

Editor's key points

- ▶ The rapid virtualization of primary care services during the COVID-19 pandemic has required health systems to rethink the delivery of care, but how virtual visits impact clinical work flows is unclear.
- ▶ Physicians expressed various views regarding how virtual visits impacted their processes, which might reflect the variation of primary care practice types and available administrative or team-based supports within organizations.
- ▶ Those who were able to leverage in-house or external implementation support had more success in rostering a larger volume of patients to virtual visits and reported improvements in work flow and clinic efficiencies.
- ▶ Having dedicated time for implementation, emphasis on asynchronous secure messaging, and structured change management support could improve physician uptake and practice efficiencies.

Impact of virtual visits on primary care physician work flows

Jamie K. Fujioka MPH Megan Nguyen PhD RN MSN Michelle Phung MSc
Onil Bhattacharyya MD PhD CCFP Leah Kelley JD Vess Stamenova PhD
Nike Onabajo MSc Michael Kidd AM FAHMS Laura Desveaux PT PhD
Ivy Wong MPA R. Sacha Bhatia MD MBA FRCPC Payal Agarwal MD CCFP

Abstract

Objective To understand the impact of virtual visits on primary care physician (PCP) work flows.

Design Qualitative semistructured interviews.

Setting Primary care practices within 5 regions in southern Ontario.

Participants Physicians representing primary care practices of various sizes and remuneration models (eg, capitation and fee-for-service models).

Methods Interviews were conducted with PCPs involved in a large-scale pilot project implementing virtual visits (via a Web-based application) into clinical practices. Convenience and purposive sampling were used to recruit PCPs between January 2018 and March 2019. To obtain a representative sample, participants were sought from a variety of practice types and geographic regions. High and low users of virtual visits were included. Interviews were audiorecorded and transcribed. An inductive thematic analysis was used to identify prominent themes and subthemes.

Main findings Twenty-six physicians were interviewed (n=15 using convenience sampling and n=11 through purposive sampling). Four themes were identified: PCPs employ diverse approaches to integrate virtual care into their work flow; PCPs recognize that implementing virtual visits requires upfront time and effort but have variable perceptions regarding long-term impact of virtual care on processes; asynchronous messaging is preferable to synchronous audio or video visits; and strategies were identified to improve the integration of virtual visits.

Conclusion The potential of virtual care to improve work flow is dependent on the way these visits are implemented and used. Dedicated time for implementation, emphasis on using asynchronous secure messaging, and access to clinical champions and structured change management support were associated with more seamless integration of virtual visits.

Impacts des visites virtuelles sur le déroulement du travail des médecins de soins primaires

Jamie K. Fujioka MPH Megan Nguyen PhD RN MSN Michelle Phung MSc
Onil Bhattacharyya MD PhD CCFP Leah Kelley JD Vess Stamenova PhD
Nike Onabajo MSc Michael Kidd AM FAHMS Laura Desveaux PT PhD
Ivy Wong MPA R. Sacha Bhatia MD MBA FRCPC Payal Agarwal MD CCFP

Résumé

Objectif Comprendre les impacts des visites virtuelles sur le déroulement du travail des médecins de soins primaires (MSP).

Type d'étude Des entrevues qualitatives semi-structurées.

Contexte Des pratiques de soins primaires dans 5 régions du sud de l'Ontario.

Participants Des médecins représentant des pratiques de soins primaires de différentes tailles et ayant divers modes de rémunération (p. ex. modèle forfaitaire par patient et par rémunération à l'acte).

Méthodes Des entrevues ont été effectuées avec des MSP participant à un projet expérimental à large échelle pour implanter les visites virtuelles (au moyen d'une application sur le Web) dans des pratiques cliniques. Des échantillonnages de convenance et intentionnels ont été utilisés pour recruter des MSP, entre janvier 2018 et mars 2019. Dans le but d'obtenir un échantillonnage représentatif, nous avons cherché des participants provenant de divers types de pratiques et de différentes régions. De forts et de faibles utilisateurs des visites virtuelles ont été inclus. Les entrevues ont fait l'objet d'un enregistrement sonore et d'une transcription. Une analyse thématique inductive a servi à dégager les principaux thèmes et sous-thèmes.

Principales constatations Un total de 26 médecins ont été interviewés (n=15 par échantillonnage de convenance et n=11 par échantillonnage intentionnel). Quatre thèmes ont été cernés : les MSP utilisent diverses approches pour intégrer les visites virtuelles dans le déroulement de leur travail; les MSP reconnaissent que l'implantation des visites virtuelles exige du temps et des efforts au début, mais ils ont des perceptions différentes concernant les impacts à long terme des soins virtuels sur les processus; la messagerie asynchrone est préférable aux visites synchrones par audio ou vidéo; et des stratégies ont été identifiées pour améliorer l'intégration des visites virtuelles.

Conclusion Le potentiel qu'ont les soins virtuels d'améliorer le déroulement du travail dépend de la façon dont ces visites sont mises en œuvre et utilisées. Du temps consacré à l'implantation, un accent mis sur des messages asynchrones sécuritaires et l'accès à des champions cliniques, de même que du soutien structuré en gestion du changement étaient associés à une intégration plus homogène des visites virtuelles.

Points de repère du rédacteur

► La virtualisation rapide des services de soins primaires durant la pandémie de la COVID-19 a exigé des systèmes de santé qu'ils révisent la prestation des soins, mais les répercussions des visites virtuelles sur le déroulement du travail clinique demeurent incertaines.

► Les médecins ont exprimé différents points de vue sur la façon dont les visites virtuelles ont influé sur leurs processus, ce qui est peut-être le reflet de la variation dans les types de pratiques en soins primaires, et dans les soutiens administratifs ou en équipe accessibles au sein des organisations.

► Les médecins qui ont pu obtenir un soutien interne ou externe pour la mise en œuvre ont mieux réussi à transférer un nombre plus élevé de patients vers des visites virtuelles, et ont signalé des améliorations dans le déroulement du travail et l'efficacité clinique.

► Le fait de consacrer du temps à la mise en œuvre, l'accent mis sur des messages asynchrones sécuritaires et la disponibilité d'un soutien structuré à la gestion du changement pourraient améliorer l'adhésion des médecins et l'efficacité de la pratique.

Virtual visits in primary care have proven to be an invaluable tool during the COVID-19 pandemic,¹⁻³ and many physicians anticipate they will become a ubiquitous mode of care delivery.⁴ However, clinics have been forced to implement virtual visits out of necessity and at a fast pace, so optimal operationalization of virtual visits has yet to be determined. Importantly, how virtual visits impact the organization of work in primary care settings is not well known. While research has established that virtual visits in primary care can offer benefits such as improved convenience, patient satisfaction, and patient access to care,⁵⁻⁷ current evidence regarding their impact on clinical work flows is mixed at best. A systematic review suggests that virtual visits require extensive changes to work practices and substantive time for training in new techniques, and that these demands affect both the efficiency and the effectiveness of care.⁸ Conversely, other studies have reported that virtual visits can potentially improve communication, information flow, and work organization in primary care settings.^{7,9} Most studies have also concentrated on a single health care organization¹⁰⁻¹² and used in-clinic appointment frequencies as the primary metric for work flow impact with minimal consideration given to effects on broader daily routines.¹¹

We conducted a qualitative study to better understand how the integration of virtual visits (consultations via asynchronous messaging [such as texting or online messaging], synchronous telephone calls, and synchronous video communication) affects the clinical work flows of primary care physicians (PCPs) across heterogeneous practices in Ontario. We defined *work flow* as the orchestrated activities, resources, and communication and information processes required to operationalize organizational goals.¹³ To our knowledge, this is the first study to use qualitative methods to examine both the ways in which PCPs coordinate their work activities to deliver a multimodal virtual service and the subsequent effects of that service on clinic work flows within Canada. While this study was conducted before the rapid virtualization of health services during the COVID-19 pandemic, the results provide valuable insight on how virtual visits can be integrated into clinical practice to deliver care conveniently and efficiently.

— Methods —

Study background

Primary care physician perspectives on work flow impacts were gathered from the Enhanced Access to Primary Care pilot project.¹⁴ This study is an extension of our work on PCP perspectives on the clinical utility of virtual visits.¹⁵ Launched in September 2017, the pilot project was implemented by the Ontario Telemedicine Network (OTN) and funded by the Ontario Ministry of Health and Long-Term Care to enhance patient access to their PCPs through virtual visits. The pilot was implemented

in 5 regions in southern Ontario, including urban, suburban, and rural areas. Registered patients of PCPs enrolled in the pilot could request a visit by detailing their medical issue and preferred communication modality (asynchronous messaging or synchronous consultations) using a Web-based application. Primary care physicians were advised to respond to patient requests within 2 business days. Physicians received compensation for completed visits using billing codes that were implemented by the OTN solely for use in this program.

Over the course of this initiative (September 2017 to March 2019), 194 PCPs and 6355 patients conducted at least 1 virtual visit.¹⁶ More than 80% of the visits were conducted using secure asynchronous messaging alone, while the remainder occurred via audio or video calls, or a combination of both.

Recruitment and data collection

Convenience and purposive sampling were used to recruit PCPs between January 2018 and March 2019. All participants in the pilot program provided informed consent to be contacted for research purposes prior to enrolment. Researchers (J.K.F. and L.K.) sent recruitment e-mails to providers based on the Enhanced Access to Primary Care project registration data. Implementation team members from the OTN also referred potential participants. To obtain a representative sample, participants were sought from a variety of practice types (eg, fee-for-service and capitation models) and geographic regions. We also sought both high and low users of virtual visits. Semistructured interviews were conducted over the telephone by 3 researchers (J.K.F., M.N., and L.K.). Questions were open ended and asked about PCPs' perceptions on the integration of virtual visits within their clinical routines and the impact of virtual visits on their overall workload. Interviews were 30 to 60 minutes in duration. This study was formally reviewed by the chair of the Research Ethics Board at Women's College Hospital in Toronto, Ont, and was deemed exempt from approval.

Data analysis

All interviews were audiorecorded and transcribed verbatim. An inductive thematic analysis was performed to identify themes that emerged from line-by-line coding and close analysis of the data.¹⁷ Two researchers (J.K.F. and M.N.) independently coded 3 transcripts to develop a preliminary coding framework using NVivo 12 qualitative data analysis software. Three researchers (J.K.F., M.N., and M.P.) then applied the coding framework to the remaining transcripts. The coding framework was iteratively developed to reflect emerging and recurring themes. After all the transcripts were coded, 4 researchers (J.K.F., M.N., M.P., and P.A.) thematically organized the codes into superordinate themes and subthemes. These authors also met regularly throughout the coding process to ensure the integrity and consistency of coding.

— Results —

Twenty-six physicians were interviewed (n=15 through convenience sampling and n=11 through purposive sampling). Three PCPs from the same practice requested to be interviewed collectively, while the remainder were interviewed individually. Twenty-three of the participants were part of a capitated funding model, and 3 were part of a fee-for-service model.

Four themes emerged from the thematic analysis of the transcripts (Table 1).

Theme 1. Primary care physicians employ diverse approaches to integrate virtual care into their work flow. Initially, most PCPs invited patients on an individual basis, focusing on those they perceived to be best suited for and most likely to benefit from virtual visits, so that the number of patients invited varied across participants. As their comfort with the technology improved and after they had gained experience conducting virtual visits, many PCPs increased the number of invited patients. Higher-frequency users of the platform tended to offer virtual visits to their entire roster by inviting patients through e-mail or by providing a sign-up option through their website.

In terms of scheduling, some participants reported blocking designated time on a daily or weekly basis for virtual visits. More commonly, PCPs responded to requests on an ad hoc basis using asynchronous messaging. However, some believed they would need dedicated time for virtual care if the volume of virtual visits increased. Visit structure varied, with some PCPs leveraging administrative or nursing staff to help triage and coordinate patient requests and others using the tool independently as they navigated early adoption.

Theme 2. While PCPs agree virtual visits require an upfront investment of time and effort, they have variable perceptions regarding their long-term impact on work flow. While methods for onboarding patients to virtual care evolved throughout the pilot, most PCPs expressed that registering and training patients entailed a substantial administrative burden. However, some perceived this to be an inevitable “growing pain” associated with any notable practice change that would confer downstream benefits after time and experience with the tool. Several physicians, especially those who rostered a larger proportion of their clinic online, indicated that asynchronous messaging saved them time, enabled them to conduct more visits in a day, and would allow them to increase their roster in the future. Further, most PCPs believed virtual visits could generate efficiencies by diverting clinical encounters that do not require an in-person assessment to asynchronous messaging (eg, follow-up visits for a previous diagnosis, medication renewals, or referrals for laboratory testing). However,

other participants stated that virtual visits did not save them time, primarily due to the lack of electronic medical record (EMR) integration of the platform, which meant that PCPs needed to document in both systems.

Individual and organizational factors influenced perceptions regarding impact on workload and work hours. Some PCPs believed the perceived effect was likely to depend on how much providers blurred the lines between their personal and work lives. In some cases, PCPs were already accustomed to frequent e-mail or text messaging communication with patients, and thus believed that virtual visits did not substantially change their work flow. Organizational readiness for change was highly variable among practices and influenced the time and effort required for implementation. Some larger clinics experienced challenges in enacting the technology, including generating organizational consensus on implementation, operating with a lack of support staff capacity, and working in a culture that was resistant to embracing digital solutions. Physicians in these larger clinics often had a higher burden of coordinating and conducting virtual visits with less administrative support. Practices with a high relative volume of virtual visits had strong leadership support, clinical champions (ie, someone who is highly respected in their field of expertise and possesses the skills and knowledge necessary to influence and inspire others to adopt new and innovative practices within their organization) supportive of virtual care, and dedicated time and resources for this work.

Theme 3. Asynchronous messaging integrates better into PCP work flows. Asynchronous messaging was overwhelmingly preferred by the participants, as it offered PCPs convenience and flexibility in responding to patients. Many PCPs also commented on how this modality allowed them time to think of an informed response and was also a more convenient option for patients, translating into enhanced quality of care while simultaneously improving access for patients. However, the time required to complete a visit depended on the frequency of messages, whether consultation with another provider or specialist was required, if the visit was a specialized type of visit (eg, palliative care or mental health follow-up), or if technical issues arose.

Many participants stated it was challenging to schedule and commit to online audio or video visits, especially if they were running behind schedule. While there was generally little interest among the PCPs in using video, some acknowledged its value in resolving dermatologic issues and other rare visits that require a visual, but not physical, assessment. Similarly, a subset of PCPs discussed how telephone-based communication was useful to quickly resolve a patient concern that might be too complex to discuss through messaging. However, some participants stated that it was more convenient to call a patient directly using their

Table 1. Representative quotations from participants, by theme and subtheme

THEME	QUOTATION
<p>PCPs employ diverse approaches to integrate virtual care into their work flow</p> <ul style="list-style-type: none"> • Select patients onboarded to virtual care vs offering virtual care to entire roster • Ad hoc scheduling vs blocked time • Individual vs team approach 	<ul style="list-style-type: none"> • “So we agreed, between my nurse and I, this [patient] is a good one or this [patient] is not a good one. And so, we’re doing it very, sort of, cherry picking those we think it would work well with” • “I have opened it up to all patients on our website now as of last week. It’s on our website now. A patient can just go and sign up” • “Yeah, so for myself, I haven’t set aside particular times for virtual visits ahead of time, so I don’t have blocks in my schedule that say this is an hour set aside for virtual visits” • “What we’re currently at is me allocating a portion of my schedule per week to doing virtual care. That’s currently allocated to actually only an hour per week, and that’s mainly meant for [telephone] and video communication at predetermined times” • “With the tool, because we haven’t trained the admin to use the tool, it means that the docs are processing all the incoming correspondence. And the patients have been pretty good with not sending in administrative stuff” • “My staff puts the calls, they triage them all the time. And sometimes they’ll recognize something is more urgent, and they might interrupt me on something. But most of the time they’re able to handle it, because we also have a nurse. And I actually envision that in some way there would be a triage within this as well”
<p>While PCPs agree virtual visits require an upfront investment of time and effort, they have variable perceptions regarding long-term impact on work flow</p> <ul style="list-style-type: none"> • Upfront investment of time and effort required for change management • Perceived impact on work flow and work hours is variable • Perceived impact on work flow might depend on individual (eg, work-life boundaries) and organizational (eg, baseline clinic volumes) factors 	<ul style="list-style-type: none"> • “Whenever you’re making a change to your practice it’s a barrier, because you’re trying to communicate to patients; it’s time consuming to explain to them how to register and maybe they don’t want to; they don’t understand it” • “The major difficulties are actually not to do with the technology at all. It really, it’s about how do you implement a completely different process into someone’s busy clinic. You’re seeing 20 to 30 patients a day in quick succession, and the question is, well, now you’re adding virtual visits to that, how is that going to work? Because you’ve got to still deal with the regular stuff, and now you’re dealing with things coming in virtually, you need to see patients on video, and you’re getting messages, how do you balance that?” • “It’s been a lot of work to migrate patients from a system that our patients know [and] may have been always trained and knowledgeable on, into a completely unknown system” • “For a family doctor visit, a lot of things you don’t have to see face-to-face. Some of the things, like minor things, or skin things, they can have a picture, show me, or send me a video clip, then I can make a suggestion that I would if they were there. So, [virtual visits] really reduce my workload. I mean, [they] reduce my patient office visit[s] by 30%, even more” • “I think I’ve had a couple [virtual visits] come through and I’ve kind of squeezed them into my work day. It’s not all that time consuming. It doesn’t take long to launch the platform if you’re in front of a computer. It doesn’t take long to respond so it’s not a huge work flow issue. It’s outside our normal processes. That takes some time to get used to and see how that kind of fits in” • “I think for myself this sometimes does feel like a bit more work on top of the work that I’m already doing. And part of it is that the platforms don’t mix, the [electronic visit] program does not sync up to my EMR, so despite going into the [electronic visit program] to do all of this I still have to go back into my EMR in order to make sure that is updated” • “It really hasn’t added any extra difficulty to my day. I think there’s a little bit of an issue in terms of having 1 more boundary broken down between work and life. I happen to be a physician who has almost no boundaries between work and life anyway. But for many people, I can see them being frustrated with this because it doesn’t keep work time as work time and family time as family time quite as easily” • “I think the barrier for physicians is the time you have to put into [virtual visits]. Because it depends on how physicians practise as well ... I can imagine a busier family practice, there would be no time to do that, and so you would have to carve out time in your own schedule to do so. I think to manage how easy it is to implement for different family care providers would be different based on the practice model and their preference”

Table 1 continued on page e91

Table 1 continued from page e90

THEME	QUOTATION
<p>Asynchronous messaging integrates better into PCP work flows than do audio or video visits</p> <ul style="list-style-type: none"> Asynchronous messaging is efficient and can save time <p>Audio and video visits require scheduling and specific technology</p>	<ul style="list-style-type: none"> “There is a succinctness to it [asynchronous messaging], right. I personally hate the [telephone] so the kind of text format I use a lot in my personal life and there is a succinctness to it where you can clarify things quickly. You can ask very specific questions, a list of questions. Patients of our generation are used to using text format, e-mails, and that kind of thing. I think in that way it can be helpful in kind of drilling down very quickly on what is going on and asking your red flags and that kind of thing” “I like messaging because of the asynchronous nature of it. It does allow me to answer when I have free time rather than the call, [which] is good for this certain time, or an appointment that I can schedule when I have convenience” “When I wanted to have a [telephone] conversation for a visit with a patient and it occurred over [electronic visit], I would just send them our own personal internal link and then they would book externally at the [EAPC] tool. I've never even touched a schedule with [the EAPC platform]. There's no point, because ours is directly integrated into our EMR” “I think the whole scheduling thing becomes an issue with video where what I like about even e-mail over [telephone] calls is that I can do it any time, and I don't have to worry. The biggest issue with [telephone] calls is if I try and call someone back, then I get their answering machine, and then they call me back and I'm with a patient, it just seems to go on and on, where with the messaging, you don't have that issue, obviously”
<p>Strategies to improve the integration of virtual visits into PCP work flows</p> <ul style="list-style-type: none"> Clinical champions to demonstrate work flows <p>Structured change management support</p> <p>Key technology features</p>	<ul style="list-style-type: none"> “And there's a work flow integration piece, having the [physician] explain, and it's really important to ensure that it's actually a practising [physician], somebody who is using the technology, not, again, somebody who likes the idea but hasn't practised, or barely practises, maybe half a clinic per week, that's not really a true representation of what a proper office flow is” “You definitely need people using the system and people in primary care helping to recruit interested physicians” “I think that's really where the support is really helpful to just build it into your work flow, understand what you're going to do and not going to do, and then start at a particular pace with patients. I think people have started gradually, getting a few patients on, understanding it, getting more patients on, and then expanding. I think that that is where a structured change management approach can really help the practice get into it. People often, they think they're going to be overwhelmed with requests for virtual visits, which is not the case. I think that doing it in a methodological way is really important” “It just has to be really user friendly and all in one place, especially if there's some sort of way of linking back to the person's EMR” “The one thing that has been frustrating for some of my patients is attachments. So, if I ask them to attach a picture or if they want to attach a form, that's been challenging for them ... and so, simplifying that process so patients can send me their work forms or can take a picture of their rash, like cellulitis” “I think a self-registration portal would be helpful for patients to do it, that way you can just tell them about it, give them maybe a card or something, let them register if they want. Then, it's completely on the patient to decide not only whether or not they're going to make the visit or whether they want to register in the first place” “I think having the [telephone application] for the physicians would be super helpful, because then I could be anywhere with my [telephone]. I know I can log in anywhere, but having an [application] that you just open easily, because you're having to go to a website and figure it out and log in and how well you can view it on your [telephone], etc”

EAPC—Enhanced Access to Primary Care, EMR—electronic medical record, PCP—primary care physician.

telephone line instead of through the platform because of connectivity issues. In terms of potential barriers to virtual care, many discussed that audio or video visits had certain technology requirements (eg, high-speed internet, Web camera, and microphone) that are inaccessible to many practices and patients.

Theme 4. Strategies to improve the integration of virtual visits into PCP work flows. Primary care physicians offered several suggestions to optimize virtual visits and generate efficiencies. First, they stressed the importance of leveraging clinical champions who could guide PCPs in tailoring virtual visits to fit within their

schedule, while simultaneously vouching for the quality and value of the service. Second, participants emphasized that structured and upfront change management support to enhance training and registration, alongside customization to match the diverse operational models of practices, were foundational for successful implementation. Third, many participants highlighted key technological features that would improve the tool's usability and enhance provider work flow: these included EMR integration, online booking capabilities, self-registration options for patients, automatic population of patient and provider information on prescriptions and requisition forms sent from the platform, easier ability to send attachments and images, and the development of a user-friendly mobile application (which was introduced later in the pilot). Finally, PCPs indicated that adoption could be further supported by ensuring PCPs are involved in the design of the tool to improve compatibility with their routine.

— Discussion —

The COVID-19 pandemic has prompted the rapid integration of virtual visits into primary care and has highlighted the critical need to leverage virtual care to generate work flow efficiencies that can alleviate the health care burden.¹⁻³ While this study was conducted before the pandemic, it provides relevant insights regarding the impact of virtual care and the operationalization of PCP services. Congruent with other research,⁹ this study found that PCPs leveraged diverse approaches to integrating virtual visits into their clinical routines and reported variable impact on work flow. This might reflect the variation of primary care practice types and available administrative or team-based supports within organizations.

While most participants stated virtual visits improved efficiency, quality of care, and access to care, which are consistent with other reports,¹⁸ challenges such as lack of EMR integration and duplicate documentation prevented some PCPs from using the solution at high volumes. We also found that organizational readiness for change, the technology's usability, and PCPs' capacity to adopt and learn a new technology influenced uptake, mirroring the findings of other studies.^{18,19} Reported strategies to streamline work flow included leveraging strong clinical champions who could demonstrate new processes and involving providers during the tool's design stage to improve its compatibility with their routines. Additionally, implementation of virtual visits appeared to require upfront support to help with training activities, patient registration, and troubleshooting of technical issues.²⁰ For example, PCPs who used administrative support from external implementation teams or in-house personnel in this study were able to invite a higher volume of patients and reported more visits over a shorter time.

The most notable finding, consistent with other evidence,^{9,21} was that asynchronous messaging was the best modality to be integrated into clinical operation and could improve both patient access and satisfaction. Many participants stated it offered providers the additional benefit of convenience and time. While few participants expressed concerns that high messaging volumes could increase their workload, many stated operational efficiencies could be gleaned by channeling administrative requests and follow-up visits to messaging. Asynchronous messaging has been found to be valuable for chronic disease management, especially for frequent provider-patient communication.²² These findings are in contrast to trends in virtual care policy in Ontario, where video and telephone visits appear to be taking precedence.²³ During the COVID-19 pandemic, provincial billing codes for telephone and video visits were introduced. However, there are currently no billing codes for online messaging care outside of the Enhanced Access to Primary Care pilot.^{24,25}

Our study also suggests that work flow efficiencies might only be gleaned after high patient volumes of virtual visits are achieved. Several PCPs who rostered a larger proportion of their clinic to virtual care indicated that it saved them time, allowed them to conduct more visits a day, and, in some cases, allowed them to increase their roster. Other physicians with smaller volumes, however, noted that there were no time savings in using virtual visits, consistent with the results of published studies.²¹ A study of 36 general practices piloting a primary care online consultation system in the United Kingdom similarly found that improvements in staff workload and patient wait times were negligible, but attributed the result to insufficient volume.²⁶ Since many clinics have been forced to quickly transition to virtual care at high volumes due to the pandemic, future research should be conducted to quantitatively and qualitatively assess the impact of clinic factors (eg, roster size and virtual visit volumes) on provider work flow. Primary care providers would also benefit from professional guideline development and support regarding best practices on virtual primary care to enhance their competency. In addition, the widespread adoption of virtual visits provides an excellent opportunity to explore approaches that can be used to redesign processes and optimize primary care in the long term.

Limitations

The Enhanced Access to Primary Care pilot project was implemented within 5 regions at different time points, so participants might have spent variable amounts of time using the technology. Further, participation was voluntary and those who were included might have been more open to technological innovation or changes in practice than their peers. It was sometimes difficult to discern if virtual visits alone or contextual factors

(eg, organizational culture or implementation approach) influenced PCPs' views on the impact of virtual visits on work flow. Moreover, data for this study were collected before the COVID-19 pandemic and may not reflect current usage trends. Additionally, the study findings might not be representative of all PCPs since most participants practised in urban areas and were part of capitated funding models.

Conclusion

Virtual visits require an upfront investment in terms of time and effort. While the pandemic has prompted the virtualization of some primary care services, the impact of virtual visits on work flow depends on how the tool is implemented and used, which might be influenced by individual and organizational factors. Dedicated time to implement, emphasis on using asynchronous secure messaging, and access to clinical champions and structured change management support were factors associated with a more seamless integration of virtual visits. 🌿

Jamie K. Fujioka is a research coordinator at Women's College Hospital Institute for Health System Solutions and Virtual Care (WIHV) in Toronto, Ont. **Dr Megan Nguyen** is a strategist at Throughline Strategy Inc in Toronto. **Michelle Phung** is a program manager at the Center for Artificial Intelligence in Medicine & Imaging at Stanford University School of Medicine in Palo Alto, CA. **Dr Onil Bhattacharyya** is the Frigon Blau Chair in Family Medicine Research and Director of WIHV. He is Lead at the Centre for Digital Health Evaluation in Toronto. He practises family medicine and is Associate Professor in the Department of Family and Community Medicine and the Institute of Health Policy, Management and Evaluation (DHPE) at the University of Toronto (U of T). He is national Co-chair of the Primary and Integrated Health Care Innovations Network and has been a Harkness Fellow in Health Care Policy and Practice at the Commonwealth Fund in New York, NY, and a Takemi Fellow at the Harvard T.H. Chan School of Public Health in Boston, MA. **Leah Kelley** is a graduate of the U of T Faculty of Law. **Dr Vess Stamenova** is a research lead at WIHV. **Nike Onabajo** is a project manager at North York Ontario Health Teams in Toronto. **Dr Michael Kidd** is Principal Medical Advisor and Deputy Chief Medical Officer with the Australian Government Department of Health and Aged Care, Professor of Primary Care Reform at the Australian National University in Canberra, and Adjunct Professor in the DHPE at U of T. **Dr Laura Desveaux** is Scientific Lead and Learning Health System Program Lead at Trillium Health Partners in Toronto. **Ivy Wong** is Director of Ontario Health Team and Transformation at North York General Hospital and Backbone Lead of North York Toronto Health Partners Ontario Health Team. **Dr R. Sacha Bhatia** is Senior Vice President of Population Health and Value Based Care at Ontario Health and a cardiologist at the University Health Network in Toronto. **Dr Payal Agarwal** is a practising family physician affiliated with the DHPE at U of T and Innovation Fellow at WIHV.

Acknowledgment

We thank **Payam Pakravan**, **Lency Abraham**, **Vivian Henderson**, **Rhonda Wilson**, **Karen Blackley**, **Beth Banting**, and **Ian Cummins** at the Ontario Telemedicine Network for their support in helping us perform this evaluation study.

Contributors

All authors contributed to the concept and design of the study; data gathering, analysis, and interpretation; and preparing the manuscript for submission.

Competing interests

None declared

Correspondence

Jamie K. Fujioka; e-mail jamie.fujioka@wchospital.ca

References

- Bhattacharyya O, Agarwal P. Adapting primary care to respond to COVID-19 [blog]. *Can Fam Physician* 2020 Apr 9. Available from: <https://www.cfp.ca/news/2020/04/09/04-09-1>. Accessed 2022 Oct 27.
- Greenhalgh T, Wherton J, Shaw S, Morrison C. Video consultations for COVID-19. *BMJ* 2020;368:m998.
- Greenhalgh T, Koh GCH, Car J. COVID-19: a remote assessment in primary care. *BMJ* 2020;368:m1182.
- Mann DM, Chen J, Chunara R, Testa PA, Nov O. COVID-19 transforms health care through telemedicine: evidence from the field. *J Am Med Inform Assoc* 2020;27(7):1132-5.
- Donaghy E, Atherton H, Hammersley V, McNeilly N, Bicker A, Robbins L, et al. Acceptability, benefits, and challenges of video consulting: a qualitative study in primary care. *Br J Gen Pract* 2019;69(686):e586-94.
- Polinski JM, Barker T, Gagliano N, Sussman A, Brennan TA, Shrank WH. Patients' satisfaction with and preference for telehealth visits. *J Gen Intern Med* 2016;31(3):269-75. Epub 2015 Aug 13.
- Fagerlund AJ, Holm IM, Zanaboni P. General practitioners' perceptions towards the use of digital health services for citizens in primary care: a qualitative interview study. *BMJ Open* 2019;9(5):e028251.
- Scott Kruse C, Karem P, Shifflett K, Vegi L, Ravi K, Brooks M. Evaluating barriers to adopting telemedicine worldwide: a systematic review. *J Telemed Telecare* 2018;24(1):4-12. Epub 2016 Oct 16.
- Hoonakker PLT, Carayon P, Cartmill RS. The impact of secure messaging on workflow in primary care: results of a multiple-case, multiple-method study. *Int J Med Inform* 2017;100:63-76. Epub 2017 Jan 18.
- Pearl R. Kaiser Permanente Northern California: current experiences with internet, mobile, and video technologies. *Health Aff (Millwood)* 2014;33(2):251-7.
- North F, Crane SJ, Chaudhry R, Ebbert JO, Ytterberg K, Tulledge-Scheitel SM, et al. Impact of patient portal secure messages and electronic visits on adult primary care office visits. *Telemed J E Health* 2014;20(3):192-8. Epub 2013 Dec 18.
- Zhong X, Hoonakker P, Bain PA, Musa AJ, Li J. The impact of e-visits on patient access to primary care. *Health Care Manag Sci* 2018;21(4):475-91. Epub 2017 May 18.
- Cain C, Haque S. Organizational workflow and its impact on work quality. In: Hughes RG, editor. *Patient safety and quality: an evidence-based handbook for nurses*. Rockville, MD: Agency for Healthcare Research and Quality; 2008.
- Women's College Hospital Institute for Health Systems Solutions and Virtual Care. *Enhanced Access to Primary Care: project evaluation final report*. Toronto, ON: Ontario Telemedicine Network, Ministry of Health and Long-Term Care; 2019. Available from: <https://otn.ca/wp-content/uploads/2019/08/eapc-evaluation-report.pdf>. Accessed 2023 Mar 27.
- Fujioka JK, Nguyen M, Phung M, Bhattacharyya O, Kelley L, Stamenova V, et al. Redesigning primary care. Provider perspectives on the clinical utility of virtual visits. *Can Fam Physician* 2023;69:e78-85.
- Stamenova V, Agarwal P, Kelley L, Fujioka J, Nguyen M, Phung M, et al. Uptake and patient and provider communication modality preferences of virtual visits in primary care: a retrospective cohort study in Canada. *BMJ Open* 2020;10(7):e037064.
- Braun V, Clarke V. Thematic analysis. In: Cooper H, Camic PM, Long DL, Panter AT, Rindskopf D, Sher KJ, editors. *APA handbook of research methods in psychology, vol 2. Research designs: quantitative, qualitative, neuropsychological, and biological*. Washington, DC: American Psychological Association; 2012. p. 57-71.
- Hickson R, Talbert J, Thornbury WC, Perin NR, Goodin AJ. Online medical care: the current state of "eVisits" in acute primary care delivery. *Telemed J E Health* 2015;21(2):90-6. Epub 2014 Dec 4.
- Garavand A, Mohseni M, Asadi H, Etemadi M, Moradi-Joo M, Moosavi A. Factors influencing the adoption of health information technologies: a systematic review. *Electron Physician* 2016;8(8):2713-8.
- De Grood C, Raissi A, Kwon Y, Santana MJ. Adoption of e-health technology by physicians: a scoping review. *J Multidiscip Healthc* 2016;9:335-44.
- Bishop TF, Press MJ, Mendelsohn JL, Casalino LP. Electronic communication improves access, but barriers to its widespread adoption remain. *Health Aff (Millwood)* 2013;32(8):1361-7.
- Dixon RF, Rao L. Asynchronous virtual visits for the follow-up of chronic conditions. *Telemed J E Health* 2014;20(7):669-72. Epub 2014 May 2.
- Shift to virtual care. *Primary care response to COVID-19 pandemic*. Toronto, ON: Association of Family Health Teams of Ontario; 2020. Available from: https://www.afhto.ca/sites/default/files/2020-04/Shift%20to%20Virtual%20Care%20Primary%20Care%20Response%20to%20COVID-19%20pandemic_V3_April%202%202020_0.pdf. Accessed 2023 Mar 21.
- Health Services Branch. *INFOBulletin. Virtual care program—new virtual care billing codes effective (April 1, 2020)*. Toronto, ON: Ontario Ministry of Health and Long-Term Care; 2020. Available from: <http://health.gov.on.ca/en/pro/programs/ohip/bulletins/4000/bul4750.aspx>. Accessed 2022 Aug 14.
- Virtual care and the 2019 novel coronavirus (COVID-19). Toronto, ON: OntarioMD; 2020. Available from: <https://www.ontariomd.ca/documents/resource%20library/covid%2019%20bulletin%20for%20physicians%20mar%202020.pdf>. Accessed 2022 Oct 27.
- Edwards HB, Marques E, Hollingworth W, Horwood J, Farr M, Bernard E, et al. Use of a primary care online consultation system, by whom, when and why: evaluation of a pilot observational study in 36 general practices in South West England. *BMJ Open* 2017;7(11):e016901.

This article has been peer reviewed.

Cet article a fait l'objet d'une révision par des pairs.

Can Fam Physician 2023;69:e86-93. DOI: 10.46747/cfp.6904e86