



VIRTUAL CARE IN THE COVID-19 ERA EVALUATION: SUMMARY REPORT

Centre for Digital Health Evaluation,
Women's College Hospital Institute for
Health System Solutions and Virtual
Care



Contact Information

For inquiries and comments, please contact:

Centre for Digital Health Evaluation,
Women's College Hospital for Health System Solutions and Virtual Care
6th Floor, 76 Grenville Street, Toronto ON M5S 1B2

Email: wihv@wchospital.ca

Website: <https://www.wchwihv.ca/>



Acronyms

APMs Alternative Payment Models

CDHE Centre for Digital Health Evaluation

CHC Community Health Centre

EMR Electronic Medical Record

FFS Fee-for-Service

OHT Ontario Health Team

PCP Primary Care Provider

PHI Personal Health Information

SJHH St. Joseph's Healthcare Hamilton

SMH St. Michael's Hospital

WCH Women's College Hospital



Definitions

Alternative Payment Models (APMs) are alternatives to fee-for-service remuneration (e.g., capitation) for physicians that are often intended to promote value-based care (1).

Asynchronous Messaging encompasses virtual care modalities of secure messaging (e.g., through a patient portal), email, or text messaging.

Case Study refers to a health or social care program, identified by one or more health or social care providers delivering a specific service to a particular population of patients or users, that has historically been delivered via face-to-face visits and has now been rendered virtual in response to the COVID-19 pandemic.

Clinical appropriateness refers to whether the healthcare services provided are suitable according to the symptoms presented by a patient (2).

Community Health Centres (CHCs) are non-profit organizations that provide healthcare services (e.g., primary healthcare, health promotion/education) to members of a specific community, usually geographically defined (3).

Modality refers to the method in which care is delivered including in-person, phone, video, asynchronous messaging, and remote monitoring.

An **Ontario Health Team (OHT)** supports the continuum of care with healthcare providers and organizations, including hospitals, physicians and home and community care providers, in certain geographic catchment areas. Specifically, the goal of the OHT is for patients to receive all their care from one team of healthcare providers so that patients can navigate the system and transition easily between different providers and health services (4).

Organizational Leaders refer to individuals (e.g., managers, directors) overseeing the operational aspects of virtual care delivery across various clinical departments in the hospital.

Primary Care Provider (PCP) refers to any healthcare provider (e.g., family physician, nurse practitioner, registered nurse, social worker, dietician, pharmacist) that provides primary care services (5).

Providers refer to the frontline staff (e.g., physicians, social workers, occupational therapists) that provide healthcare services to patients.



Underserved Communities refers to groups of people whose combination of shared socio-demographic and environmental characteristics influence their ability to access comprehensive health and social services or receive high quality of care.

Virtual care includes the use of technology, synchronous or asynchronous, to provide and receive healthcare services in lieu of in-person care. Modalities include phone calls, video conferencing, remote monitoring, asynchronous messaging (e.g., email, texting) and the use of a patient portal (6,7).

Virtual visits refer to synchronous modalities of providing virtual care, specifically, phone and video conferencing, for which the alternative would be an in-person appointment.



Executive Summary

Background

Virtual care is the use of technology, such as phone calls, video conferencing, remote monitoring, asynchronous messaging (e.g., email, secure text messaging), and patient portals, to provide and receive healthcare services. Virtual care has become the dominant form of healthcare delivery in response to 1) the COVID-19 pandemic and 2) rapid changes in healthcare reimbursement and regulation across Ontario. Virtual care is a key strategy to enable access to care during physical distancing, but also to improve coordination of services and support the current strategies for system integration like the Ontario Health Team model.

Objectives and Methodology

The overall objectives of the evaluation were to:

1. Describe the uptake and impact of virtual care use in Ontario across regions and patient populations during the pandemic using health administrative data.
2. Identify and describe challenges and best practices in enabling equitable access to virtual care across the Ontario health system.
3. Describe and evaluate how virtual care has been used in primary care settings during the pandemic.
4. Describe and evaluate how virtual care has been used in hospital settings during the pandemic.

This report is based on the combined findings from four streams of work, including the impact of virtual care on health service utilization, health equity, primary care services, and hospital services.



Key Findings

- Most visits were conducted by phone due to its convenience for healthcare providers, with few visits by video or asynchronous messaging.
- Selection of the virtual care modality was driven by providers and based on remuneration, convenience, ease of access, and organizational constraints, leading to high utilization of phone visits. Thus, selection of modality during the pandemic may not necessarily be based on what is clinically appropriate or preferred by patients.
- Providers and administrative staff had an increased workload because of the need to triage patients to in-person or virtual visits, adapt workflows, and onboard/register patients for virtual care.
- Patients/caregivers valued the convenience, continued access, timeliness, and reduced costs of virtual care; however, they had variable preferences for different modalities.
- All participants envisioned a mix of in-person and phone/video/message-based interactions in the future based on patient preference and clinical appropriateness.
- Due to the rapid implementation of virtual care services, many clinics and hospital sites did not have strategies in place to promote equitable access. Virtual care may not be accessible for certain populations with unique needs.

Recommendations

While the health system is undergoing transformation to promote patient-centered and integrated care under Ontario Health Teams (OHTs), recommendations to sustain virtual care use will depend on 1) who is being prioritized (e.g., patient or provider experience), and 2) what the main goals are (e.g., improving health outcomes, reducing costs, or promoting patient-centered care). The following recommendations are organized to align with different priorities/goals:

Recommendations to promote sustainable remuneration and support infrastructure costs

1. Develop a remuneration model for virtual care modalities (including telephone) that promotes selection based on patient preference and clinical appropriateness.
2. Clarify who is accountable for covering infrastructure and operational costs associated with virtual care.



Recommendations to optimize patient-centered care

3. Ensure equitable and affordable access to digital devices, cellular service, high-speed Internet, and other technology infrastructure required to engage in virtual care.
4. Develop policies and guidelines outlining patients' right to access various virtual care modalities.
5. Enable access to each virtual care modality (phone, video, asynchronous messaging) to promote equitable access and enable patient choice.

Recommendations to build capacity to develop efficient workflows for virtual care

6. Offer training and change management support for administrative staff, providers, and learners to redesign workflows to maximize the benefit of virtual care.
7. Co-develop a triage tool to help identify which modality is clinically appropriate for the interaction.
8. Create a centralized hub for guidelines, best practices, and other educational resources.

Recommendations to promote integrated care

9. Leverage existing strategies (e.g., Digital Health Playbook) to promote the digital connection and exchange of information across the continuum of health services to support the coordination of care within and across OHTs.
10. Develop and implement a long-term virtual care strategy that aligns with the evolving digital health ecosystem.



1. Background

1.1 Context

The COVID-19 pandemic drastically changed the way Ontarians interact with healthcare providers. During the first wave of the pandemic, virtual visits accounted for up to 70% of all ambulatory care visits (i.e., healthcare services performed on an outpatient basis). Virtual visits were meant to reduce transmission of COVID-19 and included the use of phone, synchronous and asynchronous messaging, videoconferencing, and remote monitoring. This transformation was enabled by government policy changes where the Ontario Ministry of Health and the Ontario Medical Association added temporary billing codes for virtual services effective March 14, 2020.

As Canada moves into the recovery phase of the pandemic, there is uncertainty regarding how health services should be delivered moving forward. The speed at which virtual care was deployed made it challenging to provide a structured rollout of best practices regarding patient selection, clinical workflows, appropriateness of testing and treatments, equity of access, and follow-up for patients. As a result, many questions remain about the impact of virtual care on patients, providers, and the healthcare system. Furthermore, the goals of virtual care to date have been primarily to maintain access to care during a time of physical distancing. However, different policies, workflows, and tools may be needed for virtual care to support Ontario Health Teams (OHTs) and patient-centered integrated healthcare delivery more broadly.

This evaluation incorporates the results of 4 streams of work: the impact of virtual care on health service use (Stream 1), health equity (Stream 2), primary care services (Stream 3) and hospital-based health systems (Stream 4) to summarize policy implications for health system planning.

1.2 Purpose and Objectives

1. Describe the uptake and impact of virtual care use in Ontario and across regions and patient populations during the pandemic using health administrative data.
2. Identify and describe challenges and best practices in enabling equitable access to virtual care across the Ontario health system.
3. Describe and evaluate how virtual care has been used in primary care settings during the pandemic.



- Describe and evaluate how virtual care has been used in hospital settings during the pandemic.

2. Methodology

To address the research objectives outlined above, a variety of data collection methods were used to gather information. The evaluation included literature reviews synthesizing 153 articles, analysis of administrative data on billing and health service utilization, data from hospital and primary care electronic medical records, 5 case studies, 4 surveys with 891 respondents, and 105 semi-structured interviews with patients, provider, and administrators. It also draws on concurrent data from a wide range of partners.

3. Summary of Findings

In this section we detail unique findings that were identified from Streams 1-4 and the stakeholder symposium. We also describe common themes and key tensions that emerged across streams.

SYSTEM-WIDE IMPLEMENTATION OF VIRTUAL CARE

We used billing data, electronic medical record (EMR) data, and patient and provider surveys to describe the use of virtual care. Table 1 describes the pandemic-related periods as they relate to virtual care usage. From the billing data, we saw a rapid increase in the use of virtual care, with 69% of all ambulatory care provided virtually during the first wave of the pandemic. This was followed by a decrease in virtual visits over the summer to 50% and a steady increase during the second wave to 62% (Figure 1). Variations in virtual care uptake were likely influenced by the COVID-19 burden and associated public health restrictions which differed over time and across regions throughout the province. Uptake was broad, as 86% of providers had at least one virtual visit during the pandemic. Psychiatrists had the greatest percentage of virtual care adoption (83%), followed by Primary Care Providers (PCPs) (65%) and other specialties (47%). A total of 94% of virtual care was billed through temporary billing codes (called K codes), and EMR and survey data suggest that phone was the most common modality.

Table 1. Date definitions for various pandemic-related periods.

Pre-pandemic	First Wave	Summer	Second Wave
Jan 1, 2018 – Mar 15, 2020	Mar 16, 2020 – Jul 5, 2020	Jul 6, 2020 – Sep 6, 2020	Sep 7, 2020 – Jan 16, 2021



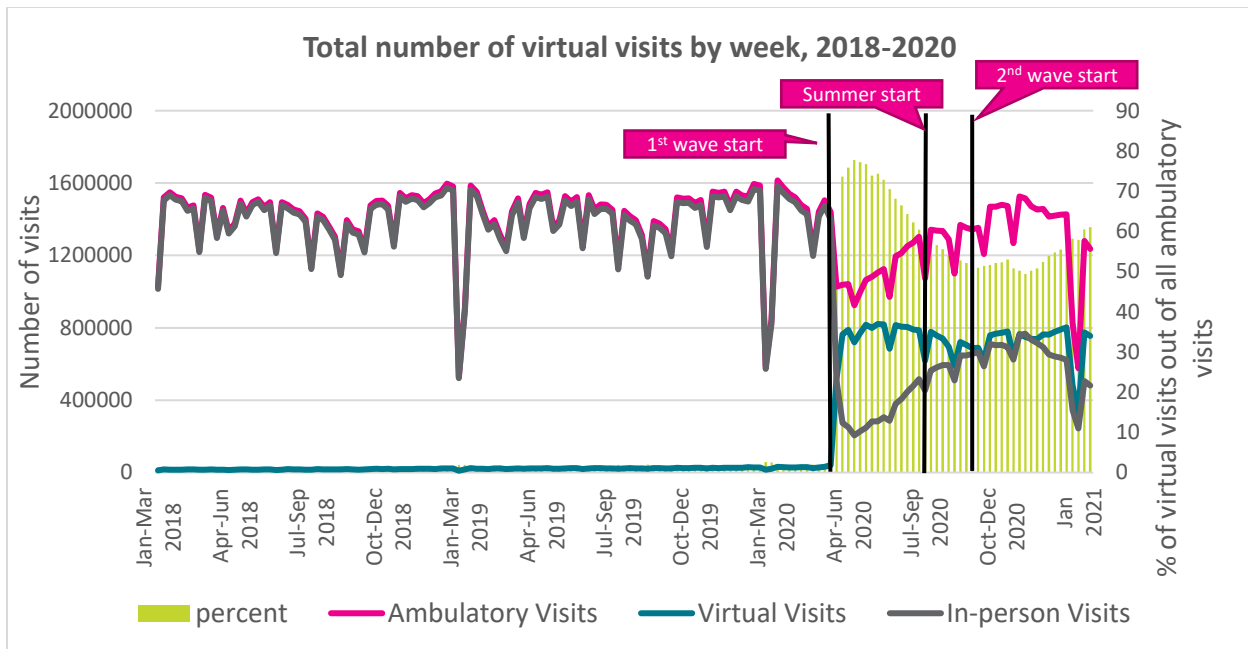


Figure 1: Total number of virtual and in-person visits (line) and percent virtual care use out of total ambulatory care (bars).

During the **first wave** of the pandemic, total ambulatory care reduced by 22%, in-person visits reduced by 75%, and 69% of ambulatory care occurred virtually (12.1 million visits). As COVID-19 cases decreased during the **summer** recovery period, some in-person care returned, but 53.8% of care still occurred virtually (6.4 million visits). Virtual care use during the **second wave** was 53.8% of all ambulatory care (13.6 million).

EQUITY OF ACCESS

Organizations struggled to mitigate health equity challenges during the rapid implementation of virtual care through the COVID-19 pandemic. Table 2 summarizes the facilitators and barriers of equitable virtual care implementation across four categories: patients, providers, clinical encounters (i.e., interaction between patients and providers), and contextual factors (i.e., organizational structures, policies, and processes, or changes within the health care system). Organizations with more experience working with structurally marginalized communities were able to draw upon prior knowledge and incorporate health equity considerations into virtual care planning. However, organizations without this expertise did not develop practice guidelines, clinical workflows, resources, and training on virtual care with equity specifically in mind. Virtual care is embedded in an existing healthcare system that has its own unique structure and history, resulting in differences in the resources or capabilities of diverse demographic populations. A

major challenge in accessing virtual care is the lack of availability and affordability of the Internet, cellular service, and/or digital devices. In addition, digital literacy (i.e., the interest and ability of individuals to use digital technology and communication tools) largely influenced how patients and providers engaged with each other virtually. Virtual care may not be accessible for certain populations with unique needs (e.g., older adults, people experiencing homelessness, non-English speakers, and people with sensory disabilities). Many patients without digital devices leveraged creative, yet unsustainable strategies to access a virtual visit, such as asking family members to borrow a phone or computer. Organizations with a history of caring for marginalized groups, like Community Health Centres (CHCs), used targeted outreach and provided devices and data plans for high-risk patients to receive virtual care and showed a similar use of phone/video/text and in-person visits across income, education, and racial groups.

Table 2. Facilitators and barriers to equitable implementation of virtual care during the COVID-19 pandemic.

Level	Facilitators	Barriers
Recipient: Patients	<ul style="list-style-type: none"> • Timely access to care • Cost savings • Avoiding the risk of racist in-person encounters • More frequent contact with healthcare providers 	<ul style="list-style-type: none"> • Distrust in formal systems of care • Preference for in-person care • Lack of safe physical location • Unaware that services had been virtualized • Low digital literacy • Limitations in physical, cognitive, or sensory abilities
Recipient: Provider	<ul style="list-style-type: none"> • Engaging in virtual care practice sessions • Able to connect with more patients • Instructional videos and cheat sheets • More frequent contact with patients • Saves time (travelling) 	<ul style="list-style-type: none"> • Low digital literacy • Uncertainty of virtual care technologies • Time-consuming set-up support process • Inconsistent advice from professional colleges to healthcare professionals • Dissatisfaction towards current reimbursement models • Variable knowledge about patient determinants to access
Clinical Encounters	<ul style="list-style-type: none"> • Patient preference for virtual care modality was prioritized • Set up support for patients using technology 	<ul style="list-style-type: none"> • Virtual service delivery was not adapted to suit cultural expectations • Providers did not maintain contact with patients
Context Factors	<ul style="list-style-type: none"> • Physical distancing orders • Temporary billing codes • Donation of digital devices and equipment 	<ul style="list-style-type: none"> • Lack of organizational capacity to consider health equity • Lack of feedback processes to improve virtual service delivery



	<ul style="list-style-type: none"> • Guidelines from professional colleges and the Ontario Ministry of Health • Previous experience working with structurally marginalized communities 	<ul style="list-style-type: none"> • Under-staffed and under-resourced facilities • Redeployment and layoffs • Lack of digital literacy programs • Lack of available and affordable infrastructure
--	--	--

The widespread use of the telephone likely contributed to more equitable access across the province. Virtual care use increased with age and there were no differences in rate of virtual care use across neighbourhood income quintiles. Urban areas overtook rural areas as higher users of virtual care. Female patients had higher rates of virtual care (55 females per 1000 used virtual care) than male patients (40 per 1000). Patients who were high virtual care users (2+ visits during the pandemic) were higher users of the health care system before and during the pandemic.

THE EXPERIENCE OF VIRTUAL CARE

Most visits were conducted by phone due to its convenience for providers, with few visits by video (due to set up and technical issues) or asynchronous messaging (because it was rarely offered and not billable) (Figure 2). The selection of virtual care modality was driven by providers and was based on remuneration, convenience, ease of access, and constraints on organizational resources, leading to a preference for phone visits. Thus, selection of modality during the pandemic may not necessarily be based on what is clinically appropriate or preferred by patients.

“I think the convenience factor, both for patients and for staff, has been a big driver for [phone] because with getting patients onboarded onto a new technology, it can be challenging sometimes just with the amount of guidance and instruction that has to be there.”
 – Family Physician

Primary Care

Providers felt virtual care increased their workload because of the need to match patient needs to a modality (i.e., triage), adapt workflows, and onboard/register patients. Administrative staff workloads also increased because of the extra work required for scheduling, training, and onboarding patients to virtual care. This highlighted the fact that virtual care is a new form of practice and clinics had varying ability to adapt their processes. Providers felt costs for virtual care



infrastructure (i.e., obtaining a video visit solution, digital devices, and technical and administrative support) were a barrier in providing the most appropriate virtual care modality. The degree of administrative support and infrastructure investment needed varied based on practice model (i.e., how healthcare providers work and bill their services), size, and geography.

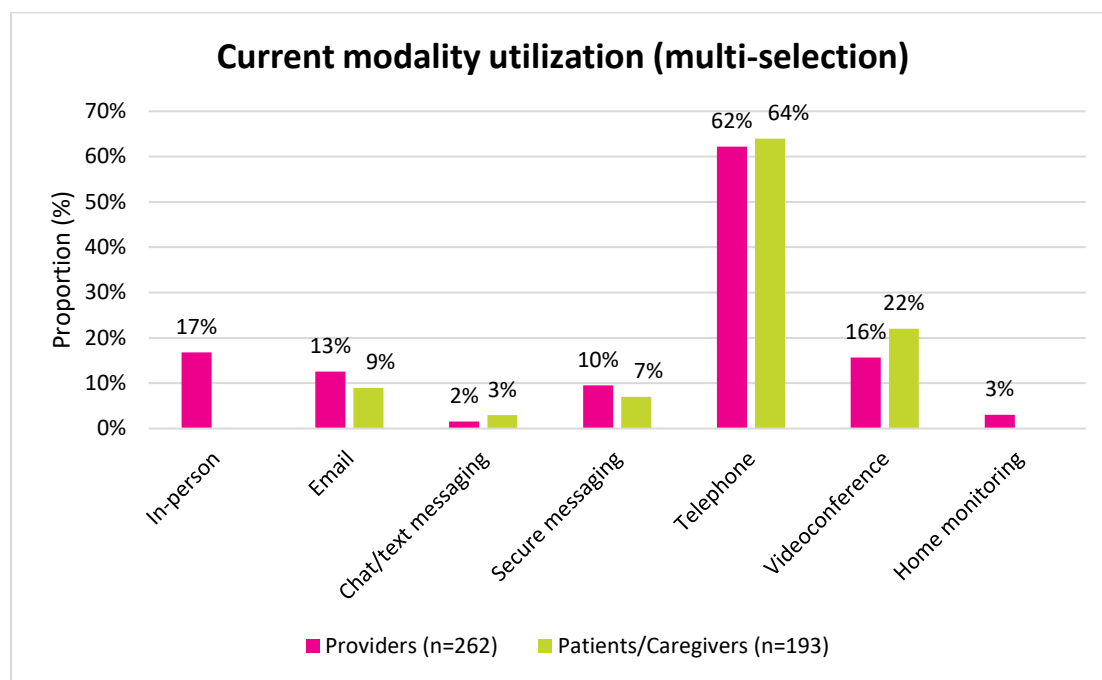


Figure 2. Proportion of modality used by patients/caregivers and PCPs.

Note: Participants could choose more than one modality (multi-selection). Thus, the sum of proportions does not equal 100%.

Patients/caregivers valued the convenience, continued access/continuity of care and timeliness to care, and reduced costs of virtual care (e.g., by not having to pay for parking or travel), along with avoiding COVID-19 transmission in public spaces. However, they had variable preferences for in-person, video, and phone visits. While providers prefer phone due to its ease of use, convenience, and ability to receive compensation comparable to in-person care, patient modality preferences are context-dependent (i.e., based on comfort with and access to technology, nature of their clinical concerns, and how much they value in-person interactions). During the pandemic, modality decisions were driven by providers. This limited patient options, which conflicts with patient-centered care. Despite this concern, both patients and providers envisioned a mix of in-person and virtual interactions in the future, based on both patient preference and clinical appropriateness (Figure 3).



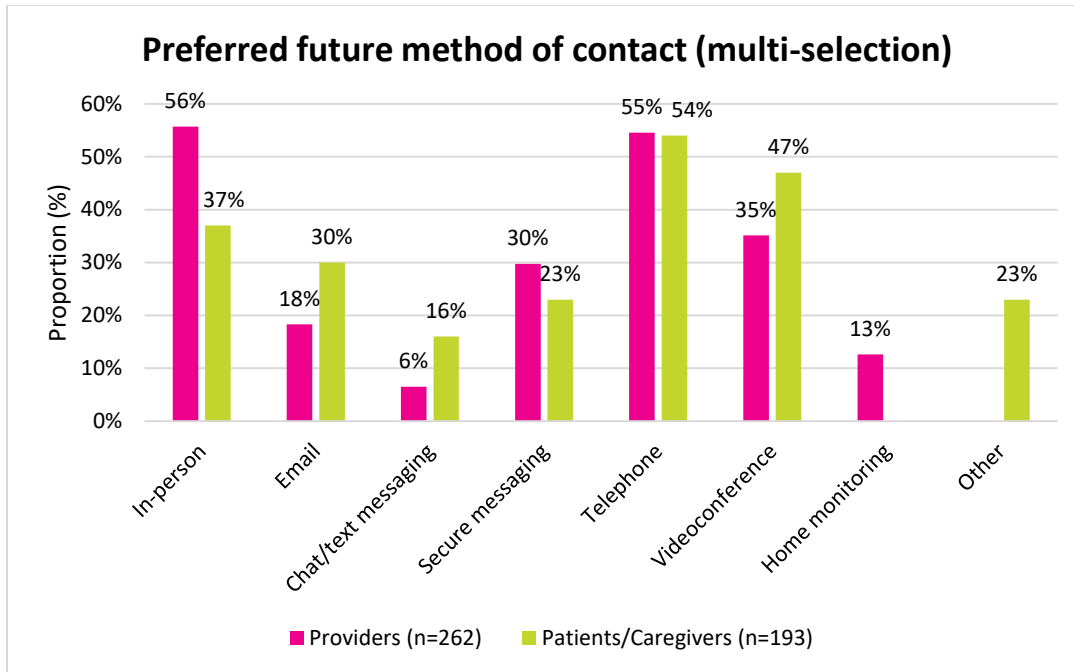


Figure 3. Proportion of patients/caregivers and PCPs preferred modality to use in the future.

Note: Participants could choose more than one modality (multi-selection). Thus, the sum of proportions does not equal 100%.

*"I think it's more of an ethical obligation on **both sides to use the most appropriate channel for the most appropriate situation** so that the costliest, and most resource intensive, and most humanistic channels are there for the people who really need it."*

– Patient

SPECIALTY CARE

Despite experiencing a slight decrease in patient volumes between March to May 2020, total visit volumes remained relatively consistent or increased in 2020 (compared to 2018 and 2019 volumes) at the three hospitals we studied: St. Joseph’s Healthcare Hamilton (SJHH), St. Michael’s Hospital (SMH), and Women’s College Hospital (WCH) (Figures 4a–c). Phone visits were used the most at all three sites. Provider preferences for the use of virtual care modalities varied depending on clinical area and patient context. Clinical areas where use of video was high and perceived to be more appropriate compared to phone include mental health, women’s health, and pain management. Across other chronic/acute care clinics, phone and in-person visits were the most common modalities. Lack of funding and rapid implementation were some reasons that factored into modality selection, which may not reflect clinical appropriateness and patient or provider preference. There was only one remote monitoring program that was clearly built into clinical workflows, the COVIDCare@Home program at WCH, which was used to monitor patients with a positive COVID-19 diagnosis.

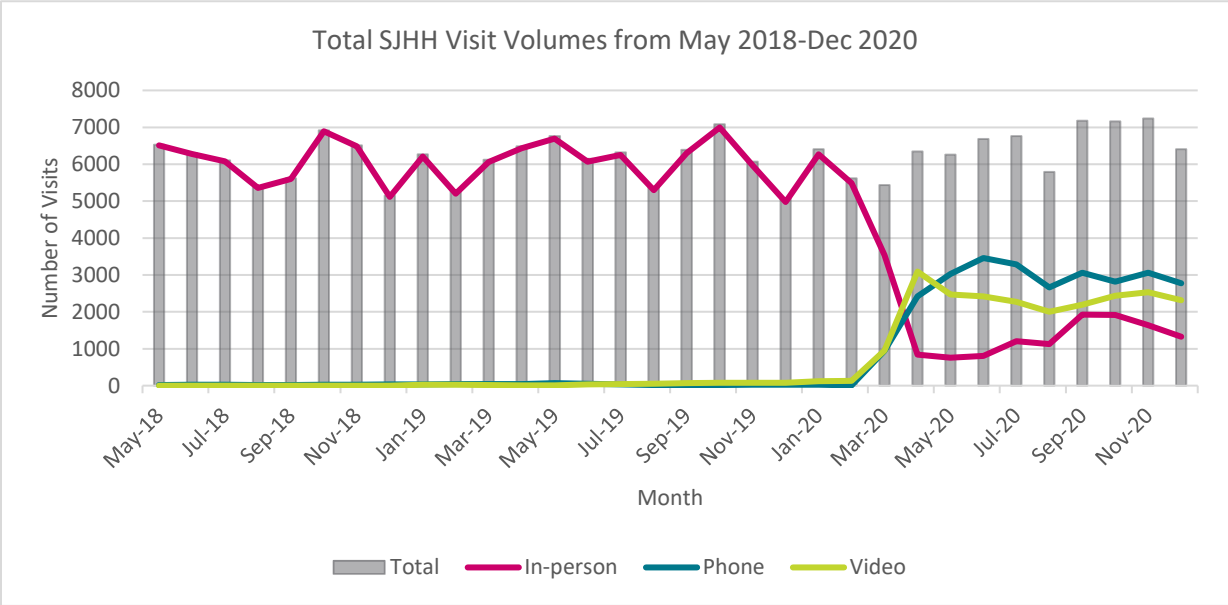


Figure 4a. Total number of visits at SJHH from May 2018 to Dec 2020, including in-person, phone, and video visits.



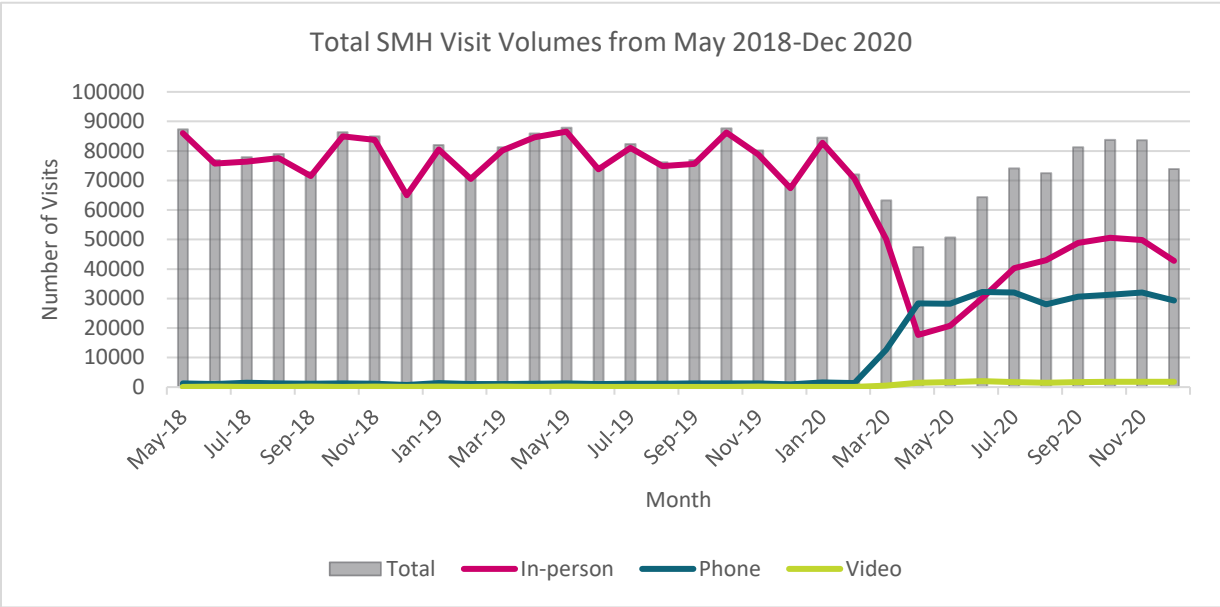


Figure 4b. Total number of visits at SMH from May 2018 to Dec 2020, including in-person, phone, and video visits.

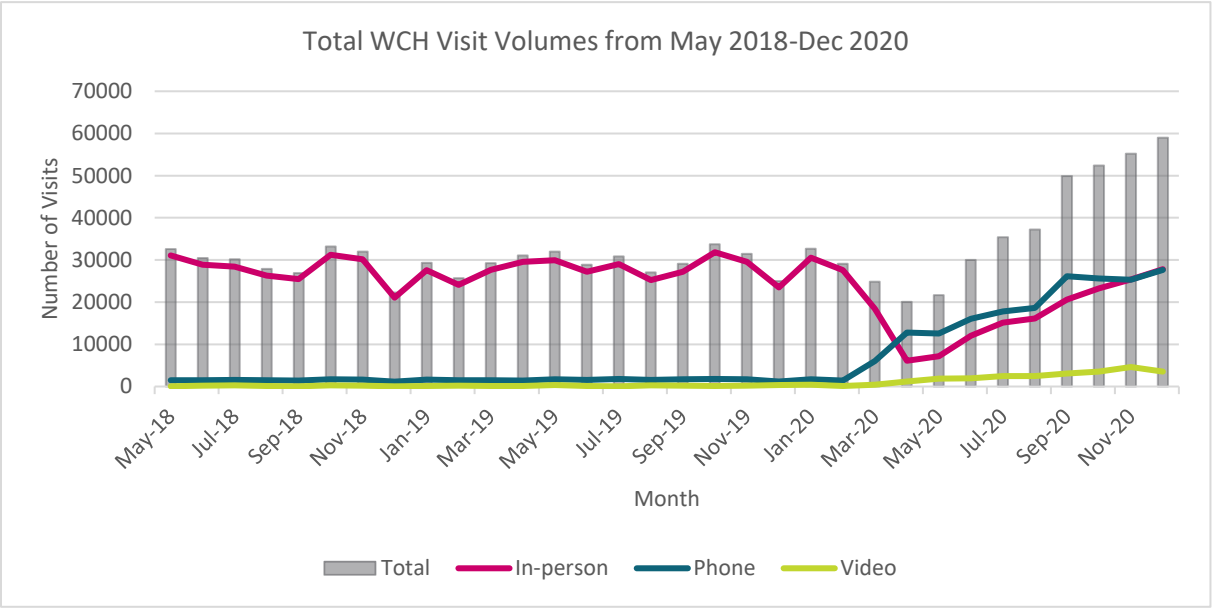


Figure 4c. Total number of visits at WCH from May 2018 to Dec 2020, including in-person, phone, and video visits.

"Phone was most successful and probably, remains the most used modality of virtual care. Because it's easy, less threatening and universal. It's quick and there is less overhead burden for the provider."

– Organizational Leader

A hybrid model of in-person and virtual healthcare delivery was recommended by all interview participants, with perceptions of the appropriate balance depending on the nature of the encounter (Table 3).

Table 3. Perceived appropriateness of healthcare encounters by modality.

In-Person	Phone	Video	Asynchronous Secure Messaging
<ul style="list-style-type: none"> Initial visits - for a comprehensive examination and to build a good rapport with the patient Group programs - where it is important to establish a strong therapeutic environment or demonstrate physical techniques Physical examination Sensitive conversations with patients (e.g., discussing palliative care, planning a transplant, patients with a history of mental trauma) 	<ul style="list-style-type: none"> Quick check-in to follow-up and reassure the patient in acute illness (e.g., COVID-19) For patients who feel self-conscious during a video call To address questions that cannot be answered via messaging To discuss changes in medication Back-up option for when video preferred but technical or other factors impede Follow-up for patients with chronic conditions who require regular monitoring (context-specific) 	<ul style="list-style-type: none"> Initial visits (when in-person is not possible) Deliver group programs (e.g., mental health, educational sessions) for patients who live far away Assess the non-verbal cues and build a therapeutic relationship with patients with mental health conditions Demonstrate activities (e.g., exercise, recording blood pressure using automated monitors) Discuss treatment plan or therapy by screen sharing Follow-up for patients with chronic conditions who require regular monitoring (context-specific) 	<p>Email</p> <ul style="list-style-type: none"> Sending pictures to the provider (e.g., wound, swollen joint) <p>Text Message</p> <ul style="list-style-type: none"> Disseminate educational material such as for mental health and quarantining Quick questions Prescription renewal Logistical and administrative support for patients (e.g., information about group programs, cancellations, troubleshooting tech issues, scheduling appointments) Appointment reminders

Note: The above categorizations represent the perceptions of participants and do not necessarily equate to what is possible. Should evidence suggest a broader range of appropriateness (e.g., that physical examinations can be effectively done virtually), these perceptions will need to be addressed with the supporting evidence prior to implementing these changes within the system.

4. Policy Recommendations

While the health system is undergoing transformation to promote patient-centered and integrated care under OHTs, recommendations to sustain virtual care use will depend on whose interests are ultimately being prioritized (e.g., patients or providers) and what the main goals of virtualized healthcare are (e.g., reducing health system costs, improving access or coordination, or promoting patient-centered care). Consequently, we outline below recommendations that align with different priorities/goals.

RECOMMENDATIONS TO PROMOTE SUSTAINABLE REMUNERATION AND SUPPORT INFRASTRUCTURE COSTS

1. Develop a sustainable remuneration model for virtual care modalities that promotes selection based on patient preference and clinical appropriateness.

A key driver for the ongoing use of virtual care is appropriate physician compensation. However, it is also important to balance remuneration with the need to ensure utilization is patient-centered and does not lead to unsustainable costs for the health system. Generally, alternative payment models (APMs) promote use of the most time-efficient modality to address a patient's concern, while fee for service (FFS) promotes utilization of the most profit-making modality (8). However, without broad adoption of APMs, FFS may be an appropriate interim solution to promote uptake of less frequently used modalities while other payment models are developed. While physicians were glad to receive temporary compensation through the K codes in Ontario, remuneration could be modified to sustain use. Overarching suggestions to improve remuneration are listed below:

- **To optimize patient-centered care, remuneration should not incentivize providers towards any particular modality** to ensure decisions around virtual care are based on patient preference and the clinical nature of the issue being attended to. During the COVID-19 pandemic, implementation was provider-centric where providers predominately offered patients phone visits due to its convenience for providers and ability to receive equivalent payment as in-person or video visits.
- **To regulate healthcare spending, remuneration should be considered through a lens of value**, defined as the dollars per improvement in health outcomes and access to care, including reductions in travel time and minimizing disruptions to patients/caregivers (9,10). There is limited longitudinal evidence on how virtual care quality differs from in-person care (i.e., in terms of safety, efficacy, efficiency, patient-centeredness, and equity)



(11). Therefore, further effort is required to 1) identify if certain specialties benefit more from virtual care, 2) measure if improvements in health outcomes or access are worth the increased upfront expenditure associated with new health technologies, and 3) determine if cost savings can be realized long-term (10). The ultimate goal should be incentivizing high-value use and discouraging lower-value use (9,10).

- **To enhance the provider experience, billing for virtual care should reflect the time and effort required to conduct the particular visit** and any outside work involved (e.g., if it takes more effort to conduct and coordinate chronic disease management visits by phone than in-person, billing should be adjusted to reflect this added effort), emphasizing the need to specify which tasks are associated with a given fee. The time and effort required during initial adoption is related to the modality (with video often taking longer to coordinate than phone), available supports for patient onboarding, triaging, and troubleshooting technical issues, and the clinical nature of the visit itself. The relative effort between modalities will decrease as workflows are refined and technologies are better integrated. It is important to identify the associated actions and requirements that enhance the quality of the interaction both within and outside the actual visit. An episode of care could include determining patient concerns, doing an assessment of multiple organ systems, developing a plan, providing education, and monitoring the response to treatment. This is best managed with multiple touchpoints, preferably within an ongoing patient-family physician relationship (1). Remuneration should be modeled in such a way to encourage physician behaviours that enhance virtual care.
- **Recognize the continued innovation in virtual care.** The emergence of omni-channel care, wherein one could use multiple virtual care modalities to address a health concern, is underway. For instance, a clinical encounter can begin with a phone interaction and then be later resolved through an asynchronous messaging exchange. This means that modality-specific remuneration may be inappropriate as it may take more than one modality to resolve a clinical issue. In turn, some suggest creating a fee schedule defined by the clinical encounter resolution rather than by modality. There are also new modalities arising, such as do-it-yourself care, artificial intelligence, virtual reality and other technologies, that need to be considered in payment models (12,13).
- **Enable flexibility in technology procurement.** Remuneration for the same virtual modality should not depend on the tool being used (e.g., billing for Zoom video visits should be the same as Ontario Telemedicine Network video visits) to enable flexibility for



clinics to procure technologies that best suit their organizational needs. However, it is also important to recognize that the promotion of integrated care requires using technologies that can be shared across different healthcare settings and institutions.

There are four potential remuneration models to bill for virtual visits that could be adapted for FFS and capitated physicians: 1) billing based on time increments (similar to K codes); 2) equivalent billing with base code (i.e., FFS billing on par with in-person visit by applying a base code for the type of care provided with an additional note specifying the virtual modality); 3) base rate (similar to capitation remuneration; compensating physicians a fixed amount per patient per year to incorporate phone, video, and messaging visits in their suite of services); and 4) virtual care bundle (i.e., physicians receive a fixed amount of care for the patient over the course of the acute illness). There are advantages and disadvantages to each potential remuneration model. However, due to the lack of evidence on the long-term value, costs, and health outcomes of virtual care delivery outside an unusual pandemic environment, our suggestion is to promote the ongoing utilization of K codes with adaptations for other modalities (e.g., asynchronous messaging) or an intermediary billing structure until a sustainable, value-based model can be identified through further research and consultation with physician organizations.

2. Identify and clarify who is accountable for covering infrastructure and operational costs associated with virtual care.

Interview data highlighted that the integration of virtual care solutions required providers and organizations to invest upfront and ongoing funds to support infrastructure and operational costs to redesign workflows for virtual care. This includes costs associated with obtaining and upgrading hardware (e.g., computers, laptops, webcams), software (e.g., subscriptions to video conferencing platforms), and additional administrative and technical support (e.g., to support patient triage, onboarding, troubleshooting technical issues). However, these added costs can dissuade from the use of virtual care modalities, particularly at smaller clinics which have fewer funds available and where providers are often responsible for covering additional overhead costs.

Providers emphasized the need for more administrative support as most have experienced an increase in administrative tasks due to the uptake of virtual care modalities, negatively impacting their workflow and leading to burnout in some cases. Additional technical support is required to help patients and providers troubleshoot technical issues. While some larger organizations may be able to offer onsite technical support directly to patients, smaller clinics may not have this capacity and assign this responsibility to administrative staff or providers who may not have the appropriate knowledge or time to resolve technical issues. Going forward, the Ministry of Health



must identify and communicate who is responsible for covering the additional infrastructure and operational costs associated with virtual care.

RECOMMENDATIONS TO OPTIMIZE PATIENT-CENTRED CARE

3. Ensure equitable and affordable access to digital devices, cellular service, high-speed Internet, and other technology infrastructure required to engage in virtual care.

With the increasing dependence on technology for employment, education, and now healthcare, equitable access to the Internet is being considered a fundamental human right (14). In turn, the Ontario provincial government should ensure access to affordable digital devices and the Internet is available to all citizens (15). In addition, healthcare organizations should have access to funding and resources to develop community programs that promote equitable access to digital devices and data plans. There is also a need to resolve geographic variability in access to broadband Internet and cellular services. Special measures should also be put in place for populations with distinct needs, such as Indigenous communities, older adults, and people with disabilities. It is also important to encourage vendors and implementers to co-design virtual care technologies and services with diverse populations (if the tool has a broad user base) or targeted populations (for tailored solutions) to ensure the device is user friendly and satisfies relevant needs. In addition, there should be guidelines for virtual care solutions that have a minimum standard of accessibility based on ability, cultural safety, readability, and other design features.

4. Develop policies and guidelines outlining patients' access rights to various virtual care modalities.

To promote patient-centered care, the Ministry of Health should develop policies that clearly outline patients' access rights to various virtual care modalities. In addition, it is important to have monitoring procedures in place to ensure this is enforced within organizations.

5. Enhance patient education and public awareness of virtual care modalities.

Key informant interviews revealed that patient education on health and digital literacy is variable and a barrier to virtual care adoption. In turn, there needs to be an increase in programs and services that enhance digital health literacy within clinics and hospital sites. Clinics and healthcare organizations need to ensure patients are fully informed on:

- The technical requirements for various virtual care modalities.
- How to register, log on, and use the appropriate technology.
- The various virtual care modalities that are available and the risks/benefits of each.



- Their access rights during decision-making with their providers when selecting virtual care modalities.

Providing patients clear education and resources on how to conduct virtual care will lessen the burden of addressing these issues among clinical and administrative staff. To promote consistent and equitable patient-facing information and resources, we suggest that Ontario Health develop the types of education and training patients require to participate and meaningfully engage with different modalities. These resources should then be leveraged by organizations and within OHTs to promote consistent patient education and messaging across clinics and hospital sites. In addition, we suggest OHTs implement active knowledge translation activities (vs. passive dissemination strategies) to promote patient awareness and capacity building of these requirements. To promote digital health literacy, there should be dedicated and sustainable funding to run digital health literacy initiatives associated with healthcare delivery organizations and other community-based organizations (e.g., libraries, schools, senior centres, centres for newcomers to Canada, and community centres). It is important to recognize different demographic groups are unique and require specific outreach and knowledge translation activities.

6. Enable access to each virtual care modality (phone, video, asynchronous messaging) to promote equitable access and enable patient choice.

Multiple factors influence modality selection as seen in Figure 5. Throughout the pandemic, virtual care modality selection was limited by available clinic and organizational resources and was primarily driven by providers. To promote equitable access and enable patient choice beyond the pandemic, all patients, providers, and organizations should have standard access to at least phone and video visit tools. Further exploration is needed to understand how other modalities (e.g., asynchronous messaging, remote monitoring) can be incorporated into routine care.

The Ministry of Health can support this by providing financial incentives or subsidies for organizations to adopt virtual modalities. Ideally, each modality should also be integrated into staff workflows such that no modality is substantially more burdensome than the others. In addition, clinics and hospitals within OHTs should be encouraged to adopt integrated virtual care solutions.



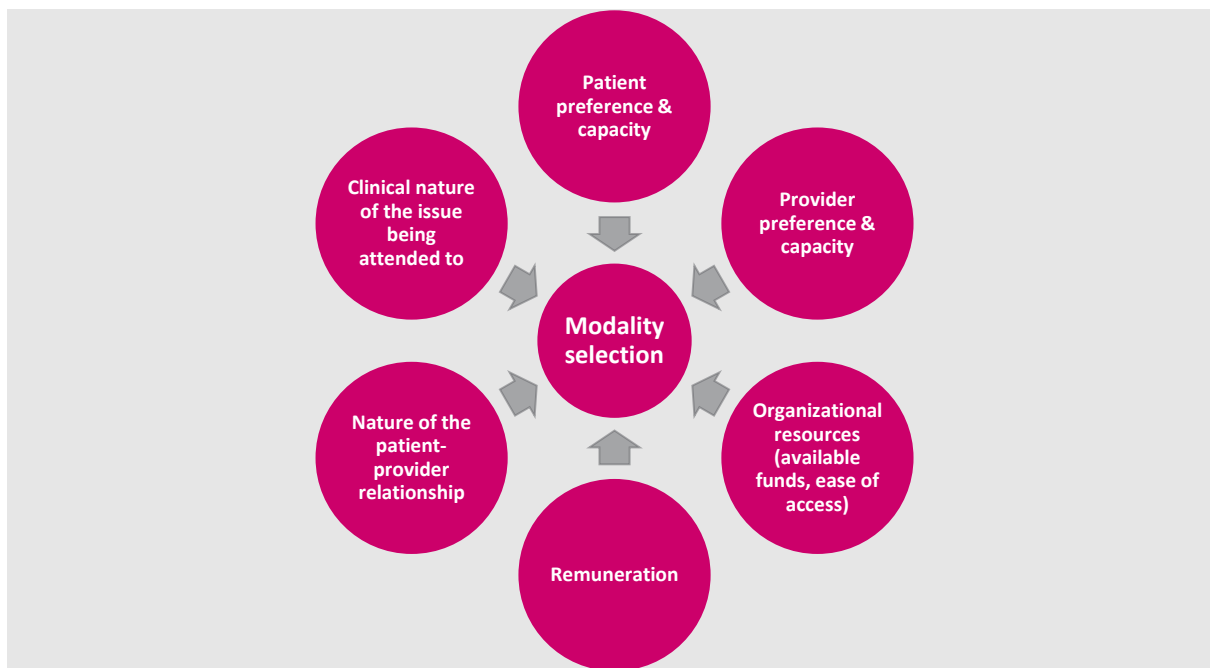


Figure 5. Factors determining modality selection, developed from key informant interview findings.

RECOMMENDATIONS TO BUILD CAPACITY TO DEVELOP EFFICIENT WORKFLOWS FOR VIRTUAL CARE

7. Offer training and professional development opportunities for administrative staff, providers, and learners to build capacity.

To build capacity for administrative staff and healthcare providers, Ontario Health should develop specific training requirements on how to appropriately triage, consent, and onboard patients onto virtual care platforms with the goal of improving clinical workflows. Training and professional development opportunities should be offered by professional health associations based on the established Ontario Health training requirements.

To plan for the future and enable the delivery of a hybrid care model (i.e., mixture of both in-person and virtual care), Ontario Health should also collaborate with professional health associations to embed virtual care training into education curriculums across various disciplines (e.g., nursing, allied health professionals, medical receptionists, etc.). Additionally, there needs to be further guidelines and best practices on how to integrate learners (e.g., nursing and medical students) in the delivery of virtual care services.



8. Co-develop a triage tool to help identify which modality is clinically appropriate for the interaction.

Virtual care has introduced a need to triage incoming patient requests based on who needs to address it (e.g., receptionist, nurse or doctor) and by what modality. To prioritize patient choice and safety, the specifications for a triage tool that is used by clinics should be co-developed by Ontario Health in partnership with patients, providers, administrative staff, and organizational leaders. This triage tool would help clinics determine when and which care modality is most appropriate or wherein multiple modalities should be used to resolve a clinical encounter. To create harmonization within the health system, regulatory bodies and groups involved in clinical quality improvement should be involved. Virtual care solutions can be leveraged to create an effective triage process which has the ability to improve access to care, the quality of care delivered, health system efficiency, and the patient and provider experience (16). The tool should be based on the following considerations:

1. Patient capacity which includes their comfort level and preferences alongside important equity considerations, such as their ability to access and navigate technology, availability of a private space to conduct a virtual visit, and ability to engage with their care given their English language literacy, and cognitive, sensory, and physical capabilities.
2. The nature of the clinical encounter (e.g., if the patient needs a physical exam, complex tests or require discussion of sensitive/serious information).
3. The patient-provider relationship (i.e., whether a relationship has already been established).

Individual organizations and/or OHTs will be responsible for adapting these standards to be clinic specific. Examples of triage tools include simple decision trees or algorithms embedded in a “digital front door” for clinics or hospitals. This tool should be widely disseminated and available on a centralized hub of virtual care guidelines and best practices outlined in recommendation 9.

9. Create a centralized hub for guidelines, best practices, and other educational resources

Providers and organizational leaders have commented that the amount of educational resources (e.g., toolkits, webinars) to guide virtual care decision-making can be overwhelming. To coordinate a standard approach to virtual care, providers and organizational leaders want a single, centralized hub to combine the most up-to-date recommendations and best practices for virtual care. This hub should draw upon resources from other jurisdictions (e.g., Doctors of BC (17), Alberta Medical Association (18)) and regulatory bodies, and should include the following:



1. **Decision-making processes for modality selection during patient triage** which includes guidelines on how to identify patient capacity with regards to technology and selecting the most clinically appropriate modality.
2. **Incorporating virtual care to optimize clinical workflow.**
3. **Communicating with patients** including guidance on patient consenting and onboarding onto virtual care platforms.

RECOMMENDATIONS TO PROMOTE COORDINATED CARE WITHIN THE HEALTH SYSTEM AND UNDER ONTARIO HEALTH TEAMS (OHTs)

10. Develop and implement a strategy to promote digital interoperability across the continuum of health services to support the coordination of care within and across OHTs.

This evaluation reemphasized the need for the Ministry of Health to improve provincial interoperability of personal health information (PHI), and to make this data interoperable with EMRs. Although some providers recognized that there are platforms that exist that are meant to centralize PHI, including ConnectingOntario and ClinicalConnect, they noted that these platforms were not user-friendly and lacked relevant clinical information, dissuading use. Patients would benefit from accessing their PHI from a single point of entry, allowing them to be actively involved in their own care and allowing seamless communication when navigating between different providers. Consolidating PHI would improve the continuity and coordination of care across the health system. It is also important to ensure patients have equitable and consistent access to their PHI, calling into question whether organizations should be mandated to make this data accessible via patient portals. It is also important to have clear policies outlining patients' data access rights.

The ability for different digital products or systems to readily connect and share information (i.e., interoperability) is crucial to advance future virtual care use (6,19). Data interoperability has the potential to reduce administrative tasks for providers and increase workflow efficiency, allowing providers to focus their time on patient care (20). It will also ease the patient burden of sharing relevant information when navigating between multiple healthcare providers. To make data integration easier, standard clinical terminology (e.g., descriptors for labs, imaging, etc.) should be used. This can also serve as a proactive step on the pathway to patient data portables across provinces (21).



11. Develop and implement a long-term virtual care strategy that aligns with the evolving digital health ecosystem.

The Ministry of Health should develop and implement a long-term virtual care strategy to provide clarity to patients, providers, and organizations on the future of healthcare delivery.

To allow organizations and clinics to make rational buying decisions when investing in their long-term virtual care infrastructure, Ontario Health should promote the existing virtual visit verification process as many interview respondents were unaware of this resource. This guideline should detail the technical and interoperable capabilities of each vendor/platform, its associated costs and what will be covered through government support, and whether provincial security and privacy standards are met, and should be published on the centralized hub. Guidelines should also consider a minimum standard of accessibility based on ability, cultural safety, readability, and other design features. From a patient perspective, there could be challenges with needing to log on and learn to navigate multiple systems to access various virtual care modalities across the continuum of health services. We suggest expanding current provincial efforts to build a federated digital identity and promote integrated virtual care systems by creating a select list of certified vendors that meet interoperability standards that clinics/organizations could choose from.

To foster and engage with innovative models of care (e.g., virtual walk-in clinics, virtual emergency departments, artificial intelligence in healthcare and autonomous do-it-yourself virtual healthcare solutions (13,22)), the Ministry of Health should consider public-private partnerships with third-party vendors to build a resilient healthcare system (19). The digital health sector has grown tremendously in the last year, and it will provide many valuable solutions but its role within the virtual care strategy should be clarified to minimize the risks to continuity of care, further fragmentation of services, and exacerbation of inequities within the health system (22–24). In addition, the health system must be responsive to the constantly evolving nature of digital health technology to keep pace with new innovations.

5. Limitations and Future Research

LIMITATIONS

Due to the rapid uptake and implementation of virtual care modalities, there are limitations to this evaluation project. First, the interview findings collected were based on the unusual environment of the COVID-19 pandemic. During the evaluation, Ontario was still in the second wave of the pandemic. Perspectives and preferences, for both providers and patients, on virtual care use may



differ beyond the pandemic. Second, there were issues recruiting diverse participants that reflect all demographic users, geographic regions, and areas of the health system. Third, the implementation of virtual care modalities was primarily based on cost, ease, and timeliness of access. Thus, patient and provider perspectives on clinical appropriateness were influenced by organizational constraints and access to various modalities. Thus, these perspectives may not reflect appropriateness based on patient preference or the clinical nature of the issue being attended to. Similarly, there was low use of specific virtual care modalities (e.g., asynchronous messaging, remote monitoring, video visit technologies) during the pandemic which limited our ability to receive in-depth feedback on these. In addition, this evaluation excluded many emerging virtual care services, such as third-party vendor solutions, virtual emergency room services, and emerging do-it-yourself virtual care technologies, which are important to consider in the broader digital health ecosystem. Further research is required to understand the value of these technologies and their impact on health equity and integrated care.

FUTURE RESEARCH

To address evidence gaps with respect to virtual care use, we suggest the Ministry of Health invest in longitudinal evaluation research that assesses the medium and long-term impact of virtual visits on healthcare costs, health outcomes, patient and provider experience, and the quality of care delivered in geographically diverse sites across the continuum of health services. Specifically, this research should explore:

- High-value vs. low-value clinical areas for virtual care
- Leveraging innovative models of care (e.g., remote monitoring, omni-channel virtual care pathways) to deliver more effective care for the management of clinical conditions and as a cost savings measure
- The types of actions (both within and outside a virtual visit) and provider behaviours that lead to high-value virtual care
- The quality of various virtual care modalities in comparison to in-person care in terms of safety, efficacy, efficiency, timeliness, equity, and patient-centeredness (11) alongside health outcomes
- The types of virtual care encounters that are substitutive vs. additive (10)
- The impact of various virtual care modalities on downstream care (i.e., emergency department visits, hospital admissions, specialty referrals, and testing) (10)



- The relative cost difference between virtual visits and equivalent in-person visits for patients, organizations, and the health system (10)
- The upfront and ongoing administrative, infrastructural, and operational costs of virtual care to determine the requirements for additional financial supports to implement or sustain virtual care use and who is accountable for these costs
- A sustainable remuneration model that satisfies providers, while prioritizing patient-centered and integrated care alongside clinically appropriate delivery

6. Conclusion

The COVID-19 pandemic, aided by provincial billing codes, has prompted a new era of virtual delivery across health systems. This has also laid the groundwork for the current system change occurring within Ontario which aims to enhance person-centered and integrated care through OHTs. The value of virtual care lies in its ability to improve access, especially for populations in rural/remote settings, busy caregivers, and chronically ill patients who need routine touchpoints with providers. As such, virtual care, including both phone and video visits, should continue after the pandemic and patients, providers, and organizational leaders unanimously endorse a hybrid approach of in-person and virtual visits. Uptake of different communication modalities is likely dependent on available resources, access to technology, clinical area, and preference. However, during the pandemic, decisions regarding modality were often driven by providers, which may conflict with patient-centered care. To enhance the patient experience, patients/caregivers should be given the option to engage in modalities that align with their capacity, preferences, and clinical needs. In addition, further effort is required to enhance equitable access. To optimize the provider experience, workflows, triage, and the clinical elements of virtual care models need to be resolved. There is also a need to guide procurement decisions for various technologies and to promote interoperability to align with the health system's broader goals for more patient-centered and integrated care. Further, evidence regarding the value of virtual care in comparison to in-person visits would help elucidate a sustainable remuneration model. There is also untapped potential to leverage a mix of modalities and other virtual care technologies to generate innovative care models that facilitate more efficient, timely, and high-quality patient care. However, these benefits will not be realized without targeted support. While this report outlined several policy recommendations to promote ongoing use of virtual care after the pandemic, optimal policy is contingent on the main goals being prioritized by the health system.



References

1. Bazemore A, Petterson S, Peterson LE, Bruno R, Chung Y, Phillips RL. Higher primary care physician continuity is associated with lower costs and hospitalizations. *Ann Fam Med*. 2018 Nov;16(6):492–7.
2. Lavis JN, Anderson GM. Appropriateness in health care delivery: Definitions, measurement and policy implications. *Can Med Assoc J*. 154(3):321–8.
3. Ontario Ministry of Health, Ontario Ministry of Long-Term Care. Community Health Centres [Internet]. 2019 [cited 2021 Feb 24]. Available from: <http://www.health.gov.on.ca/en/common/system/services/chc/>
4. Ontario Ministry of Health, Ontario Ministry of Long-Term Care. Become an Ontario Health Team - Health Care Professionals - MOH [Internet]. 2021 [cited 2021 Feb 4]. Available from: <http://health.gov.on.ca/en/pro/programs/connectedcare/oht/>
5. Health Canada. About primary health care [Internet]. *aem*. 2005 [cited 2021 Feb 4]. Available from: <https://www.canada.ca/en/health-canada/services/primary-health-care/about-primary-health-care.html>
6. Canadian Medical Association. Virtual care in Canada: Discussion paper. *CMA*; 2019 Aug p. 24.
7. Waddell K, Scallan EM, Wilson MG. Understanding the use of and compensation for virtual-care services in primary care. *McMaster University*; 2018 Jul p. 16.
8. Berenson R, Shartz A. The mismatch of telehealth and fee-for-service payment. *JAMA Health Forum*. 2020 Oct 2;1(10):e201183–e201183.
9. Mehrotra A, Bhatia RS, Snowswell CL. Paying for telemedicine after the pandemic. *JAMA*. 2021 Feb 2;325(5):431.
10. Mehrotra A, Wang B, Snyder G. Telemedicine: What should the post-pandemic regulatory and payment landscape look like? 2020 [cited 2021 Mar 2]; Available from: https://www.commonwealthfund.org/publications/issue-briefs/2020/aug/telemedicine-post-pandemic-regulation?redirect_source=/publications/issue-briefs/2020/aug/telemedicine-what-should-post-pandemic-regulatory-and-payment
11. Herzer KR, Pronovost PJ. Ensuring quality in the era of virtual care. *JAMA*. 2021 Feb 2;325(5):429.
12. Le D-N, Van Le C, Tromp JG, Nguyen GN. Emerging technologies for health and medicine: virtual reality, augmented reality, artificial intelligence, internet of things, robotics, industry 4.0. *John Wiley & Sons*; 2018.
13. Timmis JK, Timmis K. The DIY digital medical centre. *Microb Biotechnol*. 2017 Sep;10(5):1084–93.



14. United Nations General Assembly. The promotion, protection and enjoyment of human rights on the Internet [Internet]. Human Rights Council; 2016 Jun. Available from: https://www.article19.org/data/files/Internet_Statement_Adopted.pdf
15. Weiss D, Rydland HT, Øversveen E, Jensen MR, Solhaug S, Krokstad S. Innovative technologies and social inequalities in health: A scoping review of the literature. Virgili G, editor. PLOS ONE. 2018 Apr 3;13(4):e0195447.
16. Bakhai M, Croney L, Henshall N, Waller O, Felsted C. Using online consultations in primary care [Internet]. 2020 Jan p. 195. Available from: <https://www.england.nhs.uk/wp-content/uploads/2020/01/online-consultations-implementation-toolkit-v1.1-updated.pdf>
17. Doctors Technology Office. Virtual Care Toolkit. Doctors of BC; 2020 Jun.
18. Alberta Medical Association. Virtual Care - Toolkit. Alberta Medical Association; 2020 May.
19. Deloitte. COVID-19: Digital health & virtual care [Internet]. p. 11. Available from: <https://www2.deloitte.com/content/dam/Deloitte/ca/Documents/life-sciences-health-care/ca-covid-19-digital-health-and-virtual-care-aoda-en.pdf>
20. Lehne M, Sass J, Essenwanger A, Schepers J, Thun S. Why digital medicine depends on interoperability. Npj Digit Med. 2019 Dec;2(1):79.
21. Experts: Clinical Terminology Mapping Will Be Essential Tool. J AHIMA 77. 2006 Jan;1:56–7.
22. Canadian Medical Association, The College of Family Physicians, Royal College of Physicians and Surgeons of Canada. Report of the Virtual Care Task Force [Internet]. 2020 Feb p. 52. Available from: https://www.cma.ca/sites/default/files/pdf/Virtual-Care-Playbook_mar2020_E.pdf
23. Glauser W. Virtual care has potential to fragment primary care and disturb continuity of care, warn doctors [Internet]. CMAJ News. 2019 [cited 2021 Mar 1]. Available from: <http://cmajnews.com/2019/08/29/virtual-care-has-potential-to-fragment-primary-care-and-disturb-continuity-of-care-warn-doctors/>
24. Wharton GA, Sood HS, Sissons A, Mossialos E. Virtual primary care: Fragmentation or integration? Lancet Digit Health. 2019 Nov;1(7):e330–1.

