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## Introduction

- Diabetic retinopathy (DR) is a prevalent yet treatable complication of diabetes, which includes Type I and Type II Diabetes.
- Research shows that DR screening is highly cost-effective at reducing blindness, yet is not used routinely in primary care physician's offices despite the availability of tools to do so.
- **Problem**
  - Up to 1/3 of diabetics will suffer vision loss due to diabetic retinopathy as a complication from Diabetes Mellitus.
- **Goals and Aims of This Collaborative Activity**
  - Identify barriers related to patient follow up for retina screening/assessment/preventive care
  - Identify barriers related to the use of retina scans or other tools for preventive care for patients with diabetes.
  - Overall initiative goal: Decrease the number of diabetic retinopathies causing vision loss in the population by offering point-of-care screening.
  - This may also assist in the goal to lower the overall costs of care of the patient, as the convenience of POC testing would increase the percentage of diabetic patients to be screened and thus reducing the complications by early identification.
- **Collaboration process**
  - The team consisted of three health care practice members with one full-time faculty member.
  - The practice-centered members contacted each diabetic educator, diabetic manager, or diabetic specialist within their institutions. Each member had a set of specific questions to gather data from the sites, which included:
    - How many diabetic patients does the clinic or practice manage?
    - What is the current method used of assessing eye disease related to diabetes?
    - If patient do not follow up with ophthalmologist, what are the reasons offered?
    - Do you have any initiatives in place to eliminate barriers to diabetic eye care?
    - The full-time faculty member consulted fellow educators from different level programs to inquire about diabetes education within the nursing programs, most particularly at the Associate Degree level.

## Literature Review

### Diabetes Technology

- The literature reviewed was aimed at technology to be used by patients for monitoring such as CGM and/or insulin pumps.
- The ADDITION-Cambridge trial protocol identified that it was clearly beneficial for diabetics to have intensive treatment for cardiovascular risks. The study also identified secondary endpoints to include reduced retinopathy.
- In the study titled Psychology, Technology, and Diabetes Management (Gonder-Frederick, 2018) the theoretical framework of diffusion of innovation theory and unified theory of acceptance and use of technology helped to plan implementation and adoption of new technology to help our patients.
- These theories explain the adoption and use of technology, the perceived benefits and ease of use, and the perceived return on investment.
- Participation in programs that are incentivized by meeting clinical quality measures lend further justification to the implementation of fundal photography in the Primary Care Setting. (Example: Care First PCMH Diabetes Composite Measure)

### Fundal photography

- The literature reviewed supported the importance of fundal photography for the monitoring of fundal changes related to diabetes (O'Hare, et al., 1996; Thomas, et al., 2015; Wang, et al., 2017).
- The studies reviewed included a large sample (over thousands of participants) to evaluate the effectiveness of fundal photography to monitor diabetic changes and how it assists physicians to implement interventions to prevent complications as compared to participants that did not have fundal photography as a way to monitor changes (O'Hare, et al., 1996), showing this has been a long term concern for providers.

### Telemedicine

- The literature review supported the use of telemedicine, as an innovative technology to monitor and manage diabetics to enhance their quality of life, allow them to live independently, and be in more control of their own health state at a distance and as frequently as needed (Lee, et al., 2018; Schreier, et al., 2012; Welch, et al., 2014).
- Technological devices (mobile phones and electronic pill boxes) have been one source for patients to engage in the use of telemedicine to manage their diabetes care (Schreier, et al., 2012).
- Patients viewing their own retinal images has improved self-management behavior and clinical outcomes (Bursell, Brazionis & Jenkins, 2012).

### Retinal Screening

- The literature supported the importance of early retinal screening to detect early retinal dysfunction as a result of a loss of pancreatic insulin. (Antonetti, et al., 2006; Abramoff, et al., 2008).
- The study done by Munch, et al., 2010, shows that retinopathy screening is a great diagnostic tool for identifying elevated lifelong hyperglycemia.
- The studies reviewed were conducted over several years with large samples, similarly identifying early and frequent retinopathy testing allows for comparison and the ability to maintain strict glycemic control. (Aiello, 2014; Antonetti, et al., 2006, Munch, et al., 2010)

## Data Collection and Analysis

- Each practice area member spoke with their diabetic education designee and collected details specific to that place.
  1. **Large primary care practice-** Various satellite practices with thousands of patients.
    - The current method of assessing eye disease at this practice included referring patient to an optometrist or ophthalmologist for a dilated eye exam.
    - Patients who receive DSMT at the clinic were educated on how preventive measures assist them in managing issues before they become serious.
    - As this practice is relatively new to EPIC (a technological medical record system), the referral loop is often left open – as many patients fail to schedule an appointment or the provider fails to send a consult note.
    - Registry reports for diabetes in EPIC currently do not account for completion of screening for retinopathy, but are useful in identifying the patient's current self-management status. This would be significantly improved if screening for retinopathy is added.
  2. **Hospital with a Center for Diabetes and Endocrinology**
    - This diabetes and endocrinology clinic manages between 7,000-8,000 patients on average.
    - The patients are offered retinal screening through the clinic, in which 60-70% of patients have screening done yearly by their own ophthalmologist or are referred to the hospital's eye clinic.
    - This facility uses EPIC for their EHR. Documentation can be streamlined for easier use.
    - The CDE clinic was recognized for their eye screenings by the National Committee of Quality Assurance.
  3. **Hospital setting with Diabetes Educators**
    - The number of patients that the educator/TNN sees on a monthly basis is over 2,000 outpatients.
    - Diabetes retinopathy screens are not done in the office, but are recommended to be done.
    - This is in addition to consults on inpatients but often only gets to see 30% or less before discharge. The educator is only available for 8 hours a week to assess inpatients, which are mostly lower income to middle class population.
    - The educator also offers Diabetes series 'chats' to the community, as well as email communication.
    - The new nurse navigator greets the patient on admission (readmissions only) to the hospital and helps them transition from outpatient to inpatient.
  4. **Connection to academia**
    - The connection to academia lies in the education received by undergrad nursing students related to diabetes, its pathophysiology, trends, prevention medicine, medical treatment, nursing management, handling of complications, and impact on overall health outcomes.

## Recommendations

### Findings- What are the perceived barriers to this initiative?

- Each team member offered area specific barriers to the use of tools to monitor for diabetic retinopathy.
- Barriers to implementation:
  - Billing department and lack of understanding of the use of Global Management billing codes & contracting out to vendors specialists for professional reading of fundal photography.
  - Payers agreement to reimburse for the Global Mgt fee
  - Price of camera (5k), monthly fee for software (~180), and perceived ROI.
  - Aging population of providers who mistrust technology
  - Lack of patient follow-up with ophthalmologists after retinal screening
  - EPIC documentation. There are 4 different places to monitor eye exams: Reporting needs to be streamlined.

### Recommendations for the future

- PCPs can improve the screening of their diabetic patients for retinopathy in a cost effective manner by:
  - Improving patient education regarding preventive measures by utilizing multiple techniques may increase the patient's understanding of the need for regular screening.
  - Teaching our patients to self-advocate/self-manage and be engaged in their own care will improve compliance with preventive measures, thus improving patient outcomes
  - Obtain more diabetes educators to do one on one teaching with newly diagnosed patients and help with follow-up patients that have been referred to an ophthalmologist for retinal screening.
  - In academia, incorporate a curriculum that utilizes health models such as the health literacy expanded model (Mosley & Taylor, 2017) the perceived existing gap in nursing education, especially in the Associate Degree program level can be narrowed.

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