



# EVIDENCE SYNTHESIS

**A REVIEW OF THE CLINICAL AND COST-EFFECTIVENESS  
OF VIRTUAL CONSULTATIONS**

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## EVIDENCE BRIEF

# A Review of the Clinical and Cost-Effectiveness of Virtual Consultations

### Background:

Synchronous virtual consultations continue to be explored as a means of alleviating economic pressure on the health care system, shortening wait times, and improving accessibility of care. Canadians are open to virtual consultation with physicians: according to a recent survey, 38% of Canadians would like their first point of contact with a physician to be delivered virtually. However, this does not reflect the way health care is currently provided, as only approximately 8% of Canadians have accessed services virtually.<sup>1</sup> Low uptake may be attributed to potential limitations when providing care during virtual consultations, such as the patient perception of having more clinical risk, the types of care physicians can provide virtually, and other technical, logistical and regulatory challenges.<sup>2</sup> This review focuses on the provision of virtual consultations by physicians, and the evidence related to their cost and clinical effectiveness.

### Methods:

An analysis of the literature was completed to understand the breadth of information available related to virtual consultations with general practitioners and their effectiveness. Databases searched included PubMed, PsychInfo, CINAHL, JSTOR, and Proquest. The articles that were included needed to be published after 2005, and had a focus on advantages, limitations, effectiveness, and cost-effectiveness of virtual consultations provided by physicians. Search terms were broad, and included virtual consultations, remote virtual consultation, telemedicine, e-visits, and teleconsultation, as the terms are interchangeable in many jurisdictions. The lack of evidence related to marginalized groups inhibited our ability to complete this review with a gender-based analysis focus (GBA+), and therefore did not adequately capture the additional access difficulties

experienced by visible minorities, those with mental illness, those living in rural or remote communities, those with low socioeconomic status, Indigenous communities, and members of the LGBTQia2+ community.

Note: This review was completed on the information available for synchronous virtual consultations between doctors and patients, not between doctors and other doctors. For the purpose of this document, the following definitions were used

Synchronous telehealth: Real-time telehealth that typically involves the use of audiovisual technology to enable individuals to communicate live (or synchronously) over a videoconference link.<sup>3</sup>

Teleconsultation: A general term for any consultation between doctors and patients on a network or video link (e.g., Facetime, intranet, Internet, Skype, etc.)<sup>4</sup>

Virtual consultation: An internet physician consultation for which, depending on the diagnoses, medical therapy may be prescribed<sup>5</sup>

E-visit: eVisits enhance access to care by enabling patients to see a physician by video from your computer or other device.<sup>6</sup>

## Part 1) Clinical Effectiveness of Virtual Consultations

Clinical effectiveness of virtual consultations, as defined by the papers reviewed in this document is the improvement of a morbid condition (e.g., diabetes), where the inclusion of technology-based consultation methods resulted in comparable, or improved, health outcomes, as in-person consultations (e.g., patient satisfaction being lower after a remote consultation, patient wait time, etc).<sup>7</sup>

Canadians are keen on increasing virtual access to their physicians. A 2019 Canadian Medical Association (CMA) report noted that seven in 10 (69%) Canadians stated that they would take the opportunity to have a virtual visit if available, and almost four in 10 (37%) indicated that they would use this method for either all or more than half of their physician visits.<sup>8</sup> Despite considerable interest from the general public, there remains a sizeable discrepancy between interest and uptake. A possible barrier to delivering care through a virtual consultation is their clinical effectiveness. Although evidence remains limited on this subject, there are several studies to date that indicate promising results for the clinical effectiveness of virtual consultations.

A 2014 study examined the use of Skype for orthopaedic clinical consultations following total joint arthroplasty. Thirty-four of the 78 patients participated in a Skype consultation, whereas 44 did not have appropriate electronic devices or internet connection to use the Skype service. The study reported that there was no significant difference in clinical outcomes for the users and non-users of this service. However, those who opted for a virtual consultation had fewer unscheduled in-clinic visits and called the office for medical advice less frequently. While the results were encouraging, several limitations render findings of effectiveness inconclusive.<sup>9</sup> First, the study had a small number of participants, and participation was voluntary, making it difficult to attribute differences in clinical outcomes for patients to the virtual services themselves. Moreover, those unable to access the Skype calls because of a lack of appropriate electronic devices or internet connection were likely in a different socioeconomic cohort, which are generally associated with worse health outcomes.

A second study compared remote video consultations in follow-up after surgery for prostate cancer to usual care. Participants were randomly assigned to video follow-up or usual, in-person care. In this study, video consultations were assessed as 'equivalent in efficiency' to conventional outpatient visits, as measured by amount of time spent face-to-face, patient wait time and total time devoted to care. There were no significant differences in patient perception of visit confidentiality,

efficiency, education quality or overall satisfaction. Video consultations resulted in lower costs to patients and similar levels of urologist satisfaction to conventional outpatient visits.<sup>10</sup>

Another study suggested that patients who are seeking advice for diabetes management through general virtual consultations fared better than a control group who continued to seek in-person consultations. The study found that virtual consultations improved glycaemic control and resulted in fewer emergency visits, although the sample size was small. While these data are encouraging, patients were not randomised and some of those who initially signed up to the remote service subsequently withdrew from it. Therefore, a conclusion that virtual consulting is effective would be extremely premature.<sup>11</sup> It is also possible that patients who were unlikely to fare well in the virtual consultation group, such as people who have underlying conditions, or those who were unwilling to keep an open mind about virtual consultations, had already excluded themselves prior to the intervention and therefore created significant bias in the study.

Although initial results suggest that virtual consultations may be clinically effective, there is not enough evidence in Canada to date to determine whether they can provide the same quality of care as in-person consultations.<sup>12</sup> Based on the studies highlighted, it is premature to determine whether virtual consults are as clinically effective as traditional care. However, the confidence by physicians that they are able to deliver the same level of care virtually is encouraging.

## Part 2) Cost-Effectiveness of Virtual Consultations

Given the relatively high cost of in-person consultations, virtual consultations may offer a number of cost-savings, both to patients and the health care system. Patients seeking a virtual consultation would be able to simply log on to any device to consult their physician, which would offer potential advantages such as a reduction in the cost and inconvenience of travel, while also ensuring patients are not required to take time off work or seek child care to attend an in-person appointment.<sup>13,14</sup> At a system-level, virtual consultations may increase accessibility by ensuring physicians are using their time as effectively as possible. Although evidence remains limited on the

economic ramifications of virtual consultations in Canada, especially for virtual consultations with general practitioners, international studies have shown promising results.

One study based in the United Kingdom (UK) showed that using videoconferencing for orthopedic consultations in the remote clinic costs less than standard outpatient consultations at the specialist hospital, as long as a certain threshold number of consultations was met annually. Further, results indicate that for 300 consultations per year, the annual cost savings amounted to €18,616. These results are especially noteworthy when considering the geographical challenges faced by Canadians living in rural and remote communities and provides a promising alternative to frequent medical-related travel for these populations. Additionally, a quality-adjusted life years gained (QALY) analysis was performed to ensure that patients were still receiving quality care in the telemedicine group, resulting in .09 years gained per patient, which was not significantly different to the .05 gain in the standard consultation group.<sup>15</sup> Another study, from Minnesota, analysed two groups of patients: those who had an online visit and a comparison group who had regular office care for same-day, acute visits. Median standard costs for the health care system were \$161 for online visits and \$219 for same-day acute visits. Online visits also appeared to reduce medical costs for patients during a 6-month period after the visit. In contrast, some evidence indicates that the upfront costs and technological support heighten the cost to the system. Data from another UK based study showed that virtual consultations may be more costly to the United Kingdom National Health Service than face-to-face consultations (£724 versus £625 per patient), when factoring in the purchasing of equipment and technology required to deliver virtual consultations. However, it is estimated that time taken off work to visit a general practitioner actually costs the British economy in excess of \$5 billion per year.<sup>16</sup> Thus, while virtual consultations may carry heavy upfront technology adoption costs, cost-savings can be experienced beyond the healthcare system.

Appointment attendance rates may also impact the economic effectiveness of virtual consultations. According to one study, virtual consultations were more popular than traditional consultations with patients (especially young adults) and the staff responsible for delivering the service. In the UK, between 2011 and 2014, 480 remote consultations were documented involving 104 patients. Overall, the 'did not attend' rates were 13% in patients accepting the virtual consultation option and 28% in those who chose not to use this option. However, given that patients were able to choose which consultation method they preferred, the study results may be biased and would require further assessment, as the patients who were less likely to attend had opted out of the study.<sup>17</sup> Accordingly, further research is needed to understand how attendance rates are affected by virtual consultations, and how attendance rates affect the cost incurred by physicians and patients alike.

Lastly, it is found that the cost of virtual consultations can be offset by careful selection of the circumstances and the patients who would benefit most. In a time of continuous technological advancement, it is possible that virtual consultations will become incrementally more efficient, which may reduce the cost of using these services over time. Therefore, the framework in which these virtual consultations are delivered, and who is able to access them, must be at the forefront of the discussion.<sup>18</sup> It is clear from the literature that further studies should be completed to look at patient convenience and societal economic benefits. These benefits can include increased productivity, as well as improvements in patient outcomes and health status.<sup>19</sup> This also includes the possible benefits associated with an increase in attendance rate, and how much patients and the health care system may be saving in long-term health care costs when patients are more frequently attending their appointments.

### Part 3) An Overview of Key Considerations for Implementation and Scale of Virtual Consultations in Canada

The interest in virtual consultations has gained momentum in Canada over the past several years and has been further accelerated by the COVID-19 pandemic. According to one survey, Canadians have had to completely alter the way they access the health care system during the COVID-19 pandemic. Previously, Canadians had been seeking advice from a physician in-person 61% of the time and since the pandemic began, have only been meeting in-person 10% of the time.<sup>20</sup> This created an instantaneous shift in the way patient consultations are delivered and forced physicians to adjust the way they provide care. It is possible that the COVID-19 pandemic will permanently disrupt the way health care is delivered in our country, and finally push reluctant stakeholders to make the necessary changes to better serve Canadians. However, it is also possible that this shift towards virtual health care services may deepen the digital divide and exacerbate challenges already being experienced by marginalized groups, thereby enhancing inequities within the system as a whole. In this section, the existing barriers to the provision of virtual health care services as well as the potential differential impacts of the digital health transformation are explored for consideration in future policy decision-making.

The primary barrier identified through this review is the lack of available research evidence in Canada on the clinical and cost effectiveness of virtual consultation implementation in a health care setting. The idea of offering synchronous virtual consultations as an option is not a widespread norm, making it difficult for researchers to determine their clinical and cost-effectiveness. Additional investments and government incentives for technology adoption are necessary in order to create a stronger evidence base surrounding the use of virtual consultations in Canada. Although evidence remains limited, the research identified in this document indicates positive outcomes in clinical effectiveness of virtual consultations. These studies also indicated that virtual consultations, in many cases, are more cost-effective than in-person consultations when factoring in cost-savings beyond the health care sector. The additional research being developed

as a result of the COVID-19 pandemic will help to bolster the available databases and provide more evidence to support, or disprove, these findings.

Second, while interest in virtual health care continues to increase among Canadians, access to virtual services remains limited in most jurisdictions. Prior to the pandemic, a 2019 report showed that 41% of Canadians were interested in having video visits with their health care provider but just 4% of family physicians offered this as an option.<sup>21</sup> Barriers experienced by physicians to moving toward virtual services include a perceived increase in workload, concerns over patients' security, insufficient remuneration, and technical issues. Without significant buy-in from physicians, virtual consultations will continue to be inaccessible for most Canadians, and evidence regarding effectiveness will remain limited on a large scale.<sup>22,23</sup> For more details on the barriers experienced by physicians in this context, see *A Review of Policies and Barriers that Influence the use of Virtual Health in Primary Care.*<sup>24</sup>

Finally, although virtual care has the potential to increase access to health care, it also has the potential to exacerbate existing geographic and socioeconomic inequalities. Many rural Canadians do not have equal access to the Internet as those in populated, urban centres. According to the Canadian Radiotelevision and Telecommunications Commission, nationally, 86% of Canadian households can access download speeds of at least 50 megabits per second and upload speeds of 10 megabits per second. In contrast, just 41% of households in rural communities have similar access. These slow speeds demonstrate a clear divide in who may be able to take advantage of virtual services. There is also a significant socioeconomic divide between those in different income quintiles, which makes it much more difficult to access devices that would be suitable for virtual consultations. In 2017, it was estimated that only two out of three households in the lowest income quintile had a home computer (63%) or Internet access at home (69%), compared with more than nine of out ten households in the top three income quintiles. Low broadband capacity and limited purchasing power will result in further division

between those who can take advantage of virtual services and those who cannot. This document did not explore additional equity considerations that impact marginalized groups, which will be critical to understanding how virtual consultations can alleviate, or further exacerbate inequalities experienced by these groups.

Although barriers remain to the equitable adoption of virtual health services more broadly in Canada, the COVID-19 pandemic has presented a paradigm shift that our country would be remiss to not take advantage of as we move forward. A CMA report acknowledges that consumer demand and the drive to improve access will probably make virtual care more common in the Canadian health care system. Moving forward, the development of a pan-Canadian framework to establish excellence in virtual care will be critical in the years to come. The Framework should explore themes such as quality health service and continuity of care among care teams. Without such a framework, there is a risk that a series of fragmented virtual care services will be established that detract from continuity and potentially lead to quality-of-care issues. Given the lack of studies assessing the clinical and cost effectiveness of virtual consultations in Canada to date, it will be difficult to create an evidence-informed framework that best serves the economic interest of the government, the health of patients, and ease-of use for physicians.<sup>25</sup> Additionally, it will be difficult to establish a framework that meets the needs of Canadians equitably across the country, and that will have an effect in local, regional, and provincial level policy. It is clear that there will be many obstacles in the effort to scale and deliver virtual consultations across Canada, however with support from government, physicians, and patients alike, a more usable and digitized health care system can be established that will give Canadians more options in how they manage their health.

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