

Remote surgical consultation in the time of COVID 19: a patient oriented, mixed methods approach

Journal:	CMAJ Open
Manuscript ID	CMAJOpen-2021-0159
Manuscript Type:	Mixed methods
Date Submitted by the Author:	16-Jun-2021
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Keywords:	General surgery, Surgery, Qualitative research
More Detailed Keywords:	
Abstract:	Background: There has been a rapid shift in healthcare delivery over the past year in the setting of COVID-19 where virtual and remote consultations have replaced many face-to-face interactions. Our study gathered patients' perspectives on the advantages and disadvantages of this emerging method of healthcare delivery and determined how to optimize its use in the future of surgical care. Methods: Using a patient oriented, mixed methods approach, we conducted forty-five telephone interviews with patients who had a virtual consultation with a general surgeon in Saskatoon, Saskatchewan, between the months of April and May 2020. The interviews contained both open and closed-ended questions. As research team members, two patient partners were involved in identifying priorities, developing the research question, designing research methods, analyzing data, and disseminating findings. Results: We established themes for both the advantages and disadvantages of remote consultation. The advantages were 'convenience', 'not having to take time off work', 'more time efficient', 'no need to travel', 'decreased burden on care givers', 'cost savings' and 'decreased exposure to pathogens'. The disadvantages were the 'inability to perform a physical exam', 'less personal', 'no previous relationship', 'receiving bad news', 'not given an appointment time', 'not prepared to ask questions', and 'issues with technology'. Participant age, geographical location or appointment type did not have significant effect on satisfaction or future willingness to use virtual care. Interpretation: Participants reported that virtual consultation is an

effective and efficient way to deliver surgical care but is not appropriate for every situation.

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Table 1Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

No	Item	Guide questions/description
Domain 1: Research team and reflexivity		
Personal Characteristics		
1.	Interviewer/facilitator	Which author/s conducted the interview or focus group? Student researcher, Kyle Irvine (Page 2)
2.	Credentials	What were the researcher's credentials? <i>E.g. PhD, MD</i> MD
3.	Occupation	What was their occupation at the time of the study? Surgical resident
4.	Gender	Was the researcher male or female? Male
5.	Experience and training	What experience or training did the researcher have? Previous experience with qualitative research, focus groups and patient interviews. No formal training.
Relationship with participants		
6.	Relationship established	Was a relationship established prior to study commencement?

No	Item	Guide questions/description
		No
7.	Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research Participants were told the researcher's profession and the aim of the research project.
8.	Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic There were no biases or conflicts of interest to disclose. Participants were told the reason for conducting the research was to understand patient perspectives on remote consultations and see how the process could be improved.
Domain 2: study design		
Theoretical framework		
9.	Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis Thematic analysis approach as well as a deductive approach. (Page 2)
Participant selection		

No	Item	Guide questions/description
10.	Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball Recruitment by student researcher based on participant data provided by surgical offices. (Page 2)
11.	Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email Telephone and email (Page 2)
12.	Sample size	How many participants were in the study? 45 (Page 3)
13.	Non-participation	How many people refused to participate or dropped out? Reasons? 0 (Page 3)
Setting		
14.	Setting of data collection	Where was the data collected? e.g. home, clinic, workplace Via telephone in a private office (Page 2)
15.	Presence of non- participants	Was anyone else present besides the participants and researchers? In some cases family members of participants were present
16.	Description of sample	What are the important characteristics of the sample? <i>e.g. demographic data, date</i>

No	Item	Guide questions/description
		We collected age, gender, and distance from Saskatoon. (Page 3)
Data collection		
17.	Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested? Questions were provided by the researchers in the form of a brief, semi-structured interview guide. It was pilot tested with our two patient partners (Page 2)
18.	Repeat interviews	Were repeat interviews carried out? If yes, how many? No repeat interviews were done
19.	Audio/visual recording	Did the research use audio or visual recording to collect the data? The interviews were audio-recorded (Page 2)
20.	Field notes	Were field notes made during and/or after the interview or focus group? No field notes were made
21.	Duration	What was the duration of the interviews or focus group? 2-8 minutes (Page 2)
22.	Data saturation	Was data saturation discussed? Yes, we did a retrospective analysis to determine we had reached data saturation.

No	Item	Guide questions/description
		(Page 2)
23.	Transcripts returned	Were transcripts returned to participants for comment and/or correction? Participants did not have the opportunity to review transcripts
Domain 3: analysis and findings		
Data analysis		
24.	Number of data coders	How many data coders coded the data? 1 (Page 3)
25.	Description of the coding tree	Did authors provide a description of the coding tree? Yes (Page 5)
26.	Derivation of themes	Were themes identified in advance or derived from the data? Derived from the data. (Page 2)
27.	Software	What software, if applicable, was used to manage the data? Nvivo (Page 3)
28.	Participant checking	Did participants provide feedback on the findings? Patient partners helped with analysis, interpretation and writing the manuscript.

No	Item	Guide questions/description
		(Page 3)
Reporting		
29.	Quotations presented	Were participant quotations presented to illustrate the themes / findings? Was each quotation identified? e.g. participant number Quotations were presented but not identified. (Pages 5-8)
30.	Data and findings consistent	Was there consistency between the data presented and the findings? There was consistency between the data reported and the findings. (Pages 5-8)
31.	Clarity of major themes	Were major themes clearly presented in the findings? Major themes were all presented in the findings (Pages 5-8)
32.	Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes? Subthemes were discussed in the interpretation (Pages 8-11)

GRIPP2 short form Section and topic Item

1: Aim	Report the aim of PPI in the study	Reported on page 2
2: Methods	Provide a clear description of the methods used for PPI in the	Reported on page 3
	study	
3: Study results	Outcomes—Report the results of PPI in the study, including	Reported on page 10
	both positive and negative outcomes	
4: Discussion and	Outcomes—Comment on the extent to which PPI influenced	Reported on page 10
conclusions	the study conclusions overall. Describe positive and negative	
	effects	
5: Reflections/critical	Comment critically on the study, reflecting on the things that	Reported on page 10
perspective	went well perspective and those that did not, so others can	
	learn from this experience	





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Supplemental funding for patient partners was provided through the Saskatchewan Centre for Patient Oriented Research (SCPOR).

The authors have no conflicts of interest to report

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Abstract

Background: There has been a rapid shift in healthcare delivery over the past year in the setting of COVID-19 where virtual and remote consultations have replaced many face-to-face interactions. Our study gathered patients' perspectives on the advantages and disadvantages of this emerging method of healthcare delivery and determined how to optimize its use in the future of surgical care.

Methods: Using a patient oriented, mixed methods approach, we conducted forty-five telephone interviews with patients who had a virtual consultation with a general surgeon in Saskatoon, Saskatchewan, between the months of April and May 2020. The interviews contained both open and closed-ended questions. As research team members, two patient partners were involved in identifying priorities, developing the research question, designing research methods, analyzing data, and disseminating findings.

Results: We established themes for both the advantages and disadvantages of remote consultation. The advantages were 'convenience', 'not having to take time off work', 'more time efficient', 'no need to travel', 'decreased caregiver burden', 'cost savings' and 'decreased exposure to pathogens'. The disadvantages were the 'inability to perform a physical exam', 'less personal', 'no previous relationship', 'receiving bad news', 'not given an appointment time', 'not prepared to ask questions', and 'issues with technology'. Participant age, geographical location or appointment type did not have significant effect on satisfaction or future willingness to use virtual care.

Interpretation: Participants reported that virtual consultation is an effective and efficient way to deliver surgical care but is not appropriate for every situation.

Plain Language Summary

In a research team guided by patient partners, we asked patients about their appointment with their surgeon either over the telephone or by video conference in place of a face-to-face consult. We interviewed forty-five patients who had appointments between April and May 2020 and asked them what they did and did not like about this type of consultation method and whether there is a role for telephone or video appointments in the future delivery of surgical care. The majority of participants were satisfied with their virtual consultation and felt as though the care that was provided was not compromised in any way. Many patients appreciated the convenience of doing the appointment from home as well as the cost savings related to travel and taking time off work. Patients also felt safer doing the appointment remotely as they did not have to go into a hospital or clinic during the COVID-19 pandemic. Some participants did have concerns about the scheduling of appointments as well as the surgeon not being able to examine them physically or look at their wounds post-operatively. Remote consultation was also not the preferred method for delivering bad news. Having appointments by phone or video was preferred by many of the participants, and they would be willing to use this type of remote consultation in the future if it were available.

Introduction

Over the past decade, remote consultation has become an increasingly popular resource in the medical world¹ and has expanded to encompass many different clinical areas of medicine, including specialist consultation.²,³ With the emergence of COVID-19, there was a rapid shift in the delivery of healthcare to a virtually based platform.⁴-8 Remote consultation has the ability to reduce many of the barriers patients experience when trying to access medical services and allows them to receive the care they need from the safety of their homes.⁴ Moreover, initial studies have shown that remote consultation for surgical services can be equally as effective as in-person appointments for patient outcomes and patient satisfaction.²,³,10-12

In rural Saskatchewan, where there are often no readily available specialist services, patients are required to travel many hours for consultations and follow up appointments.¹³ The goal of our research was to analyze the initial implementation of remote consultation in the setting of COVID-19 and offer evidence to support continued remote consultation for surgical patients in Saskatchewan. Our study gathered patients' perspectives on the advantages and disadvantages of this emerging method of healthcare delivery and determined what role it may play in the future of surgical care in our province.

Methods

Recruitment: We contacted seventeen general surgeons and general surgery subspecialists in Saskatoon, Saskatchewan to approach patients about our study. Seven surgeons invited their patients to participate, five surgeons did not schedule remote consultations during the study period, and the remaining five either did not reply or did not provide patient contacts. Any patient over the age of eighteen who had a telephone or video appointment between April and May 2020 was eligible to participate. Each surgical office provided contact information for up to ten eligible participants to the primary researcher who recruited participants via email or telephone and obtained verbal consent prior to conducting the interviews.

Data Collection: A mixed methods approach was used to ensure that patient experiences were fully understood. All interviews occurred remotely by telephone and were conducted from a Saskatchewan Health Authority (SHA) hospital or private office location. A brief, semi structured interview guide was co-developed with patient partners. The guide contained both open and closed ended questions that related to overall satisfaction with and the advantages and disadvantages of the remote consultation process. Interview duration ranged from two to eight minutes. Interviewing ceased once no new themes were identified, and a retrospective analysis of themes showed data saturation had been reached. All interviews were audio-recorded and then transcribed by the Canadian Hub for Applied and Social Research.

Data Analysis: Transcripts were uploaded to NVivo 12[©] software for coding and analysis. Using a thematic analysis approach,^{16,17} the research team developed codes and identified coding frequencies which were then sorted into relevant groupings as overarching themes and subthemes. The main themes were then categorized into advantages and disadvantages using a deductive approach based on our research question.¹⁸ Descriptive statistics of the responses to closed ended questions and demographic data were analyzed using IBM SPSS for Windows version 26. Patient satisfaction and future willingness to use remote consultation were

compared to patient age, gender, location, and appointment type. We calculated p values (statistical significance set as p <0.05) using Fisher's Exact test of significance. *Patient engagement*: Our research team used the Saskatchewan Centre for Patient Oriented Research (SCPOR) Patient-Oriented Research Level of Engagement Tool (PORLET) to guide our engagement with patient partners. ¹⁹ Two patient partners were recruited through SCPOR's patient and researcher connection site. ²⁰ Researchers and patient partners identified remote surgical consultation as a priority for the study, and patient partners suggested a mixed-methods approach. The patient partners were part of all seven team meetings held over video conference from the research proposal stage to completion of the manuscript. Patient partners co-developed recruitment methods and interview questions. Furthermore, patient partners undertook qualitative analysis by identifying themes and contributing to interpretation. They helped write, edit, and review the manuscript as well advocated for findings to be integrated into surgical practice by volunteering to co-present at upcoming conferences. *Ethics*: Ethics was obtained through the University of Saskatchewan Behavioural Research Ethics Board (Beh ID- 1827).

Results

Forty-five patients were contacted to participate. All patients contacted consented to be interviewed. The majority of participants (69%) were female with a mean age of 62 years. Approximately two thirds of participants (64%) lived outside of the city and over half had previous experience with remote consultation (55%). Most appointments were follow-ups (73%) and conducted by telephone (91%). Demographic and appointment information is summarized in Table 1.

Table 1. Summary of participant demographic and appointment information.

Age (yr)		Gender	
Mean (range)	62 (31-87)	Male	14 (31%)
Remote Consultation Experience		Female	31 (69%)
First time	17 (38%)	Type of Remote Consultation	
Previous experience	25 (55%)	Telephone	41 (91%)
Not stated	3 (7%)	Video conference	1 (2%)
Location/Distance from Saskatoon		Both	3 (7%)
Lived inside the city	15 (33%)	Appointments	
Lived outside the city (<200 km)	18 (40%)	Initial consult	12 (27%)
Lived outside the city (>200 km)	11 (24%)	Follow-up	33 (73%)

The interview contained several closed-ended questions pertaining to overall satisfaction with the remote consultation method, preference for appointment type and future willingness to use a remote platform (Table 2). The vast majority of participants were satisfied with the remote consultation process (91%) which led to many stating they would use it again in the future (71%). However, given the choice, less than half of participants would prefer a remote consultation (38%) and many said it would depend on the circumstances (38%). Most participants felt that their care was not compromised in any way by a virtual appointment (87%).

Table 2. Summary of closed-ended question responses.

Satisfaction		Care Provided		
Satisfied	41 (91%)	Did not feel compromised 39 (87		
Not Satisfied	4 (9%)	Felt may have been compromised 6 (13%)		
Would use Remote Consultation in the Future		Remote Consultation vs In-Person		
Would use	31 (70%)	Prefer remote	17 (38%)	
Would not use	4 (9%)	Depends on circumstances	17 (38%)	
Maybe	9 (21%)	Prefer in-person	11 (24%)	

There was no statistical difference in satisfaction based on participant age (p>0.99) or gender (p>0.99). Additionally, the participants location and whether their appointment was initial consult or follow-up did not have any significant impact on their satisfaction (p=0.66 and p>0.99 respectively, Table 3).

Table 3. Overall satisfaction based on participant age, gender, location, and appointment type.

	, ,	Overall Satisfaction n (%)		
		Satisfied Not Satisfied		
Ago group	30-65	20 (91)	2 (9)	
Age group	66-87	16 (89)	2 (11)	
	Female	28 (90)	3 (10)	
Gender	Male	13 (93)	1 (7)	
	Saskatoon	13 (87)	2 (13)	
Location	<200 km	16 (89)	2 (11)	
	>200 km	11 (100)	0 (0)	
A	Initial Consult	11 (92)	1 (8)	
Appointment Type	Follow-up	30 (91)	3 (9)	

As Table 4 outlines, there were no statistical differences based on participant age (p=0.61), gender (p=0.87), location (p=0.88), or appointment type (p=0.51) and participants' willingness to use remote consultation in the future.

Table 4. Future willingness to use remote consultation based on participant age, gender, location, and appointment type.

		Would you use remote consultation in the future- n (%)		
		Yes No Maybe		
Age group	30-65	17 (77)	2 (9)	3 (14)
	66-87	11 (61)	2 (11)	5 (28)
Candan	Female	22 (71)	3 (10)	6 (19)
Gender	Male	9 (64)	1 (7)	4 (29)
Location	Saskatoon	10 (67)	2 (13)	3 (20)

	<200 km	12 (67)	2 (11)	4 (22)
	>200 km	9 (82)	0 (0)	2 (18)
A nuncintum and Tum	Initial Consult	10 (83)	0 (0)	2 (17)
Appointment Type	Follow-up	21 69)	4 (9)	10 (22)

The results from the analysis of the open-ended interview responses are described in Figure 1. We developed our thematic framework around the advantages and disadvantages of remote consultation based on our research question and the participants' interview responses.

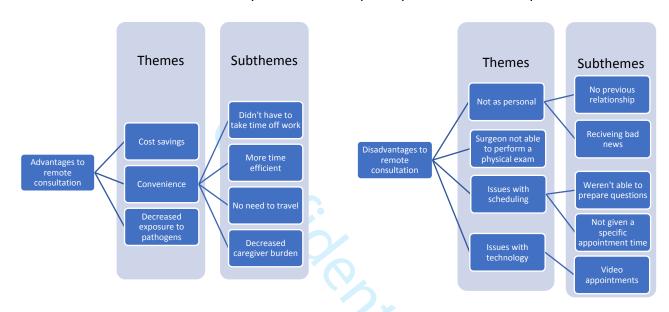


Figure 1. Themes and subthemes for patient perspectives on remote consultation.

Advantages (Refer to Table 5):

'Convenience' was the most prominent theme across the interviews being mentioned by thirtynine participants and with ninety-eight coding references. Subthemes under 'convenience' included 'more time efficient', 'no need to travel', 'not having to take time off work' and 'decreased caregiver burden'. Two additional themes were 'cost savings' and 'decreased exposure to pathogens'.

Table 5: Participant quotations related to the advantages of remote surgical consultation

Themes/subthemes	Direct quotes from participants
Convenience	You know what? It is such a hindrance to have to go to the University hospital, find parking, take time off and go and sit and wait there. When you make that appointment and 20 minutes later you're off the phone and you're on your way. You didn't even have to leave your house. As mentioned before, in this day of technology personal visits should be rare. I sent him pictures by email as well and he would respond. We have used video conference, phone calls and email with pictures with my GP, my surgeon and oncologists and their assistants. It's wonderful.

	Sat here in the kitchen, we were on the phone and he was in his office and we could talk back and forth, and everything was a hundred percent.
- More time efficient	it saved me time, saved him time, he was very succinct it just takes a lot less time 'cause in-person, you'd have to drive down there, find parking, pay for parking, and then you go up and then sometimes there's a wait as well in the waiting room. Then you go there, you're shown into a room, then you wait some more. So there's a whole lot of time there that you could be doing something else and all of that time leading up to that point is just so that you can spend, what? Five maybe ten minutes with someone. I think the fact that the doctor maybe had a little more time to spend talking with (us), he answered all of the questions and took the time to really see if there were any problems. We didn't feel rushed or worried as you often do maybe when you have an appointment in person. The responsiveness was good, probably was able to get to see him or speak to him sooner than I would've if I had to do an in-person consultation. So luckily the response was quicker which was good.
- No need to travel	Most of my concerns were easily addressed without having to travel. I don't think it made a lot of difference other than I would be traveling to Saskatoon if it was an in-person appointment where this way I could just talk from home, save the trip. I mean for the most part thinking back to all the appointments I had before surgery, probably a lot of them could've been done over the phone I mean if there's no actual test that needs to be done or anything like that I don't see why you can't do the majority of it over the phone until you actually need to examine someone it seems fine.
 Didn't have to take time off work 	I would have had to take at least a half day, but more likely a full day off work. I didn't have to go back to Saskatoon and miss another day of work.
- Decreased burden on care givers	he wasn't very strong and it's quite a long ways from the parking lot, into the hospital and you've gotta get wheelchairs types of things and navigate through it. It's a bit nerve wracking. It does take two people, I could probably do it just by myself now but when these took place yeah it would two people and a day and 75 bucks and a wheelchair. It would require two drivers, one to drive me there because there's no place even to really stay because of COVID they came back and then the other driver picked me up the next day.
Cost savings	I live out of province, so it would have been expensive to attend the appointment in person - accommodations, gas, meals, etc. especially if I have to go to a doctor at RUH or whatever for sure because it's the exuberant parking fees

Decreased exposure to pathogens	You eliminate all the risks, in fact you eliminate the risk of traveling down the highway as far as I'm concerned. So you don't have that risk, you don't have the risk like I say of getting any infections or anything at the hospital which is minimal but still there's a chance.
	worry about perhaps meeting other people, in a waiting room situation that might have been compromised. And the fact that' health wasn't the best but he was still able to have a very good appointment online.
	Considering that it was during COVID and the issues that I was having were lung-related so yes, I preferred it over the phone and not needing to go into St. Pauls.

Disadvantages (Refer to Table 6):

The most common concern that patients had with remote consultations was that it was not as personal as an in-person appointment. This was mentioned in twenty participant interviews. Subthemes identified under this category were 'receiving bad news' and 'no previous relationship'. Additional themes were 'the inability to perform a physical exam' which was mentioned by eleven participants, 'issues with scheduling', which included the subtheme 'not prepared to ask questions' and 'issues with technology'.

Table 6: Participant quotations related to the disadvantages of remote surgical consultation

Table 0. Farticipant quot	ations related to the disadvantages of remote surgical consultation
Themes/subthemes	Direct quotes from participants
Not as personal	I find him kind of hard to read just over the phone Even like the Pexip appointment is preferable 'cause then you can actually see the person who's going to be providing you care. Otherwise it's just a voice on the end of the phone.
 Receiving bad news 	I'm like six months into cancer treatment, I have—Dr is the first doctor I have laid eyes on in-person. So it's been a, it's not a good process when you're going through something that's traumatizing it's not a good process.
- No previous relationship	I guess I was nervous because I had never met him, didn't know nothing about him. it helps having met the doctor before and having a kind of relationship and was in the hospital steadily for five months and he saw this doctor quite often. So he already knew the doctor so that made a difference as well.
Not able to perform physical exam	I was quite satisfied with my initial consult via telephone, but post-op, would prefer an in-person appointment simply because as a patient I may not be able to describe my concerns accurately and having a surgeon see, touch or feel would make me feel more comfortable that there was no misunderstanding or communication error. I may be describing a situation or concern with the wrong vocabulary that won't be caught via phone call. it doesn't work well for everythingI mean they're satisfactory to a point depends on what you have wrong with you. Sometimes you just have to be seen because it's impossible to explain.

Issues with scheduling - Not given a specific appointment time	The remote consultation was more difficult mentally because I didn't know when the call would occur. Additionally, I wasn't as prepared for the discussion due to my day-to-day distractions. Child at home with me versus on my own at doctor appointment. I ended up missing the initial call because I happened to be out of the house. So caught off-guard, often in the middle of a meeting see that I have to take a call. So, it would've been nice to have been given an appointment time because it did feel frenetic.
 Not prepared to ask questions 	the downfall with that is I couldn't ask the questions I wanted to ask. There were so many questions that after we hung up that I thought- why didn't? If I had an appointment seeing him before, I would've had the list of questions with me. I was caught at a time where I didn't have the questions with me
Issues with technology	Only to the extent that the video didn't work, the problem that I have now could've been assessed earlier.

Interpretation

Our findings indicate that remote surgical consultation is an acceptable alternative to inperson appointments but may not be appropriate for every situation. Most participants found remote consultation to be more convenient, as it saved time, money and the need to travel. It also decreased family and caregiver burden and reduced the patients' exposure to potential pathogens. The disadvantages of remote consultation were that some participants found it less personal, and it was not sufficient when a physical exam was required or if the patient was receiving bad news. There were also issues around scheduling appointments, and participants felt that they were not prepared to ask questions. We did not find any significant difference in participant satisfaction or their future willingness to use remote consultation based on participant age, gender, appointment type, or location.

We anticipated that participants who lived further from Saskatoon would benefit more from remote consultation and therefore have higher levels of satisfaction and be more willing to use remote consultation in the future. This was not the case as many of the advantages participants noted such as not taking time off work, paying for parking, burden on care givers and exposure to pathogens were still applicable to those that did not have to travel from outside the city. The participants who were not satisfied were also those that stated they would be unwilling to use remote consultation in the future. Their responses focused mainly on the need to have a physical exam and receiving bad news by telephone. These respondents did not feel that the advantages of remote consultation outweighed the benefits of seeing a surgeon in-person. Over one-third of participants stated that they would prefer a remote consultation, however the same number said that it would depend on the circumstances.

The advantages of remote consultation in this study were similar to those identified in other research.^{2,3,10} Particularly, studies done over the past year have highlighted patients' concerns surrounding exposure to COVID-19.4-7 Conducting surgical consultations remotely allows patients to adhere to travel restrictions, maintain social distancing measures, and minimizes risk of patients contracting the virus or other hospital associated illness.⁵ Saskatchewan's geographic distribution of health services requires many rural patients to travel long distances to receive specialist services. 13 Participants appreciated not having to travel many hours, often during poor winter road conditions, to spend only a few minutes talking with their surgeon, a finding consistent with the literature. 10-12 The remote consultations were widely viewed as more time efficient for both the patient and the surgeon, and participants commented on shorter wait times for virtual versus in-person consultation, all findings consistent with other studies. 10,11 The costs associated with travel and parking, as well as having to take time off work to attend an in-person appointment, were additional barriers to patients accessing care that were negated with remote consultation. These were prominent themes for participants that lived outside of Saskatoon and for those that lived in the city centre. Similar to other research, our study identified the ability of remote consultation to alleviate caregiver burden for patients who require assistance attending in-person consultations.²¹ Some studies have found that younger patients are more willing to use remote consultation and report higher levels of satisfaction,^{3,6} however, we did not find age to have a significant impact on satisfaction, perhaps due to sample size or the relatively high mean age.

Remote consultation may not be appropriate for all surgical appointments, and our study identified several areas we think the remote consultation process could be improved. First, patients prefer a set appointment time or a narrow time range for when the appointment occurs. Participants often noted they were only given a date for the appointment. If patients had an appointment time, they could prepare a list of questions and be in an appropriate setting to have a discussion. Second, patients should have a clear avenue to ask follow-up questions or contact their surgeon if something was missed during their appointment. The inability to perform a physical exam is an obvious downside to remote consultation, however the use of video conference and smartphone technology to send photos could help to alleviate a portion of those concerns.^{4,5} This raises the concept of a hybrid approach,²⁴ where a virtual consultation be considered a component of the entire consultation process. A virtual consultation can facilitate the surgeon triaging patients and organizing necessary investigations prior to meeting in-person. Subsequent in-person appointments can be made for physical exams, discussing diagnoses, or explaining more complex treatment options to patients and their families. Follow up could be either in-person or virtual depending on patient preference and needs. This concept would require further research to determine its feasibility and effectiveness. The technological issues surrounding video consultations is another area to be addressed because video appointments typically require more substantial infrastructure, increased user technical ability, a higher bandwidth internet connection and more formal approach

on behalf of the surgeon.^{7,11,22} Our findings suggest that video consultations might be better received than phone consultations, and it is worth exploring how it might be used more frequently.^{22,23}

Limitations:

Because our sample was primarily telephone consultations; (n=41), it was difficult to assess the effectiveness of video consultation. Since all patients included in the study had already agreed to have a virtual appointment, selection bias could be present. We were unable to interview participants from every surgical office in Saskatoon and the surgical offices provided us with the participant information which may have contributed to sampling bias. Additionally, some interviews took a few minutes to complete which could limit the quality of the qualitative data.²⁵ This study examined surgical consultations only and extrapolation of the findings may not be applicable to all medical specialties. Although data saturation was reached for our thematic analysis, our sample size may have been too small to see significant trends based on age, location or appointment type.

Lessons learned from patient engagement:

We were fortunate to have two patient partners that had significant experience with the healthcare system as well as an interest in research and prior involvement in patient-oriented projects. The patient partners contributed their personal experience with remote consultation to help tailor the research project to address an area of healthcare they felt was important. Actively involving patient partners as full team members led to a research question that was relevant and could lead to system change in a timely manner. Open and frequent communication with the patient partners facilitated engagement and empowered their contributions to the research. As part of every video conference team meeting, they helped to identify the concerns that would be most relevant to patients and ensured that the research was conducted in a patient-oriented manner with the goal to improve patient outcomes. We encouraged a strong theme of shared decision making²⁶ within our team to build an effective relationship with the partners. The researchers made accommodations as needed to allow the partners to fully contribute, such as presenting data in visual formats, avoiding jargon, limiting the technological requirements, and doing frequent check-ins to see if there was any way to make the process easier. By creating an environment that acknowledged the values, preferences, and experiences of the patient partners, partners were comfortable raising concerns and providing direction, resulting in a stronger research project that can lead to changes in healthcare with real value to patients.²⁷ The patient partners repeatedly emphasized the importance of having our findings integrated into clinical practice and volunteered to copresent at upcoming research conferences.

Conclusions:

Overall, the advantages of remote consultation were a prominent theme throughout the interviews and resulted in high patient satisfaction with this emerging delivery method. Remote consultation has the potential to improve patient outcomes by delivering healthcare in a more convenient, costly, and timely manner, without compromising the quality of care. Many patients commented not only on their willingness, but their

preference, to use remote consultation for future surgical care. Based on our findings, we highlight several areas where remote consultation could be improved which included proper scheduling, patient selection, a process for follow-up questions and increased utilization of video platforms and pictures. If a patient requires a physical exam or is discussing a sensitive topic, they may not be appropriate for a remote appointment. It may not be perfect for every patient or every situation, but remote consultation has many benefits, and we argue it should continue to be offered to patients in a post-pandemic world.



References:

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Table 1. Summary of participant demographic and appointment information.

Age (yr)		Gender	
Mean (range)	62 (31-87)	Male	14 (31%)
Remote Consultation Experience		Female	31 (69%)
First time	17 (38%)	Type of Remote Consultation	
Previous experience	25 (55%)	Telephone	41 (91%)
Not stated	3 (7%)	Video conference	1 (2%)
Location/Distance from Saskatoon		Both	3 (7%)
Lived inside the city	15 (33%)	Appointments	
Lived outside the city (<200 km)	18 (40%)	Initial consult	12 (27%)
Lived outside the city (>200 km)	11 (24%)	Follow-up	33 (73%)

Table 2. Summary of closed-ended question responses.

Satisfaction		Care Provided	
Satisfied	41 (91%)	Did not feel compromised	39 (87%)
Not Satisfied	4 (9%)	Felt may have been compromised 6 (13%)	
Would use Remote Consultation in th	e Future	Remote Consultation vs In-Person	
Would use	31 (70%)	Prefer remote	17 (38%)
Would not use	4 (9%)	Depends on circumstances	17 (38%)
Maybe	9 (21%)	Prefer in-person	11 (24%)

Table 3. Overall satisfaction based on participant age, gender, location, and appointment type.

		Overall Satisfaction n (%)		
		Satisfied	Not Satisfied	
A go group	30-65	20 (91)	2 (9)	
Age group	66-87	16 (89)	2 (11)	
Gender	Female	28 (90)	3 (10)	
Gender	Male	13 (93)	1 (7)	
	Saskatoon	13 (87)	2 (13)	
Location	<200 km	16 (89)	2 (11)	
	>200 km	11 (100)	0 (0)	
Appointment Type	Initial Consult	11 (92)	1 (8)	
	Follow-up	30 (91)	3 (9)	

Table 4. Future willingness to use remote consultation based on participant age, gender, location, and appointment type.

	Would you use remote consultation in the future- n (%)			
		Yes	No	Maybe
Age group	30-65	17 (77)	2 (9)	3 (14)
	66-87	11 (61)	2 (11)	5 (28)
Gender	Female	22 (71)	3 (10)	6 (19)
	Male	9 (64)	1 (7)	4 (29)

Location	Saskatoon	10 (67)	2 (13)	3 (20)
	<200 km	12 (67)	2 (11)	4 (22)
	>200 km	9 (82)	0 (0)	2 (18)
Appointment Type	Initial Consult	10 (83)	0 (0)	2 (17)
	Follow-up	21 69)	4 (9)	10 (22)

Table 5: Participant quo	tations related to the advantages of remote surgical consultation
Themes/subthemes	Direct quotes from participants
Convenience	You know what? It is such a hindrance to have to go to the University hospital, find parking, take time off and go and sit and wait there. When you make that appointment and 20 minutes later you're off the phone and you're on your way. You didn't even have to leave your house. As mentioned before, in this day of technology personal visits should be rare. I sent him pictures by email as well and he would respond. We have used video conference, phone calls and email with pictures with my GP, my surgeon and oncologists and their assistants. It's wonderful. Sat here in the kitchen, we were on the phone and he was in his office and we could talk back and forth, and everything was a hundred percent.
- More time efficient	it just takes a lot less time 'cause in-person, you'd have to drive down there, find parking, pay for parking, and then you go up and then sometimes there's a wait as well in the waiting room. Then you go there, you're shown into a room, then you wait some more. So there's a whole lot of time there that you could be doing something else and all of that time leading up to that point is just so that you can spend, what? Five maybe ten minutes with someone. I think the fact that the doctor maybe had a little more time to spend talking with (us), he answered all of the questions and took the time to really see if there were any problems. We didn't feel rushed or worried as you often do maybe when you have an appointment in person. The responsiveness was good, probably was able to get to see him or speak to him sooner than I would've if I had to do an in-person consultation. So luckily the response was quicker which was good.
- No need to travel	Most of my concerns were easily addressed without having to travel. I don't think it made a lot of difference other than I would be traveling to Saskatoon if it was an in-person appointment where this way I could just talk from home, save the trip. I mean for the most part thinking back to all the appointments I had before surgery, probably a lot of them could've been done over the phone I mean if there's no actual test that needs to be done or anything like that I don't see why you can't do

	the majority of it over the phone until you actually need to examine someone it seems fine.
 Didn't have to take time off work 	I would have had to take at least a half day, but more likely a full day off work. I didn't have to go back to Saskatoon and miss another day of work.
- Decreased burden on care givers	he wasn't very strong and it's quite a long ways from the parking lot, into the hospital and you've gotta get wheelchairs types of things and navigate through it. It's a bit nerve wracking. It does take two people, I could probably do it just by myself now but when these took place yeah it would two people and a day and 75 bucks and a wheelchair. It would require two drivers, one to drive me there because there's no place even to really stay because of COVID they came back and then the other driver picked me up the next day.
Cost savings	I live out of province, so it would have been expensive to attend the appointment in person - accommodations, gas, meals, etc. especially if I have to go to a doctor at RUH or whatever for sure because it's the exuberant parking fees
Decreased exposure to pathogens	You eliminate all the risks, in fact you eliminate the risk of traveling down the highway as far as I'm concerned. So you don't have that risk, you don't have the risk like I say of getting any infections or anything at the hospital which is minimal but still there's a chance. worry about perhaps meeting other people, in a waiting room situation that might have been compromised. And the fact that' health wasn't the best but he was still able to have a very good appointment online. Considering that it was during COVID and the issues that I was having were lung-related so yes, I preferred it over the phone and not needing to go into St. Pauls.

Table 6: Participant quotations related to the disadvantages of remote surgical consultation

Themes/subthemes	Direct quotes from participants
Not as personal	I find him kind of hard to read just over the phone
	Even like the Pexip appointment is preferable 'cause then you can actually see the person who's going to be providing you care. Otherwise it's just a voice on the end of the phone.
- Receiving bad news	I'm like six months into cancer treatment, I have—Dr is the first doctor I have laid eyes on in-person. So it's been a, it's not a good process when you're going through something that's traumatizing it's not a good process.
 No previous relationship 	I guess I was nervous because I had never met him, didn't know nothing about him.

Not able to perform physical exam	it helps having met the doctor before and having a kind of relationship and was in the hospital steadily for five months and he saw this doctor quite often. So he already knew the doctor so that made a difference as well. I was quite satisfied with my initial consult via telephone, but post-op, would prefer an in-person appointment simply because as a patient I may not be able to describe my concerns accurately and having a surgeon see, touch or feel would make me feel more comfortable that there was no misunderstanding or communication error. I may be describing a situation or concern with the wrong vocabulary that won't be
	caught via phone call. it doesn't work well for everythingI mean they're satisfactory to a point depends on what you have wrong with you. Sometimes you just have to be seen because it's impossible to explain.
Issues with scheduling - Not given a specific appointment time	The remote consultation was more difficult mentally because I didn't know when the call would occur. Additionally, I wasn't as prepared for the discussion due to my day-to-day distractions. Child at home with me versus on my own at doctor appointment. I ended up missing the initial call because I happened to be out of the house. So caught off-guard, often in the middle of a meeting see that I have to take a call. So, it would've been nice to have been given an appointment time because it did feel frenetic.
 Not prepared to ask questions 	the downfall with that is I couldn't ask the questions I wanted to ask. There were so many questions that after we hung up that I thought- why didn't? If I had an appointment seeing him before, I would've had the list of questions with me. I was caught at a time where I didn't have the questions with me
Issues with technology	Only to the extent that the video didn't work, the problem that I have now could've been assessed earlier.

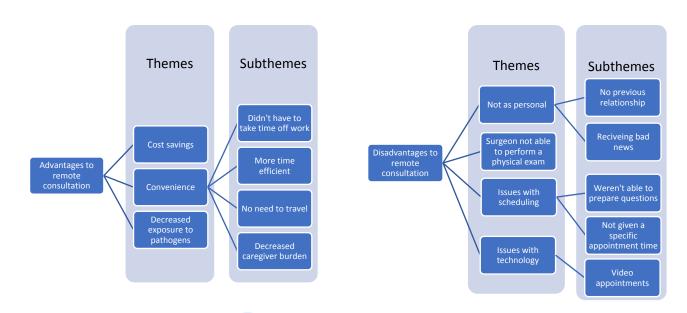


Figure 1. Themes and subthemes for patient perspectives on remote consultation.