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Patient and provider perspectives on the design and implementation of an electronic consultation system for kidney care delivery in Canada: A focus group study

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Abstract

Objectives: We assessed stakeholder perceptions on the use of an electronic consultation system (e-Consult) to improve the delivery of kidney care in Alberta. We aim to identify acceptability, barriers, and facilitators to the use of an e-Consult system for ambulatory kidney care delivery.

Methods: This was a qualitative focus group study using a thematic analysis design. Eight focus groups were held in 4 locations in the province of Alberta, Canada. In total there were 72 participants in 2 broad stakeholder categories: patients (including patients' relatives) and providers (including primary care physicians, nephrologists, other care providers, and policymakers).

Findings: The e-Consult system was generally acceptable across all stakeholder groups. The key barriers identified were length of time required for referring physicians to complete the e-Consult due to lack of integration with current electronic medical records, and concerns that increased numbers of requests might overwhelm nephrologists and lead to a delayed response or an unsustainable system. The key facilitators identified were potential improvement of care coordination, dissemination of best practice through an educational platform, comprehensive data to make decisions without the need for face-to-face consultation, timely feedback to primary care providers, timeliness/reduced delays for patients' rapid triage and identification of cases needing urgent care, and improved access to information to facilitate decision making in patient care.

Conclusions: Stakeholder perceptions regarding the e-Consult system were favourable, and the key barriers and facilitators identified will be considered in design and implementation of an acceptable and sustainable electronic consultation system for kidney care delivery.

Key words: e-Consult, kidney care, CKD, rural/remote, quality of care

Strengths and limitations of this study

- The use of electronic consultation systems to facilitate interactions between specialists and primary care practitioners have not been widely adopted in Canada for kidney care delivery.
- To our knowledge, this is the first study that explored the feasibility of e-Consult for ambulatory kidney care - the barriers to and facilitators of uptake of the system among patients and providers, prior to its implementation.
- Using focus groups, we explored stakeholder perceptions about potential barriers to and facilitators for a new electronic consultation strategy, focusing on elements that are most important for the design of a feasible, acceptable, implementable e-Consult system.
- These results have direct implications for a health system re-design and inform the development and implementation of this electronic system aimed to improve access to specialist kidney care.
- The key limitations were that focus group studies though important source of information but are dependent on the knowledge, expertise, and perceptions of the participants. We leveraged a robust methodological design, reported on stakeholder perceptions about potential barriers to and facilitators for e-Consult implementation.

Introduction

Specialist kidney care is critical for diagnosis and management of patients with chronic kidney disease (CKD), particularly those with advanced CKD, and over the last decade there has been a steady increase in the number of referrals to nephrologists.¹⁻⁷ This issue is compounded by the large rural geography of Canada, with resultant disparities in the distribution of health care resources, health workforce, and access to care.^{8,9} Thus there is a need for an alternate CKD care delivery model that can facilitate efficient, effective, cost-saving, convenient, and timely care for patients with CKD, particularly those living in rural/remote locations.

The use of electronic consultation systems – secure and confidential electronic system of using patients' health information to facilitate a meaningful interaction between a specialist and a PCP (herein referred to as e-Consult) – and other telehealth systems to facilitate access to specialist care is entering the clinical arena in many countries.¹⁰⁻¹⁷ Nevertheless, e-Consult systems have not been widely adopted in Canada.^{11,13,18-21} It is crucial to establish the feasibility, acceptability, and the optimal format for such a system prior to its implementation.²²

We aim to develop an e-Consult system for CKD for primary care providers in Alberta. The purpose of this study was to explore the barriers to and facilitators of uptake of the system among patients and providers, prior to its implementation.

Methods

The Consolidated Criteria for Reporting Qualitative Research (COREQ) were used to structure and report the study findings.²³

Setting

The study was conducted across the province of Alberta, supported by the Northern and Southern Alberta Renal Programs (NARP/SARP). These are large renal programs in Canada, providing care to ~4 million people residing in western and northern Canada. The two programs have a catchment area characterized by a vast geography (Alberta and Northwest Territories (NWT), as well as adjoining parts of British Columbia, Saskatchewan, and Nunavut); this area constitutes >20% of the Canada National Land Area and includes remote locations with low population density (**Figure 1**). Ethical approval for the study was received from the Research Ethics Boards at the University of Alberta and University of Calgary, Alberta, Canada.

Alberta e-Consult initiative

The Alberta e-Consult provides a secure, reliable, and efficient platform for the interactions of PCPs and nephrologists to deliver ambulatory kidney care. This tool is hosted on the provincial Netcare system, a secure and confidential electronic system of patients' health information in Alberta. The e-Consult model involves direct asynchronous communication between referring physicians and nephrologists via a Netcare portal to coordinate patient management and limit face-to-face visits between patients and nephrologists to situations where such visits are truly required.

Design and population

This study was part of a larger integrated, sequential, and mixed methods study²⁴⁻²⁷ conducted in three phases.^{28,29} The focus of this report is the pre-implementation phase in which the perceptions, readiness, and key barriers and facilitators to the uptake of the e-

Consult system were explored to identify key issues fundamental to its implementation and widespread application. A qualitative focus group study with purposive sampling and thematic analysis was conducted in this phase of the study. The design was chosen since it is the most appropriate for studies exploring feasibility of programs and stakeholder views/opinions to implementation, when little is known about the topic.

Sampling in this particular study was purposive; statistical power and generalization were not the aim.^{25-27,29} We purposively selected study participants to ensure that our survey captured the views of the stakeholders, including PCPs, nephrologists and policymakers involved directly with the organization of CKD care and patients with CKD and their relatives. People in the identified groups of the study population were invited to participate in a focus group session. Sessions with patient groups were conducted separately from provider groups. No financial incentives were offered for participation.

Data collection

Data were collected in eight focus groups, four with patient groups and four with provider groups. They were conducted in four locations across urban and rural Alberta. An experienced facilitator familiar with the study and its aims conducted the focus groups, asking pertinent questions and prompting questions when necessary.³⁰ An observer was also present to witness proceedings, manage equipment, and examine issues of group dynamics. Each focus group lasted for approximately 2 hours, was audio-recorded, and transcribed verbatim. A semi-structured interview guide was used (**eAppendix 1, eFigure 1**).³¹⁻³³ In the development of the patient-specific questions, we utilized the Picker Institute Model, which is based on eight dimensions of patient perspectives to care provision. The open-ended nature of the questions provided opportunities for extensive exploration of the issues.

Data analysis

Thematic analysis was conducted using categories (**eAppendix 2**) established *a priori* based on the research questions relating to acceptability, barriers, and facilitators to implementing an electronic consultation service. Two analysts, who were not part of data collection, reviewed and coded the focus group transcripts, using NVivo 10 qualitative data analysis software. Transcript data was divided into small meaningful units (i.e., sentence, phrase, paragraph related to topic) and a descriptor was attached to each of the units. Contrasting perspectives that did not fit the themes were also identified. As the analysts immersed themselves in the data, themes crystalized and saturation of categories was evident.³⁴ Analysis of the patient and provider focus groups was conducted separately. Themes for the two groups (patients and providers) were then compared.

Results

Participants

There was a total of 72 participants (n=36 in both patient and provider groups) (**Table 1**). **Table 2** provides a summary of the demographics of the focus group participants.

Key findings

The themes of acceptability, barriers, and facilitators as found in both the patient and provider datasets, with some areas of overlap, are described below in an integrated presentation and separated for ease of comparison in **Table 3**.

Acceptability

Few concerns about the concept of e-Consult were raised in the focus groups. Both providers and patients described the potential benefits to patients of e-Consult in terms of decreased wait times and more appropriate and effective referrals – only patients the nephrologist identified as requiring a nephrology consult would be seen in-person, whereas, others could be safely managed by their referring physician in the community. Participants perceived this would eliminate inappropriate referrals and make better use of resources such as appointment times. This was especially appreciated by participants outside of urban centres, who noted an opportunity to decrease patient burden by reducing unnecessary travel for inappropriate visits.

F2: *Well we'd get information faster so that our doctor could know, would know what to do.*

F1: *That would be a benefit, yeah.*

F2: *Yeah, without us having to travel.*

F7: *Lots of times you could be treated without going anywhere too. (Patient FG#7)*

Patients and providers agreed that through e-Consult, nephrology referrals would be more effective as appropriate tests would be ordered and results communicated to the nephrologist prior to the scheduled visit (or in place of the visit). Similarly, the outcomes of the nephrology consult would be more accurately reported back to the referring physician through e-Consult, thus enabling a higher quality of care. An additional benefit of the e-Consult system commonly noted by providers was increased confidence in physician decision-making about kidney care. Some attributed this confidence to the current best practices content of the e-Consult system. Others proposed that increased confidence would result because decisions about kidney care would be reviewed by a nephrologist.

M3: *If you enter this in the system and you get it clear that you know why you do not have to refer; you have that on file, as even a legal statement, saying, "Hey I did an e-referral. It was generated half-electronically and briefly reviewed by a nephrologist." And at least I feel comfortable. I can tell my patient that we have a couple of decision rules when he needs to be referred. It's also to give confidence that you're okay just to follow people. (Provider FG#2)*

Barriers

Although participants were in favour of the e-Consult system in principle, some practical concerns regarding its implementation were identified: potential decreased access to care for patients by increasing wait times at other points in the care pathway, lack of integration with current electronic medical record (EMRs) systems in physician offices; and the length of time required for physicians to complete the e-Consult.

Interestingly, both patients and providers speculated that the new system might inadvertently slow the course of kidney care.

M2: *The only part that I'm concerned with is the overload of your local doctors, which will slow down the information back to your patient..... (Patient FG#4)*

Providers voiced concerns that the potential increase in nephrology referrals as a result of having the e-Consult system might overwhelm the nephrologists, leading either to delay in response or creation of a system that was not sustainable.

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2
3 *F3: But is there a plan for physician sustainability? Because even though it's faster to*
4 *answer a question on email or over electronic, you could be having 75 of those as*
5 *opposed to seeing four patients. (Provider FG#6)*
6

7
8 Another area of concern for patients and providers was the capacity of information
9 technology systems to effectively house the e-Consult system. A few patients speculated that
10 rural PCPs may lack the required internet resources. Most providers' comments were centred
11 on the lack of integration of the system and any outcomes of the consultation (e.g., lab tests,
12 results) with their EMRs. The high prevalence of these comments made "lack of integration
13 with EMR" one of the strongest themes in the provider dataset.

14 *M2: My only barrier would be if I have two separate systems that I have to go log on*
15 *and in and on and in to see what's going on...But I don't want to have two systems*
16 *that now I have to check this, now I have to check this. (Provider FG#8)*
17

18
19 Apprehension about the lack of integration across EMRs was closely interrelated with the
20 amount of time to complete the e-Consult.

21 *M2: Well I think that's the biggest barrier for primary care docs that we see for e-*
22 *Consult is exactly that, it's very labour intensive. When we made great efforts to*
23 *populate our own EMR with relevant information and now we have to reinvent the*
24 *wheel again to put it into the e-Consult system so I think that if that could be fixed it*
25 *would be awesome. (Provider FG#6)*
26

27
28 The length of time to complete the e-Consult was problematic primarily because of the fee-
29 for-service Canadian context. Some providers assumed (inaccurately) that PCPs would not be
30 compensated for their time spent completing the e-Consult.

31 *Facilitators*

32 Focus group discussion about what would facilitate implementation of the e-Consult system
33 was categorized into three main areas: incentives, ease of use, and enabling communication
34 between referring physicians and nephrologists.

35
36 When concerns were raised about completion of the e-Consult, providers suggested that
37 incentives would encourage acceptance and use of the e-Consult system. When providers in
38 the focus groups understood that financial compensation would be available and allow them
39 to bill for form completion, it was consistently received with enthusiasm.

40 *M1: But is there a plan or is there going to be some kind of a fee schedule for this*
41 *service? There will be good buy-in for guys who are working fee-for-service. It's*
42 *going to take a significant chunk of time. (Provider FG#8)*
43

44
45 Another incentive, suggested less frequently, was awarding Continuing Medical Education
46 (CME) credits for the best practices content of the e-Consult system.

47 *F1: I wonder if you want to again attach a carrot, if you can give CME credit.*
48 *...Because then you might not get paid for...navigating that CKD pathway with the*
49 *patient but if you can say, "Well no, I went through it and it took me a half an hour*
50 *and that's my CME credit." (Provider FG#6)*
51

52
53 One of the strongest themes within the provider dataset was "ease of use". This was related to
54 discussion about the importance of the e-Consult system being easy to use, accompanied by
55 suggestions such as make the process quick, minimize the number of logins, and integrate it
56 as much as possible with existing systems such as Netcare and EMRs.
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3 *M5: I'm a primary care physician too. I worked in a rural area before now. Now*
4 *three things: One is that you want something so easy to use...something that click-*
5 *click-click. (Provider FG#2)*
6

7 The concept of the e-Consult system being easy to use was often equated with it not taking
8 too much time and not duplicating work completed in other work processes.

9
10 *F2: As GPs, we've worked hard to get this EMR system going for us but now you've*
11 *got to reinvent the wheel, I've got to pull all the data, re-enter it...there's no access; I*
12 *have to go out and handwrite it and type it in. That's very time consuming, yeah.*
13 *(Provider FG#6)*
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15 Ensuring ease of use was identified as essential to achieving the benefits apparent in using the
16 system: for providers, reducing duplication of work, improving quality; and for patients,
17 increasing access and reducing wait times.
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21 Some providers similarly stated that knowing the nephrologist and engaging in two-way
22 communication to co-manage patients with CKD could increase their ability and confidence
23 in meeting best practice. This was corroborated by nephrologists participating in the focus
24 groups:

25 *M5: We can always work around that where you have the certain doc that you're*
26 *used to referring to. You still want to keep that relationship going in certain cases*
27 *that are not too clear-cut. Sometimes maybe you're not going to be able to write but*
28 *you can just pick your phone up and talk to the doc. (Provider FG#2)*
29

30 Discussion

31 Using focus groups, we explored stakeholder perceptions about potential barriers to and
32 facilitators for a new electronic consultation strategy, focusing on elements that are most
33 important for the design of a feasible, acceptable, implementable e-Consult system.³⁵⁻³⁷ These
34 results will be used to inform the development and implementation of this electronic system
35 aimed to improve access to specialist kidney care.
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37
38 Previous data have documented evidence of benefits of using telehealth to facilitate patient
39 care in nephrology.^{11,13,38-41} However, to the best of our knowledge, this is the first attempt to
40 identify important factors that could hinder or facilitate the introduction of electronic
41 consultation in kidney care for patients with CKD. Through our focus group study with
42 provider and patient participants, we have been able to establish that the e-Consult system is
43 generally acceptable given its potential to reduce or remove travel time, improve information
44 sharing between PCPs and nephrologists, and ensure appropriate tests are performed and
45 communicated between PCPs and nephrologists. We also identified that providers and
46 patients are generally in agreement regarding the usefulness of such a system and the impact
47 it could have in improving patient care and boosting confidence of non-nephrology
48 physicians in kidney care. Chen et al.³⁵ described the advantages of an e-Consult system
49 including: reduction in the demand for clinic visits for some patients due to co-managed care,
50 which results in shorter waiting times for patients who need a visit; formalization of the
51 "curbside consult" in a manner that addresses certain limitations (e.g., incomplete data, lack
52 of documentation of the interaction), but identifies cases that require formal consultation; and
53 avoidance of the contentious issue of whether a particular referral is appropriate.
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3 Our ability to integrate the e-Consult system with an existing province-wide and secured
4 EMR (Alberta Netcare), with automated interface for consultations and patients' data pull,
5 facilitates potential for wider practice adoption and implementation. This has potential for
6 impact, with strong policy implications, as it would allow us to partner with providers and
7 policymakers in the provincial renal programs and to improve kidney care delivery by
8 implementing the new model for PCP-nephrologist interactions. The study findings lead
9 naturally into more in-depth studies to generate evidence on the relevance and feasibility of a
10 model of electronic consultation to improve the care of patients with CKD, as a potential
11 educational platform for PCPs, and to change the way kidney care is delivered in terms of
12 effectiveness, efficiency, accessibility, and timeliness. This work has potential to favorably
13 influence referral patterns, access to care, care quality, patient outcomes, and health care
14 costs for people with CKD, which is a common and expensive condition. Once benefit is
15 demonstrated for CKD patients, our findings will be applicable to other chronic diseases.
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19 There are some limitations to this study. Focus group studies are an important source of
20 information but are dependent on the knowledge, expertise, and perceptions of the
21 participants. We carefully selected participants by the most important variables to mitigate
22 some of these limitations. Varying degrees of expertise and knowledge may have contributed
23 to reported perceptions; for example, technologically savvy participants might have viewed e-
24 Consult more favourably. Further, one of the key criticisms of qualitative research is limited
25 generalizability of the results to a larger population. We mitigated this by ensuring a
26 minimum number of participants for each stakeholder group and continued data collection
27 until theoretical saturation was obtained.^{30,34}
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29
30 This work, using a robust methodological design, reported on stakeholder perceptions about
31 potential barriers to and facilitators for e-Consult implementation, focusing on elements that
32 are most important for the design of a feasible, acceptable, implementable intervention. The
33 participants in this study had a favourable view of the e-Consult system as an alternate
34 ambulatory kidney care delivery model, and this support suggests a high likelihood of success
35 when implemented. These findings would allow us to partner with renal programs across the
36 province to potentially improve ambulatory kidney care delivery, and subsequently
37 implementing and evaluating the effectiveness of the system on patients' outcomes and cost
38 savings, which is the subject for future, in-depth studies.
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Table 1: Focus group geographical distribution and modality of facilitation

Focus group	Location	Participant group	# of Participants	Date conducted
#1	Calgary*	Patients/relatives	7	Jun 9, 2015
#2	Calgary*	Providers/policymakers	8	Jun 9, 2015
#3	Edmonton*	Patients/relatives	8	Feb 19, 2015
#4	Edmonton*	Providers/policymakers	15	Feb 19, 2015
#5	Peace River**	Patients/relatives	10	Feb 25, 2015
#6	Peace River*	Providers/policymakers	6	Feb 24, 2015
#7	Brooks*	Patients/relatives	11	Jun 10, 2015
#8	Brooks**	Providers/policymakers	7	Jun 10, 2015

*In-person

**In-person/virtual

Table 2: Demographic characteristics of focus group participants

Provider Focus Groups		Patient Focus Groups	
	(n= 36) (%)		(n= 36) (%)
Gender		Gender	
• Males	21 (61.1)	• Males	17 (47.2)
• Females	15(38.9)	• Females	19 (52.8)
Time in practice*		Location of residence:	
• <5 years	1 (3.1)	• Rural	21 (58.3)
• 5 – 10 years	2 (6.3)	• Urban	15 (41.7)
• 10 – 20 years	11 (34.4)	Designation:	
• > 20 years	18 (56.2)	• Patient	31 (86.1)
Profession Grouping:		• Family	4 (11.1)
• Nephrologists	10 (27.8)	• Other***	1 (2.8)
• General Practitioners	15 (41.7)		
• Others**	11 (30.6)		
Practice location:			
• Rural	13 (36.1)		
• Urban	23 (63.9)		

* Years since medical school graduation for physicians only (n=32)

** Includes non-nephrology specialists and nurse practitioners

***Friend of patient

Table 3: Summary of key findings

	Provider Focus Groups	Patient Focus groups
Acceptability	<ul style="list-style-type: none"> - Reduction in patient wait time - Increased quality of care through accurate feedback to referring physician - Appropriate tests would be ordered and communicated with nephrologists - Increased confidence in PCPs decision-making about nephrology care 	<ul style="list-style-type: none"> - Easier access to information - Reduction in travel - Ability to receive care without requiring an in-person visit - Appropriate tests would be ordered and communicated with nephrologists
Barriers	<ul style="list-style-type: none"> - Length of time required for PCPs to complete the e-referral due to lack of integration with current EMR - Increase in referrals might overwhelm the nephrologists and lead to delayed response or unsustainable system 	<ul style="list-style-type: none"> - Potential decreased access to care by increasing wait times at other points in the care pathway - Difficult access for nephrology care as the new system will take up a lot of PCP's time
Facilitators	<ul style="list-style-type: none"> - Incentives: <ul style="list-style-type: none"> • Availability of financial remuneration to enable PCPs to be compensated for this work • Awarding CME credits for learning current nephrology best practice by working through the decision-making structure of the form - Ease of use: <ul style="list-style-type: none"> • The tools/process should be made easy to use (i.e., minimize number of logins and integrate with existing platforms (e.g., Netcare and EMRs)) - Ease of communication between referring physicians and nephrologists: <ul style="list-style-type: none"> • The need for the e-referral system to allow multiple options for two-way communication between referring physicians and nephrologists • Two-way communication with nephrologists likely to increase the ability and confidence of PCPs in meeting best practice • Improved efficiency if the system allowed for communication of additional patient information 	<p>NA</p> <p>NA</p> <ul style="list-style-type: none"> • Improve communication and information sharing between PCPs and nephrologists • Better access to care as a consequence of good communication between physicians

EMR – electronic medical records; CME – continuous medical education; NA – not applicable, PCPs=Primary care providers

Figure legends

Figure 1: Map of Canada showing the Alberta Kidney Care Programs (NARP & SARP): Vast geographical catchment area and sparse population across remote communities and regions

eFigure 1 : : Netcare screenshots for electronic consultation

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eAppendix 1: Focus Group Guide

Patients

On behalf of the Alberta Kidney Disease Network (AKDN) and e-Referral and Alberta Referral Pathways, Alberta Health Services (AHS); we would like to thank you all for coming in today. As you may know, the AHS is making efforts to improve the care of people with chronic diseases, including chronic kidney disease (CKD).

Recently, work done in Edmonton and other cities has identified that rural/remote residents of Alberta with CKD have less access to specialist kidney care and often receive poorer clinical care. People in rural/remote communities have poorer outcomes from their disease compared to people living in cities. In this study, we will use study an alternate way to provide care by kidney specialists using the internet. Specifically, we will study how to best have an electronic consultation to improve access to specialist kidney care in Alberta. An electronic consultation involves a family doctor communicating to a specialist through a secured internet portal (NETCARE). This may involve reviewing relevant information and tests to seek advice and further management plans. The key purpose is to facilitate easier referral and faster access to specialist kidney care. As well, more thorough and timely feedback will be provided to family doctors and other care providers.

The purpose of this focus group is to get your opinion about access to specialist kidney care and how it can be made better for you or your relative. We have drafted a web-based tool to enhance communication between your doctor and kidney specialist communications. We would appreciate your feedback on it. We thank you very much for agreeing to participate in this discussion.

Objective: *To evaluate attitudes and perceptions of the system in facilitating effective and efficient chronic disease care.*

What do you think about a web-based consultation and referral system to get specialist kidney care? Is this important to you or not?

Prompting questions:

- Are you comfortable with your family doctor interacting with a kidney specialist electronically to exchange information on your kidney disease in order to facilitate your ongoing care?
- Would you prefer this type of consultation over the usual face-to-face meeting with a specialist?

We would like to show you an example of what this type of care might look like. [Follow with a 10-15 minutes presentation using the NETCARE screenshots (see eFigure 1).]

What are your general impressions of this system? *Prompting questions:*

- What do you think are the potential benefits and likely problems with the use of this approach?
- In your opinion, are there obstacles or problems that prevent you from receiving the best kidney disease care? How can those be addressed? Do you think any of these will be solved or reduced by the use of this electronic tool?

Providers & Policymakers

On behalf of the Alberta Kidney Disease Network (AKDN) and e-Referral and Alberta Referral Pathways, Alberta Health Services (AHS); we would like to thank you all for coming in today. As you may know, the AHS is making efforts to improve the care of people with chronic diseases, including chronic kidney disease (CKD). Our research work has demonstrated that there is a need for an alternate CKD care delivery model that can facilitate an efficient, effective, cost-saving, convenient and timely care for patients living with CKD particularly in rural/remote Alberta.

We are conducting a study to develop and evaluate an e-consultation system for CKD care in Alberta.

The purpose of this focus group is to get your opinion about the tool, so that we can develop and refine it for a pilot study. We thank you very much for agreeing to participate in this discussion.

During this meeting, we will run through some screenshots of this tool which is in its draft form to demonstrate how it works. Afterward, we will seek your feedback. This is just a prototype of the tool. It will be refined further based on feedback elicited today. Please note that at this point it is in development, and therefore not all functionalities will be available.

Objective: *To evaluate attitudes and perceptions of the system in facilitating effective and efficient chronic disease care.*

For this objective, a 10-15 minutes presentation using the NETCARE screenshots will be given (see **eFigure 1**).

Post presentation questions for discussion:

- What are your overall perceptions about the e-Consult tool (acceptability)?
- What do you think are the facilitators and barriers to the use of this tool as a portal on NETCARE to enhance access to specialist kidney care?
- To what extent would you be willing to adopt the technology when fully developed?
- What do you think are the specific strengths and weaknesses of this tool? What are the good points about it? What are the weaknesses or what can be made better?
- What functionalities did you find particularly useful and what is not useful?
- Do you like the formats and the workflow structure?
- If you could change one thing about the tool, what would that be?
- What would influence your decision to use this tool for your referrals and consultations with a kidney specialist?
- Are there any organizational or policy barriers to the uptake of this tool in the region/zone of your clinical practice? How can these be addressed?
- Your feedback has been very useful but if you had to make one final comment about this initiative, what would that be?

eAppendix 2: Pre-identified themes**Facilitators:**

- Improvement in care coordination
- Better clinical care
- Disseminate best practice and educational platform
- Facilitate better continuity of care
- Comprehensive data to make decisions easily without the need for a face-to-face consultation
- Quick feedback to family doctors
- Clarity of information and improved details
- Timeliness/reduced delays for patients
- Convenience (e.g., less travels for patient)
- Rapid triage and identification of cases needing urgent care

Barriers:

- Issues with privacy and security
- Limited awareness and ease of use
- Aversion to adopt new technology
- Required pace of change
- Cost
- Limited workforce
- Lack of interest
- Aversion to change
- Lack of time
- Convincing patients to agree difficult
- Compensation issues

Map of Canada showing the Alberta Kidney Care Programs (NARP & SARP): Vast geographical catchment area and sparse population across remote communities and regions



	Land area (km ²)	Percentage of national land area	Population size
Alberta	642,317	7.1%	3,645,257
NWT	1,183,085	13.0%	41,462
Ontario	917,741	10.1%	12,851,821

The red circle represents the catchment area for NARP and SARP (>20% of Canada's national land area). Mainly the province of Alberta, the Northwest Territories, plus the adjoining communities of British Columbia, Saskatchewan and Nunavut.
 Abbreviations: NARP, Northern Alberta Renal Program; SARP, Southern Alberta Renal Program

view only

Advice Request – Response section

Advice Response

The advice provided is based on the information that the requesting provider has submitted. It is one piece of information that contributes to the overall care of the patient. It is the responsibility of the requesting provider to incorporate this information into the broader knowledge of the patient context.

Response



Attach External Documents File size restricted to 1MB

Patient Information | Recipient | Advice Request | Advice Response | Referring Provider

Referring Provider Information

Name*

Phone Number*

Address

Line 1*

Line 2*

City*

Province*

Postal Code*

Advice Request

Advice Request

Please clearly describe your question, including pertinent patient history and other related details. The associated lab or diagnostic results may be attached below.

Requested Information*

Link Alberta Netcare Portal Laboratory Results The results displayed on this referral may not be the most recent version. Clicking on the above links will allow you to view the most recent results.

Link Alberta Netcare Portal Reports The reports displayed on this referral may not be the most recent version. Clicking on the above links will allow you to view the most recent reports.

Attach External Documents File size restricted to 1MB

Comments

Please enter any additional comments or special considerations

Comments

BMJ Open

Patient and provider perspectives on the design and implementation of an electronic consultation system for kidney care delivery in Canada: A focus group study

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Manuscripts

Patient and provider perspectives on the design and implementation of an electronic consultation system for kidney care delivery in Canada: A focus group study

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Abstract

Objectives: We assessed stakeholder perceptions on the use of an electronic consultation system (e-Consult) to improve the delivery of kidney care in Alberta. We aim to identify acceptability, barriers, and facilitators to the use of an e-Consult system for ambulatory kidney care delivery.

Methods: This was a qualitative focus group study using a thematic analysis design. Eight focus groups were held in 4 locations in the province of Alberta, Canada. In total there were 72 participants in 2 broad stakeholder categories: patients (including patients' relatives) and providers (including primary care physicians, nephrologists, other care providers, and policymakers).

Findings: The e-Consult system was generally acceptable across all stakeholder groups. The key barriers identified were length of time required for referring physicians to complete the e-Consult due to lack of integration with current electronic medical records, and concerns that increased numbers of requests might overwhelm nephrologists and lead to a delayed response or an unsustainable system. The key facilitators identified were potential improvement of care coordination, dissemination of best practice through an educational platform, comprehensive data to make decisions without the need for face-to-face consultation, timely feedback to primary care providers, timeliness/reduced delays for patients' rapid triage and identification of cases needing urgent care, and improved access to information to facilitate decision making in patient care.

Conclusions: Stakeholder perceptions regarding the e-Consult system were favourable, and the key barriers and facilitators identified will be considered in design and implementation of an acceptable and sustainable electronic consultation system for kidney care delivery.

Key words: e-Consult, kidney care, CKD, rural/remote, quality of care

Strengths and limitations of this study

- The use of electronic consultation systems to facilitate interactions between specialists and primary care practitioners have not been widely adopted in Canada for kidney care delivery.
- To our knowledge, this is the first study that explored the feasibility of e-Consult for ambulatory kidney care - the barriers to and facilitators of uptake of the system among patients and providers, prior to its implementation.
- We leveraged a robust methodological design, reported on stakeholder perceptions about potential barriers to and facilitators for e-Consult implementation.
- These results have direct implications for a health system re-design and inform the development and implementation of this electronic system aimed to improve access to specialist kidney care.
- The key limitations were that focus group studies though important source of information but are dependent on the knowledge, expertise, and perceptions of the participants.

Introduction

Specialist kidney care is critical for diagnosis and management of patients with chronic kidney disease (CKD), particularly those with advanced CKD, and over the last decade there has been a steady increase in the number of referrals to nephrologists.¹⁻⁷ This issue is compounded by the large rural geography of Canada, with resultant disparities in the distribution of health care resources, health workforce, and access to care.^{8,9} Thus there is a need for an alternate CKD care delivery model that can facilitate efficient, effective, cost-saving, convenient, and timely care for patients with CKD, particularly those living in rural/remote locations.

The use of electronic consultation systems – secure and confidential electronic system of using patients' health information to facilitate a meaningful interaction between a specialist and a PCP (herein referred to as e-Consult) – and other telehealth systems to facilitate access to specialist care is entering the clinical arena in many countries.¹⁰⁻¹⁷ Nevertheless, e-Consult systems have not been widely adopted in Canada.^{11,13,18-21} It is crucial to establish the feasibility, acceptability, and the optimal format for such a system prior to its implementation.²²

We aim to develop an e-Consult system for CKD for primary care providers in Alberta. The purpose of this study was to explore the barriers to and facilitators of uptake of the system among patients and providers, prior to its implementation.

Methods

The Consolidated Criteria for Reporting Qualitative Research (COREQ) were used to structure and report the study findings.²³

Setting

The primary responsibility for provision of health care in Canada is by the various provinces and territories. The funding for healthcare is single payer at each level of delivery and provided by each province or territory with some contributions by the Federal Government. The system encompasses a public basic insurance coverage combined with private insurance beyond the basic coverage. Alberta is one of the 10 provinces in the country. Patients do not pay for ambulatory care delivered by a PCP or specialist in Alberta, as this covered by the public coverage that provided fee codes for both referring and consulting physicians.

The study was conducted across the province of Alberta, supported by the Northern and Southern Alberta Renal Programs (NARP/SARP). These are large renal programs in Canada, providing care to ~4 million people residing in western and northern Canada. The two programs have a catchment area characterized by a vast geography (Alberta and Northwest Territories (NWT), as well as adjoining parts of British Columbia, Saskatchewan, and Nunavut); this area constitutes >20% of the Canada National Land Area and includes remote locations with low population density (**Figure 1**). Ethical approval for the study was received from the Research Ethics Boards at the University of Alberta and University of Calgary, Alberta, Canada.

Alberta e-Consult initiative

The Alberta e-Consult provides a secure, reliable, and efficient platform for the interactions of PCPs and nephrologists to deliver ambulatory kidney care. This tool is hosted on the provincial Netcare system, a secure and confidential electronic system of patients' health

1
2
3 information in Alberta. The e-Consult model involves direct asynchronous communication
4 between referring physicians and nephrologists via a Netcare portal to coordinate patient
5 management and limit face-to-face visits between patients and nephrologists to situations
6 where such visits are truly required.
7

8 *Design and population*

9 This study was part of a larger integrated, sequential, and mixed methods study²⁴⁻²⁷
10 conducted in three phases.^{28,29} The focus of this report is the pre-implementation phase in
11 which the perceptions, readiness, and key barriers and facilitators to the uptake of the e-
12 Consult system were explored to identify key issues fundamental to its implementation and
13 widespread application. A qualitative focus group study with purposive sampling and
14 thematic analysis was conducted in this phase of the study. The design was chosen since it is
15 the most appropriate for studies exploring feasibility of programs and stakeholder
16 views/opinions to implementation, when little is known about the topic.
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19 Sampling in this particular study was purposive; statistical power and generalization were not
20 the aim.^{25-27,29} We purposively selected study participants to ensure that our survey captured
21 the views of the stakeholders, including PCPs, nephrologists and policymakers involved
22 directly with the organization of CKD care and patients with CKD and their relatives
23 People in the identified groups of the study population were invited to participate in a focus
24 group session via email and/or mailed letters of invitation. Sessions with patient groups were
25 conducted separately from provider groups. No financial incentives were offered for
26 participation.
27
28

29 *Data collection*

30 Data were collected in eight focus groups, four with patient groups and four with provider
31 groups. They were conducted in four locations (clinics) across urban and rural Alberta by the
32 lead investigator (AKB), who is male and an academic physician/nephrologist (MD, PhD).
33 An experienced facilitator familiar with the study and its aims facilitated the focus groups,
34 asking pertinent questions and prompting questions when necessary.³⁰ An observer was also
35 present to witness proceedings, manage equipment, and examine issues of group dynamics.
36 Each focus group lasted for approximately 2 hours, was audio-recorded, and transcribed
37 verbatim. A semi-structured interview guide was used (**eAppendix 1, eFigure 1**).³¹⁻³³ In the
38 development of the patient-specific questions, we utilized the Picker Institute Model, which is
39 based on eight dimensions of patient perspectives to care provision^{34,35}. The open-ended
40 nature of the questions provided opportunities for extensive exploration of the issues. No
41 prior relationship was established with the study participants. Focus group participants were
42 informed at the start of each focus group session the key objectives of the study (reasons for
43 the focus group) and a declaration of no conflict of interest from the investigator and other
44 members of the study team.
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48 *Data analysis*

49 Thematic analysis was conducted using categories (**eAppendix 2**) established *a priori* based
50 on the research questions relating to acceptability, barriers, and facilitators to implementing
51 an electronic consultation service. Two analysts, who were not part of data collection,
52 reviewed and coded the focus group transcripts, using NVivo 10 qualitative data analysis
53 software. Transcript data was divided into small meaningful units (i.e., sentence, phrase,
54 paragraph related to topic) and a descriptor was attached to each of the units. Contrasting
55 perspectives that did not fit the themes were also identified. As the analysts immersed
56 themselves in the data, themes crystalized and saturation of categories was evident.³⁶ The
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transcripts were not returned to the participants for comments. Analysis of the patient and provider focus groups was conducted separately. Themes for the two groups (patients and providers) were then compared.

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Results

Participants

There was a total of 72 participants (n=36 in both patient and provider groups) (**Table 1**). **Table 2** provides a summary of the demographics of the focus group participants. All invited providers and patients participated.

Key findings

The themes of acceptability, barriers, and facilitators as found in both the patient and provider datasets, with some areas of overlap, are described below in an integrated presentation and separated for ease of comparison in **Table 3**.

Acceptability

Few concerns about the concept of e-Consult were raised in the focus groups. Both providers and patients described the potential benefits to patients of e-Consult in terms of decreased wait times and more appropriate and effective referrals – only patients the nephrologist identified as requiring a nephrology consult would be seen in-person, whereas, others could be safely managed by their referring physician in the community. Participants perceived this would eliminate inappropriate referrals and make better use of resources such as appointment times. This was especially appreciated by participants outside of urban centres, who noted an opportunity to decrease patient burden by reducing unnecessary travel for inappropriate visits.

Well we'd get information faster so that our doctor could know, would know what to do.

That would be a benefit, yeah.

Yeah, without us having to travel.

Lots of times you could be treated without going anywhere too. (Patient)

Patients and providers agreed that through e-Consult, nephrology referrals would be more effective as appropriate tests would be ordered and results communicated to the nephrologist prior to the scheduled visit (or in place of the visit). Similarly, the outcomes of the nephrology consult would be more accurately reported back to the referring physician through e-Consult, thus enabling a higher quality of care. An additional benefit of the e-Consult system commonly noted by providers was increased confidence in physician decision-making about kidney care. Some attributed this confidence to the current best practices content of the e-Consult system. Others proposed that increased confidence would result because decisions about kidney care would be reviewed by a nephrologist.

If you enter this in the system and you get it clear that you know why you do not have to refer; you have that on file, as even a legal statement, saying, "Hey I did an e-referral. It was generated half-electronically and briefly reviewed by a nephrologist." And at least I feel comfortable. I can tell my patient that we have a couple of decision rules when he needs to be referred. It's also to give confidence that you're okay just to follow people. (Provider)

Barriers

Although participants were in favour of the e-Consult system in principle, some practical concerns regarding its implementation were identified: potential decreased access to care for patients by increasing wait times at other points in the care pathway, lack of integration with current electronic medical record (EMRs) systems in physician offices; and the length of time required for physicians to complete the e-Consult.

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4 Interestingly, both patients and providers speculated that the new system might inadvertently
5 slow the course of kidney care.

6 *The only part that I'm concerned with is the overload of your local doctors, which*
7 *will slow down the information back to your patient..... (Patient)*
8

9
10 Providers voiced concerns that the potential increase in nephrology referrals as a result of
11 having the e-Consult system might overwhelm the nephrologists, leading either to delay in
12 response or creation of a system that was not sustainable.

13 *F3: But is there a plan for physician sustainability? Because even though it's faster to*
14 *answer a question on email or over electronic, you could be having 75 of those as*
15 *opposed to seeing four patients. (Provider)*
16

17
18 Another area of concern for patients and providers was the capacity of information
19 technology systems to effectively house the e-Consult system. A few patients speculated that
20 rural PCPs may lack the required internet resources. Most providers' comments were centred
21 on the lack of integration of the system and any outcomes of the consultation (e.g., lab tests,
22 results) with their EMRs. The high prevalence of these comments made "lack of integration
23 with EMR" one of the strongest themes in the provider dataset.

24 *My only barrier would be if I have two separate systems that I have to go log on and*
25 *in and on and in to see what's going on...But I don't want to have two systems that*
26 *now I have to check this, now I have to check this. (Provider)*
27

28
29 Apprehension about the lack of integration across EMRs was closely interrelated with the
30 amount of time to complete the e-Consult.

31 *Well I think that's the biggest barrier for primary care docs that we see for e-Consult*
32 *is exactly that, it's very labour intensive. When we made great efforts to populate our*
33 *own EMR with relevant information and now we have to reinvent the wheel again to*
34 *put it into the e-Consult system so I think that if that could be fixed it would be*
35 *awesome. (Provider)*
36

37
38 The length of time to complete the e-Consult was problematic primarily because of the fee-
39 for-service Canadian context. Some providers assumed (inaccurately) that PCPs would not be
40 compensated for their time spent completing the e-Consult.

41 *Facilitators*

42
43 Focus group discussion about what would facilitate implementation of the e-Consult system
44 was categorized into three main areas: incentives, ease of use, and enabling communication
45 between referring physicians and nephrologists.

46
47 When concerns were raised about completion of the e-Consult, providers suggested that
48 incentives would encourage acceptance and use of the e-Consult system. When providers in
49 the focus groups understood that financial compensation would be available and allow them
50 to bill for form completion, it was consistently received with enthusiasm.

51 *But is there a plan or is there going to be some kind of a fee schedule for this service?*
52 *There will be good buy-in for guys who are working fee-for-service. It's going to take*
53 *a significant chunk of time. (Provider)*
54
55

56
57 Another incentive, suggested less frequently, was awarding Continuing Medical Education
58 (CME) credits for the best practices content of the e-Consult system.

1
2
3 *I wonder if you want to again attach a carrot, if you can give CME credit. ...Because*
4 *then you might not get paid for...navigating that CKD pathway with the patient but if*
5 *you can say, "Well no, I went through it and it took me a half an hour and that's my*
6 *CME credit." (Provider)*
7

8
9 One of the strongest themes within the provider dataset was "ease of use". This was related to
10 discussion about the importance of the e-Consult system being easy to use, accompanied by
11 suggestions such as make the process quick, minimize the number of logins, and integrate it
12 as much as possible with existing systems such as Netcare and EMRs.

13 *I'm a primary care physician too. I worked in a rural area before now. Now three*
14 *things: One is that you want something so easy to use...something that click-click-*
15 *click. (Provider)*
16

17 The concept of the e-Consult system being easy to use was often equated with it not taking
18 too much time and not duplicating work completed in other work processes.

19 *As GPs, we've worked hard to get this EMR system going for us but now you've got to*
20 *reinvent the wheel, I've got to pull all the data, re-enter it...there's no access; I have*
21 *to go out and handwrite it and type it in. That's very time consuming, yeah. (Provider)*
22
23

24 Ensuring ease of use was identified as essential to achieving the benefits apparent in using the
25 system: for providers, reducing duplication of work, improving quality; and for patients,
26 increasing access and reducing wait times.
27
28

29 Some providers similarly stated that knowing the nephrologist and engaging in two-way
30 communication to co-manage patients with CKD could increase their ability and confidence
31 in meeting best practice. This was corroborated by nephrologists participating in the focus
32 groups:
33

34 *We can always work around that where you have the certain doc that you're used to*
35 *referring to. You still want to keep that relationship going in certain cases that are*
36 *not too clear-cut. Sometimes maybe you're not going to be able to write but you can*
37 *just pick your phone up and talk to the doc. (Provider)*
38
39

40 Discussion

41 Using focus groups, we explored stakeholder perceptions about potential barriers to and
42 facilitators for a new electronic consultation strategy, focusing on elements that are most
43 important for the design of a feasible, acceptable, implementable e-Consult system.³⁷⁻³⁹ These
44 results will be used to inform the development and implementation of this electronic system
45 aimed to improve access to specialist kidney care.
46

47 Previous data have documented evidence of benefits of using telehealth to facilitate patient
48 care in nephrology.^{11,13,40-43} However, to the best of our knowledge, this is the first attempt to
49 identify important factors that could hinder or facilitate the introduction of electronic
50 consultation in kidney care for patients with CKD. Through our focus group study with
51 provider and patient participants, we have been able to establish that the e-Consult system is
52 generally acceptable given its potential to reduce or remove travel time, improve information
53 sharing between PCPs and nephrologists, and ensure appropriate tests are performed and
54 communicated between PCPs and nephrologists. We also identified that providers and
55 patients are generally in agreement regarding the usefulness of such a system and the impact
56 it could have in improving patient care and boosting confidence of non-nephrology
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3 physicians in kidney care. Chen et al.³⁷ described the advantages of an e-Consult system
4 including: reduction in the demand for clinic visits for some patients due to co-managed care,
5 which results in shorter waiting times for patients who need a visit; formalization of the
6 “curbside consult” in a manner that addresses certain limitations (e.g., incomplete data, lack
7 of documentation of the interaction), but identifies cases that require formal consultation; and
8 avoidance of the contentious issue of whether a particular referral is appropriate.
9

10
11 Our ability to integrate the e-Consult system with an existing province-wide and secured
12 EMR (Alberta Netcare), with automated interface for consultations and patients’ data pull,
13 facilitates potential for wider practice adoption and implementation. This has potential for
14 impact, with strong policy implications, as it would allow us to partner with providers and
15 policymakers in the provincial renal programs and to improve kidney care delivery by
16 implementing the new model for PCP-nephrologist interactions. The study findings lead
17 naturally into more in-depth studies to generate evidence on the relevance and feasibility of a
18 model of electronic consultation to improve the care of patients with CKD, as a potential
19 educational platform for PCPs, and to change the way kidney care is delivered in terms of
20 effectiveness, efficiency, accessibility, and timeliness. This work has potential to favorably
21 influence referral patterns, access to care, care quality, patient outcomes, and health care
22 costs for people with CKD, which is a common and expensive condition. Once benefit is
23 demonstrated for CKD patients, our findings will be applicable to other chronic diseases.
24
25

26
27 There are some limitations to this study. Focus group studies are an important source of
28 information but are dependent on the knowledge, expertise, and perceptions of the
29 participants. We carefully selected participants by the most important variables to mitigate
30 some of these limitations. Varying degrees of expertise and knowledge may have contributed
31 to reported perceptions; for example, technologically savvy participants might have viewed e-
32 Consult more favourably. Further, one of the key criticisms of qualitative research is limited
33 generalizability of the results to a larger population. We mitigated this by ensuring a
34 minimum number of participants for each stakeholder group, which were all analysed and a
35 theoretical saturation was obtained.^{30,36} However, an interim analysis in between focus
36 groups was not conducted.
37
38

39
40 This work, using a robust methodological design, reported on stakeholder perceptions about
41 potential barriers to and facilitators for e-Consult implementation, focusing on elements that
42 are most important for the design of a feasible, acceptable, implementable intervention. The
43 participants in this study had a favourable view of the e-Consult system as an alternate
44 ambulatory kidney care delivery model, and this support suggests a high likelihood of success
45 when implemented. These findings would allow us to partner with renal programs across the
46 province to potentially improve ambulatory kidney care delivery, and subsequently
47 implementing and evaluating the effectiveness of the system on patients’ outcomes and cost
48 savings, which is the subject for future, in-depth studies.
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Table 1: Focus group geographical distribution and modality of facilitation

Focus group	Location	Participant group	# of Participants	Date conducted
#1	Calgary*	Patients/relatives	7	Jun 9, 2015
#2	Calgary*	Providers/policymakers	8	Jun 9, 2015
#3	Edmonton*	Patients/relatives	8	Feb 19, 2015
#4	Edmonton*	Providers/policymakers	15	Feb 19, 2015
#5	Peace River**	Patients/relatives	10	Feb 25, 2015
#6	Peace River*	Providers/policymakers	6	Feb 24, 2015
#7	Brooks*	Patients/relatives	11	Jun 10, 2015
#8	Brooks**	Providers/policymakers	7	Jun 10, 2015

*In-person

**In-person/virtual

For peer review only

Table 2: Demographic characteristics of focus group participants

Provider Focus Groups		Patient Focus Groups	
	(n= 36) (%)		(n= 36) (%)
Gender		Gender	
• Males	21 (61.1)	• Males	17 (47.2)
• Females	15(38.9)	• Females	19 (52.8)
Time in practice*		Location of residence:	
• <5 years	1 (3.1)	• Rural	21 (58.3)
• 5 – 10 years	2 (6.3)	• Urban	15 (41.7)
• 10 – 20 years	11 (34.4)	Designation:	
• > 20 years	18 (56.2)	• Patient	31 (86.1)
Profession Grouping:		• Family	4 (11.1)
• Nephrologists	10 (27.8)	• Other***	1 (2.8)
• General Practitioners	15 (41.7)		
• Others**	11 (30.6)		
Practice location:			
• Rural	13 (36.1)		
• Urban	23 (63.9)		

* Years since medical school graduation for physicians only (n=32)

** Includes non-nephrology specialists and nurse practitioners

***Friend of patient

Table 3: Summary of key findings

	Provider Focus Groups	Patient Focus groups
Acceptability	<ul style="list-style-type: none"> - Reduction in patient wait time - Increased quality of care through accurate feedback to referring physician - Appropriate tests would be ordered and communicated with nephrologists - Increased confidence in PCPs decision-making about nephrology care 	<ul style="list-style-type: none"> - Easier access to information - Reduction in travel - Ability to receive care without requiring an in-person visit - Appropriate tests would be ordered and communicated with nephrologists
Barriers	<ul style="list-style-type: none"> - Length of time required for PCPs to complete the e-referral due to lack of integration with current EMR - Increase in referrals might overwhelm the nephrologists and lead to delayed response or unsustainable system 	<ul style="list-style-type: none"> - Potential decreased access to care by increasing wait times at other points in the care pathway - Difficult access for nephrology care as the new system will take up a lot of PCP's time
Facilitators	<ul style="list-style-type: none"> - Incentives: <ul style="list-style-type: none"> • Availability of financial remuneration to enable PCPs to be compensated for this work • Awarding CME credits for learning current nephrology best practice by working through the decision-making structure of the form - Ease of use: <ul style="list-style-type: none"> • The tools/process should be made easy to use (i.e., minimize number of logins and integrate with existing platforms (e.g., Netcare and EMRs)) - Ease of communication between referring physicians and nephrologists: <ul style="list-style-type: none"> • The need for the e-referral system to allow multiple options for two-way communication between referring physicians and nephrologists • Two-way communication with nephrologists likely to increase the ability and confidence of PCPs in meeting best practice • Improved efficiency if the system allowed for communication of additional patient information 	<p>NA</p> <p>NA</p> <ul style="list-style-type: none"> • Improve communication and information sharing between PCPs and nephrologists • Better access to care as a consequence of good communication between physicians

EMR – electronic medical records; CME – continuous medical education; NA – not applicable, PCPs=Primary care providers

Figure legends

Figure 1: Map of Canada showing the Alberta Kidney Care Programs (NARP & SARP): Vast geographical catchment area and sparse population across remote communities and regions

eFigure 1 : : Netcare screenshots for electronic consultation

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eAppendix 1: Focus Group Guide

Patients

On behalf of the Alberta Kidney Disease Network (AKDN) and e-Referral and Alberta Referral Pathways, Alberta Health Services (AHS); we would like to thank you all for coming in today. As you may know, the AHS is making efforts to improve the care of people with chronic diseases, including chronic kidney disease (CKD).

Recently, work done in Edmonton and other cities has identified that rural/remote residents of Alberta with CKD have less access to specialist kidney care and often receive poorer clinical care. People in rural/remote communities have poorer outcomes from their disease compared to people living in cities. In this study, we will use study an alternate way to provide care by kidney specialists using the internet. Specifically, we will study how to best have an electronic consultation to improve access to specialist kidney care in Alberta. An electronic consultation involves a family doctor communicating to a specialist through a secured internet portal (NETCARE). This may involve reviewing relevant information and tests to seek advice and further management plans. The key purpose is to facilitate easier referral and faster access to specialist kidney care. As well, more thorough and timely feedback will be provided to family doctors and other care providers.

The purpose of this focus group is to get your opinion about access to specialist kidney care and how it can be made better for you or your relative. We have drafted a web-based tool to enhance communication between your doctor and kidney specialist communications. We would appreciate your feedback on it. We thank you very much for agreeing to participate in this discussion.

Objective: *To evaluate attitudes and perceptions of the system in facilitating effective and efficient chronic disease care.*

What do you think about a web-based consultation and referral system to get specialist kidney care? Is this important to you or not?

Prompting questions:

- Are you comfortable with your family doctor interacting with a kidney specialist electronically to exchange information on your kidney disease in order to facilitate your ongoing care?
- Would you prefer this type of consultation over the usual face-to-face meeting with a specialist?

We would like to show you an example of what this type of care might look like. [Follow with a 10-15 minutes presentation using the NETCARE screenshots (see eFigure 1).]

What are your general impressions of this system? *Prompting questions:*

- What do you think are the potential benefits and likely problems with the use of this approach?
- In your opinion, are there obstacles or problems that prevent you from receiving the best kidney disease care? How can those be addressed? Do you think any of these will be solved or reduced by the use of this electronic tool?

Providers & Policymakers

On behalf of the Alberta Kidney Disease Network (AKDN) and e-Referral and Alberta Referral Pathways, Alberta Health Services (AHS); we would like to thank you all for coming in today. As you may know, the AHS is making efforts to improve the care of people with chronic diseases, including chronic kidney disease (CKD). Our research work has demonstrated that there is a need for an alternate CKD care delivery model that can facilitate an efficient, effective, cost-saving, convenient and timely care for patients living with CKD particularly in rural/remote Alberta.

We are conducting a study to develop and evaluate an e-consultation system for CKD care in Alberta.

The purpose of this focus group is to get your opinion about the tool, so that we can develop and refine it for a pilot study. We thank you very much for agreeing to participate in this discussion.

During this meeting, we will run through some screenshots of this tool which is in its draft form to demonstrate how it works. Afterward, we will seek your feedback. This is just a prototype of the tool. It will be refined further based on feedback elicited today. Please note that at this point it is in development, and therefore not all functionalities will be available.

Objective: *To evaluate attitudes and perceptions of the system in facilitating effective and efficient chronic disease care.*

For this objective, a 10-15 minutes presentation using the NETCARE screenshots will be given (see **eFigure 1**).

Post presentation questions for discussion:

- What are your overall perceptions about the e-Consult tool (acceptability)?
- What do you think are the facilitators and barriers to the use of this tool as a portal on NETCARE to enhance access to specialist kidney care?
- To what extent would you be willing to adopt the technology when fully developed?
- What do you think are the specific strengths and weaknesses of this tool? What are the good points about it? What are the weaknesses or what can be made better?
- What functionalities did you find particularly useful and what is not useful?
- Do you like the formats and the workflow structure?
- If you could change one thing about the tool, what would that be?
- What would influence your decision to use this tool for your referrals and consultations with a kidney specialist?
- Are there any organizational or policy barriers to the uptake of this tool in the region/zone of your clinical practice? How can these be addressed?
- Your feedback has been very useful but if you had to make one final comment about this initiative, what would that be?

eAppendix 2: Pre-identified themes**Facilitators:**

- Improvement in care coordination
- Better clinical care
- Disseminate best practice and educational platform
- Facilitate better continuity of care
- Comprehensive data to make decisions easily without the need for a face-to-face consultation
- Quick feedback to family doctors
- Clarity of information and improved details
- Timeliness/reduced delays for patients
- Convenience (e.g., less travels for patient)
- Rapid triage and identification of cases needing urgent care

Barriers:

- Issues with privacy and security
- Limited awareness and ease of use
- Aversion to adopt new technology
- Required pace of change
- Cost
- Limited workforce
- Lack of interest
- Aversion to change
- Lack of time
- Convincing patients to agree difficult
- Compensation issues

Map of Canada showing the Alberta Kidney Care Programs (NARP & SARP): Vast geographical catchment area and sparse population across remote communities and regions



	Land area (km ²)	Percentage of national land area	Population size
Alberta	642,317	7.1%	3,645,257
NWT	1,183,085	13.0%	41,462
Ontario	917,741	10.1%	12,851,821

The red circle represents the catchment area for NARP and SARP (>20% of Canada's national land area). Mainly the province of Alberta, the Northwest Territories, plus the adjoining communities of British Columbia, Saskatchewan and Nunavut.
 Abbreviations: NARP, Northern Alberta Renal Program; SARP, Southern Alberta Renal Program

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Advice Request

Advice Request

Please clearly describe your question, including pertinent patient history and other related details. The associated lab or diagnostic results may be attached below.

Requested Information*

Link Alberta Netcare Portal Laboratory Results

Link Alberta Netcare Portal Reports

Attach External Documents

[⊕ Link a document](#)

The results displayed on this referral may not be the most recent version. Clicking on the above links will allow you to view the most recent results.

[⊕ Link a document](#)

The reports displayed on this referral may not be the most recent version. Clicking on the above links will allow you to view the most recent reports.

File size restricted to 1MB

Comments

Please enter any additional comments or special considerations

Comments


173x108mm (300 x 300 DPI)

Review only

Advice Request – Response section

Advice Response
The advice provided is based on the information that the requesting provider has submitted. It is one piece of information that contributes to the overall care of the patient. It is the responsibility of the requesting provider to incorporate this information into the broader knowledge of the patient context.

Response

 Attach External Documents
File size restricted to 1MB

Patient Information [Recipient](#) [Advice Request](#) [Advice Response](#) [Referring Provider](#)

Referring Provider Information

Name*

Phone Number*

Address

Line 1*
 Line 2*
 City*
 Province*
 Postal Code*

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COREQ (CONsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Page No.
Domain 1: Research team and reflexivity			
<i>Personal characteristics</i>			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	
Occupation	3	What was their occupation at the time of the study?	
Gender	4	Was the researcher male or female?	
Experience and training	5	What experience or training did the researcher have?	
<i>Relationship with participants</i>			
Relationship established	6	Was a relationship established prior to study commencement?	
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	
Interviewer characteristics	8	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	
Domain 2: Study design			
<i>Theoretical framework</i>			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	
<i>Participant selection</i>			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	
Sample size	12	How many participants were in the study?	
Non-participation	13	How many people refused to participate or dropped out? Reasons?	
<i>Setting</i>			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	
<i>Data collection</i>			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	
Repeat interviews	18	Were repeat interviews carried out? If yes, how many?	
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	
Field notes	20	Were field notes made during and/or after the interview or focus group?	
Duration	21	What was the duration of the interviews or focus group?	
Data saturation	22	Was data saturation discussed?	
Transcripts returned	23	Were transcripts returned to participants for comment and/or	

Topic	Item No.	Guide Questions/Description	Reported on Page No.
		correction?	
Domain 3: analysis and findings			
<i>Data analysis</i>			
Number of data coders	24	How many data coders coded the data?	
Description of the coding tree	25	Did authors provide a description of the coding tree?	
Derivation of themes	26	Were themes identified in advance or derived from the data?	
Software	27	What software, if applicable, was used to manage the data?	
Participant checking	28	Did participants provide feedback on the findings?	
<i>Reporting</i>			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	
Data and findings consistent	30	Was there consistency between the data presented and the findings?	
Clarity of major themes	31	Were major themes clearly presented in the findings?	
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

Once you have completed this checklist, please save a copy and upload it as part of your submission. DO NOT include this checklist as part of the main manuscript document. It must be uploaded as a separate file.