Title:

Building Access to Specialist Care through E-Consultation

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Abstract

Background: Access to specialist care remains a major barrier to patients and primary care providers in Canada− both in terms of long wait times and inequitable availability. We developed an electronic consultation system using a secure web-based tool as an alternative to a face-to-face consult.

Methods: In a pilot program, the e-consultation system was tested with 18 primary care providers and 11 specialists in a large health region in Eastern Ontario, Canada, in 2010. We collected both quantitative data from exit surveys and system utilization data and qualitative information from provider interviews and focus groups.

Results: Pilot results showed good uptake, high levels of satisfaction, better integrated process of referral and consultation and avoidance of unnecessary specialist visits. A total of 78 e-consult requests were processed from January 2010 to April 2011. Less than 10% of the referrals required face-to-face follow-ups. The most noted perceived benefits for patients included improved access and reduced wait times. Primary care providers valued the ability to assist with patient assessment and management in terms of providing responses to clinical questions, clarifying the need for diagnostic tests or treatments and confirming the need for a formal consult. Specialists enjoyed receiving comprehensive, advanced work on a case before a consultation as well as having control about who should be referred.

Interpretation: There is potential for broader implementation of this low-cost referral system once payment models for physicians are adapted to include e-consultation.

Key Words: e-consultation, specialist care, wait times

Introduction

Primary care providers manage a broad range of health issues with their patients, with many requiring specialist support at some point. In Ontario alone, 54,000 patients are referred to specialists daily, the majority requested by primary care providers. [1]

Traditionally, when a consultation is needed, primary care providers will send their patients for a formal face-to-face consultation with the specialists, which may be delayed due to lack of availability and frequently requires patient's travel.

Waiting for specialist care remains the number one barrier to access in Canada. [2] The average wait time to see a specialist after being referred by a primary care provider increased to 8.9 weeks in 2010 from 3.7 weeks in 1993. [3] After being seen by a specialist, Canadian patients wait, on average, another 9.3 weeks to receive treatment. [3] When a consultation is successfully initiated, the complexity of the system and the many steps involved also contribute to the overall length of the process (see Figure 1).

Some primary care physicians use informal (curbside) consultations to ask questions of specialists they know and meet. However, opportunities for informal consultations with specialists is reduced as many primary care providers now work completely outside the hospital setting. [4,5] In addition, concerns about the quality and adequacy of the exchanged information during an informal consultation exist. [5-8] Alternatively, the consultation can be done informally by telephone or e-mail. [6,9,10]

The use of e-mail systems for consultation has been explored in different settings, including in military medical centres and clinical teaching units. [11-14] However, confidentiality, privacy, and security of e-mail systems are areas of concern [10] and have limited the potential expansion of such consultations.

The use of telemedicine is another alternative to traditional consultation, especially in remote areas. [15] However, telemedicine is not widely used and requires specialized and often expensive equipment, so it is not accessible to most primary care providers. Studies have found the overall cost effectiveness of

telemedicine to be limited. [16] In addition, it requires the patient, primary care providers, and specialists to be present simultaneously. [5,17]

We developed and piloted a referral system with 18 primary care providers and 11 specialists in Eastern Ontario based on an existing multi-purpose virtual collaboration space. The use of a secure region wide network allowed for ease of access similar to e-mail while fulfilling all privacy requirements. We were interested in the feasibility of establishing an electronic consultation (e-consultation) system and in exploring the impacts and potential benefits of the system for patients and their providers.

This article reports on the findings from our evaluation of the pilot phase, which ran from January 2010 through to April 2011.

Methods

Setting and participants

The study took place in a health region in Eastern Ontario, which is culturally diverse with a population of 1.2 million and has chronic disease burdens and patient health outcomes comparable to Ontario and the rest of Canada. [18] The area has one main urban centre with a large tertiary care hospital housing many of the speciality services who provide care to people living in outlying rural communities.

Our pilot participants included 29 providers (14 family physicians, 4 nurse practitioners, and 11 specialists) of whom all were invited to give feedback in an interview and/or focus group.

We used a mixed-methods exploratory embedded design whereby the qualitative methods, consisting of interviews and focus groups, served as the primary design and the quantitative methods, involving system utilization data, played a supplementary role. [19]

E-consultation service

The system was built on an existing, secure collaboration space hosted out of a local semi-rural hospital, but widely available beyond the local region due to its web-based platform. This web-based tool had already been successfully deployed for e-scheduling applications and other interactions between health

care workers in the region. The e-consultation applications, including associated forms, automated workflows, and interface engines were based on off-the-shelf components and were adapted internally by the research team and in consultation with the participants. The system does require high-speed internet access.

This e-consultation system allowed primary care providers to submit a patient specific clinical question to a specialist, by using a standardized electronic form. Supplementary patient information, such as laboratory results, digital images, and health history could be included to assist the specialist in making an informed recommendation. The consultation request was assigned by project staff to an appropriate specialist (based on availability and specialty) who had one week to respond. Depending on the request, the specialist could:

a) Provide answers to questions and avoid the need for a patient visit.
b) Request additional information before being able to provide advice.
c) Recommend a formal referral, in which case any additional diagnostic tests or courses for treatment could be requested and started before the appointment.

Both the specialist and the primary care provider received email notifications at each stage of the process so they knew the status of the e-consultation and could log back into the system to see the response and/or provide more information as needed. In addition, a permanent record of the e-consultation was created which may be downloaded into the patient's health record.

Data sources

Quantitative: System utilization data

For each e-consultation, the data regarding the primary care provider, consulting specialist, questions, and answers were automatically stored by the system.

Qualitative: Interviews and focus groups

Primary care providers and specialists identified as active users of the system (having at least one e-consultation) were potential invitees to the qualitative interviews and focus groups. For primary care provider interviews and focus groups, we used a purposeful sampling with maximum variation seeking to include providers from all sites as described by Patton (2002). [20] For the specialist, due to smaller numbers we conducted qualitative interviews with all but one of the specialist participants who was not interviewed due to scheduling conflicts.

Semi-structured telephone interviews, approximately 60 minutes in length, were completed by a research consultant with nine primary care providers who met the criteria of being active users and 10 specialists covering seven specialties. All the interviews and focus groups were audiotaped and transcribed verbatim. An experienced qualitative researcher developed the initial coding framework based on the interview questions and moderator's guide, coded the transcripts from interviews and focus groups respectively, and worked with other members of the research team to further refine these categories, which were then applied to all transcripts. Data were analyzed using NVivo8 software. Themes were identified through review of the data within and across codes. Coding summaries were reviewed by two other members of the research team. Inconsistencies were solved through consensus among the team. Study findings derived from each source of data were triangulated using relevant study findings from other sources wherever appropriate.

The ethics approval for this study was obtained from the Ottawa Hospital Research Ethics Board. All primary care physicians and specialists provided informed consent prior to their participation in the study. Primary care providers were asked to use the e-consultation system only after the patient's verbal consent was obtained.

Results

Of the nine primary care providers who participated in the interviews or focus groups, all used a computer or web-based device to assist in their daily practice; eight were located in a rural location, and one in a semi-rural location; and two worked in a solo practice and seven in a group practice. The median number

of years in practice was 20 (2-27.5 years). The average number of usual referrals per week for the primary care providers was 15. For the 10 specialists who participated, all use a computer or web-based device to assist in their daily practice; nine were in urban locations/academic practice, and one was in a rural location/community practice. The median number of years in practice for specialists was 25 (4-34 years).

Use of E-Consultation

From January 1, 2010, to April 1, 2011, 77 e-consultation requests were made through the system by 18 primary care providers and responded to by one of 11 participating specialists. Most e-consultation requests were addressed to dermatologists (24%), endocrinologists (23%), cardiologists (11%), and rheumatologist (11%). Most responses (75%) were received within the expected one week, with 25 % being completed within 1 day. The average response time was 5.5 days. Less than 10% of the e-consults required follow-up face-to-face visits. In those cases, the specialist often asked for further actions by the primary care provider (such as advice to patient, diagnostic tests, or courses of treatment) while the patient was waiting for his/her consultation.

Satisfaction

We found the majority of physicians were satisfied with the e-consultation service. Many physicians commented on the simplicity and effectiveness of e-consultation. A primary care provider (ID 205) stated: *"It is pretty straightforward. I typed in my consult and sent if off."* One specialist (ID 101) said: *"I was absolutely satisfied with the type of information, the clarity of it and especially the timeliness of it"*

Some specialists mentioned how useful it was to build their work on what another physician has already done. Noted one (ID 202): *"It's always quicker to read someone's findings rather than to go ahead and do the full exam yourself." I probably would spend anywhere from 30 to 45 minutes with a new patient." What I reported as having spent on e-consultation was much less than that. Nothing more than 20 minutes."* All specialists and most primary care providers suggested that the e-consultation service be expanded in the future and many indicated that they would recommend e-consultation to a colleague.

Perceived or potential benefits

The perceived or potential benefits of e-consultation apply to four main groups: patients, primary care physicians, specialists, and the healthcare system (see Table 1).

The most noted benefits include improved access by avoidance of face-to-face consultation or re-consultation and reduced time delays or the provision of timely access for patients. Both groups of providers commented on the value of the two-way communication allowing for triaging of cases and clarification of clinical questions and responses. Specialists enjoyed receiving comprehensive, advanced work on a case before a consultation to better understand the patient's history and/or previous investigative work done as well as having decision-making control about who should be referred.

Areas of concern

There were a few areas of concern that e-consultation users commented on during the pilot phase, including:

- The impersonal nature of communication through an electronic system. For example, one specialist (ID 205) noted: "We are always worried about giving advice over the phone. And, in this case, we are giving advice having not seen or examined the patient, everything being based on the information that has been posted is our working knowledge." As well, often primary care providers seek specialists for regular referrals based on familiarity, comfort, or having an existing working relationship. This process of selecting a specialist is currently not available in the e-consultation pilot. Consequently, lack of comfort in use stemmed partly from primary care providers not knowing who they were consulting with. Specialists also welcomed making e-consultation more personal by knowing the identity of the requesting primary care provider.

- Technical issues related to system use, such as variability in typing skill, ability to learn and adopt new technology, privacy and security-related concerns, use of online forms and quality of attachments.

Future suggestions

The participants provided suggestions for a larger scale e-consult service including adaptation of workflow processes for referrals to account for higher volumes of e-consultation. Most primary care providers suggested that the integration of e-consultation into electronic medical records will be a positive next step. All respondents envisioned a role for an 'e-consultation assistant' to help with such tasks as triaging patients, booking appointments when needed, scheduling e-consultations, taking pictures, etc.

Furthermore, having some form of hands-on training for initial set-up and having access to a resource person were desired by novice users which could potentially be subsumed under the e-consultation assistant role: *"I am wondering if I can get [trained on] how to implement the e-Consult in my office or if we can go 'get some training [on] how to implement the E-Consult through [EMR software] by direct link'"* (FG2).

Interpretation

We have developed and implemented an effective e-consultation system in our health region. We found that this approach is feasible and highly acceptable to both specialists and primary care providers. The use of existing infrastructure and system development based on off-the-shelf components of a commonly used software product means that this system could be broadly implemented at low cost. Although many requests for specialist advice and consultations for procedures will still require a face-to-face consultation even a 10% reduction in the number of face-to-face consults would be significant and equate to 5,400 fewer consults a day in the province. [1] This could reduce overall wait times for individuals who do require face-to-face and reduce costs to patients for time off work, travel, etc.

The estimated costs savings even factoring in specialists' ongoing e-consultation fees could be as much as $500,000/day (assuming the usual costs/visit is $150 and e-consult cost is half of that, or $75).

The e-consultation system we developed and implemented addresses many of the limitations and barriers reported with other e-systems, such as high cost, the need for special equipment, synchronous appointment scheduling, extensive training, and privacy and security issues. [10,11,14,21,22] We have overcome these drawbacks by developing a system that is based on existing secured private infrastructure, requires less than 30 minutes training, is very convenient for the providers, and is asynchronous communication.

The evaluation results are very encouraging; most participants (primary care providers and specialists) were very satisfied with their experience of using e-consultation. Engagement and adoption of new technology with health care providers is challenging. Physicians who see innovation as having a relative advantage over current practice will more readily commit and adopt new innovations. [23] As perceived by our participants, the use of e-consultation results in several benefits for patients, physicians, and the health care system including a considerable decrease in the need to refer primary care patients to a specialist for an in-person visit. Both primary care providers and specialists saw much value in expanding e-consultation.

Several issues need to be addressed when moving beyond the pilot stage including greater organization of speciality care and integration into regular workflows for all providers. A population based approach to delivery of speciality services would include the creation of 'groups' of specialists who together see their mandate as providing whole population speciality care as opposed to the current system of individual referral based demand.

Looking forward, there is the question of how to incorporate some of the best features of existing systems into our e-consultation system, such as the face-to-face capacity of telemedicine or simply the ability to deal with urgent questions over the telephone. Furthermore, there is the larger concept of system-wide

integration, whereby e-consultation is linked with other health information systems, such as regional diagnostic centres and labs or even further as a stepping stone to an e-referral system.

Limitations

This study is limited by its sampling bias. The sampling for interview involved providers who were most interested in participating in the e-consultation pilot. Most primary care providers were from a group practice in a rural setting and most specialists had an academic practice in an urban setting. Further studies should explore the experiences of a wider sample of participants. The addition of patient interviews would also strengthen the evaluation.

Current status of e-consultation service

We have continued to develop this system and, in response to feedback from the pilot study participants, created self-registration and simplified instructions for use and automatic identification of the provider in the e-consult. We are addressing sustainability issues related to funding mechanisms for e-consultation. The service continues and as of May 1, 2012, 103 family doctors, 13 nurse practitioners, and 40 specialists across 17 specialties are registered users. A total of 242 new consults have been completed with 64 in the last month alone.

Conclusion

The actual and potential benefits of e-consultation are clear for patients, providers, and the health care system. We have improved access to care, while ensuring high quality, secure advice is received leading to overall cost savings for the health system.

Biographies

Dr. Clare Liddy is an assistant professor in the Department of Family Medicine at the University of Ottawa, and a clinician investigator at the C.T. Lamont Primary Health Care Research Centre.

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Competing interests

None declared.

Contributors

Clare Liddy and Erin Keely originally conceived of the idea, developed the methods, wrote the first draft of the manuscript, and implemented the project. Margo Rowan led the qualitative data collection and analysis. All authors participated in design, analysis, critical review, and final approval of the manuscript.

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Table 1: Physicians' perceived benefits of e-consultation

Theme	Sub-theme	*Quote*
Perceived benefits for patients	Avoiding face-to-face consultation	*"Patients love it if I can just call the specialist and ask the question" (ID 104)*
	Reducing time delays	*"[E-consult allowed me to] identify or clarify the urgency with which a patient should be seen and cut down on any other forms of communications that might take longer" (ID 219)*
	Avoiding unnecessary travel	*"I had some specific non-urgent questions so I sent a consult to [name of specialist] and he gave me some specific answers that the patient found helpful, the patient lived in [rural area] and was quite happy to hear from the specialist and didn't have to travel to Ottawa to get an endocrine consult, which takes six months" (FG2).*
	Providing psychological reassurance	*"There may be a psychological benefit to the patient to know that their case has already been discussed. Because sometimes patients get very anxious especially if there's a wait involved" (ID 219)*
Perceived benefits for primary care providers	Improved patient management	*"I think that the benefit would be largely for the referring physicians in terms of patient management" (ID 219)*
	Gaining confidence and comfort level	*"Almost a filtering system to reassure family doctors" (ID 202)*
	Education and knowledge translation for primary care providers	*"It provides vehicles for some feedback to family docs/education to let them know how we deal with things so that maybe they can feel more confident dealing with things themselves" (ID 212)*
	Improved interaction with specialists	*"And also it would make it easier if I get a letter back from the specialist and either I don't understand the condition they're talking about or what they've said to me seems ambiguous or in some way I'm not comfortable with the letter I've gotten back, it's a lot easier to [e-mail] back*

		and say, 'What did you mean'" (FG1)
Perceived benefits for specialists	Advanced work by primary care provider on a case before a consultation	*"So for me it was nice to be involved in the situation where I've got a lot more from the family doctor. I had a good sense of what they've tried, what they didn't try, what investigations they've done, everything was attached because to see it right there you don't have to call them up and ask them for more" (ID 202)*
	Decision-making control on which patient should be referred	*"[When] we get referrals to see you face to face, you book the patient in to see, you don't really decide necessarily that they absolutely need to see you. Whereas if you recommend it with E-Consult, you are making the statement, you are saying that they absolutely need to see you because this is something that you can do" (ID 202)*
	Improved interaction with primary care providers	*"I think it helps in the interaction with the healthcare provider. They tell you what information they have, you evaluate it and then if you need further information, you tell them 'This is what you need.'" (ID 216)*
	Reduced specialists' wait times	*"in our clinic sometimes we struggle to get in the urgent consults within a timely manner just because the wait times are getting longer, not just for the non-urgent but also for the urgent clinic appointments reducing wait times can be associated with less stress to [us] and so forth" (ID 211)*
Perceived benefits for healthcare system	Improving efficiency	*"If things were organized in an efficient fashion so that specialists could sit down and do 10 e-Consultations over a two-hour period, then that is better use of that specialist's time and more patients [are] being addressed" (ID 202)*
	Reducing wait times	*"Yes I think the cut in wait times is a very important benefit to the healthcare system because that's a major limitation to the way that our clinics are set up. There is a long wait for patients to get in to see a specialist" (ID 202)*

		"I think that's where I could see it affecting wait times is that the consultants wouldn't be busy with cases that really aren't necessary" (ID 107)

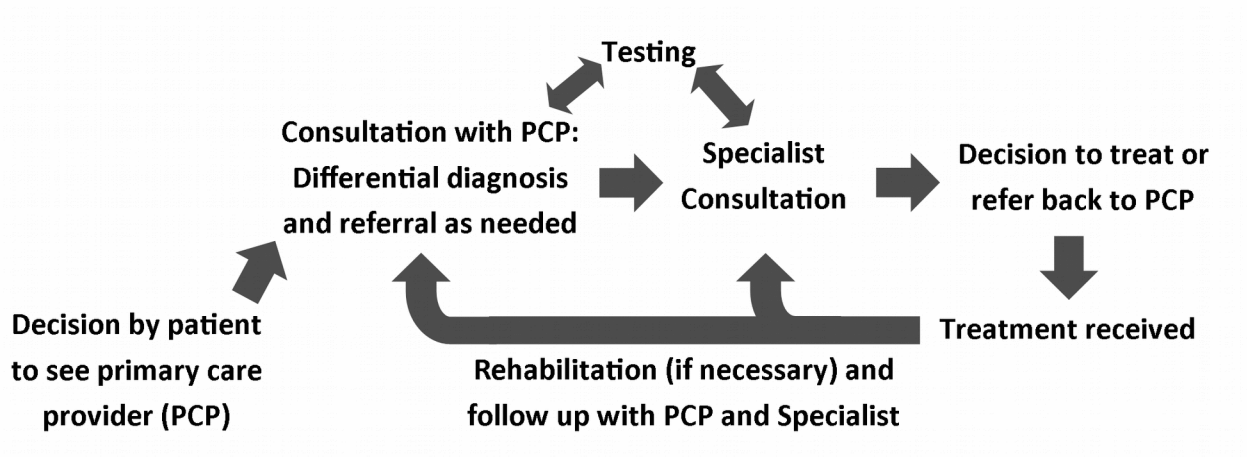

Figure 1: Adaptation of prototype shared by the College of Family Physicians of Canada and from ICES, Access to Health Services in Ontario, Fig. 1.1