The role of telehealth in improving continuity of care: The Carrier Sekani Family Services primary care model

Findings from a study in Northern BC suggest that the benefits of telehealth increase in association with face-to-face physician visits and when a relationship has been established with a specific physician and primary care home.

ABSTRACT

Background: Residents of rural communities face unique challenges when accessing primary care services. In both developed and developing countries, technology has been found to increase access to and continuity of care in rural and remote areas, especially when used in a thoughtful manner. In BC, telehealth has been shown to benefit patients in rural areas by increasing access to care, and to benefit health care professionals by providing additional support through increased communication with specialists and other practitioners based in urban centres. In 2010, Carrier Sekani Family Services (CSFS) began developing a sustainable, high-quality, community-based primary care model to address the challenges presented by geography, high client need, and the difficulties of physician recruitment and retention in First Nations communities with higher than average proportions of complex care issues and poor access to primary care services. Today the model combines delivery of on-site services and telehealth services using a fully equipped clinic, an electronic medical record system, telehealth and IT equipment, and administrative support.

Methods: To evaluate the effectiveness of the CSFS primary care model, we surveyed patients 18 years or older who had accessed primary care services at least once in the 6-month period prior to April 2016 from the clinics serving the 11 member CSFS First Nations of the region. Participants were asked questions related to medical trust, satisfaction, usability, effectiveness, and convenience of telehealth. The questions were dichotomous (yes/no) or scored on a five-point Likert scale, and were informed by the work of Field, Holden, and Dew, and the developers of the EQUIP Healthcare intervention.

Results: Data were analyzed from questions answered by 210 study participants. Overall, answers indicated that continuity of care has been improved by the introduction of telehealth, especially for those patients who viewed CSFS as their primary care home. Of survey respondents who had made use of telehealth services, 78 (77%) stated they had been able to see their doctor more regularly and 83 (82%) indicated that they were able to attend more appointments since telehealth became available in their

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community. The use of telehealth services did not have an impact on patients' levels of medical trust, with no significant difference found in patient scores for face-to-face physician visits and telehealth visits. Patients were found more likely to be satisfied with telehealth if they considered the clinic where they accessed this service their primary care home. Similarly, patient ratings of usability, effectiveness, and convenience of telehealth services were higher when they accessed telehealth at the clinic they considered their primary care home.

Conclusions: Study findings indicate that telehealth improved continuity of care by increasing access to care and reducing the need for travel and associated costs. Patient scores for satisfaction, usability, effectiveness, and convenience of telehealth care were affected by whether telehealth services were provided at a patient's primary care home, suggesting that the benefits of telehealth increase in association with face-to-face visits and when a relationship has been established with a specific physician and primary care home.

Background
Residents of rural communities face unique challenges when accessing health care. Factors that can make access to care difficult include populations that are small or fluctuate in size, lack of practitioner availability, geographic remoteness, and inclement weather. Generally speaking, residents of rural communities have comparatively poorer health outcomes and lower socioeconomic status than residents of urban areas.

As well, rural BC is home to many First Nations communities and a high proportion of residents who identify as Aboriginal.

First Nations communities in British Columbia remain extremely disadvantaged when attempting to access high-quality, timely, and culturally sensitive primary care services that meet their individual needs. First Nations people suffer from a greater burden of chronic disease than other Canadians and rank at the bottom for just about every social determinant of health. Health problems are increased for those living in rural and remote areas by limited access to services, poverty, and mistrust of the health care system. Individuals who live on reserve in rural northern areas are at an even greater risk of reporting poor health status. A history of sporadic, fragmented, and reactive primary care services by the health care system has fallen well short of the mark in achieving First Nations wellness. In some cases it has done harm.

Looking to the future, technology provides an opportunity to increase access to and continuity of care to rural and remote First Nations communities without negatively impacting the quality of care provided. This is especially the case if technology is used in a thoughtful manner.

In 2013, life expectancy was 75.9 years for Status Indians (Aboriginal individuals registered under the federal Indian Act) compared with 81.6 years for other Canadian residents. Looking at diabetes, the prevalence rate for Status Indians increased from 8.0 cases per 100 population in 2012 to 8.1 cases in 2013, an increase slightly larger than seen in other residents. Northern British Columbia has the highest incidence rates in the province for chronic disease and behavior-related illness and injury. In addition, hypertension, diabetes, congestive heart failure, and cardiovascular disease are more pervasive in First Nations populations.

Poverty often exacerbates health concerns and issues by limiting access to healthy foods, placing people in inadequate housing, and making it impossible for them to obtain care because of obstacles such as user fees and travel costs. In spite of the acute need for primary care services, only limited services are available on reserve. It is difficult for those living on reserve to access the kind of high-quality interdisciplinary care required to address complex chronic disease. Typically individuals must travel off reserve to see a primary care physician and be assessed and treated for even minor conditions. When health conditions require specialist care or the expertise of an allied health professional, travel even further afield is required. Overall, longitudinal care is hampered by funding models for physicians that are not designed for small-density populations and do not support care in the isolated communities where First Nations people in Northern BC often reside.

Benefits of telehealth
While most people in Canada live within 5 km of a physician, many do not, and the expansion of telehealth can have a positive impact, especially in rural communities that have
historically been underserved. Telehealth, also commonly referred to as telemedicine, is defined by the World Health Organization as “the delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities.” Telehealth can help overcome geographical barriers, provide continuity of care, and connect patients to health care providers in different locations to improve health outcomes.

When examining how telehealth has been used globally for care, there is a consistent finding of increased uptake of health services in rural areas with telehealth. In developed countries, telehealth is predominantly used for continuity of care, diagnosis, and clinical management. An extensive literature review of reported benefits of telehealth in rural Australia found patients had improved access to specialized health care and improved quality of care. In many developed nations, telehealth has been used for specialized diagnostic services such as teleECG, ultimately decreasing treatment time and resulting in better patient outcomes. In developing countries, telehealth provides a link to specialized health care providers and tertiary care centres. This has permitted early diagnosis of patients who needed to seek further specialized care and has reduced the number of unnecessary trips to urban centres.

The Canada Health Act sets out five national principles for health service delivery: public administration, comprehensiveness, universality, portability, and accessibility. This means there should be equal access to health care services in all communities, regardless of location.

In British Columbia, telehealth continues to grow and benefit the most vulnerable populations in rural areas. The BC Ministry of Health saw billing codes for General Practitioner Telehealth increase 42%, 180%, and 617% in year-over-year growth between 2011 and 2013. Telehealth provides flexibility and has the capacity to focus on specific population health needs. When integrated into the current health system, telehealth has proven to be cost-effective and to provide continuity of care, especially for populations living in rural areas.

The BC Ministry of Health argues that specialized location-specific health care models can be expanded through telehealth technology by using collaborative and cooperative primary and community care practices and increased professional communication. Telehealth has been shown to benefit patients by increasing access to care, and to benefit health care professionals practising in rural areas by providing additional support through increased communication with specialists and other practitioners based in urban centres. In addition, telehealth has the potential to produce clinical outcomes that are equivalent to those of patients receiving face-to-face care.

**Carrier Sekani Family Services primary care model**

In north-central British Columbia, Carrier Sekani Family Services (CSFS) was established to reassert First Nations control over child and family services, justice, and health, all of which have been negatively impacted by colonization. For over 25 years, CSFS has been working to offer holistic wellness services to the 11 member First Nations extending over an expansive geographical area of roughly 76,000 square kilometres.

From the beginning, the founders of CSFS recognized the importance of primary care services for the communities it serves and attempted to provide various solutions. Prior to 2011, CSFS engaged in a program that provided visiting physician services 1 day per month to its most remote health centres in Yekooche and Takla Lake. Physicians would fly in and provide patient care based on a fee-for-service model. Paper medical records were maintained for each patient. This led to record-keeping problems because typically the same physician did not visit each time, and visiting physicians sometimes took their notes to their own offices.

In 2010, CSFS began developing a sustainable, high-quality, community-based primary care model to address the challenges presented by geography, high client need, and the difficulties of recruitment and retention of physicians to rural and remote First Nations communities with populations ranging from 100 to 1500 people, many of whom have complex care needs. With the help of multiple partners, CSFS built a secure, state-of-the-art health-grade broadband network that connects the community health centres with a corporate network, which in turn can connect to the Northern Health Authority, Panorama, and other relevant public health systems. The CSFS-wide area network adopted the network security and technology standards of the BC health authorities and the Ministry of Health. Each community was given access to MOIS, the CSFS electronic medical record (EMR) system, and videoconferencing technology to enhance on-site care and increase access to specialist consultation.

Today the model builds relation-
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ships by combining on-site service delivery with telehealth service delivery to increase continuity of care. The Northern Health Authority, First Nations Health Authority, and individual communities have been key partners with CSFS in developing a model that reflects the unique challenges of rural First Nations primary care. The telehealth component has been critical to delivering timely and reliable longitudinal care, and CSFS has been a provincial and national leader in harnessing the power of virtual health care tools to support on-the-ground services.  

The implementation of telehealth services by CSFS in the most remote and isolated communities has reduced significant barriers to health service access and created a more seamless and coordinated care model for patients. CSFS documents show that the great strength of the wide area network is the way it supports videoconferencing and an EMR system that enables continuity of care by allowing patients to contact their physicians at any time and CSFS physicians to access patient charts from wherever they are. The model provides for a blend of walk-in visits and booked appointments, and is flexible enough to meet the needs of patients in each location. When physicians are not physically in a community, a member of the physician team is available daily through telehealth. In 2015, CSFS facilitated roughly 3000 face-to-face physician visits and 1000 visits by videoconference.

Prior to the introduction of this technology, Carrier Sekani communities relied on the services of fly-in physicians and the residents’ health problems were grossly underappreciated. With no access to care between visits by fly-in physicians, individuals typically had no primary care home. Instead they traveled to other providers and accessed primary care services from community clinic nurses who rotated through the communities. Now a Carrier Sekani patient can walk into any CSFS location and the health care professional there can immediately access the patient’s information from any other CSFS location or physician home office. As well, the focus can shift from in-community services to maintenance and preventive care.

The model created by CSFS enables physicians to concentrate on practising medicine while CSFS provides IT and administrative support along with the infrastructure needed, including a fully equipped clinic, EMR system, and telehealth equipment.

**Methods**

Data were derived from a sample of patients who had used CSFS clinics for physician services at least once in the 6-month period prior to April 2016. Inclusion in the study required patients to be 18 years of age or older and to have accessed physician services from a CSFS clinic in the 6-month study period prior to April 2016. In April and May 2016, first-year medical students traveled to CSFS health clinics in Stellat’en, Takla, Yekookeche, Nadleh, Southside, Tacht, Woyenne, Wet’suwet’en, Burns Lake, and Sai’kuz and invited all individuals who met the inclusion criteria to participate in a survey. Participants were asked questions related to medical trust, satisfaction, usability, effectiveness, and convenience of telehealth. Survey questions were dichotomous (yes/no) or scored on a five-point Likert scale, and were informed by the work of Field, Holden, and Dew, and the developers of the EQUIP Healthcare intervention. Once the survey was completed, responses were grouped into two categories: those from patients who identified a CSFS physician as their family doctor and those from patients who identified another physician as their family doctor or indicated they did not have a family doctor and used a CSFS clinic on a walk-in basis.

All statistical analysis was conducted using IBM SPSS 21 software, with a probability value of less than .05 considered statistically significant. Following CSFS Research Ethics Policy, the project received approval from the CSFS Research Review Committee prior to commencing.

**Results**

A total of 210 individuals participated in the survey, including 135 females (64%) and 75 males (36%) with a mean age of 47 years (SD 15.6). Of these, 114 (57%) were categorized as CSFS primary care home patients and 87 (43%) were categorized as having no primary care home. In these two groups, more patients with a primary care home (82 of 114, 72%) used telehealth than those patients without a primary care home (19 of 87, 22%).

Looking at all 210 participants, 109 (52%) had previously used telehealth at a CSFS clinic while 101 (48%) reported having used telehealth in the previous 6 months. Also looking at the 101 telehealth patients, 65 (64%) had used the service more than once, and 93 (92%) stated that they would recommend telehealth to others. In addition, it appears that comfort with telehealth improved with experience, as 74 (73%) of those who used telehealth reported that they felt more comfortable with the technology after multiple visits.

**Continuity of care**

To determine if continuity of care was improved by increasing access to ser-
sults indicate that patients who considered a CSFS clinic their primary care home (mean 7.16, SD 1.99) and patients who used CSFS clinics on a walk-in basis (mean 5.00, SD 4.01): $F(1, 26.28) = 6.54$, $P = .01$. These results indicate that patients who considered the clinic where they accessed telehealth their primary care home were more likely to give a high rating to the usability of the service.

**Usability**
To determine if usability ratings for telehealth increased when patients considered a CSFS clinic their primary care home, a 1-way ANOVA was used to compare patient scores. A statistically significant difference was found between patients who indicated a CSFS clinic was their primary care home (mean 4.33, SD 1.14) and patients who used CSFS clinics on a walk-in basis (mean 3.17, SD 1.97): $F(1, 27.47) = 7.64$, $P = .01$. These results indicate that patients who considered the clinic where they accessed telehealth their primary care home were more likely to be satisfied with the service.

**Convenience**
Finally, to determine if convenience ratings for telehealth increased when patients considered a CSFS clinic their primary care home, a 1-way ANOVA was used to compare patient scores. A statistically significant difference was found between patients who indicated a CSFS clinic was their primary care home (mean 5.78, SD 2.43) and patients who used CSFS clinics on a walk-in basis (mean 3.54, SD 2.62): $F(1, 108) = 15.32$, $P < .001$. These results indicate that patients who considered the clinic where they accessed telehealth their primary care home were more likely to find the service convenient.

**Conclusions**
The results of this study reflect findings in the literature regarding the positive impact of face-to-face physician visits supplemented by telehealth on improving continuity of care, overcoming geographical barriers, and connecting patients to primary care services. Survey findings indicate that the Carrier Sekani Family Services model of primary care is improving access to care without impacting quality of care, particularly for patients who view a CSFS physician as their primary care provider.

Patients surveyed reported seeing a physician more regularly and visiting the emergency room less often. Patients also reported spending less on travel and managing their chronic conditions more effectively with the help of telehealth.

The primary aim of the CSFS model is to build relationships with patients who have historically received fragmented care and viewed doctor-patient interactions with mis-
trust. We have demonstrated that when telehealth is used in association with face-to-face visits there is no significant impact on medical trust, and that patients who consider a CSFS clinic their primary care home are more likely to be satisfied with telehealth and give high ratings to the usability, effectiveness, and convenience of the service. Overall, these results suggest that the benefits of telehealth increase in association with face-to-face physician visits and when a relationship has been established with a specific physician and primary care home. 

References


