EVIDENCE SYNTHESIS BRIEFING NOTE

TOPIC: PROVIDER-LED VIRTUAL CARE IN AMBULATORY CARE

Information finalized as of August 28, 2020.[1]

Purpose: This note provides a summary of scientific evidence and Canadian/international experiences on clinician-led virtual care services used to replace in-person care in hospital-based ambulatory care settings.

Key Findings:

- Type of Technology Used: Most jurisdictions and scientific evidence sources note the greater use of synchronous virtual care technologies, particularly video consultations, compared to asynchronous technologies. For example, hospital networks across Canada and eight large hospital networks in the US use a range of communication platforms to conduct virtual care services for synchronous video consultations, and telephone for synchronous audio-only consultations.
- Type of Patients Consulted: Across Canada, the US, and Australia, the following medical specialities use virtual care technology for patient-provider interactions: complex conditions; mental health and substance use; cancer care; endocrinology care; outpatient care; obstetrics and gynaecology care; remote and rural care; pulmonary care; spinal care; aging and geriatrics care; cardiac care; inpatient care; sexual health; optometry; genetics; surgery; nephrology; respirology; neurosurgery; rehabilitation services; group patient education; and neurology.
- Quadruple-Aim Impact and Effectiveness:
  - Health Outcomes: Virtual care technologies may be effective in improving clinical outcomes and the efficacy of virtual care may be dependent on the technological modality being used.
  - Cost-effectiveness: Virtual care technologies have been demonstrated to be cost-effective in comparison to in-person care, for example in Local Health Districts in Australia.
  - Patient Experiences: At the pan-Canadian level, patients are less satisfied with virtual visits than in-person visits and tend to be more satisfied with telephone consultations than synchronous video or asynchronous messaging. In Australia, however, patient experiences with virtual care technology are overall positive compared to in-person care. Common themes of patient satisfaction include increased access and equity, reduced travel times, increased quality of care, and increased access to timely supports and care.
  - Provider Experiences: In Australia, provider experiences with virtual care technology are overall positive compared to in-person care. Common themes of provider satisfaction include reduced travel time, increased patient consultations, increased geographic coverage, reduced burden on the health care system, increased quality of care, and increased time of service.

Analysis for Ontario:

- There are five health systems in Ontario that use virtual care services, including the Ontario Telemedicine Network (telephone, videoconferencing); Hamilton Health Sciences (telephone, videoconferencing); University Health Network (telephone, videoconferencing, remote monitoring); Humber Hospital (telephone, videoconferencing); London Health Sciences Centre (telephone, videoconferencing); and Ottawa Hospital System (videoconferencing).

[1] This briefing note includes current available evidence as of the noted date. It is not intended to be an exhaustive analysis, and other relevant findings may have been reported since completion.

Supporting Evidence

Table 1 below summarizes scientific evidence and lessons learned from international and Canadian experiences on clinician-led virtual care services used to replace in-person care in hospital-based ambulatory care settings. Findings are organized by: the type of technology used, the type of services offered, the type of patients consulted; and effectiveness and impact of virtual care.

Additional details are provided in the Appendix in Table 2 (scientific evidence evaluating the effectiveness of virtual care in ambulatory care settings), Table 3 (key findings from highly relevant evidence documents, with the full systematic reviews from higher to lower quality), Table 4 (experiences from large hospital networks in the US), Table 5 (effectiveness of virtual care programs in Australia), Table 6 (Canadian provinces' and territories' experiences shifting to virtual care), Table 7 (guidance on virtual care platforms and/or programs available for use in Canada), and Table 8 (effectiveness of virtual care programs in Canada).

This Briefing Note was completed by the Research, Analysis, and Evaluation Branch (Ministry of Health) based on information provided by members of the COVID-19 Evidence Synthesis Network. Please refer to the Methods section for further information.

Table 1: A Summary of the Scientific Evidence and Lessons Learned from International and Canadian Experiences

Scientific Evidence	• Information on virtual care technologies was identified from scientific evidence sources pertaining to the topics below: o The type of services offered: There are different services offered within synchronous and asynchronous virtual care technologies, and overall videoconferencing was identified as the most commonly used virtual care technology, followed by telephone calls, telemonitoring, teleconsultation, and store-and-forward (e.g., photos). o The type of patients consulted: Most virtual care technology is offered to patients seeking: endocrinology care (e.g., diabetes care), mental health and additions care, outpatient care, obstetrics and gynaecology care, and inpatient care. o Effectiveness and Impact: Virtual care technologies are effective in improving patient and provider experiences, and are cost-effective. In particular: ▪ Patient experience and equity: Patient experiences with virtual care technology are overall positive compared to in-person care. Common themes of patient satisfaction when using virtual care include reduced travel (i.e., fewer trips required), increased quality of care, and reduced time travelling. ▪ Provider experience: Provider experiences with virtual care technology is overall positive compared to in-person care. A common theme pertaining to provider satisfaction when using virtual care includes reducing physician-related medication errors. ▪ Cost-effectiveness: Virtual care technologies are cost-effective in comparison to in-person care, with cost savings being reported from reduced travel and accommodation expenses.
International Scan	• In the US, there are eight large hospital networks (i.e., Cleveland Clinic, Dartmouth-Hitchcock Health System, Johns Hopkins, Kaiser Permanente, Massachusetts General Hospital, Mayo Clinic, NYC Health + Hospitals, and Providence Health and Services) which had extensive virtual care services in place prior to the pandemic.

	However, four of these hospital networks had to increase their capacity to provide virtual services as a result of the COVID-19 pandemic. o The type of technology used: Specific virtual care programs used to provide virtual services across the eight hospital networks include: Cleveland Clinic Express Care Online, Doximity Dialer, Facetime, Google Duo, Mayo Clinic Express Care Online, Microsoft Teams, MyChart, Virtual ExpressCare, and VirtualVisit SBR Health App. o The type of services offered: At Kaiser Permanente, the majority of virtual services are telephone-based, although other options, including email and chat services as well as synchronous video visits, are available. The Mayo Clinic, NYC Health + Hospitals, and Providence Heather Services operate similarly, while Dartmouth-Hitchcock Health System and Johns Hopkins rely more heavily on video consultations. During the pandemic, NYC Health + Hospitals transitioned visits to be telephone-based with all ancillary team members (e.g., chronic disease nurses, nutritionists, social workers) and some administrative roles. o The type of patients consulted: Virtual services are offered to patients seeking: ▪ Initial COVID-19 consultations (Kaiser Permanente); ▪ Cancer screening (e.g., colorectal cancer) (Kaiser Permanente); ▪ Management of and monitoring of various chronic conditions (Kaiser Permanente; Providence Health and Services; Johns Hopkins; Cleveland Clinic); ▪ Management and monitoring of various complex conditions (Kaiser Permanente; Mayo Clinic; Providence Health and Services; Johns Hopkins; Cleveland Clinic); ▪ Virtual cardiac rehabilitation (Kaiser Permanente); ▪ Virtual dermatology (Providence Health and Services); ▪ Virtual oncology services (Providence Health and Services); ▪ Virtual pediatric care (Dartmouth-Hitchcock Health System); ▪ Virtual psychiatry, mental health and behavioural services (Providence Health and Services); ▪ Virtual triaging for local emergency rooms (Dartmouth-Hitchcock Health System); and ▪ Virtual medical rounds (Massachusetts General Hospital). • Local Health Districts (e.g., Adelaide, Kingswood, New England, New South Wales, Sydney) in Australia reported on virtual care technology in general (i.e., not specifically in the context of the COVID-19 pandemic): o The type of services offered: Synchronous videoconferencing is the most commonly used virtual care technology, followed by asynchronous store-and-forward technology (e.g., photos). o The type of patients consulted: Most virtual care technology is offered to patients seeking: endocrinology care (e.g., diabetes care), mental health and additions care, outpatient care, cancer care, chronic spinal care, remote and rural care, aging and geriatrics care, cardiac care, and inpatient care. o Effectiveness and Impact: Australia reports virtual care technologies being effective in improving patient and provider experiences, and are cost-effective. In particular: ▪ Patient experience and equity: Common themes of patient satisfaction when using virtual care include increased access and equity, reduced travel, increased quality of care, and increased access to timely supports and care.

	▪ Provider experience: Common themes pertaining to provider satisfaction when using virtual care include reduced travel time, increased patient consultations, increased geographic coverage, reduced burden on health care system, increased quality of care, and increased time of service. ▪ Cost-effectiveness: All Local Health Districts in Australia report that telehealth models are cost-effective.
Canadian Scan	• At the provincial level, 10 hospital networks across four provinces (i.e., British Columbia, Alberta, Ontario, and Quebec) are using a range of platforms to conduct virtual care services. o The type of technology used: Virtual care technologies include Microsoft Teams, Ontario Telemedicine Network, Vivify Pathways, Zoom for Healthcare, REACTS, Pexip, Webex, Lumeca, Doxy.me, Memora Health, Accuro EMR – QHR Technologies, Med Access EMR – Telus, Maple, Econsult, eDOCSNL which are used for synchronous video and audio consultations, and asynshronous store-and-forward. o The type of patients consulted: Most virtual care technology is offered to patients seeking care related to: mental health, sexual health, obstetrics and gynecology, optometry, genetics, oncology, surgery, nephrology, respirology, neurosurgery, rehabilitation services, group patient education, and neurology. In response to the pandemic, some Canadian hospital networks have expanded their virtual offerings and are providing a range of ambulatory services using synchronous video and audio including: ▪ Virtual consultations for cancer patients that have tested positive for COVID-19 (University Health Network [UHN] - Princess Margaret Cancer Centre); ▪ Virtual cardiac rehabilitation program (Vancouver Hospital and Health Science Centre); ▪ Virtual management and monitoring for heart failure (UHN); ▪ Virtual oncology services (UHN); ▪ Virtual peri-operative care management and monitoring (UHN); ▪ Virtual post-operative care for cardiac and vascular surgery (Hamilton Health Sciences); ▪ Telepsychiatry (UHN; Centre hospitalier de l'Universite de Montreal); ▪ Drug addictions services (Centre hospitalier de l'Universite de Montreal); ▪ Virtual prenatal checkups (London Health Sciences Centre; Centre hospitalier de l'Universite de Montreal); ▪ Virtual triage for pediatric urgent and emergency care (London Health Sciences Centre); and ▪ Telephone line for triage with nursing staff (Centre hospitalier de l'Universite de Montreal). o Effectiveness and Impact: Canadian provinces and territories report virtual care technologies being effective in improving patient experiences. In particular: ▪ Patient experience: At the pan-Canadian level, Canada Health Infoway released a report (July 20, 2020) that examines the experiences of patients shifting to virtual services. It was generally found that patients are less satisfied with virtual visits than in-person visits and tend to be more satisfied with telephone consultations than synchronous video or asynchronous messaging. Ontario, Manitoba, Saskatchewan, Yukon, Prince Edward Island, Newfoundland and Labrador, Northwest Territories, and Nunavut report the importance of ensuring the privacy and security of personal health information; data management and

	recording of personal health information virtual visits; ensuring patient centered good quality care; and equitable and fair access to marginalized patient populations when using virtual care technology. o Cost effectiveness: Ontario, Manitoba, Saskatchewan, Yukon, Prince Edward Island, Newfoundland and Labrador, Northwest Territories, and Nunavut note the importance of ensuring a fair and correct payment model when using virtual care.
Ontario Scan	• Five health systems in Ontario were identified that are using virtual care services: o Hamilton Health Sciences ▪ Hamilton Health Sciences has implemented virtual care services that enable patient-clinician communication through phone calls and/or home-video visits (eVisits) during the COVID-19 pandemic. ▪ As of May 6, 2020, there are three approved modalities for virtual care visits: 1) Ontario Telemedicine Network; 2) Zoom for Healthcare; and 3) telephone. o UHN ▪ UHN has implemented the use of virtual care in the form of phone visits and video visits using conferencing tools provided by Ontario Telemedicine Network and Microsoft Teams. ▪ Princess Margaret Cancer Centre started a Nurse-Led Virtual Care Clinic, which aims to support cancer patients that have tested positive for COVID-19. ▪ On June 25, 2019, UHN partnered with Vivify Health to offer Vivify Pathways Go, a peri-operative care management and engagement strategy that allows for the remote monitoring of patients. ▪ In 2016, UHN launched Medly, a digital tool that aims to provide support to heart failure patients. This service is designed for patients to monitor their own heart health, obtain personalized feedback messages, and communicate remotely with their care team as needed. o Humber Hospital ▪ In March 2020, Humber River Hospital implemented Virtual Video Visits for clinicians to interact and connect with patients from home. This virtual-care service is conducted through audio (telephone) or video (Microsoft Teams) technologies. o London Health Sciences Centre ▪ Non-urgent or outpatient appointments have largely been re-scheduled and are now taking place through phone and virtual consultations. ▪ On May 19, 2020, the London Health Sciences Centre announced virtual prenatal check-ups with obstetricians for expectant patients. ▪ On May 11, 2020, the London Health Science's Children Hospital launched an urgent and emergency care virtual clinic. Under the clinic, families of children with complex needs can connect with a physician to evaluate their child's condition and determine next steps. o Ottawa Hospital System ▪ On April 27,2020, the Ottawa Hospital launched Epic-Zoom virtual platform for health care providers to connect with patients through video for non-urgent appointments and outpatient programming. ▪ As of July 2019, the Ottawa Hospital provides all patients receiving care at partner locations access to MyChart free of charge.

Methods

The COVID-19 Evidence Synthesis Network is comprised of groups specializing in evidence synthesis and knowledge translation. The group has committed to provide their expertise to provide high-quality, relevant, and timely synthesized research evidence about COVID-19 to inform decision makers as the pandemic continues. The following members of the Network provided evidence synthesis products that were used to develop this Evidence Synthesis Briefing Note:

- McMaster Health Forum. COVID-19 Rapid Evidence Profile #16 - What clinician-led virtual-care services can be used to replace in-person care in hospital-based ambulatory care settings? July 31, 2020.
- Canadian Agency for Drugs and Technologies in Health (CADTH). Informal Jurisdictional Scan on Virtual Care Visits. August 28, 2020.
- Evidence Synthesis Unit. 857. Rapid Response on Provider-Led Virtual Care in Ambulatory Care. August 20, 2020.

APPENDIX

Table 2: Scientific Evidence on the Effectiveness of Virtual Care in Ambulatory Care

Type of Study/ Reference	Study Purpose Type of Technology, Patient, and/or Service	Effectiveness: Clinical, Cost, Patient, and/or Provider
Systematic Review (DeNicola et al., 2020)	Study Purpose • Reviewing the effectiveness of telehealth interventions for improving obstetric and gynecologic health outcomes.[1] Technology • Synchronous: Virtual visits in women's health care delivery.[1] • Asynchronous: Mobile media, remote monitoring and care-delivery, and patient generated data.[1] Type of Patients • Women needing obstetric and gynecologic services.[1] Type of Services • Telehealth interventions that report health outcomes in low-risk obstetrics, high-risk obstetrics, family planning, and gynecologic conditions. Telehealth activities can involve one-way or two-way communication exchange.[1]	Effectiveness According to the 2020 study on telehealth interventions to improve obstetric and gynecologic health outcomes: • Telehealth interventions overall improved obstetric outcomes related to smoking cessation and breastfeeding. Telehealth interventions decreased the need for high-risk obstetric monitoring office visits while maintaining maternal and fetal outcomes. • Telehealth interventions were effective for the continuation of oral and injectable contraception. One text-based study found increased oral contraception rates at six months. • Telehealth provision of medication abortion services had similar clinical outcomes compared with in-person care and improved access to early abortion.[1] Clinical Effectiveness • One study found reductions in diagnosed preeclampsia among women with gestational hypertension.[1,2]
Rapid Response (CADTH, 2020)	Study Purpose • No information identified. Type of Technology • Synchronous: Telephone or videoconferencing technologies.[2] Type of Patients	Effectiveness • A 2020 CADTH rapid response on telehealth and mobile services for substance use disorder found that telehealth or mobile health interventions improved treatment retention, adherence, and relapse prevention in patients with substance use.

[2] Preeclampsia is a pregnancy complication characterized by high blood pressure and signs of damage to another organ system, most often the liver and kidneys. Preeclampsia usually begins after 20 weeks of pregnancy in women whose blood pressure had been normal (MayoClinic, 2020).

	• Adults with substance use disorder with or without other co-occurring mental health or addictions issues.[2] Type of Services • Telepsychiatry, telemedicine delivered opioid agonist therapy.[2]	Cost-Effectiveness • No information identified. Patient Experience and Equity • No information identified. Provider Experience • No information identified.
Survey Study (American College of Physicians, 2019)	Study Purpose • Evaluating the adoption of telehealth by internal medicine physicians, specifically whether telehealth technologies were available to their practice and how frequently they used the technology with their patients.[3] Type of Technology • Synchronous: Video visits, e-consults, monitoring, management, and wearables.[3] Type of Patient • Outpatient care.[3]	Provider Effectiveness According to a 2019 survey study of American College of Physician members: • Overall, 51% of the respondents indicated they worked in a practice that adopted more than one of the five telehealth technologies. • Telehealth implementation and usage varied widely among internists and subspecialists, depending on the category of telehealth technology. • The most widely adopted technology was e-consult, which 33% of the respondents reported having the technology to perform; of these, 63% said they used e-consults weekly whereas only nine percent said they never used it. • The least implemented technologies were remote care management (24%) and video visits (18%). • Having the technology did not equate to its adoption and usage (e.g., of individuals with remote care management technology, only 50% used it every week, and only 19% used video visit technology every week).[3]
Comparative Effectiveness Review (Totten et al., 2019)	Study Purpose • Identifying and summarizing the available evidence about the effectiveness of telehealth consultations using decision modeling techniques 28 Type of Technology • Synchronous: Teleconsultation.[4] Type of Patient	Effectiveness According to a 2019 Agency for Healthcare Research and Quality (AHRQ) report on telehealth for acute and chronic care consultations: • The overall results varied by setting and clinical topic, but generally the findings are that telehealth improved outcomes or identified no difference between telehealth and the comparators across the settings. • Remote intensive care unit (ICU) consultations likely reduce ICU and total

	• Inpatient, emergency, or outpatient care.[4] Type of Services • Telehealth consultations facilitate collaboration between two or more providers, often involving a specialist, or among clinical team members, across time and/or distance. Consultations may focus on the prevention, assessment, diagnosis, and/or clinical management of acute or chronic conditions.[4]	hospital mortality with no significant difference in ICU or hospital length of stay. • Remote consultations for outpatient care likely improve a range of clinical outcomes, with moderate strength of evidence in favour of telehealth. • Telehealth consultations in emergency care may improve outcomes, with low strength of evidence in favour of telehealth. • Telehealth consultations in emergency services likely reduce heart attack mortality. • Remote ICU consultations likely reduce mortality.[4] Cost Effectiveness The 2016 AHRQ report on telehealth for acute and chronic care consultations reported that: • A model comparing telehealth to transfers and in-person neurosurgical consultations for acute traumatic brain injury suggested that the impact of telehealth on costs may depend on multiple factors, including how alternatives are organized (e.g., if the telehealth and in-person options are part of the same health care system) and whether the cost of a telehealth versus an in-person consultation differ. • Telehealth consultations in emergency care may reduce costs due to fewer transfers, and may also reduce outpatient visits and costs due to less travel.[4] Patient Effectiveness The 2016 AHRQ report on telehealth for acute and chronic care consultations suggested that: • Specialty telehealth consultations likely reduce the time patients spend in the emergency department. • Remote consultations for outpatient care likely improve access.[4]
Meta-Analysis (Wu et al., 2018)	Study Purpose • A systematic review of the literature and performing a meta-analysis of comparing the clinical outcomes of telehealth and usual care in the management of diabetes.[5]	Clinical Effectiveness According to a 2018 meta-analysis on the evaluation of the clinical outcomes of telehealth for managing diabetes: • Compared with usual care, telehealth had a positive effect on glycemic and

	Type of Technology • Synchronous:, teleconsultation, telecase management, telementoring.[5] • Asynchronous: Tele-education, telemonitoring.[5] Type of Patient • Adults with type I or type II diabetes.[5]	blood pressure control, while no significant difference was found in the control of body mass index (BMI).[3] • For total cholesterol and quality of life, telehealth was similar or superior to usual care.[5]
Rapid Response (CADTH, 2018)	Study Purpose • Synthesizing and appraising the available evidence on the clinical effectiveness of telepsychotherapy for the assessment and treatment of major depression, generalized anxiety disorder, and post-traumatic stress disorder (PTSD) in adult patients.[6] Type of Technology • Synchronous: Telephone, videochat, or videoconferencing technologies.[6] Type of Patients • Adult patients with a primary diagnosis of major depressive disorder, PTSD, or generalized anxiety disorder.[6] Type of Services • Remote psychotherapy.[6,4]	Effectiveness A 2018 CADTH rapid response on telehealth for the assessment and treatment of major depression, generalized anxiety disorder, and PTSD identified: • Limited evidence that psychological assessment via telehealth is clinically effective in patients with depression. • No relevant evidence to support use of telehealth for psychological assessment in patients with anxiety or PTSD. • Psychological treatment delivered by telehealth is clinically effective and the magnitude of the treatment effect is comparable when the same intervention is provided by telehealth or by traditional means such as in-person/same room therapy.[6] Cost-Effectiveness • No information identified. Patient Experience and Equity • No information identified. Provider Experience • No information identified.
Systematic Review and Network Meta-Analysis	Study Purpose • Reviewing the literature on telemedicine to determine the relative effectiveness of the various telemedicine technologies in an outpatient setting.[7]	Effectiveness A 2017 systematic review on telemedicine for diabetes found that: • Over a median of six months follow-up, telemedicine reduced hemoglobin A1c (HbA1c) by a mean of 0.43% (95% CI: −0.64% to −0.21%).[6]

[3] Body mass index (BMI) is a measure of body fat based on height and weight that applies to adult men and women (National Health Institutes, n.d.).
[4] Remote psychotherapy is a psychological intervention mediated by remote communication (Bee et al., 2008).
[6] The HbA1C test is a common blood test used to diagnose type I and type II diabetes and to monitor diabetes management (MayoClinic, 2018).

(Huey Lee et al., 2017)	Type of Technology • Synchronous: Tele-education, telecase-management, telementoring, and teleconsultation.[7] • Asynchronous: Telemonitoring.[7] Type of Patients • Patients with type II diabetes.[7] Type of Services • Teleeducation, telemonitoring, telecase-management, telementoring, and teleconsultation.[7,5]	• Network meta-analysis showed that all telemedicine strategies were effective in reducing HbA1c significantly compared to in-person care except for telecase-management and telementoring. When the strategies were ranked according to their effectiveness, the three most effective interventions were: teleconsultation alone, followed by telecase-management plus telemonitoring, and teleeducation plus telecase-management.[7] Cost-Effectiveness • No information identified. Patient Experience and Equity • No information identified. Provider Experience • No information identified.
Rapid Response (CADTH, 2016)	Study Purpose • No information identified. Type of Technology • Synchronous: Telephone call.[8] Type of Patients • Outpatients (i.e., patients living in the community or discharged from hospital, excluding in-patients) with COPD.[8]	Effectiveness A 2016 CADTH rapid response on telehealth for outpatients with COPD identified: • Phone calls to COPD patients, initiated by a health care worker, had a negative effect on health status when compared to usual care. Another study suggested that "problem-solving therapy"[7] in the form of 12 phone calls from nurses to COPD patients had no difference when compared to usual care. • An improvement was identified in depressive symptoms and self-efficacy in

[5] Teleeducation is any intervention that uses application of information and communication technologies (e.g., telephone lines, internet) for the delivery of distance learning, teaching or training to remote participants.
Teleconsultation is two way communication between a health care provider/specialist and patients or between clinicians using a range of communication and information technologies (e.g., email, phone, automated messaging system, internet, or other equipment without face-to-face contact) that aim to provide health care at a distance. Telemonitoring is any process which uses an audio, video, or telecommunication and electronic information to monitor health status of a patient from a distance which is then transmitted back to the clinician. Telecase-management is a collaborative approach that focuses on the coordination, integration, and direct delivery of beneficiary services provided in collaboration with or supplementary to primary care for improving the efficiency, depth or breadth of clinical care.
Telementoring is the process of using either audio, video or any telecommunication and electronic information processing technology by a person who has gone through a specific experience to provide individual guidance, mentorship or direction to another person who is new to the experience (Huey Lee et al., 2007).
[7] Problem-solving therapy (PST) is a cognitive-behavioural intervention that trains patients to use problem-solving attitudes and skills (Yoon et al., 2014).

	Type of Services • Telehealth, rehabilitation programs via telephone.[8]	clinically depressed patients who received the phone calls. • Telehealth intervention in COPD patients improved quality of life; however, it found no change in COPD-related hospitalization and all-cause mortality.[8,8] Cost-Effectiveness • No information identified. Patient Experience and Equity • No information identified. Provider Experience • No information identified.
Systematic Review (Flodgren et al. 2016)	Study Purpose • Assessing the effectiveness, acceptability, and cost of interactive telemedicine as an alternative to, or in addition to, usual care (i.e., face-to-face care, or telephone consultation). Data was summarized from 16 studies recruiting people with heart failure, high to moderate certainty of evidence, and from 21 studies recruiting people with diabetes, high to low certainty of evidence.[9] Type of Technology • Synchronous: Videoconferencing.[9] • Asynchronous: Telemonitoring.[9] Type of Patient • The studies recruited participants with a number of clinical conditions: cardiovascular disease, diabetes, respiratory conditions, mental health problems or substance abuse, conditions requiring a specialist consultation, complex comorbidities, urogenital conditions, neurological injuries and conditions, gastrointestinal conditions, neonatal conditions requiring specialist care, patients recovering after solid organ transplantation, and cancer.[9]	Effectiveness According to the 2015 systematic review on interactive telemedicine, the results from these studies provide a good indication of the likely effect of using telemedicine to deliver health care to people with these conditions on health outcomes. The findings from the other studies are less certain, due to a relatively small number of studies recruiting participants with other clinical conditions: • There was no difference in mortality between participants with heart failure receiving care through telemedicine, compared to those receiving health care without telemedicine. • Telemedicine may improve glucose control in people with diabetes, but the effect varied across studies. • There was some evidence for a decrease in low density lipoprotein (LDL) cholesterol, in participants allocated to telemedicine as compared to those allocated to usual care. • There was a greater decrease in blood pressure in those allocated to telemedicine compared to those who were allocated to usual care. • Seven studies that recruited participants with different mental health and substance abuse problems reported no differences in the effect of therapy

[8] All-cause mortality is the death rate from all causes of death for a population in a given time period (Alaska Native Epidemiology Center, n.d.).

	Type of Service • The main telemedicine function varied depending on clinical condition, but fell typically into one of the following six categories, with some overlap: o Monitoring of a chronic condition to detect early signs of deterioration and prompt treatment and advice; o Provision of treatment or rehabilitation (e.g., stroke rehabilitation); o Education and advice for self-management; o Specialist consultations; o Real-time assessment of clinical status (e.g., post-operative assessment after minor operation); and o Screening for depression or angina.[9]	delivered over videoconferencing, compared to face-to-face delivery. • Findings from the other studies varied; there was some evidence that monitoring via telemedicine improved blood pressure control in participants with hypertension, and a few studies reported improvement for those with a respiratory condition. Studies recruiting participants requiring specialist consultation for a dermatological condition reported no differences between groups.[9] Cost Effectiveness • The 2015 systematic review on interactive telemedicine noted that the cost to a health service, and acceptability by patients and healthcare professionals, is not clear due to limited data reported for these outcomes.[9]
Rapid Response (CADTH, 2015)	Study Purpose • Reviews recent evidence and relevant practice guidelines on the use of telemedicine with a video component in the emergency setting.[10] Type of Technology • Synchronous: Videoconferencing health consultations.[10] Type of Patients • Adults and children requiring emergency care for conditions other than strokes.[10] Type of Services • Telehealth.[10]	Effectiveness • A 2015 CADTH rapid response on telemedicine for the treatment of urgent conditions found “weak positive" evidence of telehealth effectiveness and safety compared to in-person care in minor treatment clinics, and “strongly positive" evidence for clinical outcomes in specialty patient populations across disease types. • A 2015 study identified in the CADTH rapid response on telemedicine for the treatment of urgent conditions matched 7261 patients with at least one telepsychiatry visit to 7261 patients at hospitals without telepsychiatry services. The intervention statistically significantly decreased inpatient admissions and length of stay. • A 2014 study identified in the CADTH rapid response on telemedicine for the treatment of urgent conditions compared 38 patients receiving telemedicine mental health evaluations to 24 patients receiving mental health evaluations prior to implementation of the telemedicine service. The intervention statistically significantly decreased order-to-consult time in the intervention versus the control groups.[10] Cost-Effectiveness • No information identified.

		Patient Experience and Equity • No information identified. Provider Experience • A 2013 study identified in the CADTH rapid response on telemedicine for the treatment of urgent conditions compared telemedicine consultations to telephone consultations, and no consultations among children admitted to the emergency in the highest triage category. The occurrence of physician-related medication errors was statistically significantly reduced with telemedicine compared to no consultation.[10]
Systematic Review (Kotb et al., 2015)	Study Purpose • Examining the impact of telemedicine against in-person care and comparing the effectiveness of different interventions against one another.[11] Type of Technology • Synchronous: Telephone support, video monitoring, or electrocardiographic monitoring.[11,9] • Asynchronous: Telemonitoring.[11] Type of Patients • Patients with heart failure.[11] Type of Services • Structured telephone support, telemonitoring, video monitoring.[11]	Effectiveness • A 2015 systematic review on telemedicine for heart failure found that compared to in-person care, structured telephone support was found to reduce the odds of mortality and hospitalizations due to heart failure. Telemonitoring was also found to reduce the odds of mortality and reduce hospitalizations related to heart failure compared to usual post-discharge care.[11] Cost-Effectiveness • No information identified. Patient Experience and Equity • No information identified. Provider Experience • No information identified.
Systematic Review and Meta-Analysis	Study Purpose • Investigating the effects of home-based telehealthcare on physical activity level, physical capacity, and dyspnea in patients with COPD, as well describing how these telehealthcare interventions have been designed.[12]	Effectiveness • According to the 2015 systematic review and meta-analysis on telehealthcare in COPD, for physical activity level, there was a significant effect favouring telehealthcare. No difference between groups was found for

[9] Ambulatory electrocardiography monitoring (AECG) allows the non-invasive evaluation of a suspected arrhythmia during normal daily activities. It aids in the diagnosis, documentation of frequency, severity, and correlation of an arrhythmia with symptoms such as palpitations, light-headedness, or overt syncope (ScienceDirect, 2014).

(Huang et al., 2015)	Type of Technology • Synchronous: Phone calls, live text chats, and video-calls.[12] • Asynchronous: Website to report physical activity symptoms.[12] Type of Patients • Patients with COPD.[12] Type of Services • Motivational feedback or counseling provided to the patient through telehealthcare.[12]	physical capacity and dyspnea.[12] Cost-Effectiveness • No information identified. Patient Experience and Equity • No information identified. Provider Experience • No information identified.
Meta-Analysis (Tchero et al., 2010)	Study Purpose • Comparing the effectiveness of telemedicine intervention with usual care in diabetes patients in a meta-analysis of 42 randomized controlled trials.[13] Type of Technology • Synchronous: Teleconsultation, telemonitoring.[13] Type of Patient • Diabetes patients.[13]	Clinical Effectiveness According to the 2019 meta-analysis on the clinical effectiveness of telemedicine in diabetes mellitus: • The mean reduction in HbA1c was significantly higher in the telemedicine groups. • Type II diabetes patients experienced a higher reduction in HbA1c compared to type I diabetes patients. • Telemedicine programs lasting more than six months produced a significantly greater reduction in HbA1c levels.[13] Patient Effectiveness • The 2019 meta-analysis on the clinical effectiveness of telemedicine in diabetes mellitus suggested that older patients (e.g., 41-50 years, older than 50 years), benefited more compared to their younger counterparts.[13]

Table 3: Overview of Key Findings from Highly Relevant Evidence Documents Focused on Clinician-Led Virtual Care Services that can be Used to Replace In-Person Care in Hospital-Based Ambulatory Care Settings

Type of Document	Key Findings From Highly Relevant Evidence Documents
Guidelines developed using a robust process (e.g., GRADE)	No highly relevant guidelines developed using a robust process (e.g., GRADE) were identified
Full systematic reviews	Telephone interventions provide a convenient way of supporting self-management of cancer-related symptoms with most evidence relating to depression, anxiety, emotional distress and fatigue, however little information was available related to cost savings (AMSTAR rating 10/10; literature last searched January 2019)
	Referral accuracy for teledermatology for high-risk lesions when compared to face-to-face is relatively high, however, for low-risk lesions it is significantly more variable and requires face-to-face verification (AMSTAR rating 10/10; literature last searched August 2016)
	Telerehabilitation, with high levels of patient satisfaction and improvement in physical activity and functional status, was a practical alternative to conventional face-to-face rehabilitation therapy in patients following total knee arthroplasty (AMSTAR rating 7/10; literature last searched 2014)
	Application of telemedicine in emergency rooms (ERs) included: 1) telemedicine for diffuse patient populations that typically present in ERs; 2) telemedicine in the context of minor treatment clinics for patients with minor injuries or illnesses; 3) the use of telemedicine to connect providers in ERs to medical specialists for consultations on patients with specific conditions; current studies reported positive findings in clinical processes, outcomes, and user satisfaction (AMSTAR rating 5/9; literature last searched September 2013)
	Real-time video telemedicine in the emergency department was an application with significant potential but was still lacking evidence supporting improved patient outcomes (AMSTAR rating 4/9; literature last searched 15 February 2016)
	Telemedicine delivered via single wire networks is unable to guarantee good quality and service and may need additional technological improvements, further the review found that quality of experience was often overlooked and requires evaluation to improvement (AMSTAR rating 4/9; literature last searched 2018)
	Pre- and post-use of telemedicine for neurosurgery appears promising for patient management, however some failures were reported due to technological difficulties or patients requiring further face-to-face evaluations (AMSTAR rating 3/9; literature last searched 6 April 2020)
	There is good support for teleneuropsychology assessments for older adults throughout the duration of the COVID-19 pandemic, in addition the review provides an outline of viable procedures for teleneuropsychology (AMSTAR rating 3/9; literature last searched 2017)
Rapid reviews	Internet-delivered cognitive behavioral therapy is effective for reducing depression and anxiety symptoms, as well as improving patient quality of life (AMSTAR rating 7/9; last updated 22 July 2019)
	While there is not enough evidence to support the use of a digital mental health intervention for children, it has shown to improve depression and anxiety symptoms in adults, with web-based interventions having shown the most significant effects (AMSTAR rating 5/9; literature last searched 11 June 2020)

	Evidence on telerehabilitation (using synchronous video software) and surgical procedures were in favour of it for patients following total knee and hip arthroplasty, as well as telephone follow-up for patients after myocardial revascularization (AMSTAR rating 3/9; published 16 July 2020)
	The strongest evidence for telehealth is available for the acute management of ischaemic stroke via telehealth and for the monitoring and management of chronic disease such as diabetes and heart failure (2/9 AMSTAR rating; published 28 May 2020)
Guidelines developed using some type of evidence synthesis and/or expert opinion	Key principles for the management of dermatology patients remotely during COVID-19 pandemic include: 1) streamline skin cancer patients on two-week wait pathways, using teledermatology to triage referrals and book patients directly to surgery where possible; 2) manage urgent, on-call patients and in-patient referrals using secure email or mobile messaging apps where possible; 3) redirect new patients through Advice and Guidance services where possible rather than referral; 4) manage referred patients by switching face-to-face clinics to teleconsultation (with or without video consultation) where possible for new and follow-up patients; 5) optimize remote access to allow dermatology staff to continue to provide patient care from home if required; 6) facilitate virtual staff team meetings to coordinate patient care; and 7) establish patient-consent policies for receiving reviewing and storing patient images from health care professionals and patients (British Association of Dermatologists; last updated 17 June 2020)
	Virtual-visit guideline are detailed for midwives, including: 1) considerations for virtual visits (understanding professional obligations, identifying a virtual-visit solution, complying with privacy and security requirements, onboarding clients, assessing needs, ensuring the settings for video visits is private and secure and ensuring appropriate resources are available); 2) taking steps to conduct a virtual visit (confirm identity, obtain consent for virtual visit, document the clinical encounter, provide needed prescriptions and document the visit); and 3) signing up for the Ontario Telemedicine Network (OTN); and 4) choosing a platform for the virtual visit (Doxy, FaceTime, Medeo, OTN, Skype, Telephone or Zoom) (Association of Ontario Midwives; last updated 25 March 2020)
	Guidance is provided on patient evaluation and use of laboratory testing by healthcare practitioners via virtual assessment (phone, telehealth or regionally available platforms) for the management of ambulatory heart failure patients (Canadian Cardiovascular Society COVID-19 Rapid Response Team; published in 2020)
Single studies that provide additional insight into how virtual care has been implemented during the COVID-19 pandemic	Virtual telehealth treatments were implemented for tobacco-dependent cancer patients in a New York City hospital, and there was significant improvements in patient engagement in ambulatory tobacco-treatment services with greater attendance at scheduled telehealth visits than in-person visits, bedside hospital counseling visits were transformed into inpatient telephone visits with high levels of sustained patient engagement, and group telehealth services were launched rapidly to increase capacity and provide greater psychosocial support for cancer patients struggling with tobacco dependence (published 9 July 2020)
	A study of the impact of an adapted telemedicine Objective Structured Clinical Examination (OSCE) on telemedicine-specific training competencies of residents in three areas of telemedicine competency (technical proficiency; virtual information gathering, including history, collateral information collection, and physical exam; and interpersonal communication skills - both verbal and nonverbal) found that residents expressed enthusiasm for telemedicine training, but had concerns about their preparedness for telemedicine practice and the need for further competency and curricular development (published 8 July 2020)
	A uniform obstetric protocol for all low-risk patients was developed during the COVID-19 pandemic in Florida by adapting a virtual-care model (OB Nest) to reduce in-person visits and incorporate telehealth visits into the schedule of prenatal care, which has been found to have high patient satisfaction and lower stress and includes: a combined virtual prenatal care protocol that combines eight in-person visits with six virtual nursing visits; an asynchronous online portal for questions and education; an online community for patients moderated by nurses; patients being provided with blood pressure cuffs and fetal dopplers (published 20 June 2020)

	It is crucial to maintain a human presence during virtual visits, which can be done by including video capability, ensuring comfort for both patient and physician, being prepared, acknowledging current anxieties and stress, finding creative ways to communicate via body language through the camera, clearly delivering medical information and thoroughly explaining the assessment and plan, and showing support (published 19 June 2020)
	The development of national guidelines in the United States for maternity care were developed, and emphasized designing care delivery around essential services using in-person care for services that cannot be delivered remotely and offering video visits for other essential services and creating flexible services that allow patients to tailor support to meet their needs through opt-in programs, and then this rapidly transitioned to a new model during the COVID-19 pandemic with four in-person visits, one ultrasound visit, and four virtual visits (the 4-1-4 prenatal plan) which required an implementation process that focused on: 1) training providers; 2) engaging patients; and 3) advocating for policies to support sustainable change (published 17 May 2020)
	A four-day roadmap for emergency scaling up of virtual care in the outpatient setting (using EPIC as the electronic health record system with MyChart as the patient portal with Vidyo integrated into both for secture video connection) at the Amsterdam University Medical Centres is outlined, which progressed from the appointment of a crisis policy team and expansion of available digital infrasutrue (iPads), creation, testing and refinement of a video-consultatatioin pathway (day 2), merging the tested and refined pathway with the live environment in the electronic health record system (including distribution of iPads to providers and real-time support) (day 3) to providing the first video consultation (day 4) (published 14 April 2020

Table 4: Experiences from Large Hospital Networks in the United States with using Virtual Care for Ambulatory Care Settings

Primary Locations(s) of Hospital or Hospital Network	Hospital or Hospital Network	Key Findings
Multiple states (California, Colarado, Georgia, Hawaii, Maryland, Oregon, Virgina, Washington D.C., and Washington)	Kaiser Permanente	• Kaiser Permanente (a consortium of for-profit and not-for-profit entities) has built on existing virtual-care infrastructure to accommodate their 12.4 million members across eight states. Currently, the hospital network averages 80% telehealth appointments compared to 15% telehealth appointments prior to the emergence of COVID-19. o The majority of the virtual-care services are telephone based, while other options include: email communication and chat service communication with clinicians; patient-to-clinician integrated video visits; online prescription refills by patients; health education through the patient portal; remote patient monitoring for blood-pressure measurements (with feedback from their care teams); and virtual cardiac rehabilitation and initial screening programs (e.g., colorectal cancer). • The organization has adopted a 'virtual first' strategy for suspected COVID-19 cases and non-cases, where potential patients are encouraged to schedule a telephone or video appointment with their clinician in order to be triaged for testing or for an in-person visit. For confirmed COVID-19 cases, clinicians can remotely check patients at home with thermometers or pulse oximeters.

Primary Locations(s) of Hospital or Hospital Network	Hospital or Hospital Network	Key Findings
Multiple states (Arizona, Florida, Minnnesota)	Mayo Clinic	• Mayo Clinic (a non-profit academic center) changed outpatient appointments to virtual evaluations where possible. Virtual care can be used as a first point of contact for patients with complex care needs, which provides clinicians the time to create a care plan before an in-person visit. • Mayo Clinic also provides patients with the option of a virtual visit by video or phone based on consultations with appointment coordinators. • Mayo Clinic Express Care Online provides services to patients from age 18 months to 75 years old for common ailments and conditions or needs (e.g., common respiratory illnesses such as the cold or influenza symptoms, contraceptives, acne) • Patient and clinician experience with video appointments appear to be positive based on a few virtual care features such as the chat function and screening sharing. • Mayo Clinic in collaboration with Medically Home (a technology-based health services company), recently announced a care model, which will allow clinicians to shift care from a hospital to a home-based setting with integrated technology and virtual care services for patients with complex care needs.
Multiple states (Alaska, California, Montana, New Mexico, Oregon, Texas and Washington)	Providence Health and Services	• Providence Health and Services (a non-profit Catholic network including 51 hospitals) provides more than 40 telehealth services, including ambulatory care for certain conditions such as mental health. • Individuals can consult primary or speciality clinicians by phone or video (through Zoom technology) at the same cost as an in-person visit. Additionally, Providence Health and Services utilize MyChart to help manage patient-clinician interactions (e.g., book appointments, view lab results, prescription refills, email questions) • Virtual ExpressCare allows individuals access to services with healthcare providers through synchronous video for a select conditions (e.g., common ailments, respiratory, eye, skin and nails, gastrointestinal, wellness and women's health)
Maryland	Johns Hopkins	• Johns Hopkins is a non-profit academic medical center, and provides patients with MyChart accounts which give the opportunity to connect with outpatient or specialty care providers through video conferencing. • The platform provides providers with direct access to a patient's electronic medical records during a video call. • Interpreters can also be engaged in the call to assist with communication. • Specific tools, such as oxygen stat monitors, Bluetooth scales and blood pressure cuffs, can also be sent to patients with virtual calls for specific specialties.
Massachusetts	Massachusetts General Hospital	• A commentary from 6 May 2020 provides a profile of the implementation of physical distancing in the Massachusetts General Hospital among healthcare workers who often gather in multidisciplinary groups of eight to ten individuals through virtual rounds where one or two healthcare workers are physically present on the ward with all others joining remotely (via Microsoft Teams).

Primary Locations(s) of Hospital or Hospital Network	Hospital or Hospital Network	Key Findings
		• This was found to: o provide a digital replica normal medical rounds (e.g., with the intimacy of group work, social supports, task management and image sharing); o avoid dense clustering of individuals, eable other to join daily work (e.g., pharmacists, allied health professionals, coordinators, quality staff and case managers); o allow providers in self-isolation to contribute; minimize psychological trauma caused by physical distancing and wearing personal protective equipment; and o enable non-essential personnel and student trainees to re-join the workforce. • Several challenges were encountered during the development of the model, including: o The need to reconfigure a previously purchased, unit-based, portable laptop so that it could launch and run the needed collaborative software; o managing privacy concerns (e.g., ensuring patient privacy and security by maintaining a business associated agreement between the hospital system and Microsoft which allow allowed for proper privacy and security standards to be met as the shift was made to a recurring daily online meeting, and instructing team members to not forward the meeting invitation to individuals outside of the medical team); o ensuring isolation from COVID-19 (e.g., for patients known to be positive for COVID-19, a laptop was not brought into the room and the exam was described afterwards, and for patients without COVID-19 a laptop was brought into the room and pointed at the patient during the exam so all team members could see the findings and with the laptop only controlled by the attending physician and being sanitized after the visit); and o deploying enough technical support to allow for the available devices to be used 24 hour per day and seven days per week • A formal evaluation has not been conducted, but anecdotal reports on experiences from nursing leadership and patients has been positive, and that 75% of the normal 45 minutes required for nursing admission has been able to be done over the virtual intercom communication system.
New Hampshire	Dartmouth-Hitchcock Health System	• Dartmouth-Hitchcock Health System is a non-profit academic health system, and its outpatient virtual visits allows patients to book virtual appointments with adult and pediatric care specialty clinics, home visits and inpatient consults. The virtual visits allow for two-way audio and video conferencing. • Outpatient virtual visits take place through the VirtualVisit SBR Health app, which can be installed onto any personal device with a microphone, speaker, and camera.

Primary Locations(s) of Hospital or Hospital Network	Hospital or Hospital Network	Key Findings
		• The D-H TeleEmergency program also provides a platform for local emergency room teams to connect with certified emergency medicine physicians and other skilled health providers on a 24/7 basis. • Virtual-care staff provide peer consultations, assist with arranging transfers, and serve as an 'extra set of eyes' for local staff.
New York	NYC Health + Hospitals	• A commentary from 11 June 2020 highlights how prior to COVID-19 the largest safety net healthcare system in the United States (NYC Health + Hospitals (NYC H+H) served over one million patients (including the most vulnerable) and billed fewer than 500 telehealth visits monthly. • As a result of the pandemic and with the goal of keeping ambulatory care open, it transformed the system using virtual-care platforms with almost 83,000 billable televisits conducted in one month and more than 30,000 behavioral health encounters conducted via telephone and video. All members of the outpatient care team were transitioned to virtual-visit workflows, in-person visits with ancillary team members (e.g., nutritionists, chronic disease nurses and social workers) were changed to telephone appointments, care coordinators and community health workers continued to provide essential patient outreach with additional telephone-based support, and some administrative roles (e.g., on-site registrars and financial counsellors) were transitioned to telephone-based workflow. In addition, our on-site registrars and financial counselors also transitioned to a telephonic workflow, allowing us to keep enrolling patients in health insurance or our sliding scale payment program. This ensured that, per our safety net mission, ability to pay would not be a barrier to care, particularly for those most vulnerable and the growing number of New Yorkers who had recently lost their jobs and health insurance. • The transition resulted in all routine face-to-face visits (from being converted to televisits (scheduled telephone only visits), using existing infrastructure within its electronic health record system. In addition, scheduling revisits and follow-ups was done in real-time using a secure messaging system. • The system that was developed also enabled supports for patient-family communication, post-discharge follow-up, and palliative care for COVID-19 patients. • Implementation required expanded Medicaid coverage and insurance reimbursement for telehealth and as it moves to a new blend of virtual and in-person care, major regulatory and insurance changes will need to be sustained to protect access for the most vulnerable patients • Implementation was also enabled by a Telehealth Rapid Response Team (TRRT) consisting of key information technology, electronic health record, and clinical leadership, which provided strategic guidance and allocated finite telehealth staff and hardware.
Ohio	Cleveland Clinic	• Cleveland Clinic is a non-profit academic medical center and provides patients with three distinct virtual ambulatory care options.

Primary Locations(s) of Hospital or Hospital Network	Hospital or Hospital Network	Key Findings
		1) The Cleveland Clinic Express Care Online is an app that can be installed onto a patient's personal device to connect with healthcare providers through audio and video. Through the app, patients with non-urgent concerns are able to book a 10-minute virtual consult immediately or at a later date. Providers are authorized to provide diagnoses and prescriptions for controlled substances during virtual-care appointments. 2) Through the MyChart eVisit questionnaire, patients complete a questionnaire about their health and are then connected to Cleveland Clinic providers for a virtual consult. 3) Phone appointments also enable patients to connect with providers through audio only. • The Cleveland Clinic is also utilizing other video-chat platforms, such as Facetime, Google Duo and Doximity Dialer, to provide outpatient virtual care. Plans to advance the provision of virtual ambulatory care post-pandemic include the integration of EMR into Cleveland Clinic's virtual care platforms.

Table 5: Effectiveness of Provider-Led Virtual Care in Ambulatory Care in Australia

Jurisdictional Source of Report	Type of Technology, Patients, and/or Services	Effectiveness: Cost, Patients, and/or Health Care Providers
Australia		
Australia, Adelaide Far West Local Health District (FWLHD) Royal Adelaide Hospital	Type of Technology • Synchronous: Videoconferencing o An oncologist at the Royal Adelaide Hospital delivers medical oncology services through videoconferencing. The telehealth service is complimented by occasional face-to-face appointments undertaken when the oncologist travels to FWLHD.[14] Type of Patients • Patients with cancer who receive chemotherapy or who require urgent review.[14]	Effectiveness • No information identified. Cost-Effectiveness • A 2015 Ministry of Health strategic review of telehealth in New South Wales (NSW) identified that videoconferencing reduced government expenditure on travel assistance for isolated patients.[14] Patient Experience and Equity – The 2015 strategic review of telehealth in NSW noted that videoconferencing: • Significantly reduced patient travel;

Jurisdictional Source of Report	Type of Technology, Patients, and/or Services	Effectiveness: Cost, Patients, and/or Health Care Providers
	Type of Services • The oncologist provides care to patients who receive chemotherapy or need urgent review through monthly telehealth clinics. The oncologist generally sees between eight and 10 patients per clinic, including new and follow-up appointments. The telehealth service is complimented by occasional face-to-face appointments undertaken when the oncologist travels to the area. • The service involves a multidisciplinary medical oncology team that includes a psychologist, counsellor, palliative care staff, and a cancer care coordinator. Once a telehealth consultation has been completed, the patient immediately sees a member of the multidisciplinary team locally who provides any additional support or explanation.[14]	• Reduced wait time for an appointment with an oncologist; and • Enabled easier assessment of patients to determine if they require evacuation.[14] Provider Experience • The 2015 strategic review of telehealth in NSW reported that videoconferencing reduced travel for specialists.[14]
Australia Hunter New England Local Health District (HNELHD)	Type of Technology • Synchronous: Videoconferencing o Teams across a range of specialties provide outpatient services primarily through videoconferencing and iPads to patients across the HNELHD and some adjacent local health districts. Videoconferencing includes: ▪ Hospital-to-hospital videoconferencing using Polycom or Tandberg systems;[10] ▪ Hospital-to-home, GP practice, and Residential Aged Care Facility using Scopia.[14,11]	Effectiveness • No information identified. Cost-Effectiveness • The 2015 strategic review of telehealth in NSW identified cost savings with reduced need for patient transport services from health care perspective, and overall reduced cost for patient.[14] Patient Experience and Equity – The 2015 strategic review of telehealth in NSW identified that videoconferencing: • Increased equity and access to care; • Improved clinical care; • Better informed about patients of procedures/conditions;

[10] Tandberg's secure video conferencing includes codecs and solutions, with emphasis on large infrastructure projects that implement bridges, multi-site connections, and multiple monitors or cameras (Tanberg, n.d.).
[11] Scopia extends a room system application to remote and desktop users for voice, video, and data communications (Scopia, n.d.).

Jurisdictional Source of Report	Type of Technology, Patients, and/or Services	Effectiveness: Cost, Patients, and/or Health Care Providers
	Type of Patients • Patients requiring review in an outpatient setting.[14] Type of Services • Outpatient services across a range of specialties in ambulatory care including: surgery, respiratory, cardiology, endocrinology (i.e., diabetes), gynae-oncology, neurology, mental health, cancer services, genetic counselling, orthopedics, pain medicine, and pediatric services, including pediatric palliative care.[14]	• Reduced travel; • Permitted care closer to home; and • Reduced social isolation.[14] Provider Experience – The 2015 strategic review of telehealth in NSW identified that videoconferencing: • Increased the ability to deliver time-critical care; • Reduced appointment durations and travel for clinicians; • Improved collaboration and linkages between specialists and GPs; • Permitted capacity building and support for local clinicians; • Provided better clinical care with the potential to see more patients due to reduced appointment times; and • Reduced demand on patient transport services.[14]
Australia, Sydney Northern Sydney Local Health District (NSLHD) Greenwich Hospital Spinal Cord Injury Chronic Pain Clinic	Type of Technology • Synchronous: Videoconferencing o The Spinal Cord Injury (SCI) Chronic Pain Clinic team, based at Greenwich Hospital in NSLHD, delivers specialist SCI pain management services to patients across NSW using video-conferencing (i.e., Vidyo). Patients are referred to the clinic by their case manager, GP, or spinal specialist.[14,12] Type of Patients • Patients with chronic pain due to spinal cord injury.[14] Type of Services • The clinical team (i.e., the medical specialist, physiotherapist, and clinical psychologist) conduct a pre-assessment session via telehealth with the	Effectiveness • The 2015 strategic review of telehealth in NSW reported that the videoconferencing technology is flexible, mobile, simple, and user-friendly (e.g. patients can use a video-link from their iPhone to participate in the consultation); secure, and inexpensive to use, and provides high quality video and audio data transmission with minimal delays/latency.[14] Cost Effectiveness • The 2015 strategic review of telehealth in NSW reported that the videoconferencing technology permitted cost savings from reduced travel and accommodation expenses.[14] Patient Experience and Equity – The 2015 strategic review of telehealth in NSW identified that videoconferencing:

[12] Vidyo is a real-time video company that expands access across the care continuum (Vidyo, n.d.).

Jurisdictional Source of Report	Type of Technology, Patients, and/or Services	Effectiveness: Cost, Patients, and/or Health Care Providers
	patient and their case manager to determine whether they are clinically appropriate and ready to receive pain management services through this model of care. Patients then attend a face-to-face appointment at Greenwich Hospital during where they receive review, assessment, and treatment planning from the multidisciplinary team. The multidisciplinary team then provides intensive follow-up over a 12-month period (i.e., at one, two, three, six, and 12 months) via telehealth to review pain management strategies, and the patient's progress.[14]	• Improved access to timely, high quality, specialist services; • Increased convenience; • Reduced travel; • Reduced wait time for appointments; • Enabled patients to have greater control as the consultation can occur via videoconference to a location of the patient's choice (e.g., home, workplace); • Increased empowerment for patients; • Experiences are validated by the provision of the majority of their care by a remote specialist team into their local setting; and • Increased satisfaction as patients feel their issues are thoroughly explored through the multidisciplinary approach.[14] Provider Experience - The 2015 strategic review of telehealth in NSW identified that the videoconferencing: • Higher quality care through the involvement of the local team (i.e., the patient's case manager and GP) in the pre-assessment and follow-up as appropriate; • Local GPs have access to increased support for complex patients in the health system; • Supporting resource material was developed that can be used more broadly; and • Elements of the model can be leveraged to facilitate the use of telehealth to provide care to other suitable patient groups (e.g., patients with chronic pain).[14]
Australia, Sydney Sydney Local Health District	Type of Technology • Synchronous: Videoconferencing (Cisco) o The telehealth consultations are complemented by face-to-face consultations provided by some geriatricians twice a year. These visits involve upskilling of the local staff (e.g., in doing neurological examinations) to enable them to further assist the geriatricians during	Effectiveness • No information identified. Cost Effectiveness • The 2015 NSW report identified that funding is self-sustaining, where Far West and Western NSW Local Health Districts bill Medicare for the consultations and Concord Hospital invoices these Local Health Districts for the clinicians' time.[14]

Jurisdictional Source of Report	Type of Technology, Patients, and/or Services	Effectiveness: Cost, Patients, and/or Health Care Providers
Department of Geriatric Medicine at Concord Repatriation General Hospital	telehealth consultations.[14] Type of Patients • Elderly patients in regional and remote sites across NSW.[14] Type of Services • The services provided include cognitive assessments, advice about appropriate management of the consequences of cognitive assessments, medication reviews, and comprehensive geriatric assessment of frail older people with multiple chronic conditions provided to elderly patients/GPs who would otherwise not have easy access to specialist geriatric care. Suitable patients are identified by Aged Care Assessment Team (ACAT) staff or community nurses at the remote sites.[14,13]	Patient Experience and Equity – The 2015 strategic review of telehealth in NSW identified that Cisco videoconferencing: • Improved access to services – patients are able to access services they would not otherwise be able to access easily; • Improved planning and decision-making capability for families; • Improved service satisfaction among the majority of patients; and • Partially addressed inequities in the provision of health care services to rural locations.[14] Provider Experience – The 2015 strategic review of telehealth in NSW identified that Cisco videoconferencing resulted in: • Reducing the burden on local clinicians, particularly in small towns where it can be difficult for local clinicians, primarily GPs, who often see their patients outside of the doctor-patient relationship to deliver 'bad news' decisions to patients (e.g,. the geriatrician can advise a patient they can no longer drive rather than the local GP); • Upskilling of local clinicians in issues related to geriatric medicine; • Validation of the skills of the local clinicians, who often do not realize how skilled they are; • The majority of clinicians at the remote sites were satisfied with the service; and • Geriatricians found the service to be efficient with only minor and infrequent technical issues.[14]
Australia Sydney Sydney	Type of Technology • Synchronous: Videoconferencing (i.e., Lync) o Pediatric endocrinologists from CHW provide specialist consultation services to children and young people with diabetes in regional areas	Effectiveness • No information identified. Cost Effectiveness • The 2015 NSW report noted cost savings, where the telehealth model cost 78%

[13] Aged Care Assessment Teams (ACAT) are teams of medical, nursing, and allied health professionals who assess the physical, psychological, medical, restorative, cultural, and social needs of frail older people and help them and their carers to access appropriate levels of support (Government of Western Australia, n.d.).

Jurisdictional Source of Report	Type of Technology, Patients, and/or Services	Effectiveness: Cost, Patients, and/or Health Care Providers
Children's Hospital Network's (SCHN) The Children's Hospital at Westmead (CHW)	of NSW through videoconferencing.[14] Type of Patients • Children and young people with diabetes, and their families/caregivers.[14] Type of Service • The pediatric endocrinologists provide diabetes assessment, diagnosis, and management services to children, young people, and their families/caregivers. A local pediatrician is required to be present at every consultation.[14]	less to run than the face-to-face model.[14] Patient Experience • The 2015 NSW report identified that Lync videoconferencing improved clinical care and increased access to specialist services.[14] Provider Experience – The 2015 strategic review of telehealth in NSW identified that Lync videoconferencing: • Increased capacity building of clinicians at the remote sites, particularly pediatricians who are required to participate in all consultations; • Increased productivity and efficiency for clinicians at the provider end – the telehealth model saved 62% of the pediatric endocrinologists' time that was previously spent delivering the same services face-to-face; • Reduced travel for specialists; • Permitted better agreement on treatment plans by members of the care team and the patient/family; • Increased reliable health care services where specialists are less likely to be delayed (e.g., bad weather, late planes); and • Created the potential for more patients to be seen, either via telehealth or at SCHN, due to reduced travel burden on specialists – the telehealth model enabled 13% more patients to be seen.[14]
Australia, Kingswood Nepean Blue Mountains Local Health District	Type of Technology • Synchronous: Videoconferencing. • Asynchronous: Store and Forward. o The Outreach app has the ability to record patient notes, take photos (e.g., wounds), and to videoconference. Any photos are stored and made accessible to staff at the Outreach Clinic. The service is supported by a telehealth manager based at Nepean Hospital. The app was	Effectiveness • No information identified. Cost Effectiveness • No information identified. Patient Experience – The 2015 strategic review of telehealth in NSW identified that the Outreach app: • Reduced travel;

Jurisdictional Source of Report	Type of Technology, Patients, and/or Services	Effectiveness: Cost, Patients, and/or Health Care Providers
Nepean Hospital Outreach Clinic	purpose-built to meet the clinical needs of the outreach clinicians.[14] Type of Patient • Patients who have recently been discharged from hospital to their own homes.[14] Type of Service • If a patient's condition has changed, the nurse can use one of nine iPads and the Outreach app to seek advice from clinicians (i.e., doctors and other nurses) associated with the Nepean Hospital Outreach Clinic.[14]	• Increased reassurance for patients (e.g., seeing their progress in pictures); • Improved quality and access to care; and • Reduced length of stay in hospital.[14] Provider Experience– The 2015 strategic review of telehealth in NSW identified that the Outlook app: • Allowed for photos to enable better clinical decision making; • Increased reassurance for Outreach Clinic clinicians (i.e., knowing an Outreach nurse can provide updated wound progress images within a few days); • Increased convenience for Outreach nurses (i.e., they can travel with an ipad rather than a large number of paper-based records); • Permitted the possibility to re-use the custom-built technology solution for other telehealth services; • Reduced burden on the ambulance service, length of stay in hospital, and readmission rates.[14]
Australia, New South Wales Murrumbidgee Local Health District	Type Technology • Synchronous: Videoconferencing.[14] Type of Patients • Patients with mental health issues who require urgent assessment.[14] Type of Service • When a patient with a mental health problem presents to an emergency department, the clinicians use videoconferencing technology to provide an initial consultation with an initial interim management plan followed by a comprehensive assessment once the patient has been deemed fit for interview.[14]	Effectiveness • No information identified. Cost-Effectiveness • Cost savings due to reduced transfers and admissions to larger hospitals. Patient Experience – The 2015 strategic review of telehealth in NSW identified that the videoconferencing technology: • Allowed for timely access to high-quality, specialist care (24/7); • Permitted access to specialists services that were not previously available; • Allowed family members and caregivers to more easily be involved in consultations; • Enabled emergency assessment and management of mental health issues closer to home, reducing the need for travel; and

Jurisdictional Source of Report	Type of Technology, Patients, and/or Services	Effectiveness: Cost, Patients, and/or Health Care Providers
		• Reduced waiting times.[14] Provider Experience –The 2015 strategic review of telehealth in NSW identified that videoconferencing technology: • Reduced travel to local sites; • Permitted the potential to see more patients due to reduced travel; • Improved relationships and networking between staff at smaller health care facilities and larger hospitals; • Permitted educational s for local health workers; • Increased coverage of specialist mental health services with the capacity to provide emergency mental health assessments and consultations to large numbers of emergency departments, which is not possible with face-to-face services due to a shortage of mental health workers and long distances; and • Reduced burden on local services (e.g., ambulance and police) due to reduced transfers.[14]

Table 6: Canadian Provinces' and Territories' Experiences Shifting to Virtual Care

Province/ Territory	Hospital Network	Key Findings
Pan-Canadian	Not applicable	• Canada Health Infoway released a report that examines the experiences of patients shifting to virtual services and found that in general patients were less satisfied with virtual visits than in-person visits and tended to be more satisfied with telephone consultations than by virtual visits by video or messaging.
British Columbia	Vancouver Hospital and Health Science Centre	• Vancouver Coastal Health has increased its virtual-care services to promote patient-clinician communication via Zoom video conference calls. • Vancouver General Hospital has launched the Virtual Cardiac Rehab Program, a virtual-care service designed to support and provide patients with on-demand exercise videos, live online classes, and virtual appointments/consultations with a dietitian, cardiac counsellor, or psychiatrist.

Province/ Territory	Hospital Network	Key Findings
		• Vancouver Coastal Health has put forth a motion to construct a new care facility at Lions Gate Hospital by 2024. This acute-care facility will feature a telehealth centre that aims to bridge the communication gap between healthcare providers and remote patients.
Alberta	Covenant Health	• Of the 17 hospitals and care centres operated by Covenant Health, Bonnyville Health Centre is the only site that reportedly offers telehealth consultations. However, the capacity and setting in which this service is delivered in is unclear.
Ontario	Hamilton Health Sciences	• Hamilton Health Sciences has implemented virtual-care services that enable patient-clinician communication through phone calls and/or home-video visits (eVisits) during the COVID-19 pandemic. • As of 6 May 2020, there are three approved modalities for virtual care visits: 1) Ontario Telemedicine Network; 2) Zoom for Healthcare; and 3) telephone. • Due to COVID-19, this service has been expanded to allow more clinics to provide this form of virtual care. • The SMArTVIEW project is an ongoing study—by Hamilton Health Sciences' Population Health Research Institute—that aims to remotely monitor patients following cardiac or vascular surgery. Stage one of the intervention involves the postoperative monitoring of patients in the hospital. • Stage two of the intervention involves providing these patients with the appropriate technology to be monitored at home (all recorded data will be sent to a SMArTVIEW nurse in the hospital). Patients can communicate with their nurse through daily video visits and receive postoperative assessment and support as needed.
	University Health Network	• University Health Network has implemented the use of virtual care in the form of phone visits and video visits using conferencing tools provided by Ontario Telemedicine Network and Microsoft Teams. • Princess Margaret Cancer Centre started a Nurse-Led Virtual Care Clinic, which aims to support cancer patients that have tested positive for COVID-19. This virtual care service is provided over the phone and is designed to bridge the gap between "virtual care, symptom management, and psychological support" for patients. • On 25 June 2019, University Health Network partnered with Vivify Health to offer Vivify Pathways Go, a peri-operative care management and engagement strategy that allows for the remote monitoring of patients. • In 2016, University Health Network launched Medly, a digital tool that aims to provide support to heart failure patients. This service is designed for patients to monitor their own heart health, obtain personalized feedback messages, and communicate remotely with their care team as needed. • University Health Network also uses telemedicine through their Telehealth Program, a service that virtually connects patients with healthcare professionals. Patients must visit a nearby telehealth site to interact with clinicians via video conferencing services offered through the Ontario Telemedicine Network. This service is offered for oncology, psychiatry, surgery, and other specialities for clinical consultations and follow-up visits with patients.

Province/ Territory	Hospital Network	Key Findings
	Humber Hospital	• In March 2020, Humber River Hospital implemented Virtual Video Visits for clinicians to interact and connect with patients from home. This virtual-care service is conducted through audio (telephone) or video (Microsoft Teams) technologies.
	London Health Sciences Centre	• Non-urgent or outpatient appointments have largely been re-scheduled and are now taking place through phone and virtual consultations. • On May 19, the London Health Sciences Centre announced virtual prenatal check-ups with obstetricians for expectant patients. • On May 11, the London Health Science's Children Hospital launched an urgent and emergency care virtual clinic. Under the clinic, families of children with complex needs can connect with a physician to evaluate their child's condition and determine next steps. Families are first connected to clerical staff for patient registration and then to a health professional for consultation through Cisco WebEx.
	Ottawa Hospital System	• On April 27, The Ottawa Hospital launched Epic-Zoom virtual platform for healthcare providers to connect with patients through video for non-urgent appointments and outpatient programming. • The platform, developed in partnership with The Ontario Telemedicine Network, links the video-conferencing tool with the hospital's electronic health information system. Patients can connect with their health care team through any personal device with a camera and microphone. Providers can also connect with and teach trainees through virtual clinics. • As of July 2019, The Ottawa Hospital provides all patients receiving care at partner locations access to MyChart free of charge. • The platform serves as a central location for patients to access their personal and medical information, such as clinical notes, test results, progress reports and medical-imaging results. Patient profiles and records can also be accessed by a patient's health care providers.
Quebec	Centre hospitalier de l'Universite de Montreal	• It is unclear whether specific virtual-care strategies have been implemented for ambulatory care. However, CHUM patients are recommended to contact Le Centre d'optimisation des flux réseaux (COFR), a 24-hour consultation phone line, to connect with nursing staff regarding questions or concerns about their health. • The teleconsultation team works in close collaboration with a patient's treatment team and physician to provide appropriate care. • Obstetric consultations, such as pregnancy follow-ups, are also being conducted through this telehealth platform. • Psychiatry and Drug Addiction services may be provided to patients via REACTS, a video-conference platform similar to Facebook Messenger, if in-person appointments are cancelled due to COVID-19.
	Centre hospitalier universitaire de Quebec	• It is unclear whether specific virtual-care strategies have been implemented for ambulatory care. The Centre hospitalier universitaire de Quebec has launched a patient telephone support line for patients who have had their appointments or surgeries cancelled or delayed. The phone line serves as a platform for patients to ask questions about treatment options or share concerns about their health.

Province/ Territory	Hospital Network	Key Findings
	McGill University Health Centre	• The McGill University Health Centre is currently using "Zoom Télésanté", a secure telehealth platform approved by the Ministry of Health and Social Services, for clinics to connect with patients.

Table 7: Guidance on Virtual Care Platforms and/or Programs Available for Use in Canada

Source	Guidance on Virtual Care Platforms and/or Programs for Use
Ontario	
Ontario Telemedicine Network https://otn.ca/ Provincial standards for video and secure messaging solutions are available here: https://otn.ca/solution-providers-vendors/virtual-visit-guidance/ https://otn.ca/wp-content/uploads/2020/03/Virtual-Visits-Solution-standard-1.0-final.pdf https://otn.ca/evisit-primary-care/	Ontario Telemedicine Network (OTN) • As part of the Ministry's Digital First for Health strategy, Ontario has been working on a strategy that would enable providers to use their choice of virtual care solution within a standards-based framework which has been published on the OTN website. • Ontario Health has also developed a provincial process that would verify that technology solutions comply with these minimum standards and providers will need to ensure that their solutions comply with these standards. Video Visits • In Ontario, direct-to-patient and hosted video visits are distinct as some patients may require technology or internet access, nursing support or peripheral access. o Direct to patient visit: A patient may participate in the visit from home or another chosen location using a device they operate independently o Supported video visit: A caregiver or clinician may assist the patient to access care virtually by providing a device, as well as initiating and managing the video visit o Hosted video visit: Patients may be located at a secure physical environment that provides them with onsite access to technology and, in some cases, clinical support services. As per the technology standard, a hosted videoconferencing visit is a point-to-point or multipoint videoconferencing encounter where the patient is physically located at a regulated health care facility or equivalent organization which is the "host site". Patients currently receive care at over 1,500 host sites in Ontario. Many of these sites are located in Northern and rural communities and provide patients with access to nursing supports and peripheral technologies. Secure Messaging • Secure Messaging Virtual Visit: As per the technology standard, secure messaging virtual visit is a clinical encounter in which a patient and clinician exchange secure messages about a particular medical issue. It does not include videoconferencing between the patient and clinician as this would be classified as a virtual video visit instead. o A secure messaging virtual visits can be initiated by a patient as a patient-initiated visit or by a clinician as a clinician-initiated visit. Messages can be synchronous where the patient and clinician are connected at the same time and exchange messages back and forth during the session or messages can be asynchronous where the message is sent and the receiver is informed and their response is received at a later

	time. • OTN notes that virtual visits performed using secure messaging involve the collection, use and disclosure of personal health information. This is different from videoconferencing events, where patient identity can be confirmed during the encounter. It is advised that health care organizations and clinicians select a solution that offers mechanisms to both register and authenticate patients and their caregivers. • OTN also notes that secure messaging solutions exist and are used today in Ontario; however, there are no permanent physician reimbursement frameworks. Ontario is piloting physician reimbursement for minor and intermediate assessments performed using secure messaging through the eVisit Primary Care pilot.
Oakville Trafalgar Memorial Hospital http://duncanrozario.com/files/CHTMar2020.pdf http://duncanrozario.com/files/MPvirtual.pdf https://sigmahealthtech.com/	Oakville Trafalgar Memorial Hospital: • Reacts Systems was developed in Canada and is currently being used to provide virtual care through smartphones or personal computers. It allows for augmented reality as well as virtual care, messaging and sharing of images. • Sigma Health tech is a virtual care platform being explored by Oakville Trafalgar Memorial hospital as a secure and encrypted way to connect patients with physicians as well as other care providers.
CAMH The tools can be found here: https://www.porticonetwork.ca/web/telemental-health/telemental-health/information-for-health-providers The Virtual Client Experience survey is available to download, and has been disseminated across Ontario: https://edc.camhx.ca/redcap/surveys/?s=PK3EH48CNX	CAMH • The Centre for Addiction and Mental Health (CAMH) has provided Virtual Mental Health services and capacity building for physicians and inter-professional teams, with the goal of improving access to care and addressing critical gaps in service delivery, over the last ten years. • OTN-PCVC (Ontario Telemedicine Network – Personal Computer Videoconferencing) is an approved CAMH platform. • Care is provided through the OTN to over 550 communities in Ontario, with a focus on rural and underserved Northern Ontario communities. These virtual visits were offered primarily through patient host sites at their local primary care or community care centre; recent policy shifts enabled CAMH to begin providing visits to patients in their homes via OTN and Webex. • In response to the Covid-19 pandemic, CAMH has rapidly scaled up virtual care, increasing from 300 virtual visits per month pre-pandemic to 6500 visits per month by June 2020, with one of the largest areas of expansion in the Greater Toronto Area. This significant shift in care was enabled by a number of factors, including: o External changes to remuneration with temporary billing codes more widely available, and the ability to use new secure platforms in addition to OTN o CAMH's participation in the OTN and MOH's Partner Video Project, including the contribution to provincial technology and draft clinical standards. o Rapid constitution of an advisory at CAMH that included experts in virtual mental health, clinical care, privacy, legal, and IT to develop

CAMH training will also be available as a series of brief videos through eENet: https://www.eenet.ca/initiative/virtual-care-in-ontario#about	comprehensive and responsive policies, guidelines, tip sheets, and client experience surveys for virtual care. o Developing virtual training for clinicians and administrators at CAMH and providing training for over 500 clinicians on CAMH Telemental Health policies and guidelines. o Sessions were also provided to help clinical programs to review workflows and provide advice on how to best integrate virtual care in alignment with guidelines. o Development of a Virtual Client Experience Survey (VCES) that is being utilized internally, in order to understand quality outcomes relating to virtual care. • In order to sustain these gains, CAMH is using an integrated quality improvement approach to understand how to continuously improve and refine virtual care, including options for ongoing integration of technology systems.
Saskatchewan	
https://www.saskatchewan.ca/government/health-care-administration-and-provider-resources/treatment-procedures-and-guidelines/emerging-public-health-issues/2019-novel-coronavirus/information-for-health-care-providers/clinical-practice-resources/general/virtual-care https://www.ehealthsask.ca/residents/Pages/Telehealth.aspx https://www.sma.sk.ca/kaizen/content/files/SMA_Virtual%20Care%20Quick%20Start%20Guide%20April%2009%202020.pdf https://lumeca.com/	• Pexip for One-on-One Consultations is a video conference provider to patient and is approved by the SMA, Ministry of Health, SHA and SCA. This virtual care tool is being provided at no cost to all Saskatchewan physicians for 12 months from March, 2020 to March 2021. The SK EMR Program and eHealth are also providing full support with licenses, account creation, deployment, training and on-going support. Pexip is currently being used by primary care providers, as well as other healthcare providers (ie. outpatient services like speech language pathology, PT, etc) • Webex for Group Patient/Public Education • Doxy.me is provide to patient video conference platform • Memora Health is a secure text messaging service • Accuro EMR – QHR Technologies uses Medeo as a digital health patient engagement tool which enables patients to use mobile devices to securely message providers, attend virtual calls or book appointments. • Med Access EMR – Telus includes the Telus EMR Mobile, Telus EMR Video and Health Myself Services • Lumeca provides access to a provider that may not be your individual physician and may be used as a virtual walk-in clinic tool • Some areas of service that are regularly using Telehealth are: o Mental Health o Genetics o Oncology o Surgery o Nephrology o Respirology o Neurosurgery o Rehabilitation Services o Group Patient Education o Neurology

https://forms.office.com/Pages/ResponsePage.aspx?id=0GyrJH5IIkebw9qcQjJ3bFY63i1JCdVPm0rm0b7wG-xUMFlQTFhLRVQ5VzZGOUxQRFJZWUI0QIM4Qi4u	• Dr. Acheampong at the University of Saskatchewan has undertaken research on the use of virtual care services and the impact on quality of care, socio economic factors, etc. Surveys are currently being conduced with those who have had a virtual consultation with their HCP
Manitoba	
https://sharedhealthmb.ca/files/covid-19-guidance-for-outpatient-care-delivery.pdf	To facilitate virtual care offerings, Manitoba Health and Doctors Manitoba have agreed to the following new tariffs: • Virtual Visit Tariff • Virtual Psychotherapy Tariff Physicians should contact Doctors Manitoba for specific information related to the tariffs. The following tools or products can be utilized. These are preferred in the short term and should be supported and secure. • Microsoft teams or video solutions integrated in the electronic medical system. Working with the local IT provider to determine the best option is recommended. • Additionally, consumer solutions such as personal Skype or Zoom may not commit to security and clinical information should be limited to the minimum necessary. The guidance document notes that virtual care offerings, including virtual walk-in clinics and apps, have the potential to fragment care and disturb integrated care. As such, virtual care should be provided as a supplement to, and not as a replacement of - traditional models supporting continuity of care. If considering the integration of virtual visits in practice, providers and practices should refer to: • CMPA Advice on Virtual Care https://www.cmpa-acpm.ca/en/advice-publications/browse-articles/2018/thinking-of-working-with-virtual-clinics---consider-these-medical-legal-issues • CPSM Standards of Practice-See Schedule K-Virtual Medicine, pages 86-87: http://www.cpsm.mb.ca/assets/Standards%20of%20Practice/Standards%20of%20Practice%20of%20Medicine.pdf
North West Territories	
The Northwest Territories Health & Social Services Agency (NTHSSA)	• NWT Virtual Care is a joint initiative of the NTHSSA, TCSA and HRHSSA. Options to book a virtual care appointment include telephone, telemerge, Facetime by Apple, Skype by Microsoft, WhatsApp by Facebook and Zoom.

https://www.nthssa.ca/en/services/nwt-virtual-care	
Yukon	
https://yukon.ca/en/news/new-virtual-care-options-yukoners https://yukon.ca/en/health-and-wellness/care-services/how-check-your-telehealth-appointment-doctor	• Doxy.me as a secure telemedicine solution which can be used with a webcam and microphone. Thus far, virtual health appointments can be offered by family clinics and medical clinics as well as optometrists, orthopedic surgery clinics, obstetrics and gynecology clinics, sexual health clinics and psychiatry clinics
Nunavut	
https://www.gov.nu.ca/health/news/covid-19-department-health-services-update	• Ongoing appointments will be triaged to in person or virtual (phone) visits. Specialty clinics have been cancelled and work is currently underway to determine which patients can be seen by phone or other virtual care platforms.
Prince Edward Island (PEI)	
https://src.healthpei.ca/virtual-care https://www.princeedwardisland.ca/en/news/western-hospital-using-innovative-approach-reduce-emergency-department-wait-times https://www.princeedwardisland.ca/en/news/islanders-without-primary-care-provider-will-have-access-virtual-healthcare-home htt www.princeedwardisland.ca/en/	• Maple is a technology platform that allows patients to connect directly with doctors and specialists for medical care from their smartphones or computers. It also provides custom technology solutions for hospitals and clinics who to advance their delivery of care. • Virtual care from Home for residents of PEI who do not have a primary care provider is a program created in partnership with Maple to provide residents access to PEI physicians during specified clinic hours. The cost for this service is covered by the government of Prince Edward Island until March 31, 2021. The following conditions have been successfully treated: o Cold and flu o Eye and ear infections o Minor allergic reactions o Minor injuries o Urinary tract infections o Sexual health issues o Mental health issues • Western Hospital has also used this approach in the Emergency Department to provide care to patients with non critical needs and who meet a certain criteria. During the video consultation, nurses and staff are on hand to take the patient's vitals, facilitate examination and provide medications as needed. • Zoom for Healthcare is a short-term solution to provide patients care during COVID-19. It is the Government of PEI's approved video health-care

service/virtual-health-care-islanders-without-primary-care-provider	platform. The province has purchased the license on behalf of community-based health-care providers and those working in mental health and addictions. *Zoom for Healthcare* offers important enhanced security features for delivering health care. Introducing *Zoom for Healthcare* is intended to help health-care providers meet the needs of their patients while supporting social distancing and limiting, as appropriate, the use of personal protective equipment (PPE). The Department of Health and Wellness will introduce a long-term virtual care framework and strategy at a later date" • Zoom for Healthcare licenses are available to: Community-based physicians and nurse practitioners; Mental health and addictions; Long-term care and home care providers; Primary care programs (i.e. Diabetes and COPD programs).
Newfoundland and Labrador (NL)	
https://infoway-inforoute.ca/en/resource-centre/virtual-care http://www.nlma.nl.ca/Page/COVID19/Virtual-Care http://www.nlma.nl.ca/Physicians/eConsult https://virtualcarenl.ca/ https://virtualcarenl.ca/health-care-providers/virtual-care-options/ https://saegis.solutions/en/saegis-programs/practice-management-services	• eConsult is a secure, web-based tool that allows family physicians to submit non-urgent, patient specific questions to a participating specialty. The request is processed and assigned to an appropriate consultant, who is asked to respond within seven (7) days. • Information on the patient's medical history, date of birth and MCP number is available in HEALTHe NL, the province's Electronic Health Record (EHR). HEALTHe NL consolidates information from a variety of sources across the province, including the community medication profile from the Pharmacy Network, medical imaging, clinical documentation, lab results and encounters from each of the RHA MEDITECH systems, as well as immunizations from the Client Referral Management System (CRMS) and demographics from the Client Registry. It provides timely access to up-to-date patient health records when and where needed at no cost to physicians. • Physicians can access and register for HEALTHe NL by visiting https://healthenl.ca or within the patient's record in the Med Access EMR. • eDOCSNL provides resources and information to support physicians during COVID-19. The webpage, https://edocsnl.ca/covid-19-resources/ has regular updates on educational materials, suggested tools, resources and functionality. For providers using eDOCSNL, there are different virtual care applications integrated into Med Access which allow the virtual visits to be launched directly from the provider's schedule. These applicated include: o Health Myself Virtual visits o Telus EMR Virtual visits. Support for these applications is provide by Telus Health.

Table 8: Effectiveness of Provider-Led Virtual Care in Ambulatory Care in Canada

Jurisdictional Source of Report	Type of Technology, Patients, and/or Services	Effectiveness: Cost, Patients, and/or Health Care Providers
Canada		
Ontario Ontario Telemedicine Project	Type of Technology • Synchronous: Videoconferencing; telephone; and messaging. • Asynchronous: Photos. Type of Patients • Substance Use Disorder Solutions: Patients with addiction challenges;[15] • Mood and Anxiety Challenges: Patients experiencing symptoms of anxiety, depression, and mental health issues;[16] • Teleophthalmology: Patients with diabetes;[17] • Teledermatology: Patients with skin conditions;[18] • Telehomecare: Patients with chronic obstructive pulmonary disease (COPD) or heart failure;[19] and • Surgical Transitions: Patients before, during, and after surgery.[20] Type of Services • Substance Use Disorder Solutions o Big White Wall: Breaking Free is an interactive and personalized digital recovery support program for substance dependence. Breaking Free can be used as 1) a self-directed treatment, as screening is accompanied by full English and French voiceovers; or 2) can be delivered as Computer-Assisted Therapy by counsellors and practitioners who are trained via an e-learning platform.[21,14] o FeelingBetterNow: FeelingBetterNow is a confidential, evidence-	Effectiveness • Substance Use Disorder Solutions o Big White Wall: An online report of Big White Wall suggested that 70% of users saw improvement in at least one aspect of their well-being. Furthermore, 46% of users reported sharing an issue for the first time, and 51% of users reported less mental health-related time off work using Big White Wall.[21] o On the Wagon: A four month pilot study found that 67% of participants reported a decrease in triggers, 47% of participants reported a decrease in isolation, and 64% of participants reported an increase in happiness while using the On the Wagon app.[27] • Mood and Anxiety Challenges o MindBeacon: The MindBeacon website noted that four in five participants who completed therapy with BEACON experienced improvement in their symptoms.[23] • Telehomecare: An Ontario Telehealth Network report on telehomecare suggested that telehomecare patients identified a reduction of more than 50% in emergency department visits and in-patient admissions six months after completing the program. Supported by the Ontario Ministry of Health and Long-Term Care and Canada Health Infoway, telehomecare has supported more than

[14] According to Carroll and Rounsaville, Computer-Assisted Therapy is the use of computers to deliver some aspects of psychotherapy or behavioural treatment directly to patients via interaction with a computer program, or delivered via the Internet (Carroll & Rounsaville, 2010).

Jurisdictional Source of Report	Type of Technology, Patients, and/or Services	Effectiveness: Cost, Patients, and/or Health Care Providers
	based, personalized, and scalable solution available online that can support alcohol and substance use disorder. The solution provides an evidence-based assessment tool and connects individuals to a personalized and immediate action plan for self-help or collaborative care with a counsellor, action plan psychologist, or physician. o On the Wagon: Wagon is a clinical care application (app) for addiction that enables health care providers to monitor and connect with patients digitally. Each patient has a personalized recovery plan, emergency supports, coping strategies, and a journal. The clinical dashboard provides clinicians with a real-time overview of each patient, including recovery plan completion, current triggers, and feelings.[22] • Mood and Anxiety Challenges o MindBeacon (BEACON): BEACON is a fully digital experience providing treatment through digitally delivered cognitive behavioural therapy (CBT) with the one-on-one support with a dedicated therapist. BEACON is developed to achieve optimal symptom reduction for mild to moderately severe symptoms of mood and anxiety disorders.[23,15] • Teleophthalmology: A family doctor or nurse practitioner will refer patients to a teleophthalmology site. A trained nurse or technician will take a photograph of the eye, which are sent through a secure website to the specialist for review. The specialist will complete a report that	14,000 patients since it launched in 2012.[24,17] • Surgical Transitions o SeamlessMD: In a case study at the Prairie Heart Institute in Illinois identified that SeamlessMD helped reduce readmissions by 45% and decreased length of stay by one day.[28,18] o Vivify Health: In a case study at Union Hospital in Maryland, remote monitoring patients using Vivify had 0.27% readmissions versus 10.27% of patients with similar conditions who were not being monitored remotely.[26] Cost-Effectiveness • Substance Use Disorder Solutions o Big White Wall: Freely available.[29] o On the Wagon: Wagon is available as a yearly license fee, based on the number of patients seen each year.[22] • Mood and Anxiety Challenges o MindBeacon: The MindBeacon webpage on pricing noted that the cost of iCBT through BEACON can be up to 80% less expensive than face-to-face psychological therapy. BEACON Standard is up to CAD $635 and BEACON with Insight+ (i.e., assessment reviewed by clinical psychologist, and psychological diagnosis report provided) is up to CAD $960.[30] • Teleophthalmology: The Ontario Telehealth Network webpage identified that teleophthalmology is covered under the Ontario Health Insurance Plan (OHIP).[17] • Teledermatology: The Ontario Telehealth Network webpage identified that the Telederm program is available at no cost to health care providers or patients,

[15] Cognitive behavioural therapy (CBT) as a common type of talk therapy (psychotherapy) that helps an individual become aware of inaccurate or negative thinking so that they can view challenging situations more clearly and respond to them in a more effective way (MayoClinic, n.d.).
[17] Canada Health Infoway is an independent, not-for-profit organization funded by the Canadian federal government working with partners to accelerate the development, adoption, and effective use of digital health solutions across Canada (Infoway, n.d.).
[18] The Prairie Heart Institute is a centre for cardiac procedures based in St John's Hospital (St. John's Hospital, n.d.).

Jurisdictional Source of Report	Type of Technology, Patients, and/or Services	Effectiveness: Cost, Patients, and/or Health Care Providers
	indicates whether there are changes in the eye(s),or the potential for changes.[17] • Teledermatology: Primary care providers can consult with an Ontario dermatologist, delivering advice to patients within an average of five days, often eliminating the need for an in-person referral.[18] • Telehomecare: A six-month health coaching and remote monitoring program that supports people with heart failure or COPD, which includes conditions like emphysema and chronic bronchitis.[24] • Surgical Transitions: o SeamlessMD: A platform available to patients on their phone, tablet, or computer, and guides patients through their entire care pathway, before, during, and after hospitalization.[25] o Vivify Health: A mobile, cloud-based platform that delivers holistic remote care management through personalized care plans, biometric data monitoring, multi-channel patient education, and virtual visits/telemedicine.[26,16] o InTouch Health: A technology platform that connects patients and clinicians continuously throughout the surgical journey. The platform fully integrates symptoms, safety, and advanced clinical alert algorithms.[20]	and is part of Ontario's publicly funded health care system.[18] • Surgical Transitions o SeamlessMD: A 2020 study on the value of an interactive phone application in an established enhanced recovery program evaluated the impact of SeamlessMD and found that patients enrolled in the app cost CAD $11,560, while total cost of those not enrolled was CAD $13,946.[31] o Vivify Health: In a case study at Union Hospital in Maryland, Vivify Health avoided 48 30-day readmissions, achieving an estimated cost savings of CAD $336,000.[26] Patient Experience and Equity • Substance Use Disorder Solutions o On the Wagon: The On the Wagon webpage suggested that 73% of participants reported that they would recommend Wagon to others struggling with substance use disorders.[27] • Mood and Anxiety Challenges o MindBeacon: The BEACON webpage reported that nine in 10 participants agreed that using program helped them learn new skills to reduce their mental health symptoms.[23] • Surgical Transitions o SeamlessMD: In a case study at the Montreal Heart Institute, 83% of patients felt more prepared for surgery and 95% of patients would recommend SeamlessMD.[32] o Vivify Health: In a case study at Children's Health in Dallas using Vivify Health, 95% of staff reported being satisfied with the program[33]

[16] Biometric data are those that belong purely to organics (the living) and are metric (measurable), for example: outline or shape of the hand, of fingers, digital fingerprints, veins, their temperature, facial shape, image of the iris, heartbeat, its rhythm (ScienceDirect, 2019.).

Jurisdictional Source of Report	Type of Technology, Patients, and/or Services	Effectiveness: Cost, Patients, and/or Health Care Providers
		Provider Experience • Surgical Transitions o SeamlessMD: SeamlessMD has collected provider testimonials.[25] o Vivify Health: In a case study at Children's Health in Dallas using Vivify Health, 100% staff satisfaction was reported.[33] o InTouch Health: An Ontario Telehealth Network webpage identified that the InTouch Health platform improved outcomes and efficiency, and increased patient satisfaction.[20]
British Columbia (BC) Shared Care Telemedicine Project	Type of Technology • Synchronous: Videoconferencing.[34] • Asynchronous: Store and Forward.[34] Type of Patients • Videoconferencing: Pregnant patients; rural patients.[34] • Store and Forward: Patients with a dermatological concern.[34] Type of Services • Videoconferencing: o RealPresence: A secure software platform managed by internal health (IH) and available for use in rural facilities.[19] Physicians can conduct a virtual face-to-face appointment with their patient who is located in an IH facility. IH maintains 195 videoconferencing fixed or mobile hardware systems in 42 IH communities. RealPresence includes different specialties: ▪ *Telematernity:* A rural general physician in Midway, BC identified a pregnant patient who might benefit from the use of videoconferencing technology. The general physician in Midway and the patient were connected with an obstetrician for two	Effectiveness • Video Conferencing: RealPresence – A 2018 South Okanagan Similkameen report on shared care telemedicine identified the following: o Five telerespirology appointments have been completed between 2016-18; o High physician satisfaction; o Two Continuing Medical Education programs spread awareness of the potential to use RealPresence for specialist follow-up appointments at IH facilities; and o Increased awareness of a dedicated IH Telehealth help line.[34] Cost-Effectiveness • Videoconferencing: Medeo – The 2018 South Okanagan Similkameen report identified the following cost-related reported outcomes: o Physician Cost: The current cost for a physician to use Medeo is CAD $1,200 per year. o Patient Cost: Average estimated cost savings per patient is CAD $208; total projected cost savings is CAD $8,044.[34] • Store and Forward: ConsultDerm o Physician Cost: Currently free to physicians and nurse practitioners.[34]

[19] Interior Health was established as one of five geographically based health authorities in 2001 by the Government of British Columbia (Interior Health, n.d.).

Jurisdictional Source of Report	Type of Technology, Patients, and/or Services	Effectiveness: Cost, Patients, and/or Health Care Providers
	appointments. The general physician conducted the initial physical exam and used RealPresence software to connect with the specialist for a consult. Sessional time was provided for learning the software and providing feedback on the experience. ▪ *Telerespirology:* A respirology specialist and general physicians collaboratively identified suitable rural patients who might benefit from follow-up appointments using RealPresence.[34] o Medeo: Medeo is a commercial web-based videoconferencing platform that supports secure virtual medical appointments between physician offices and patients located in their own home. Both patients and physicians install the application on their personal computer, smartphone, or tablet and log in to the Medeo portal to conduct the appointment. If patients have the computer literacy required to participate in an online appointment using the virtual application, it can be an alternative for those who have difficulty leaving their home, or who must travel long distances for appointments. Modeo includes the following medical specialty: ▪ *Telerheumatology:* A rheumatologist incorporated the use of Medeo into daily clinic practice and became comfortable switching between face-to-face and virtual appointments. The specialist suggested telemedicine appointments to patients who are capable of using the technology (i.e., comfortable using platforms like Skype) or that have a caregiver available to help with the technology during the appointment. • Store and Forward: o ConsultDerm: A secure internet-based platform that supports timely dermatological consults and can be used on any device. The program is used between general practitioners (GPs) and dermatologists. Once the patient who is experiencing a	Patient Experience and Equity – The 2018 South Okanagan Similkameen report identified the following patient experience reported outcomes: • Videoconferencing: Medeo o Average estimated avoided driving time is 6.5 hours; total projected driving time saved is 252 hours. o Average hours of missed work is 7.8 hours; total projected income saved for those working CAD $2,500 (i.e.,140 hours at an average of CAD $17.50/hour).[34] Provider Experience – The 2018 South Okanagan Similkameen report identified the following provider experience reported outcomes: • Store Forward: ConsultDerm o 436 physician consults between 2015-17 for all communities in the South Okanagan Similkameen; o *High physician satisfaction*: 78% satisfied with the experience, 80% found it easy to use, and 100% found it timely; and o *Sustainable physician use*: 92% planned to use it again after the initial appointment.[34]

Jurisdictional Source of Report	Type of Technology, Patients, and/or Services	Effectiveness: Cost, Patients, and/or Health Care Providers
	dermatological concern has consented to the use of the technology, the GP takes photos of the rash or skin condition using a smartphone, tablet, or digital camera. The photos are uploaded, attached to a web-based referral, and sent to the next-available dermatologist. If the dermatologist deems that the condition can be appropriately treated by the GP, they respond with treatment advice. In more serious cases, the patients will need to be placed on a waitlist for an in-person dermatology appointment.[34]	

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