Perceptions of a teleophthalmology screening program for diabetic retinopathy in adults with type 1 and type 2 diabetes in urban primary care settings

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Key Messages:
\begin{itemize}
  \item This qualitative study explored perceptions of implementing a Teleophthalmology Program in urban primary care settings.
  \item Patients were highly satisfied with the Teleophthalmology Program, but interest for the program was lacking among providers.
  \item Methods to promote uptake include raising provider awareness of the program’s value, streamlining administrative processes, and centralizing recruitment.
\end{itemize}

Keywords: Teleophthalmology; diabetes; diabetic retinopathy; diabetic retinopathy screening; tele-retinal screening

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Abstract

**Objectives:** Teleophthalmology has improved diabetic retinopathy (DR) screening, and should be expanded in urban areas, where most unscreened individuals reside. This study explored facilitators and barriers of Teleophthalmology in primary care settings in Toronto, Canada.

**Methods:** Semi-structured interviews were conducted with 7 healthcare providers and 7 individuals with diabetes to explore their perspectives of Teleophthalmology in urban primary care settings. Interview data were analyzed using interpretive thematic analysis to generate themes.

**Results:** Six themes were identified; facilitators included: patient-centred implementation; access to Teleophthalmology at primary care sites; patients’ trust in their providers’ recommendations. Barriers included: patients’ lack of understanding of DR and the healthcare system; providers’ lack of interest; and the need to streamline administrative processes.

**Conclusion:** Although Teleophthalmology was well-received by patients, there was limited interest from primary care providers. Strategies for increasing uptake include: increasing primary care providers’ awareness of Teleophthalmology’s value in urban centres; improving administrative processes; and centralizing patient recruitment.

**Introduction**

Diabetic retinopathy (DR) is a potentially sight-threatening complication of diabetes, characterized by damaged blood vessels in the retina [1]. Among working-age Canadians, diabetes is the number one cause of blindness [2]. In Ontario, almost 1.4 million individuals are living with diabetes, with more than 50% living within the Greater Toronto Area (GTA) [3]. Best practice guidelines recommend annual DR screening for individuals with type 1 and 2 diabetes to prevent blindness [4]. DR screening is typically performed by an ophthalmologist [5] or optometrist and involves pupil dilation, retina examination through indirect ophthalmoscopy, and retinal fundus images. Despite these guidelines, DR screening rates are suboptimal in Ontario with over 400,000 residents overdue for screening [6]. Major reasons for suboptimal adherence to screening guidelines include absence of symptoms, limited knowledge of DR,
and socioeconomic/geographic barriers to screening [7,8]. In urban areas in Canada, low screening rates are found among those with low socioeconomic status, recent immigrants, and younger age groups [9].

Teleophthalmology is a telemedicine-based screening program that uses digital imaging and communications technology to capture and send ocular images to an ophthalmologist for remote assessment [10]. Previous research has demonstrated that teleophthalmology is cost-effective and improves access to timely DR screening [11,12]. In systematic reviews, the majority of the studies reported that teleophthalmology DR screening programs were comparable to traditional screening in terms of image quality, accuracy, and reliability [13–15]. Also, a number of studies cited high satisfaction or acceptability of teleophthalmology among patients and providers [10,11].

The Toronto Teleophthalmology Program – an urban DR screening program based in primary care, has been successfully implemented in community health centres (CHC) (i.e., organizations that deliver primary care and health promotion programs, especially to vulnerable populations) but is yet to be expanded to other primary care settings in Toronto. Offering Teleophthalmology in a range of primary care practices is an important strategy for expansion, considering that the majority of patients with diabetes are seen in primary care settings and the program currently requires a referral from a primary care provider (PCP). Furthermore, few studies have examined the utilization of Teleophthalmology in urban Canadian settings, where the majority of unscreened people with diabetes reside [6,16]. Therefore, this study explored the perspectives of patients with diabetes, PCPs, and eye care providers in Toronto with respect to facilitators and barriers of utilizing Teleophthalmology to gain insight into the feasibility of expanding the program across additional primary care practices in Toronto.

Methods

Study setting

This study focused on a Teleophthalmology Program in two regions within a large city (Toronto, Ontario, Canada). Through a referral from a physician, nurse practitioner, or diabetes education centre, individuals
with diabetes over the age of 18 years are eligible to receive DR screening through the program at no cost to the patient. Screenings are conducted by a trained registered practical nurse whereby medical/ocular history and images are taken, diabetes education is provided, and healthcare data are uploaded to a secure server. A retina specialist remotely evaluates images and health information and sends a digital report with treatment recommendations to the referring PCP, who is responsible for coordinating follow-up care, if required. Alternatively, support can be requested from the program to connect to ophthalmology or retina specialists.

**Study design**

This qualitative study used a semi-structured, emergent interview approach [17] to explore patients’, PCPs’, and eye care providers’ perspectives and/or experiences of the Teleophthalmology Program. The study design and interview guide were developed based on guidance from an ophthalmologist, a family physician, a patient partner with diabetes, and researchers with expertise in qualitative research. Initial interview questions focused on gaining contextual information and exploring perceived barriers and facilitators of program utilization and ways to refine the service for end-users in primary care settings in urban centres. Contextual questions were asked to enable comparisons between in-person assessment by eye care providers and Teleophthalmology and to understand perceived patient barriers to DR screening more generally in urban areas. In line with an emergent interview design, subsequent questions were based on participants’ responses to initial questions to further explore their perspectives. With this shared focus, 3 separate interview guides were developed for the different participant groups to ensure relevance of questions. See Appendices A – C.

**Recruitment and data collection**

We employed a purposive, snowball sampling recruitment approach in which we collaborated with staff members of a Toronto Teleophthalmology Program focused on DR screening to identify initial participants. Potential participants were approached in person, via phone, and email. Existing study participants also recommended other potential participants through word-of-mouth. Among 11 providers and 8 patients who were contacted, 3 providers declined to participate, 1 provider was ineligible, and 1
patient was unable to participate due to a language barrier. 14 participants in total, including 4 PCPs (1 nurse practitioner and 3 primary care physicians), 3 eye care providers (1 retina specialist and 2 optometrists) and 7 patients with diabetes were interviewed. PCPs, a retina specialist, and patients who had used the Teleophthalmology Program at least once (n=12) were recruited to share their perspectives. Optometrists who had not used Teleophthalmology (n=2) were provided background information about the program and were recruited for their contextual expertise (i.e. providing eye care in an urban area).

Interviews were conducted over the phone (n=11) and at clinics after patients’ Teleophthalmology appointments (n=3) and lasted up to approximately 50 minutes. All interviews were conducted individually with the exception of one patient interview (patient 03), where a family member consented to join and provide translation. Inclusion criteria for patients included: individuals aged 18 or older, diagnosed with type 1 or 2 diabetes, who were provided access to the Toronto Teleophthalmology Program. Inclusion criteria for primary and eye care providers included: experience providing care to patients with diabetes in the GTA and/or experience utilizing the Toronto Teleophthalmology Program.

Data analysis
Interviews were audio-recorded and transcribed verbatim. Interpretive thematic analysis [18] was initially conducted by the first author by coding the interview transcripts according to the research objectives. Coding was data-driven and involved an iterative process of reading the transcripts to identify common patterns or critical points across the data [18]. Interview data and analysis were then discussed in-depth with the second author and in multiple meetings with other research team members to refine themes.

Ethical considerations
The study received ethical approval from The Women’s College Hospital Ethics Assessment Process for Quality Improvement Projects (REB # 2019-0014-E). All participants provided either written or verbal consent before participating.

Results
Patients’ perspectives of the Teleophthalmology Program showed high satisfaction while interest among providers was modest. Facilitators of Teleophthalmology included: the program’s patient-centred implementation; access to Teleophthalmology at patients’ primary care sites; and patients’ trust in their PCP’s recommendation. Barriers included: patients’ lack of understanding of DR and how to navigate the healthcare system; lack of interest among PCPs for Teleophthalmology; and providers’ perception of the need to streamline Teleophthalmology administrative processes.

Facilitators of Teleophthalmology

Patient-centred implementation of Teleophthalmology

Patients reported high satisfaction with the Teleophthalmology Program in terms of their experience. They valued Teleophthalmology providers’ efforts to keep them informed throughout the screening process. Provider-to-patient communication opened a channel for patient education, which was an important means for promoting patients’ understanding of DR, comfort, and participation:

I was happy with [the eleophthalmology provider]. They informed me on everything that they were about to do, and then while they were doing it, I was talking with them and asking questions, so this satisfied my curiosity with that … I wasn’t worried afterwards. (Patient 07)

Teleophthalmology providers’ patient-centred care enabled a collaborative approach in which patients had the opportunity to express their needs and preferences. Participants’ responses demonstrated that patient-centred approaches are crucial for fostering their willingness to participate in DR screening. As one patient explained:

So, when I told the [Teleophthalmology provider] I think I may need another [eye] drop, at least he understood me … which I appreciated because otherwise I would not have allowed anyone to, I mean, I would not have been able to stare at the light also. … The moment I told him my eyes are not numb, he put in another drop. So, these small things make you comfortable. They listen to the patient. (Patient 06)

Patients’ trust in their PCP’s recommendation
Patients’ trust in their PCP’s recommendation was a key facilitator of program uptake. The majority of patients in our study learned about Teleophthalmology through their PCP and chose to participate because they trusted their PCP’s recommendation:

When [a patient’s] doctor tells them, ‘This is what you need to do’, then they’ll feel responsible enough that he has to more or less do this, because the doctor thinks that this is right. You have confidence in your doctor, don’t you? (Patient 07)

Most patients felt that PCPs were in the best position to raise patient awareness about the program and DR screening in general, since they were often perceived as health knowledge brokers and patient advocates. In discussing ways to increase awareness about Teleophthalmology, one participant commented:

The most important thing is the doctor, your family doctor. They have to tell you. They have to explain it to you. Then they have to remind you that it’s very important to you because you are a diabetic. As a diabetic person, it’s really hard because you don’t know what’s going on in you.

(Patient 01)

Other methods for raising awareness about Teleophthalmology (e.g. posters, advertisements etc.) were identified, however some felt that this placed the onus on patients to research the program and would likely result in the need to consult with their providers anyway. Patients relied on their providers to help them navigate the healthcare system and their recommendations were key to supporting program credibility and patient uptake.

*Access to Teleophthalmology at patients’ primary care sites*

The portability of the Teleophthalmology Program made it possible for patients to receive DR screening at their primary care sites, which a number of patients strongly preferred over getting screened elsewhere. Some were even willing to travel further than a closer DR screening option in order to be seen at their primary care sites. Patients viewed these spaces as trusted settings that would support quality and continuity of care:
It’s better if I can keep everything within the diabetic health team … Providing [Teleophthalmology] is actually going to be a holistic coverage for my diabetic care … By doing [Teleophthalmology] through this program, the access to my records is much faster and direct, so I think that would be a much better thing to do. (Patient 04)

Similarly, some providers highlighted the value in enabling patients to receive screening in a familiar place since they felt that patients were often unaware of or uncomfortable accessing care outside of their regular PCP:

It could be that they’re not sure of how to access other appointments. They might be comfortable coming to see their primary care provider at the community health centre but going to see specialists, that might be a challenge for various reasons … Having to navigate outside of that comfort zone could be a barrier. (HCP 01, nurse practitioner)

One provider noted that offering Teleophthalmology at primary care sites would enable the opportunity for PCPs to connect patients directly with the Teleophthalmology provider to further support continuity of care and engagement with DR screening:

For example, if I’m making a referral to a counselor, it’s so much easier if they’re on site. I can introduce the person to the counselor, and then there’s something there to tie them so they’re more likely to make the appointment … If I just say, you should book with a counselor … a lot of people will walk to the front and not make the appointment, and then walk out … That would be the advantage of having [Teleophthalmology] on site. (HCP 07, primary care physician)

**Barriers to Teleophthalmology**

*Patients’ lack of understanding of DR and how to navigate the healthcare system*

While all patients in this study recognized the importance of DR screening, the majority lacked knowledge of the healthcare system. Patients’ narratives often conveyed confusion over the procedures and personnel involved in DR screening. Participants shared a common notion that patients’ misconceptions about the healthcare system were a barrier to accessing the Teleophthalmology Program.
For instance, one patient commented that new immigrants in particular might be hesitant to access care, including Teleophthalmology, due to misconceptions about out-of-pocket costs:

When [new immigrants] come here, they think they have to take a risk when going to check with the doctors and all that. To pay for all the things. So they stay away, ‘Oh, I’m not going to go there’ because they don’t have money to pay for all of these expenses. (Patient 02)

Similarly, a provider discussed patients’ lack of understanding of different eye examinations and costs as barriers to participation in Teleophthalmology:

They don’t understand the difference between an optometrist and an ophthalmologist, and they don’t understand it’s a [Teleophthalmology] screening program. They don’t have to pay to have their pictures taken. (HCP 04, retina specialist)

Providers also felt that patients are often unaware of the need to receive annual DR screening and the severity of the disease due to its lack of symptoms. As one provider commented:

“It could be health literacy that is a barrier that they maybe are not understanding why it’s a priority because they don’t feel that their vision is a concern at this time” (HCP 01, nurse practitioner).

Lack of interest among providers for Teleophthalmology

Some providers believed that Teleophthalmology could benefit patients who face barriers to accessing care outside their regular primary care site; however, their interest was diluted by the perception that Teleophthalmology does not address key challenges to screening in urban centres. They felt that the program would be more valuable in areas with limited access to DR screening, such as rural communities.

Providers’ lack of interest seemed to reduce their motivation to make referrals:

I think the whole idea of Teleophthalmology is in giving patients a certain type of access that they wouldn’t normally have. We did not find that there was too much of a problem getting access for my patients in the first place, given the fact that a lot of who we refer are diabetic patients and they’re there for, sort of, an annual or biannual eye examination, which there’s time to organize months ahead of time. So the time stature and the convenience doesn’t factor in as much. (HCP 05, primary care physician)
Providers commented on a multitude of factors underlying low screening rates in the GTA, including the challenge of connecting with unscreened patients who have fallen through “cracks” in the healthcare system (e.g. due to competing priorities, fear, low health literacy etc.). Some providers felt that Teleophthalmology was not designed to address the root of the issue: the need to identify and recall unscreened patients in urban centres. This perspective acted as a barrier to uptake. As one provider explained:

… the number of people who are not getting [DR screening] because they physically can’t get to a place, like in a place like Toronto, where there’s a lot of optometrists and ophthalmologists, they’re not having their eye exam probably not because they can’t get somewhere. … we do have physical access [in the GTA], we also have less than 100% uptake, and that’s a problem. But I don’t know that Teleophthalmology actually solves the problem.

This provider endorsed a centralized approach to patient recruitment for DR screening, citing a need to “[look] through the database, [look] through people who haven’t had an eye exam in the last year, and who have a diagnosis of diabetes. You don’t need the Teleophthalmology Program to do that” (HCP 07, primary care physician).

Providers’ perception of the need to streamline Teleophthalmology administrative processes

Many providers in our study perceived a need to streamline the administrative process of Teleophthalmology with respect to the procedure for referrals, saving and sending reports, and retrieving patient information for follow-up/billing purposes. From PCPs’ perspectives, the referral process imposed increased burden, adding an additional step, which they felt was unnecessary or avoidable:

I don’t mind referring [to Teleophthalmology] if everything gets looked after, but there was a period of time at least that so many of the referrals coming back would say that the patient should see a real-life ophthalmologist … I’m wondering, why am I referring to your program in the first place? I just need to refer to an ophthalmologist and then everything gets looked after. It becomes actually more work for me to refer to your program. (HCP 05, primary care physician)
A retina specialist who uses the Teleophthalmology Program commented on the potential issue of losing patients to follow-up in the absence of a more streamlined administrative process:

There are limitations within the way it saves, sends reports, that makes us, as reviewers, a little bit unable to know the process. What I mean is, I can’t go back and make sure, at least I don’t know personally how to do it, that a report that I wrote was actually sent back and received by the referring person … Because there’s an issue also with liability which is, let’s say there is something significant that needs assessment or treatment and then that doesn’t happen, are we liable as screeners? Or is the referring person liable if they get that report and don’t refer them? So, there should be some kind of safety net in place where the screened patients that have issues don’t fall through the cracks. (HCP 04, retina specialist)

Their concern suggests the need to clearly communicate the approach to follow-up, including the responsibilities of the different providers involved and tracking mechanisms to ensure accountability and coordination.

**Discussion**

This study of patient and provider perceptions of an urban Teleophthalmology DR Screening Program revealed a disconnect between patient and provider perspectives. Our findings suggest that Teleophthalmology was well-received by patients; they favoured the ability to be screened at their regular primary care sites and trusted their PCP’s recommendation. Although providers cited benefits of the program, interest was lacking because they did not perceive that Teleophthalmology addressed key barriers to screening in urban centres. They highlighted the need to comprehensively identify and reach out directly to patients behind on screening—a mechanism that is outside the scope of the Teleophthalmology Program. Furthermore, providers’ perceptions of the need to better streamline the Teleophthalmology administrative processes also impeded uptake.

The Teleophthalmology Program’s commitment to ensuring provider-to-patient education and communication was important for facilitating patient uptake as they valued feeling informed and involved
in the care process. This could influence beliefs about the value of DR screening among patients with diabetes [19]. Health education on DR influences patients’ decision to engage in DR screening [7] and fosters participation in their care [20]. Echoing former research [10,21], our study found that PCPs play an important role in facilitating patients’ awareness of DR, and in promoting participation in DR screening. Similarly, patients with diabetes are more likely to participate in regular eye examinations when they trust their provider and receive ongoing care [22,23].

A number of studies in rural areas cite convenience as a strong facilitator of patient participation in Teleophthalmology DR screening [10,24]. In our study, patients’ strong preference to access Teleophthalmology through their regular primary care sites was mainly associated with factors related to continuity of care rather than travel distance. Offering Teleophthalmology at patients’ primary care sites makes point-of-care DR screening (i.e. screening that occurs at or proximal to the site/time of patient care) possible [20,21]. This could help reconcile some factors that participants perceived to contribute to low DR screening rates in urban areas. PCPs identified fragmented care as a reason for losing patients to follow-up when screening is shifted further away from the point of care. Providers’ views corroborate previous research [25,26], which found that offering Teleophthalmology at primary care sites could help improve continuity of care between primary and specialized health services for people with diabetes. In line with other research [27], the capacity for Teleophthalmology to make point-of-care DR screening possible is significant as it supports earlier detection and treatment, which is critical for preventing vision loss.

Teleophthalmology has demonstrated effectiveness [28,29] and was well accepted by patients in our study, like in others [24,30]; providers’ indifferent responses to the program in our study reveal the need to better communicate its value to providers and reduce provider burden. Although the program was well-accepted by patients, our findings suggest that an important factor influencing Teleophthalmology uptake among providers is their perception of the fit between the program’s offerings and perceived challenges to
DR screening. Barriers to screening in urban centres were acknowledged by providers in our study, however, some felt that Teleophthalmology only addressed a subset of barriers contributing to low screening rates. These barriers exist among a multitude of others identified in previous research [31]. Because providers largely identified Teleophthalmology as a means to address geographical and temporal access specifically, they did not see the need for it in urban centres where these issues were not considered a significant challenge. However, previous research has demonstrated that geographical and timely access to DR screening is an issue in urban settings due to limitations in health system capacity, patient knowledge, and language and financial barriers, particularly in places where patients are uninsured/underinsured [16,32,33]. Providers’ contrasting perceptions highlight the need to deepen their knowledge of patient barriers to DR screening access.

PCP education could increase providers’ understanding of the lack of access to DR screening in urban centres and improve awareness of Teleophthalmology’s ability to address this issue.

Program adjustments have been made but could be better communicated to reduce perceived workload and support uptake. Additional adjustments could include: creating workflow integrated referral/follow-up processes; improving communication between those involved in referral and review; the Ministry of Health enabling patients to attend the program without a PCP referral; and the ability for the program to directly refer patients to specialty care if needed. Building on provider’s suggestions regarding key barriers, Canadian urban settings could implement the program outside of primary care using a population-based approach to screening similar to the one in the United Kingdom [34], which used administrative health data to identify unscreened patients and mailed letters to invite them for screening at convenient locations. They found that more than 82% were screened among over 2.5 million who were contacted. Other centralized approaches (organized screening programs) have demonstrated greater effectiveness in increasing screening in other patient populations than opportunistic screening through primary care clinics [35,36]. This finding along with PCPs’ modest interest in Teleophthalmology in our study suggest the need to explore ways to expand the program through additional methods that are not
solely PCP-driven in urban areas.

Conclusion

Our results demonstrate that patients were highly satisfied with the Teleophthalmology Program, but there was a lack of interest among providers in urban centres. Continuity of care and PCPs’ recommendations represented the most critical facilitators of patient participation. However, the crucial role that PCPs play in facilitating engagement is at odds with their lack of interest in the program due to perceptions of low demand in urban regions. To facilitate the expansion of Teleophthalmology across primary care settings in Toronto, it is important to increase providers’ awareness of low DR screening rates and the value propositions of Teleophthalmology, streamline administrative processes, and consider a population-based approach using administrative health data to aid in the recruitment of patients for DR screening.

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Author Contributions

MN collected, analysed and interpreted the data, and drafted the manuscript. OB, MB, and VS led the conception of the study design, contributed to data analysis, and revised the manuscript. VS also contributed to data collection. RSB oversaw the coordination of the study and revised the manuscript. NO, RM, OS, and IW participated in the coordination of the study and revised the manuscript. KM participated in the conception of the study design, coordination of the study, data collection, and revised the manuscript. LIB participated in the study design and revised the manuscript. All authors read and approved the final manuscript.

References


Appendix A

Interview Guide for Primary Care Providers

1. Teleophthalmology
   a. Have you heard about the Ontario tele-ophthalmology screening program?
      i. (If yes) Do you use it?
      ii. (If no, give them a summary of how the program works).
   b. What do you think about the program?
   c. What challenges do you experience in the program? (e.g., policy, logistics, staffing, recruitment, etc.) (if used) OR Now that you know about the program, is it of interest for you to use? Do you see any barriers to using it?
      i. Prompt: Do you have suggestions on how to overcome these barriers?
   d. What do you like about the tele-ophthalmology screening program?
      i. Prompt: In your opinion what are the benefits of TOP?
   e. Why do you think the program is underused?
      i. Prompt: In your opinion why are PCPs not using the program?

2. Patient Barriers
   a. What are some of the common reasons patients are underscreened?
   b. What are some of the barriers to screening for your patients?

3. Eye screening outside TOP
   a. Do you refer to eye screening?
   b. Do you use an ophthalmologist that you send your patients to or do you tell them to go to an optometrist?
   c. If using an optometrist, do you know if they charge patients for images?
   d. What kind of referral process do you use?
   e. Do you receive reports back from optometrists, ophthalmologists?
   f. How long does it take to receive the screening results?
   g. Are there other satellite sites you are planning to work with or would like to work with?
Appendix B

Interview Guide for Eye Care Providers

1. Roughly what percentage of your patient population are patients with diabetes?
   a. Do you have a preference/choice with respect to what kinds of patients you see? (i.e. with/without diabetes).
      i. Are there any disadvantages to seeing patients with diabetes (e.g. reimbursement)?
   b. (Depending on their response) – do you have a preference with respect to seeing or not seeing patients with diabetes? Why?

2. Can you walk me through the process of screening patients with diabetes for diabetic retinopathy starting from the referral?
   Prompts:
   a. Where do you get your referrals from?
   b. Do you consistently get referrals from the same PCPs?
   c. How long does it take for the family doctor and patients to receive the results?

3. What is the average wait time for a patient with diabetes to get a screening appointment?

4. What is the process for dealing with no shows?

5. Could you tell me about the billing process for screening diabetic patients for retinopathy?
   Prompts:
   a. Are there specific billing codes that are used for diabetes patients?
   b. How much are you remunerated?

6. Could you tell me about any challenges (if any) that you face with respect to screening diabetic patients for retinopathy?
   a. What barriers do you think patients with diabetes might face in getting screened for retinopathy?
   b. What system-level barriers might create challenges for patients with diabetes with respect to getting screened?

7. Have you heard of the Teleophthalmology Program?
   a. (If yes) Could you tell me what you know about the program and are you involved in any way (e.g. receiving patient referrals)?
   b. (If no, explain what the program is).

8. Given what you know about the program, is it something you would be interested in using to screen your patients living with diabetes? (i.e. refer them to the program instead of you screening them). Prompts: Why or why not?

9. What would you need the program to do in order for you to be interested in using it?
   Prompts:
   a. How should it be integrated into your daily workflow? (e.g. integrated into the EMR, electronic vs. paper, details about the referral process).
   b. What existing gaps (with respect to screening for diabetic retinopathy) could the program potentially address?
   c. How would the program need to be adapted to address such gaps?

10. Is there anything else you think would be important for us to know with respect to diabetic screening or the TOP program?
Appendix C

Interview Guide for Patients

1. Have you ever had retinal screening before outside of the tele-retinal screening program? (*If no skip to question 2; if yes, go to question 1a).
   a. Was this in the last 2 years?
   b. Who suggested/sent you to do the screening? (e.g., family doctor, nurse practitioner, diabetes education centre, etc.)
   c. How long did it take from when you were sent/suggested to do the screening to when you received the screening?
   d. Who conducted the screening? (e.g., an ophthalmologist, an optometrist, a nurse technician?)
   e. What did you think of the experience?
      Prompts:
      i. What did you like?
      ii. What didn’t you like?
      iii. What could have been improved upon?
      iv. Please rate your overall experience out of 10 (1= the worst possible overall experience, 10= the best possible overall experience)

2. Have you ever had retinal screening before by the tele-retinal screening program?
   a. Was this in the last 2 years?
   b. How did you find out about the program?
   c. Who suggested/sent you to do the screening? (e.g., family doctor, nurse practitioner, diabetes education centre, etc.)
   d. How long did it take from when you were sent/suggested to do the screening to when you received the screening?
   e. Where did you have the screening done?
   f. Can you describe the process of having your eyes screened?
   g. What did you think about the experience?
      Prompts:
      i. What did you like?
      ii. What didn’t you like?
      iii. What could have been improved upon?
      iv. Please rate your overall experience out of 10 (1= the worst possible overall experience, 10= the best possible overall experience)
   h. Did you find the screening location to be convenient for you?
      i. What other places would you find convenient to go for screening?
      Prompts:
      1. Community centres?
      2. Diabetes Education Centres?
      3. Grocery stores?
      4. Other local organizations?
   i. Did you find out about the results of your tele-retinal screening?
      i. If so, how? Who contacted you?

3. Do you think it’s important to have your eyes screened for retinopathy?
   a. Prompt: Why or why not?
4. Do you think other people would be interested in having their eyes screened in the tele-retinopathy screening program?
   a. Prompt: Why or why not?
5. Would you be interested in receiving reminders when it’s time for your annual eye screening?
   a. Would you prefer to receive this by:
      i. Email?
      ii. Phone call?
      iii. Letter?
6. How else should the program reach out to patients to let them know about the service?
   Prompts:
   a. Posters?
   b. Advertisements?
   c. Family doctors?
   d. Other medical staff?
   e. Other suggestions?