Title: Exploring resident and faculty perspectives on the impact of transitioning to virtual care on clinical exposure, teaching, and assessment during the COVID-19 pandemic.

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Introduction

The COVID-19 pandemic has placed an unprecedented strain on healthcare systems worldwide, affecting all aspects of care and necessitating a rapid shift to virtual care (VC) for many medical specialties across Canada.[1,2] Beyond altering how outpatient care is delivered, VC changed how faculty teach, and modified resident learning experiences in virtual settings.[3]

Various frameworks have explored dimensions of satisfaction with VC from both patient[4] and provider perspectives.[5] The provider satisfaction framework is particularly relevant to our study, as it explores components of healthcare providers' overall satisfaction with VC: demographics, care settings, motivations, and experiences (Figure 1).[5] While prior studies have investigated the perspectives of patients and providers during transitions to VC, few have investigated the impact of VC on residents' education.[6] Understanding this impact within competency-based medical education (CBME), which emphasizes outcome-based learning and feedback,[7] is critical. In this qualitative phenomenological study, we sought to understand faculty and residents' experiences with teaching, learning, and assessment during the transition to VC.

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Methods

Context

The shift to virtual ambulatory patient care at Queen's University (Kingston, Ontario) began in March 2020, when the World Health Organization (WHO) declared COVID-19 a pandemic,[8] and VC was quickly adopted into ambulatory practice without prior training for providers. For this study, we defined VC as any form of telemedicine including phone calls or videoconferencing using regulated platforms.

Study design and population

A phenomenological approach was taken, focusing on individuals' lived experiences,[9] to understand the experiences of residents and faculty with the transition to virtual ambulatory care. Details on the study design and researcher reflexivity can be found in Appendix A. Residents (n=20) and faculty (n=17) were recruited using purposive sampling from the Departments of Surgery and Medicine at Queen's University (Table 1). Participants had a wide range of VC exposure, from very limited exposure to regularly conducting VC clinics. Focus group and interview protocols were developed and revised by the research team through a consensus

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process (see Appendices B & C). All faculty participated in semi-structured individual interviews, while residents participated in thirteen interviews or three focus groups, depending on their availability.

Data collection

Participants were invited via email, provided a letter of information and consent form, and emailed to schedule interviews. Participants were identified by study ID codes: faculty (F1 - F17), residents interviewed individually (R1 - R13) and residents interviewed in focus groups (FG1-FG3). Participants were asked to reflect on their experiences with transitioning from in-person to VC encounters during the pandemic. Thirty-to-forty-five-minute interviews and one-hour focus groups were conducted via Zoom, audio-recorded, and transcribed verbatim. The interview/focus group guides were created by the research team to reflect four topics of interest: the experience of using VC in ambulatory settings; how teaching, learning, and assessments evolved with the transition to VC; barriers to and facilitators of conducting VC; and recommendations for peers and/or institutions adopting VC.

Data Analysis

Three independent coders (HB, RL, and JH) analyzed the qualitative data using open coding in QSR International's NVivo software (Version 12). A diverse sample of transcripts from interviews and focus groups across participant groups and specialties was selected for comparison to ensure inter-coder reliability. The data were analyzed inductively using thematic analysis, and completed using an iterative approach in three steps: preliminary coding, line-by-line coding, and generation of themes.[10] In preliminary coding, three researchers coded half of an interview together, and coded the other half independently for intercoder reliability. Subsequently, a codebook was created to guide the coding of the remaining transcripts. Details on the coding process can be found in Appendix A.

Results

Four major themes around the transition to virtual ambulatory care emerged from the data: (1) Teaching and Learning, (2) Assessment, (3) Logistical Considerations, and (4) Recommendations. Within each theme, several sub-themes were identified (Tables 2-5).

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Theme 1: Teaching/Learning

Adoption of VC in ambulatory settings changed many facets of teaching and learning. Four sub-themes were identified: a) Evolution, b) Strategies, c) Facilitators, and d) Barriers (Table 2).

The teaching strategies employed by faculty using VC evolved as the pandemic progressed, and in-patient capacities fluctuated. The data represented a wide variety of virtual clinic structures and strategies, some occurring concurrently with in-person encounters, and some functioning solely virtually. Faculty who included residents in their virtual clinics frequently asked the residents to call patients independently before reviewing with them. The residents would then call the patients back to discuss the plan, with or without faculty's presence.

Many residents identified opportunities during VC clinics to research answers to clinical questions, and review with the faculty to facilitate their learning. While this helped with resident learning, faculty stated that this made assessing the residents' knowledge more challenging. Additionally, residents noted that their learning was facilitated by program support, and the "attendings...going out of their way to find learning experiences for [the residents] (R1)." Overall, there were significant barriers to teaching and learning for both faculty and residents. Most participants felt that the lack of a physical exam "[took] away...the physical learning and teaching capacity (F13)." Additionally, the decrease in patient volumes, and time constraints imposed by the virtual modalities, resulted in fewer teaching moments for residents.

Theme 2: Assessment

Five sub-themes within assessment were identified: a) Feedback, b) Entrustable Professional Activities (EPAs), c) Facilitators, d) Barriers, and e) CanMEDS roles (Table 3).

Methods and timing of feedback varied among participants. Some faculty provided oral feedback directly after cases, and others documented formal feedback in the workplace-based assessments (WBAs). Feedback frequency was low regardless of visit type. Moreover, surgery residents had limited EPAs to assess performance in clinics, with most EPAs pertaining to technical skills of the specialty, while medicine residents noted that their clinic EPAs were not adapted for VC. In general, the current EPAs "are not applicable to the virtual world (F12)."

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Most faculty suggested creating EPAs focused on communication and virtual competencies to help address this issue.

Neither residents nor faculty saw VC as a barrier to assessment. They did not foresee VC limiting a residents' ability to progress within CBME, as most residents continued to engage in some form of in-person care. However, residents and faculty noted that there was "very little, if any, direct observation (F17)" during VC, which was a significant barrier to providing constructive feedback. There was also limited in-person and narrative feedback documented on WBAs. Faculty felt they were still able to assess the various CanMEDS competencies, particularly the communicator role.

Theme 3: Logistical Considerations

Three sub-themes emerged pertaining to logistical considerations: a) Limitations of VC, b) Modality of VC, and c) Infrastructure of VC (Table 4).

While many faculty members included residents in virtual ambulatory clinics, some did not due to lack of space, the need for extra computers and phones, and time constraints. Instead, these faculty members tended to include residents for in-person clinics. Faculty and residents noted that VC had unique logistical limitations compared to in-person clinics. For example, they felt that patients treated virtual visits differently to in-person visits. Patients often missed phone calls, participated in other activities during the visit, or were less prepared to discuss with a physician, which contributed to the difficulties of maintaining a clinic schedule.

Residents and faculty felt that using video technology, rather than telephones, could help mitigate many of the barriers to teaching and assessment, including the lack of physical exam and direct observation, while establishing patient rapport. However, video consults create a significant burden on administrative staff and are often challenging for some patients to access. There was limited technical support or IT infrastructure for virtual clinics (eg. Ontario Telemedicine Network) leading to VC clinics being conducted almost exclusively by phone. Lastly, there was a reported lack of physical space and resources to conduct VC encounters in a private and confidential manner.

Theme 4: Recommendations

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Six sub-themes emerged pertaining to recommendations: a) Preparation, b) Resources, c) Technology, d) Education and Support, e) Clinic Efficiency, and f) Next Steps (Table 5).

Faculty and residents suggested that preparation was key to successfully engaging learners in VC and optimizing their educational experiences. Faculty discussed improving resources, such as administrative support, to book virtual clinics. Residents and faculty felt that a dedicated physical space with additional computers and phones was needed for residents to conduct VC and maintain patient confidentiality.

Faculty and residents emphasized that improvement in video technologies is critical for increased VC uptake, specifically for surgical specialties. Educational sessions and institutional supports surrounding VC would be beneficial, such as educational guidelines for residents on how to effectively conduct VC, and training for faculty on structuring virtual ambulatory clinics to maximize resident learning and deliver high-quality care. Residents suggested that it would be particularly helpful to have guidance on how to adapt certain physical exam maneuvers to the VC environment. Developing competencies specific to VC was emphasized as crucial for residents' education.

Overall, faculty and residents agreed that VC will persist after the COVID-19 pandemic and optimizing VC infrastructure will be necessary. Participants expressed the desire to continue providing VC for follow-up visits, disclosing patient's results, and for out-of-town visits. Participants stressed that as VC care continues, accessibility and equity need to be considered, and suggested that it would be beneficial to better understand patient perspectives on VC to ensure that it is meeting patients' needs.

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Discussion

Transitioning to VC in an ambulatory setting during the COVID-19 pandemic has altered residency education by changing the teaching strategies employed by faculty, opportunities for direct observations in assessments, and residents' interactions with faculty and patients. Primary barriers to VC include the inability to perform a physical exam, difficulty using video technologies, and the lack of applicable EPAs. Key recommendations to address these barriers include ensuring appropriate logistical infrastructure, and instructional guidelines for faculty and residents on how to deliver competency-based medical education in a virtual setting (Figure 2). As the provider satisfaction framework (Figure 1) suggests, we can analyze providers'

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satisfaction with VC from four key domains: demographics, care settings, experiences, and motivations.[5]

Teaching and learning are key aspects of residency education that were affected by the transition to VC with decreased in-person encounters and difficulty teaching in a virtual landscape. Using the provider satisfaction framework,[5] this transition corresponds to the 'Motivations' of faculty and residents to teach and learn during VC clinics. Motivation may help explain why faculty continued to include residents in VC clinics despite it taking more time, and why residents continued to seek out VC clinics outside of their in-patient or operating room experiences. By continuing to explore ways to incorporate residents into virtual clinics with opportunities for direct observation by 'listening in' on visits conducted by phone or videoconferencing, educators can ensure progression of residents within the stages of CBME.[11] However, guidance on how to balance VC clinic demands without sacrificing resident education is needed.[12] The Virtual Care Task Force of the Royal College of Physicians and Surgeons of Canada recently made a recommendation to the CanMEDS consortium to update the virtual care competencies for all levels of medical training.[13]

In our study, assessments of residents during VC were impacted by the inability to perform a physical exam, conduct direct observations, or complete EPAs specific to VC. This highlights a gap in assessment during VC, which needs to be addressed. The inability to conduct direct observations in clinic was likely a barrier even before the pandemic, with studies reporting residents rarely being observed by faculty even before March 2020.[14] However, phone-based VC creates new challenges in direct observation of residents and necessitates the development of VC-specific competencies.[15] Once developed, VC-specific EPAs can be assessed in the workplace or through objective structured clinical examinations (OSCEs) to ensure that residents are competent in conducting VC visits.[16] While blended learning models of virtual and in-person care can be effective in residency education,[17] blended models may not fully replace traditional in-person learning.[18] Current best practices for resident education using VC are unclear, though a study by Ha et al. supports the use of video technologies and educational frameworks.[19] One example is the medical virtualist framework[15], outlining three key domains for core competencies needed to provide adequate VC: I) Communication and 'webside' manner, II) Scope and standards of care, and III) Virtual clinical interactions. Creation or adoption of a VC-

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specific curriculum for residents, similar to Ha and colleagues[19], would also be helpful. Their curriculum included a didactic lecture and a quick reference handout for conducting a VC visit covering topics such as logistics, technology set-up, etiquette, effective communication, virtual physical exam, documentation, and staffing with an attending.[19]

In our study, participants were often challenged by logistical considerations including the lack of existing infrastructure and technology, time constraints, and a lack of dedicated VC spaces. These factors reflect the 'Care settings' and 'Experiences' components of the provider satisfaction framework.[5] They encompass the lack of technical support faced by providers, as well as limited software, hardware and technical support/training. Participants provided several recommendations to help address these challenges and to improve the implementation and uptake of technology for VC (Table 6). Our findings are similar to prior studies, which explored barriers to the uptake of VC and found that user experience with technologies and technological limitations were key factors in satisfaction with VC.[20,21]

Strengths and Limitations

Strengths of our study included recruitment of participants from surgery and medicine specialties and training programs, and participants with variable VC experiences, ranging from not participating in VC to conducting most of their ambulatory clinics virtually. Additionally, our research team included clinicians, medical education scholars, and qualitative methodologists to ensure a rigorous methodological approach. We included participants with different demographic characteristics such as age, gender, practice experience, and training level to increase the likelihood of a representative sample within our institution. However, the single-center nature of this study may limit the representativeness of the results outside of Queen's University and to disciplines outside of surgery and medicine. Further, we must acknowledge the limitation of self-reported data given that participants were asked to describe their VC practices. Researchers could benefit from observing VC teaching and learning interactions in order to better understand how to support faculty and learners. Our study also focused on experiences during one point in time and thus we were unable to capture the evolution or longitudinal changes in teaching, learning, or assessment during VC encounters. We collected data earlier in the COVID-19 pandemic, and teaching and assessment practices may have evolved as faculty gained experience with VC.

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Conclusion and Future Directions

The pandemic and resultant rapid transition to VC has transformed residency education by changing teaching and assessment in ambulatory settings. Increased use of video technologies with IT support, creation of VC-specific EPAs, and instructional guidelines on how to conduct VC are key recommendations to facilitate training of residents who are competent in providing safe, high-quality, and effective VC to their patients. A lack of notable differences between provider demographic groups suggests that these may not play an important role in the adoption of VC, but additional studies are required to confirm this hypothesis.

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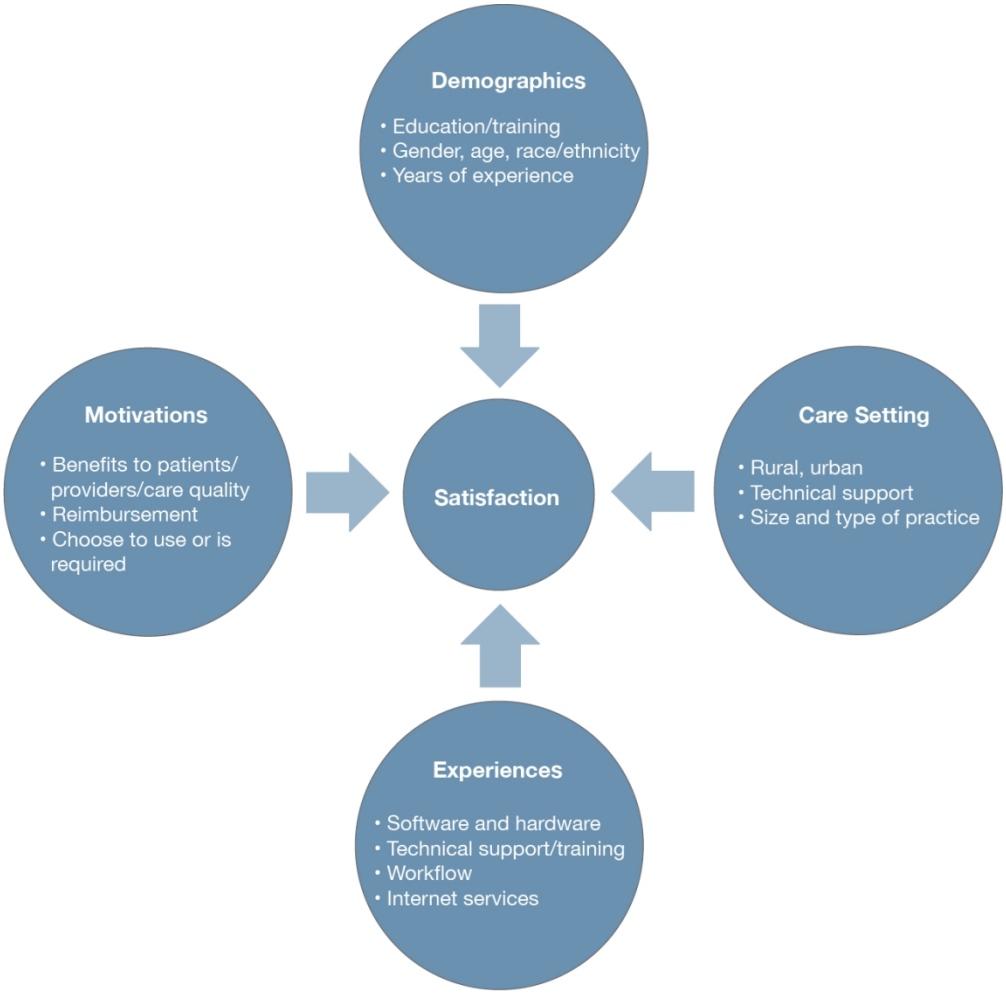

Figure 1: Law et al. 2019 conceptual framework for telemedicine provider satisfaction. Reproduced with permission.

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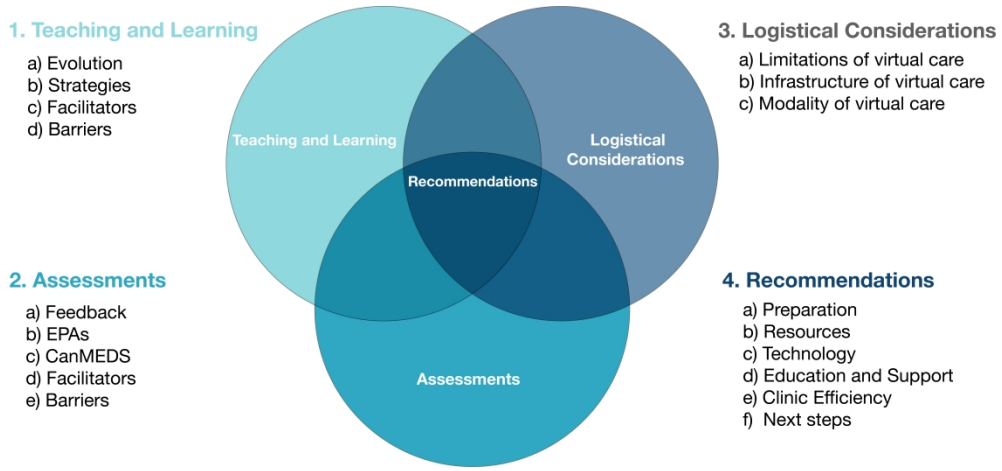

Figure 2: Integration of all themes and subthemes of resident and faculty experiences using virtual ambulatory care.

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Table 1. Demographics of participants

	Faculty participants	Resident participants
Total number	17	20
Department:		
Surgery	9	10
Medicine	8	10
Mean age (SD):	38.0 (8.6)	29.0 (5.4)
Sex:		
Male	9	9
Female	8	11
Postgraduate Year (PGY) [%]:		
PGY-1	N/A	7 [35%]
PGY-2		3 [15%]
PGY-3		6 [30%]
PGY-4		1 [5%]
PGY-5		3 [15%]
Mean years in practice (SD)	10.1 (7.8)	N/A

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Table 2. Theme 1: Teaching and Learning – sub-themes identified in interview data with quotes.

Theme 1: Teaching and Learning	
Sub-theme:	*Example Quotations:*
Evolution	So, for the virtual one it is very similar in that they will do all the gathering of information, synthesizing the information, and making the plan. And then we will review that. And the only difference is that I will call the patient back if I am not happy or if we are missing information. But if the plan is good and the resident is comfortable then they will call the patient back. (F14)
Strategies	I have [the resident] find a phone and a computer so that they can independently review their patients for the day and make phone calls...we typically have a phone conversation to review the patient and then we conference call the patient together.... depending on their level of training, I may get them to do the explanations of the plan to the patient or I may do it while they listen. (F4)
Facilitators	"...doing the teaching part when you have nothing to do, so you do a chalk board session...you never used to have any time to do that" (F17)
Barriers	"...I think the impact on the learning is mainly in terms of the volume of people that I am seeing and I am not able to practice my approaches..." (R1)

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Table 3. Theme 2: Assessment – sub-themes identified in interview data with quotes

Theme 2: Assessment	
Sub-theme:	*Example Quotations:*
Feedback	"We get feedback from cases and then also in some of the EPA assessments there is narrative." (FG1)
EPAs	"I think that is hard to answer because we don't actually have very many assessments related to clinics in general. All of my EPAs are related to surgical techniques and so I don't have many related to who I see in the clinic." (R2)
CanMEDS	"I think it is harder to assess the leader roles and the collaborative ones virtually because there are less opportunities for those integrated collaborative experiences virtually with those that are best suited for evaluation in-person or with a team." (F5)
Facilitators	"the process of doing EPAs is supported by this whole new virtual environment...these kinds of exchanges will be done online whenever possible." (FG2)
Barriers	"The lack of time to do direct observation in the clinic [is one of the biggest barriers]; I have never figured out how to make that better." (F14)

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Table 4. Theme 3: Logistical Considerations – sub-themes identified in interview data with quotes

Theme 3: Logistical Considerations	
Sub-theme:	*Example Quotations:*
Limitations of Virtual Care	"There were just too many logistical problems with [having residents in] virtual care... I essentially gave up trying to involve residents in the virtual clinic and just switched them to in-person clinics." (F6)
Infrastructure of Virtual Care	"Having to use patient rooms to create a private space for residents to go and do phone calls...Because we don't want to do a patient call in a team room where other people could be listening in and where it could be compromising patient privacy but also disruptive to the team." (F5)
Modality of Virtual Care	"The fact that [the] telephone clinics are not OTN or video clinics is a problem and we don't have really good resources in place to support that. So, I think it would be easier to do a virtual clinic where I could see the patient and the resident talking at the same time on the screen in more sophisticated ways." (F3)

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Table 5. Theme 4: Recommendations – sub-themes identified in interview data with quotes

Theme 4: Recommendations	
Sub-theme:	*Example Quotations:*
Preparation	"[Look] at the list that you are going to assign the residents the night before...look at what learning objectives you want the residents to get out of each case. And you could either assign readings around that or tell the residents, these are the objectives that you need to know. Do whatever it takes to figure it out." (F8)
Resources	"having [a] dedicated space for where these clinics are being conducted, [for example] clinics that were previously for in-person clinics [could] now become a [virtual care] station." (R2)
Technology	"And those technologies need to be better streamlined, easier to access for patients, less work for the secretary to be able to book the patients and support the patients. We need better virtual technologies where the patients find them easier to use and require less support. And they need to have requirements for less bandwidth so that they don't crash and there are not so many audio-visual barriers and challenges to getting through them successfully." (F5)
Education and Support	"I would say maybe having a formal organized approach about how we should be doing these types of assessments. Maybe having for example, a brief introduction early on about how we can maybe simplify that type, because I feel that each person is doing it on [their] own experience." (FG1)
Clinic Efficiency	"When you shift to virtual it takes longer for everything. It takes longer to get set up with the patients and it takes longer to contact them and to communicate…" (F8)
Next Steps	"I think [virtual care] will be something that I will offer patients [in my future practice]. I don't think it is a lot more convenient for physicians, but for patients it is something that we can offer them...I think it is going to be part of my practice next year." (R7)

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Table 6. Key recommendations to improve teaching and learning in virtual ambulatory clinics

Recommendation	Potential impact on residency education
1. Improve video technologies and IT support	The use of video technology will allow providers to incorporate aspects of the physical exam and to establish rapport with patients. This will allow faculty to directly observe the resident-patient encounter, facilitating resident assessment and feedback.
2. Increased teaching supports for faculty to include residents in virtual care	Increased teaching supports for faculty including guidelines on teaching using VC, increasing teaching time, and administrative support, would allow faculty to dedicate more time to teaching residents using VC, and help residents develop VC-specific competencies. Teaching supports may also aid faculty in structuring and conducting their VC clinics.
3. Provide residents with tools and instructional guidelines to approach VC patient encounters	Tools and frameworks on conducting VC such as those developed for family medicine residents,[19] that mirror those provided and taught for in-person encounters, would enhance residents' ability to conduct virtual encounters, facilitate their learning, and develop competencies. Similar tools for each specialty may improve patient interactions specific to each discipline.
4. Optimize physical space and train administrative personnel for VC clinics	Provide dedicated and private space for VC clinics would increase opportunities for residents to participate in virtual ambulatory care, increase clinic efficiency and ensure patients' confidentiality. Additionally, training administrative personnel to schedule and support video-based VC clinics would increase uptake and use of video conferencing technologies.
5. Create EPAs specific for VC	The creation of VC-specific competencies and EPAs would ensure that residents are being assessed on competencies relevant to VC encounters. This will also facilitate constructive feedback and direct observations for VC-specific competencies.

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Appendix A. Phenomenological approach and researcher reflexivity

Approach

A phenomenological approach was taken, focusing on individuals' lived experiences,[1] to understand the experiences of residents and faculty with the transition to virtual ambulatory care. VC consisted of both video and telephone based clinical interactions. This approach centers on both 'what' the experience was and 'how' it was experienced by the interviewees.[2] In particular, a hermeneutic phenomenological approach allowed understanding of themes that emerged from the experiences and interpreting these iteratively to provide insight into the experience of teaching and learning in a virtual clinical environment.[3] Consolidated Criteria for Reporting Qualitative Research (COREQ) was used to guide the reporting of this qualitative research.[4] Ethics approval was obtained from the Queen's University and Affiliated Hospitals Health Sciences Research Ethics Board (HSREB).

Researcher Reflexivity

Within the context of this study, members of the research team were involved in face-to-face virtual contact with study participants and thus had to consider the ways their interactions with participants were shaped by their own professional background and experiences. Both interviewers (RL and JH) were second year medical students at Queen's University trained to conduct interviews by HB, a health education research associate (HERA) affiliated with the Queen's University office of Professional Development and Educational Scholarship. The interviewers and HERA were not associated with the residency programs to mitigate potential bias.[5] Faculty and residents were made aware that a medical student would be conducting the interviews, provided their identity, and given the option to request an alternative interviewer. If a faculty member had a professional relationship with their interviewer, further consent was obtained. The research team also consisted of faculty from the Departments of Surgery and Medicine, as well as two residents (EK, SB); however, only members of the research team external to the departments conducted the interviews. Throughout the data analysis process, the researchers most closely involved with data collection and analysis (JH, RL, HB) met with members of the wider research team to discuss emerging codes, themes, subthemes, interpretations, and potential new lines of enquiry, thereby drawing on the combined insights of those closely handling the data and members of the team with the wider perspective of clinical

and educational experience. Members of the research team involved in data collection (JH, RL, HB) were sensitive to the possibility that focusing on the barriers to education could potentially provoke distress in the research participants concerning the disclosure of negative experiences. Interviewers ensured that participants felt comfortable sharing their thoughts at the beginning of each interview, and that all participant information remained confidential.

Coding

Thematic coding was performed independently by three researchers (HB, RL and JH). A diverse sample of transcripts from interviews and focus groups across participant groups and specialties were selected for comparison to ensure inter-coder reliability. In preliminary coding, the three researchers coded half of an interview together, and coded the other half independently to compare. This generated a preliminary codebook that was used for coding a sample of two more transcripts independently. The researchers agreed on 98% of the codes and discussed the remaining 2% until consensus was reached about the meaning. This resulted in a consensus-built codebook that was used by two researchers (JH and RL) to code the remaining data. All researchers conducted axial coding and concept grouping; throughout this process themes emerged.[6] When themes began to repeat and no new findings emerged, it was determined that data saturation had been reached.

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Appendix B. Interview guide for residents

The purpose of this interview is to gain a better understanding of resident and faculty experiences during the COVID-19 pandemic. We are particularly interested in learning about your experiences as they relate to teaching, learning and assessments using virtual care during this time. If you have not been able to participate in any in-person ambulatory clinical activities due to ongoing requirements for physical distancing, we ask you to please reflect on your experience with in-person ambulatory clinical encounters prior to the COVID-19 pandemic. Your identity and any identifying information will be kept confidential and you will be provided a unique study ID to ensure confidentiality is maintained. Any opinions or statements you make during this focus group/interview will not be attributed directly to you. Participation in this study is voluntary, and you can choose not to answer any question. This focus group/interview will be audio recorded and transcribed for the purpose of this study. We will be asking a series of open-ended questions, but please feel free to elaborate and reflect as you feel necessary. You may choose to stop your participation at any time for any reason without penalty. Consenting to participate in this study will not affect your legal right in any way. Before we begin, I would like to confirm that you received a letter of information and consented to participate in this study? And Do you consent to this interview being recorded?
I will start the recording now. Your unique participant ID is _____ and the date and time is _____.

1. How does your day look when you are doing virtual patient care in an ambulatory clinic?
(e.g. general surgery clinic, orthopaedic clinic, GIM clinic?)

2. Tell us about your current residency experiences with virtual patient care for ambulatory
clinics since the start of the changes with the Covid-19 pandemic.
    a. How is virtual care similar to in-person care, if at all?
    b. How is virtual care different to in-person care, if at all?

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3. How did your teaching and learning in ambulatory clinics using virtual patient care evolve as the pandemic progressed? (Prompts)

a. What has been your level of exposure to clinical cases? Has the volume stayed the same or changed?

b. How has your learning environment changed?

c. How has your program support changed?

PROBE: number of clinical cases encountered, preceptor's teaching in clinics, program support, changes in the learning environment and program culture

4. How did assessments during virtual ambulatory clinics using virtual patient care evolve
as the pandemic progressed?

a. To what extent have you been able to receive completed assessments (EPAs)?

b. What does your feedback look like right now?

c. How has virtual care impacted your ability to have direct observations for assessments?

d. Are you concerned about being able to satisfy your EPA requirements for promotion? Please explain why or why not.

PROBE: receive completed EPAs, quality of feedback, direct observation for assessment.

5. Please describe any barriers to [insert a, b, c] during virtual patient care in ambulatory clinics patient care, if any:

a. Teaching

b. Learning

c. Assessment strategies during virtual patient care?

6. Please describe any facilitators to [insert a, b, c] during virtual patient care in ambulatory
clinics, if any:

a. Teaching

b. Learning

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c. Assessment strategies during virtual patient care?

7. Are there any strategies that you are using now for [insert a, b, c] that you will continue to use post- COVID-19 pandemic?

a. Teaching

b. Learning

c. Assessment

8. If you do not participate in virtual patient care in virtual ambulatory clinics, how could this be implemented in your residency program?

9. How can the residency program further support you in your learning during virtual patient care?

10. What recommendations do you have for your peers to optimize their clinical experiences, and learning and assessment opportunities during virtual patient care?

11. Do you feel the current version of the EPAs is compatible with assessments made during virtual patient care in an ambulatory setting? Please explain.

12. Is there anything else you would like to add that we have not already discussed?

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Appendix C. ***Interview guide for faculty***

The purpose of this interview is to gain a better understanding of resident and faculty experiences during the COVID-19 pandemic. We are particularly interested in learning about your experiences as they relate to teaching, learning and assessments using virtual care during this time. If you have not been able to participate in any in-person ambulatory clinical activities due to ongoing requirements for physical distancing, we ask you to please reflect on your experience with in-person ambulatory clinical encounters prior to the COVID-19 pandemic. Your identity and any identifying information will be kept confidential and you will be provided a unique study ID to ensure confidentiality is maintained. Any opinions or statements you make during this focus group/interview will not be attributed directly to you. Participation in this study is voluntary, and you can choose not to answer any question. This focus group/interview will be audio recorded and transcribed for the purpose of this study. We will be asking a series of open-ended questions, but please feel free to elaborate and reflect as you feel necessary. You may choose to stop your participation at any time for any reason without penalty. Consenting to participate in this study will not affect your legal right in any way. Before we begin, I would like to confirm that you received a letter of information and consented to participate in this study? And Do you consent to this interview being recorded? I will start the recording now. Your unique participant ID is _____ and the date and time is _____.

1. How does your day look when you have a resident in your virtual ambulatory clinic?
2. How do you structure your virtual ambulatory patient clinic when you have resident learners?
    a. How is this structure different from your in-person ambulatory patient clinics?
    b. Please explain.
3. How did your teaching approach during virtual ambulatory clinics evolve as the COVID-19 pandemic progressed?
    a. Have residents been attending your virtual care ambulatory clinics?

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b. What did you do to adapt to teaching during an ambulatory virtual patient clinic?

4. How did your assessments of the residents in virtual ambulatory clinics change? PROBE: quality, quantity
    a. To what extent have you been able to complete required assessments (EPAs)?
    b. What does your feedback to the residents for virtual patient care look like right now?
    c. How has virtual patient care impacted your ability to perform direct observations for resident assessments?
    d. Are you concerned about residents being able to satisfy their EPA requirements for promotion for ambulatory clinics due to the COVID-19 pandemic? Please explain why or why not and how virtual care plays a role.
5. Do you feel the current version of the EPAs are compatible with assessment milestones as it pertains to competencies in running virtual ambulatory care clinics? Please explain
6. Please describe any barriers to [insert a, b, c] of residents during virtual patient care in ambulatory clinics, if any:
    a. Teaching
    b. Assessment strategies during virtual patient care?
7. Please describe any facilitators to [insert a, b, c] of residents during virtual patient care in ambulatory clinics, if any:
    a. Teaching
    b. Assessment strategies during virtual patient care?
8. If residents do not participate in virtual ambulatory clinics, how can this gap in resident education be addressed? How can we provide adequate ambulatory experience for residents?
9. What recommendations do you have for your peers to optimize their teaching of residents during virtual ambulatory patient care?
    a. Do you have recommendations to optimize efficiency in the clinic?

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b. Any other recommendations?

10. What recommendations do you have for your peers to optimize their assessments of residents during virtual ambulatory patient care?
11. How can faculty further support and optimize resident learning during virtual patient care?
12. Are there any strategies that you are using now for [insert a, b] for virtual ambulatory clinics now that you will continue to use post COVID 19 pandemic?
    a. Teaching
    b. Assessment
13. How can the university and the Faculty of Health Sciences support you (the faculty) in resident teaching and assessments during virtual ambulatory patient care?
14. How has increasing the use of virtual care for ambulatory patient care impacted your ability to assess residents' CanMEDS competencies (other than medical expert)? Please explain.
15. Is there anything else you would like to add that we have not already discussed?

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