2 billion direct non-medical cost, \$8 billion productivity losses
- **Specific to the Colchester, VT Community**
  - Special considerations should be made to the fact that many Vermonters are commuting from rural areas. Poverty also impacts this population, meaning receiving care outside their PCP appointment has additional barriers. Much of the population is elderly. Additionally, many individuals carry the diagnosis of diabetes.
  - Together, this population likely would significantly benefit from improved eye care access, resulting in significant reduction of health care burden

**Bottom Line:** Overall, these figures demonstrate the need for increased access and preventative treatment for eye care, which would result in saved health care dollars

# Community Perspective on Issue

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## What is a need in the community regarding eye related care?

- In an interview with Dr. Anthony Williams (PCP at Colchester Family Medicine) he notes that many of his patients struggle with access to ophthalmologic care for their eye related pathology. "Time to care is impacted by follow up wait time for my patients." We discussed how it could take a significantly long time for patients to be able to book appointments with eye specialists, and this resulted in delayed care and likely increased morbidity. He says a model in which eye care could be conducted more easily in the primary care setting would "improve patient care and morbidity risk reduction."

## If there was a model implemented in which patients could receive eye care at their primary care doctor's office (working closely with ophthalmologists), would this be beneficial for your patients?

- In an interview with Dr. Christine Staats (PCP at Colchester Family Medicine), she believes this would be a beneficial model for her patients. She notes it would improve "access, quickens time to diagnosis, quicken ability to treat and prevent consequences early."
- In an interview with another physician at the practice (anonymous), he stated that this would be a beneficial model, as it would simplify the process for patients who are resistant to another visit for eye examinations. He touches on the fact that multiple office visits are a significant burden to many patients, and this would vastly improve their health care access if only one PCP appointment was needed instead of an additional ophthalmology appointment.
- In an interview with a patient (anonymous), they remarked "I would love it if I could get my eyes checked at my PCP's! I wouldn't have to struggle with my insurance and getting an eye appointment is often difficult."

# Intervention and Methodology

## Intervention to address access to ophthalmologists

- Proposed intervention: Implement **teleophthalmology**: a model in which eye examinations are performed in the primary care setting.
  - Images of the eye are taken using non-mydratic anterior segment and fundus photography and then are sent to ophthalmologists for interpretation
  - In this way, many patients are receiving better access to eye care, monitoring, and screening.
  - This model has been implemented in other primary care settings around the globe to address eye pathologies including diabetic retinopathy, glaucoma, and macular degeneration
- This project was designed to analyze **the perception of teleophthalmology** amongst community primary care physicians and patients to determine if there was interest to establish this model in the future
- The ultimate intervention (comprehensive 4<sup>th</sup> year research project) would be to determine if this was a feasible model in my primary care assignment location, and if so, how to implement this type of resource (cost, training, billing etc.)

## Methods

- 5-question survey sent out to physicians at Colchester Family Medicine . These questions addressed perceptions about teleophthalmology, specifically the role of teleophthalmology in a primary care settings
- 4-question survey given to several patients who routinely saw ophthalmologists. This survey was aimed at addressing interest in teleophthalmology

# Survey to Physicians

## Physician Survey:

1. In your experience, is access to ophthalmic care a barrier to care for patients with eye-related pathology (diabetic retinopathy, glaucoma, cataracts, macular degeneration, etc.)?

Yes No Maybe

Comments:

2. Would you be interested in partnering with ophthalmologists to offer tele-ophthalmic care at your practice?

Yes No Maybe

Comments:

3. Considering it takes time to take digital images and discuss ophthalmologist's interpretation of images, do you feel that teleophthalmology would be feasible at your practice?

Yes No Maybe

Comments:

4. Would you be able to dedicate office staff's time and other resources to integrate teleophthalmology to increase access to eye care?

Yes No Maybe

Comments:

5. Would you be comfortable providing this level of care? (i.e. potential liability, partnership with other physicians)?

Yes No Maybe

Comments:

# Survey to Patients

## Patient Survey:

1. Would you prefer to have an eye exam done at your primary care physician's office as opposed to going to an ophthalmologist/optometrist?

Yes No Maybe

Comments:

2. Have you tried scheduling an eye exam in the last 1 year?

Yes No Maybe

Comments:

3. If you faced any difficulty in seeing an ophthalmologist, what were reasons for this?

A) lack of appointment availability at a time that works for me

B) lack of transportation

C) cost

D) unable to obtain a referral

E) Other – please describe \_\_\_\_\_

F) I did not have any difficulty in seeing an ophthalmologist

4. Would you feel like you were receiving the same level of care if you had an eye exam at your primary care's office using teleophthalmology, compared to going to see an ophthalmologist?

Yes No Maybe

Comments:

# Results/Response/Data

## 6 Colchester family physicians submitted surveys

- Is access to ophthalmologic care a barrier for their patients?
  - 50% yes, 50% maybe, 0% answered no
- Are you interested in partnering with ophthalmologists?
  - **66% yes**, 33% maybe, 0% no
- Is teleophthalmology feasible at your practice?
  - 50% yes, 50% maybe, 0% no
- Would you be able to dedicate staff time to this?
  - 33% yes, 33% maybe, 16.5% no, 16.5% n/a
- Would you be comfortable providing this level of care?
  - **100% yes**

## 3 patients at Colchester submitted surveys

- Would you prefer to have an eye exam done at your PCP's?
  - **66% yes, 33% no**
- Have you tried scheduling an eye exam in the past year
  - **100% yes**
- If you faced any difficulty in seeing an ophthalmologist, what was the reason?
  - **33% lack of appointment availability**
  - **33% unable to retain referral**
  - **33% was not difficult to see ophthalmologist**
- Would you feel you were receiving the same level of care if you had an eye exam at your PCPs vs. an ophthalmologist?
  - **100% yes**

# Evaluation of effectiveness and limitations

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- Efficacy
  - Evaluation of whether this intervention was beneficial would be done by conducting a survey of the physicians and patients after using teleophthalmology for several months in their practice.
  - If this model was implemented, a survey asking physicians perception to the model after implementation could be compared to this first survey (before implementation) to analyze how perceptions have changed. This would allow analysis of whether teleophthalmology seems like a sustainable model in practice
  - Surveying patient's perceptions after receiving this care and comparing to initial surveys would also allow us to determine how effective this model was in addressing health needs for a specific population
- Limitations
  - The multi-faceted nature of establishing this model, which requires consideration of time, technology, money and building systems of operation, can be tricky to separate. This would make analysis of perception of the model complicated, as there are many variables involved.
  - The sample size of this study was somewhat limited, and in future directions consolidating a larger sample size would be beneficial

## Recommendations for future interventions/projects

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- Future directions would focus on the cost of implementation of teleophthalmology. I would like to research the cost of machinery, costs associated with training staff on equipment, and how much this model would provide for primary care offices
- I would like to also explore the time investment of this model. For instance, how much time it would take to train staff and use the equipment in the office
- Additionally, I would like to follow up with physicians and patients once this model was implemented to determine its effectiveness. This would ideally be done through a follow up survey for patients who received eye care through their PCP

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