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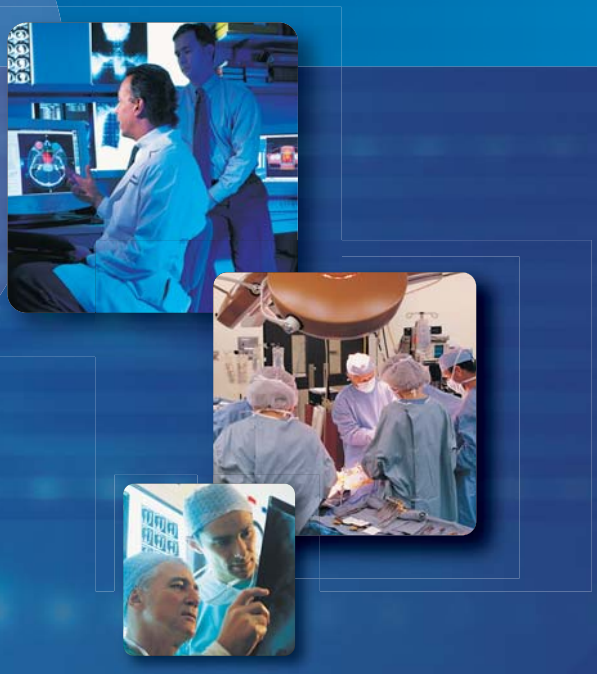
Overview of Assessments of Real-Time (Synchronous) and Asynchronous Telehealth



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Canadian Agency for Drugs and Technologies in Health

Overview of Assessments of Real-Time (Synchronous) and Asynchronous Telehealth

January 2008

We thank Lisa Hum for her assistance in creating this overview from two longer reports authored by Deshpande *et al*.

This overview is based on two technology reports commissioned by CADTH: Deshpande A, Khoja S, McKibbon A, Jadad AR. *Real-time (synchronous) telehealth in primary care: Systematic review of systematic reviews* [Technology report number 100]. Ottawa: Canadian Agency for Drugs and Technologies in Health; 2008; and Deshpande A, Khoja S, Lorca J, McKibbon A, Rizo C, Jadad AR. *Asynchronous telehealth: Systematic review of analytic studies and environmental scan of relevant initiatives* [Technology report number 101]. Ottawa: Canadian Agency for Drugs and Technologies in Health; 2008.

REPORT *IN BRIEF*

January 2008

Real-time (synchronous) Telehealth and Asynchronous Telehealth

Technology

Real-time (synchronous) telehealth and asynchronous telehealth.

Issue

There is considerable uncertainty about the effectiveness and optimal delivery of telehealth. A barrier to the widespread adoption of asynchronous and real-time telehealth could be a lack of a high quality evidence synthesis that provides the basis of policy, management, and clinical decisions.

Methods and Results

A systematic identification of studies on telehealth yielded 31 publications. A separate systematic review of studies of any modality of asynchronous telehealth identified 52 original studies. An environmental scan identified 39 organizations (five in Canada) that are using a combination of real-time and asynchronous services. Economic outcomes were extracted from clinical reviews.

Implications for Decision Making

- **The evidence supporting telehealth is compelling in some situations.** Asynchronous telehealth has led to shorter wait times, fewer unnecessary referrals, and high levels of patient and provider satisfaction in locations that lack health professionals. Real-time telehealth has reduced mortality in patients with congestive heart failure and is as effective as in-person care in supporting health professionals and patients facing psychiatric and neurological problems in remote, under-served communities.
- **Uncertainty remains.** Information about cost-effectiveness, access to services, resource utilization, process of care, and user satisfaction for synchronous telehealth is lacking. Theoretically, telehomecare could save money by eliminating travel costs and reducing the number of re-admissions to hospital. It is unclear whether the use of asynchronous telehealth for triage leads to faster care or improved health outcomes and whether it works beyond small pilot projects.
- **Opportunities for further understanding exist.** Canada has an aging population, a vast geographic area, and a limited health care workforce. As a result, telehealth programs could play a role in providing effective and efficient health services and equitable, fair, and sustainable health care delivery for Canadians. The development of programs with limited collaborative work across provinces may prevent public expectations from being met.

This summary is based on two comprehensive health technology assessments available from CADTH's web site (www.cadth.ca): Deshpande A, Khoja S, McKibbon A, Jadad AR. *Real-Time (Synchronous) Telehealth in Primary Care: Systematic Review of Systematic Reviews*; and Deshpande A, Khoja S, Lorca J, McKibbon A, Rizo C, Jadad AR. *Asynchronous Telehealth: Systematic Review of Analytic Studies and Environmental Scan of Relevant Initiatives.*

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1 Introduction

The Canadian Society of Telehealth (CST) defines telehealth as "the use of information and communications technologies (ICTs) to deliver health services and transmit health information over long and short distances. It is about transmitting voice, data, images, and information rather than moving patients or health practitioners and educators."[1] The goal of telehealth is to eliminate distance barriers and promote equitable access to services that would otherwise be unavailable in remote communities. Telehealth has played a role in the delivery of health services to remote communities worldwide for at least 50 years, across many medical conditions.

Real-Time Telehealth

Real-time telehealth typically involves the use of audiovisual technology to enable individuals to communicate live (or synchronously) over a videoconference link. Most traditional services require, at a minimum, video cameras, a sound system, computer displays, and a secure (preferably) high-speed Internet connection to transmit data between sites. As a result, real-time telehealth services have relied on the availability of dedicated videoconferencing facilities, which are generally restricted to institutional settings.

Canada is a leader in real-time telehealth, because provincial and federal agencies have viewed it as a key component in efforts to serve the needs of isolated communities. As of 2006, there were real-time telehealth programs in 10 provincial and three territorial jurisdictions, except Newfoundland and Labrador and Prince Edward Island. In Newfoundland and Labrador, a provincial telehealth program was established in 2005. In Prince Edward Island, telehealth is supported mainly at the hospital level.

Provincial telehealth programs in Canada are growing quickly. In 2001, a survey of six provincial programs and two programs from the territories found that telehealth in Canada is growing, while facing "a state of transition between pilot project and program status."[2] The survey found that although transmission methods and bandwidth were similar among programs, each program seemed to have chosen its own path to implementation. Data presented at the 2007 National Telehealth Coordinators' Special Interest Group of the CST also confirm growth among telehealth programs. Manitoba expected a 28% increase in the number of consultations in 2007. The number of telehealth consultations that were supported by the Ontario Telemedicine Network (OTN) in the first three quarters of 2006 matched the total number of consultations in 2005. In Alberta, a rural change program was started in seven non-urban regions, and a provincial evaluation framework has been completed.

Although real-time telehealth has delivered services to under-served communities, the proportion of patients who benefit remains small, because of the dependence on costly infrastructure and the decreased ability to schedule face-to-face encounters between patients and health professionals. There is an increasing number of systematic reviews that address real-time telehealth but little attempt to assess the quality of the reviews and summarize the evidence as a means of providing policy makers with a foundation on which to base decisions.

Asynchronous Telehealth

Asynchronous (or store-and-forward) telehealth is the transmission of data without the need for synchronous interaction between individuals. It involves the collection of digital samples [e.g., electrocardiograms (EKGs), spirometry results, radiological images] at one location and their

transmission to a health professional in another location for review. Technology systems for asynchronous telehealth can be any device capable of capturing a digital sample, storing it, and downloading it for transmission to a remote site. The digital images could be video images from a digital camera or iPod®, an audio file, or text files of a patient's history. Today, the Internet provides a means by which large files can be transferred securely, quickly, and inexpensively to almost any location.

Because of its independence from real-time interactions between patients and health professionals and the low cost of the infrastructure, asynchronous telehealth has the potential to reduce wait times, provide opportunities to re-think the way in which high-demand services are organized, optimize the use of limited health resources, and promote equitable access to health professionals and services. Digital samples, text messages, and laboratory test results can be transmitted to distant locations rapidly and at low cost. If asynchronous services are coupled with centralized servers to manage digital samples, work lists could be distributed among specialists who could interpret them at their convenience and from any location. In addition, if cases were prepared in advance, then specialists could achieve a higher turnover of their assessments without a need for face-to-face interaction.

Although asynchronous telehealth could alleviate certain burdens of the health care system and enhance access to services, the impact that it could have on various outcomes remains unclear. Clinical applications of asynchronous telehealth have not received the same amount of attention as those of real-time telehealth.[3] Despite several observational and experimental studies, there is a dearth of systematic efforts to assess its impact through a review of peer-reviewed literature or through an analysis of best practices by organizations that are promoting this modality. Key messages from the biomedical literature that are summarized so that policy makers and health care providers would find them useful are also lacking.

2 Objectives

Real-Time Telehealth

The objective was to provide a critical evaluation of systematic reviews that assess the impact of real-time telehealth in primary care on health outcomes, process of care, resource utilization, and user satisfaction by addressing four questions:

- What evidence exists in peer-reviewed literature to support the use of real-time telehealth modalities to improve health outcomes?
- What effect does the use of real-time telehealth have on access to health delivery services?
- What impact, if any, does real-time telehealth have on health care resource utilization?
- What is the level of patient and provider satisfaction for health services delivered through telehealth modalities?

Asynchronous Telehealth

The objective was to provide a critical evaluation of the available data on the use of asynchronous telehealth in primary care. The two components were a systematic review of peer-reviewed literature on the impact of clinical applications of asynchronous telehealth on health outcomes, process of care (e.g., access to health services), health resources, and user satisfaction; and an environmental scan to help synthesize the practices from organizations providing asynchronous telehealth services of relevance to Canadian policy makers.

Five questions were addressed:

- What evidence exists in the peer-review literature to support the use of asynchronous telehealth to improve health outcomes?
- Does the use of asynchronous telehealth improve access to health delivery services?
- Does asynchronous telehealth affect health care resource use?
- What are user satisfaction levels for services delivered using asynchronous telehealth?
- What organizations and best practices are at the forefront of asynchronous telehealth delivery?

3 Methods

Real-Time Telehealth

Published literature was obtained by searching the Database of Abstracts of Reviews of Effects (DARE), MEDLINE®, CINAHL, HealthSTAR, and the Cochrane Library. In addition, the bibliographies of retrieved reports were manually searched. Publications were included if they were described as a systematic review or a meta-analysis on telehealth applicable to primary care; published in English as a full account in a peer-reviewed journal or in the Cochrane Library; and provided, as a minimum, an explicit method to perform a thorough literature search and critical appraisal of individual studies.

Two reviewers independently screened titles and abstracts and applied the selection criteria. Disagreements were resolved by third-party consensus. Quality assessment was performed using the Oxman and Guyatt index (Overview Quality Assessment Questionnaire), which is a validated tool with a 7-point scoring scale.[4,5] Because this tool does not specify a cut-off point, the median study quality score was used to distinguish between low quality and high quality studies. Reports of low quality were those with major to extensive flaws, reflected in a score of 1 to 3. Reviews were high quality if they had minimal or minor flaws, which were reflected in a score of 4 to 7. Two reviewers extracted data independently. Any differences were resolved by third-party consensus. Although this systematic review did not include an economic analysis, data on cost-effectiveness and impact on resource utilization were collected, where available.

Reviews were grouped by quality ratings. The characteristics and quality assessments of the systematic reviews were described. The heterogeneity among reviews with respect to selection criteria, types of outcomes assessed, and clinical variability precluded subgroup analysis. A meta-analysis was not performed because of a lack of quantitative data in the original reviews.

Asynchronous Telehealth

a) Clinical systematic review

All electronic databases that were searched for real-time telehealth studies were also searched for asynchronous telehealth studies. The bibliographies of retrieved reports were manually searched. Publications were included if they evaluated one or more clinical asynchronous services; involved the capture of digital clinical samples by physicians, community-based nurses, or trained members of the public; focused on the delivery of digital samples for assessment by specialists at separate locations and transferred electronically, regarding any disease; included data on health outcomes, process of care, resource utilization, or user satisfaction; and were published in an English-language, peer-reviewed journal in 1995 or later. Publications were excluded if they focused only on diagnostic

concordance among methods (i.e., no other outcome data presented) or on technical issues (e.g., different modalities of telehealth or telehealth versus face-to-face consultations).

Two reviewers independently screened titles and abstracts and applied the selection criteria. Disagreements were resolved by third-party consensus. The methodological quality of each study, where relevant, was assessed using the Jadad scale for randomized clinical trials (RCTs)[6] or a modified version of the Downs and Black checklist for observational studies and controlled clinical trials.[7] Where no pre-specified cut-off score existed, the median study quality score was used to distinguish between low quality and high quality studies.[8] RCTs were considered to be of high quality if they received a Jadad score greater than 3. The modified Downs and Black checklist allowed for a maximum possible total score of 28. A high quality study had a score greater than 14 points. Two reviewers extracted data independently. Any differences were resolved by third-party consensus. Although this systematic review did not include an economic analysis, data on cost-effectiveness and impact on resource utilization were collected, where available.

Reports were categorized by medical specialty, and the characteristics and quality scores were described. A meta-analysis was considered inappropriate, because studies displayed clinical heterogeneity. There were disparities among studies with respect to clinical condition, acuity of health service delivery (acute, chronic), clinical setting, and technological intervention.

b) Environmental scan

Organizations providing asynchronous telemedicine services were identified from publications that were found in the clinical review and through Google searches. To be included, organizations had to indicate as a key objective the promotion and use of store-and-forward telemedicine services to promote access, provide information about its services, and generate data on the impact. A total of 87 and 155 organizations were retrieved through the clinical review and Google searches respectively. These were verified using the Telemedicine Information Exchange, and institutions were contacted to verify information and to obtain missing information.

4 Results

Real-Time Telehealth

The literature search identified 3,120 citations. Of these, 24 met the inclusion criteria. Searching the reference lists of included reports yielded two additional articles. We found five articles that were not identified by the search strategy. Of 31 included reviews, all but one were published after 2000, and most originated from the US and the UK.

None of the systematic reviews categorized the outcomes of real-time telehealth by the technology (e.g., operating system, bandwidth), although one review tried to categorize results by real-time or asynchronous telehealth.[9] None of the reviews described studies of Internet-based real-time telehealth services. Twenty reviews were not restricted to a specific disease or condition, two reviews[10,11] assessed telehealth applications in multidisciplinary interventions for congestive heart failure, six studies[12-17] were confined to mental health illness, one[18] focused on oncology, one[19] examined dermatological services, and one[20] examined chronic care conditions.

One review[11] was restricted to RCTs, whereas the others used broad inclusion criteria. Two reviews[11,13] completed a meta-analysis. Of the 31 included publications, 11 were judged to be of high quality.[9,11,21-29] Most authors of the systematic reviews concluded that the quality of evidence for health outcomes and cost-effectiveness of telemedicine was below the level needed to reach valid conclusions.

a) Clinical effectiveness

Results of high quality systematic reviews: Of 11 high quality reviews, 10 captured data on health outcomes,[9,11,21-25,27-29] and seven collected data on resource utilization.[11,21,24,26-29] Two studies concentrated on health outcomes,[9,25] and one[26] focused on resource utilization. The others captured mixed outcomes data.

One review[30] found that the use of telemedicine as a component of a multidisciplinary program for congestive heart failure reduced hospital admissions and deaths. Six studies[9,11,21,27-29] found qualitative evidence to support the use of home-based telemedicine for patients' self-care or the management of chronic disease. Home-based telehealth was found to improve communication between patient and provider and contribute to closer monitoring of chronic conditions or enhance the quality of life in elder care.[9,28] Two reviews[9,21] highlighted the effectiveness of telehealth applications in psychiatry and neurology. One concluded that videoconferencing can be useful during care in specialties involving verbal interaction and that clinical assessments are feasible and comparable to in-person interactions.[9] Two reviews[21,23] found evidence to support the use of teleradiology and teleneurosurgery, mainly for the transmission of CT scans before a patient is transferred to another institution.

Results of low quality systematic reviews: Of 20 reviews judged to be of low quality, eight[13-17,20,31,32] addressed health outcomes, 13[12,14-17,20,31,33-38] addressed resource use, and 12[13-19,31,36,37,39,40] addressed patient satisfaction. Most reviews presented multiple outcomes, although three[19,39,40] focused on patient satisfaction, four[12,33,35,38] focused on resource utilization, and eight[13-17,20,31,32] assessed health outcomes.

Five reviews[13-17,20,32] that focused on the management of mental health illness identified telepsychiatry as being successful in improving clinical outcomes and helping to build relationships. Two reviews concluded that telemonitoring in isolation or as part of a multidisciplinary program could reduce hospitalization and readmission for congestive heart failure or other chronic conditions.[20,31] One review suggested that the use of telemedicine as a supplement to professional nursing services was associated with social and health benefits in elderly home care.[32]

b) Economic analysis

Based on several high quality studies, there was little evidence to support the use of real-time telehealth in terms of cost-effectiveness. Three reviews identified teleradiology as an area with favourable economic outcomes.[21,26,28] According to these reviews, most cost savings were generated through reduced patients' expenses.[27] Hailey *et al.*[21] suggested that dermatology (for the patient, but not for the provider), mental health, and ophthalmology may benefit from the cost savings associated with telehealth. Jennett *et al.*[28] identified pediatric subspecialties, cardiology, and mental health as clinical areas for cost savings for rural or remote patients. Another review noted a decrease in resource use with fewer admissions and readmissions among patients with congestive heart failure.[11] The findings of five low quality reviews that assessed the cost-effectiveness of telepsychiatry were inconclusive.[12,14-17]

c) Health services impact

One study suggested that telemedicine could improve access to care in remote and rural areas, especially in cases of rare diseases.[28] Several low quality reviews reported the beneficial effects of real-time telehealth services on process-related outcomes.[10,14,15,17,18,32,37] The authors of one review[32] noted that elder care was associated with improved indicators of social performance, while others noted improved access to oncology[18] and telepsychiatry services[17] respectively, for patients in remote communities.

Three low quality reviews[19,39,40] found high levels of patient acceptance, with the level of satisfaction associated with reduced travel time and wait times. Hyler *et al*.[13] performed the only meta-analysis and found no difference in patient satisfaction between telepsychiatry and in-person care. Three reviews concluded that patients were generally satisfied with telepsychiatry.[15-17] Other reviews noted high patient and physician satisfaction for teleoncology,[18] satisfaction among prisoners,[36] and high patient satisfaction for telemonitoring in cases of congestive heart failure.[10]

Asynchronous Telehealth

The literature search identified 238 publications. Of these, 52 original studies were included in this review. All studies except seven[41-47] were published after 2000, and most originated from the US and the UK. The study designs included three RCTs,[48-50] seven surveys,[51-57] 36 case series, and six cohort studies.[46,47,58-61] One of the three RCTs was judged to be of high quality.[50] Of the remaining 49 studies, 15 received high quality ratings.[44,52,55,56,59,61-70] Dermatology was the topic of 25 publications, nine articles addressed mixed medical conditions,[43,47,63,71-76] six studied musculoskeletal medicine,[62,66,76-79] four examined pediatrics,[64,65,80,81] and three examined ophthalmology.[68,82,83] Other clinical settings included plastic surgery and the neurological sciences.

a) Clinical effectiveness

Dermatology: Eleven publications evaluated health outcomes, and several reported high levels of diagnostic accuracy in teledermatology. One study reported diagnostic accuracy in 73% of cases of all skin lesions and 90% when evaluating skin cancer lesions.[63] Other reports documented diagnostic accuracy rates between 75% and 88%.[41,67,69] Combining images from telehealth modalities with standard patient histories increased the diagnostic accuracy to 90% and 82% ($p<0.001$) for two teledermatologists.[69] There was a high level of agreement with the gold standard (face-to-face) for clinical teleconsultation and for teledermatoscopy.[70] The ability of asynchronous telehealth to contribute to the development of a management plan varied from 8% of cases ("advice only" was possible) to successfully assessing 55% of cases[84] to developing an appropriate management plan in 84% of cases.[85]

Many studies reported positive process-of-care outcomes, including reduced time between referral and consultation,[85,86] significantly shorter times to initial definitive intervention compared with usual care,[48] average wait times for consultations that were 50% less than those for face-to-face consultation,[61] and shorter times to complete a telehealth consultation than an in-person assessment.[46] Three studies reported the ability to properly prioritize patients to address medical urgency.[45,60,67]

Multiple clinical domains: No relevant data were reported on health outcomes. Articles generally reported that less time was needed to process referrals. Most asynchronous telemedicine cases had a total turnaround time under 72 hours and an average turnaround time that was almost 40% faster than

that for real-time telehealth.[43] Replies within one day of referral were provided in 70% to 87.5% of cases[71,73] and within three days in 100% of cases.

Orthopedics: One study noted minimal diagnostic disagreement between asynchronous telemedicine versus face-to-face and similar treatment plans to deliver care.[62] Another study[66] reported that 17% of consultations changed the initial management plan as a result of intervention. The only study reporting on process of care documented that the average time spent by orthopedic specialists was longer in videoconferencing than in asynchronous teleconsultations. The clinicians' confidence in their diagnosis, however, was generally lower in asynchronous consultations.[79]

Pediatrics: The use of asynchronous telehealth for pediatric care was associated with positive health outcomes. Asynchronous telehealth was helpful in modifying the diagnosis in up to 15% of cases in one study.[80] Two studies assessed the effect of asynchronous telehealth in pediatric asthma.[64,81] In one study,[64] inhaler technique scores and quality-of-life survey scores improved in the intervention group.

Other conditions: Two studies that focused on asynchronous telehealth for managing ocular conditions showed positive results, including high accuracy for diagnosing strabismus;[83] and in screening for retinopathy with the use of a digital ophthalmoscope, a detection rate for digital imaging that was twice that obtained with indirect ophthalmoscopy.[68] Another study that assessed the provision of non-surgical consultations to under-served communities reported that synchronous and asynchronous telemedicine enhanced communication with colleagues.[57]

b) Economic analysis

Eleven publications in teledermatology reported outcomes pertaining to resource use. Two studies[48,49] quantified costs and reported that asynchronous telehealth was less expensive than real-time teleconsultation but its clinical usefulness was limited[87] and that teledermatology seemed to be cost-effective when a faster time to definitive treatment was considered.[88] Evidence from publications suggests that asynchronous telehealth reduces the frequency[59]of or leads to the avoidance of[45,46,59-61,67,84,89] in-person visits. Reports from other clinical domains assessed resource use through the ability to avoid unnecessary patient transfer.[42,73,75,78,80,90-92]

c) Health services impact

Patient and provider satisfaction was assessed in 11 publications involving teledermatology and generally determined to be high.[41,51,52,55,61,69] High patient and provider satisfaction, positive acceptance, and a general perception that asynchronous telehealth was beneficial was reported in three studies assessing multiple clinical domains.[72,75,93]

d) Environmental scan

Thirty-nine organizations that provide asynchronous telehealth services were identified. Half of them had multidisciplinary teams, with most clinical specialties providing asynchronous telehealth services. Teleradiology, teledermatology, and telepathology were the most common. Establishing the number of staff for each program was difficult because of a lack of data, the nature of the services, and the number of departments that support them. Obtaining information on the volume of patients served was also difficult because of deficiencies in data collection and a lack of a standard unit of analysis. Most organizations lacked modality-specific data because real-time and asynchronous teleconsultations data are typically aggregated.

5 Limitations

The literature searches for real-time and asynchronous telehealth were conducted in December 2006 and may be outdated. Because these fields are evolving, systematic reviews should be updated regularly to ensure that the knowledge is current. Also, because of a lack of resources, the grey literature was not searched, and the exclusion of unpublished studies may have introduced bias to both reviews.[94-96]

The search strategy for the real-time telehealth review focused on telehealth and telemedicine in primary care, whereas the evidence suggests that telehealth may be beneficial in home-based care or remote patient monitoring. The search strategy for the asynchronous telehealth systematic review focused on the clinical applications and may not have identified all the economic evaluations of remote home-based monitoring. Future focused search strategies that take into account the classification schemas for the remote monitoring of patients may yield more robust evidence.

In general, the quality of research in real-time and asynchronous telehealth was poor. Most publications failed to meet methodological principles or described results from small samples that were usually part of feasibility studies or pilot projects. The absence of evidence to support the effectiveness of telehealth may reflect the lack of methodological resources needed to conduct valid studies.

6 Health System Implications

Real-time telehealth, particularly in remote and under-served areas, can improve cost-effectiveness, reduce wait times, and enhance access to specialized services. The lack of evidence to support the effectiveness of real-time telehealth, however, could lead to reduced support for such programs.

Given the growth of real-time telehealth programs in Canada, joint efforts to create standard protocols to evaluate the impact of telehealth programs and facilitate comparison across studies may be established. High priorities include the determination of the economic and fiscal costs and the benefits of real-time telehealth and the clinical outcomes of telehealth. It would be valuable to determine when and where traditional videoconferencing facilities are needed. Furthermore, it will become essential to address the challenges associated with a lack of acceptable financial incentives for health professionals and policy makers, medico-legal and regulatory concerns, and the organizational changes that will be needed to accommodate real-time telehealth delivery.[97]

There is a need for policy makers, researchers, and clinicians to collaborate and explore the benefits of asynchronous telehealth through larger and more rigorous studies. Canada has an opportunity to leverage the experience and resources of five asynchronous telehealth services. Efforts are underway to promote standardization, which could foster a collaborative framework among institutions. By formulating pragmatic objectives with reasonable outcomes, policy makers and researchers can promote projects, such as asynchronous telehealth triage services, that could increase the efficiency of the health care system.

7 Conclusions

There is growth in real-time telehealth services throughout Canada. There remains, however, a continued independent evolution of programs and limited collaborative work across provinces. There is support for the use of home-based telemedicine for patients' self-care or the management of chronic disease, for improved communication between patient and provider, for closer monitoring of chronic conditions, or for enhancing quality of life in elder care. In cases such as congestive heart failure, the use of home-based telehealth as part of a multidisciplinary interventional program could result in reduced mortality. Real-time telehealth could be effective in meeting the needs of health professionals and patients with psychiatric and neurological conditions in remote, under-served communities. There is weaker, but favourable, support for real-time telehealth's impact on process-of-care outcomes; for example, increased access to services. In terms of user satisfaction and resource utilization, there was no consistent message across all high quality systematic reviews.

There is consistent evidence that asynchronous telehealth could lead to shorter wait times, fewer unnecessary referrals, high levels of patient and provider satisfaction, and equivalent (or better) diagnostic accuracy when compared with face-to-face consultations. Given the poor quality of available evidence, it is unknown whether the benefits that have been shown in small local studies could be realized after widespread implementation. The number of organizations identified in the environmental scan highlights the potential of asynchronous telehealth, but it also underscores the need for standardized ways to enable comparisons across institutions.

Canada faces disparities in health care delivery based on geography and limited health care resources.[98] Clinicians, managers, policy makers, and regulators should recognize that supporting the appropriate role of telehealth, especially in remote communities, could facilitate effective health services that result in equitable health care delivery. Although weak, the evidence gathered suggests that telehealth could play a role in this process.

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