Improving access to specialist multidisciplinary palliative care consultation for rural cancer patients by videoconferencing: report of a pilot project

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Abstract

Purpose Palliative care (PC) and palliative radiotherapy (RT) consultation are integral to the care of patients with advanced cancer. These services are not universally available in rural areas, and travel to urban centers to access them can be burdensome for patients and families. The objectives of our study were to assess the feasibility of using videoconferencing to provide specialist multidisciplinary PC and palliative RT consultation to cancer patients in rural areas and to explore symptom, cost, and satisfaction outcomes.

Methods The Virtual Pain and Symptom Control and Palliative Radiotherapy Clinic was piloted from January 2008 to March 2011. Cancer patients in rural northern Alberta attended local telehealth facilities, accompanied by nurses trained in symptom assessment. The multidisciplinary team at the Cross Cancer Institute in Edmonton was linked by videoconference. Team recommendations were sent to the patients’ family physicians. Data were collected on referral, clinical, and consultation characteristics and symptom, cost, and satisfaction outcomes.

Results Forty-four initial consultation and 28 follow-up visits took place. Mean Edmonton Symptom Assessment Scale scores for anxiety and appetite were statistically significantly improved at the first follow-up visit ($p < 0.01$ and $p = 0.03$, respectively). Average per visit savings for patients seen by telehealth versus attending the CCI were 471.13 km, 7.96 hours, and Cdn $192.71, respectively. Patients and referring physicians indicated a high degree of satisfaction with the clinic.

Conclusion Delivery of specialist multidisciplinary PC consultation by videoconferencing is feasible, may improve symptoms, results in cost savings to patients and families, and is satisfactory to users.

Keywords Palliative care · Telehealth · Teleoncology · Supportive care · Rural · Remote

Introduction

Palliative care (PC) and palliative radiotherapy (RT) are recognized as integral to the care of patients with advanced cancer [1, 2]. For cancer patients residing in rural areas, accessing these services may present particular challenges. According to a comprehensive literature review, PC in rural areas is usually provided by generalists.
who may feel inadequately prepared to manage physical symptoms and psychological issues in PC patients; moreover, they often work alone to meet the needs of patients and families, as interdisciplinary team resources are limited [3]. In qualitative studies, rural PC patients and their family caregivers have described how traveling to access services that are not available locally incurs physical, psychological, and financial stress [4, 5]. Travel time for palliative RT consultation and treatment is inversely related to the uptake of this service [6].

Telemedicine is the use of telecommunication and information technologies to provide health care services to individuals who are at a distance from the health care provider [7]. Videoconsultation uses technology to provide real-time visual and audio patient assessment [8]. Telemedicine in rural oncology is increasingly viewed as a viable option [9]. Despite its increasing popularity, evidence on symptom improvement, acceptability, and costs is limited. Their interrelationships are even less well understood. We posit that acknowledging the source and magnitude of personal costs will help establish a business case for the increased uptake, satisfaction with care, and improved health outcomes. In the last 10 years, a number of studies examined personal and program costs [10–18]. The objectives of our study were to assess the feasibility of using videoconferencing to provide specialist multidisciplinary PC and palliative RT consultation to cancer patients residing in rural areas and to explore symptom, cost, and satisfaction outcomes.

Methods

Setting and project background

The province of Alberta is located in western Canada. It has an area of 661,848 km² with a population of 3.7 million, approximately one third of which lives outside of the metropolitan areas of Edmonton and Calgary [19]. The Cross Cancer Institute (CCI) is a tertiary cancer center located in Edmonton, providing specialist oncology consultation and treatment for patients in northern Alberta and parts of adjacent provinces and territories. For patients who reside in rural areas, systemic therapy may be received through a network of associate and community cancer centers, under the care of internists and family physicians (Fig. 1). However, RT within this catchment area is currently available only at the CCI. Patients who attend the CCI have access to a specialist multidisciplinary PC consultation service. Patients who receive their cancer care in rural areas may access local PC services. However, due to the large geographical area involved, PC consultation is not available in all rural communities.

In 2007, the provincial Ministry of Health provided a pilot grant to examine the provision of PC and palliative RT consultation to cancer patients in rural northern Alberta, using videoconferencing. In January 2008, the Virtual Pain and Symptom Control and Palliative Radiotherapy Clinic (Virtual Clinic) opened in one associate and one community cancer center. Between November 2008 and October 2009, the Virtual Clinic expanded to include one more associate and six more community cancer centers, with the additional resource of a rural PC nurse who had the ability to travel to telehealth facilities in multiple communities. The project was completed in March 2011.

Participating health care providers

Health care providers based at the CCI were drawn from two existing clinics: the Multidisciplinary Pain and Symptom Control Clinic [20], which provides team consultation for cancer patients with complex symptom concerns, and the Rapid Access Palliative Radiotherapy Program [21, 22], which provides same-day consultation,
simulation, and treatment for patients with bone and brain metastases. Virtual Clinic team members included physician specialists in PC and radiation oncology, a PC registered nurse, a radiation oncology nurse practitioner, and representatives from pharmacy, respiratory therapy, occupational therapy, physiotherapy, speech language pathology, psychology, social work, and spiritual care.

Health care providers based at rural sites were recruited from the registered nursing staff of the associate and community cancer centers. In addition, a PC registered nurse who served as a resource for multiple rural communities in northern Alberta participated. The nurses completed 3 days of training in symptom assessment and management, physical examination, team consultation, and use of videoconferencing equipment at the CCI.

Patient eligibility criteria, referral, and scheduling

The Virtual Clinic was available for cancer patients in the CCI catchment area residing outside of Edmonton who were experiencing inadequately controlled cancer-related symptoms. Although the Virtual Clinic was originally conceived as a service for outpatients, inpatients were also eligible as long as they were physically able to present to a telehealth facility.

Physician referrals to the Virtual Clinic were received by the CCI-based PC nurse by fax. If the referral came from a physician other than the patient’s family physician (e.g., an oncologist), the family physician was contacted to obtain agreement to receive the recommendations. A consultation could not proceed without obtaining the family physician’s consent, since that individual would be responsible for implementing the recommendations. The nurse contacted the patient by telephone to confirm appropriateness for the clinic and explain clinic procedures. To determine which team members would participate in the consultation, the nurse performed telephone screening of the patient’s symptoms and needs. A maximum of three team members could be scheduled in addition to a PC physician. The clinic appointment was booked at the associate or community cancer center closest to the patient’s place of residence. Alternatively, if the patient resided in a community served by the rural PC nurse, the appointment was booked at the nearest health care facility with videoconferencing capability. The patient’s family physician was asked to pre-arrange necessary blood tests or radiological investigations.

The Virtual Clinic was available one half-day per week. Ninety minutes of videoconference time was booked for each new patient consultation, with 30 min for each follow-up visit. A maximum of two new patient consultations and two follow-up visits were booked per clinic.

Consultation process

On the day of the clinic, the patient presented to the rural health care facility at which the appointment had been booked. The patient was encouraged to bring a family member. One hour prior to the videoconference, the rural nurse conducted an assessment using the following tools: Edmonton Symptom Assessment System [23], Folstein Mini-Mental State Examination (MMSE) [24], CAGE questionnaire [25], Palliative Performance Scale (PPS) [26], and Karnofsky Performance Status (KPS) [27]. Medications were reviewed, and a physical examination was performed. The information was faxed to the team at the CCI.

A videoconference link was then established between the rural facility and the CCI, and the rural nurse reviewed the assessments. The patient and family were brought into the telehealth room. Each CCI team member was allocated 15 min to interview the patient. After all assessments had been completed, the patient and family were asked to leave the telehealth room. A team conference took place, and a management plan was formulated. The patient and family returned to the room for discussion of recommendations. After a consensus was reached, a written summary of recommendations was immediately faxed to the patient’s family physician for consideration. A full consultation note was faxed the following day. Both the patient and the family physician were asked to complete a satisfaction survey.

Individualized follow-up was performed by the rural nurse, the CCI nurse, or other involved health care providers. Follow-up videoconference appointment was arranged if necessary.

Analysis

Descriptive analysis of referral characteristics (number, reasons, time from referral to consultation, reasons for ineligibility), clinical characteristics (age, gender, tumor type, MMSE, CAGE, PPS, KPS), consultation characteristics (geographic sites, health care providers attending at the CCI and rural facilities), and patient and physician surveys was performed. Means for initial consultation and first follow-up visit ESAS scores were compared using paired t tests.

Cost savings to the patient were analyzed through comparison of actual personal costs incurred by attending the Virtual Clinic as compared to the costs associated with travel to the CCI. Patient costs for a round trip to the telehealth facility and to the CCI were compared by estimating the respective driving distances from patient’s residence using Google Maps. In order to calculate travel costs, the following assumptions were made: the patient was accompanied by one adult for travel >0 km; travel took place by car; lodging was required if travel distance was ≥200 km
one day; meals were required; and time was lost from work. Travel, lodging, and meal rates were obtained from the Treasury Board of Canada Secretariat [28]. The patient satisfaction survey also included a question on estimated cost and affordability of travel to the CCI (no restrictions were provided on what to include). All costs are quoted in Canadian dollars.

Ethics

Approval was obtained from the Alberta Cancer Research Ethics Committee.

Results

Patient population

Between January 2008 and March 2011, 88 unique patients were referred to the Virtual Clinic. Forty-four patients from 29 different communities were eligible (Table 1), for whom the main reasons for referral were pain (n=43), nausea (n=11), constipation (n=10), dyspnea (n=4), and other (n=10); patients could have more than one reason for referral. The most common reasons for ineligibility were that the patient declined the service (n=18) or was able to attend an appointment in person at the CCI (n=10).

The median time from referral to initial consultation was 6 days (range 0–60). For patients who waited >10 days to be seen (n=11), the most frequent reason for the delay was patient unavailability for an earlier appointment (n=5). One patient waited for 60 days because he had other appointments in Edmonton and therefore was initially seen in person at the CCI. A total of 72 clinic visits took place, consisting of 44 initial consultations and 28 follow-up visits. Patients saw an average of 2.6 (range 1–4) members of the CCI multidisciplinary team during initial consultation, with the dietician required most often (56.8 % of consultations), followed by the psychologist (27.3 %), respiratory therapist (15.9 %), social worker (13.6 %), occupational therapist (9.1 %), physical therapist (9.1 %), and speech language pathologist (4.5 %). The radiation oncologist attended twice. On average, 1.4 clinicians were present per consultation at the remote site (range 1–3); besides the clinic nurse, health care providers who attended included registered nurses, pharmacists, and social workers.

Symptom palliation

Nineteen patients (43.1 %) had at least one follow-up visit (maximum of six) in the Virtual Clinic, a median of 14 (range 1–70) days after initial consultation. Mean ESAS scores (rated on a 0 to 10 numerical scale, where 0 = no symptom and 10 = worst possible symptom) for anxiety and appetite were statistically significantly improved at first follow-up (p<0.01 and p=0.03, respectively) (Fig. 2).

Distance, time, and cost savings

Comparison of the cost of travel to the telehealth site versus the CCI was available for 72 clinic visits. Savings for patients and their families in terms of distance, time, and expenses were 471.13 km, 7.96 h, and $192.71, respectively, per visit. Responding to the survey, seven patients (15.9 %) estimated that travel to the CCI would have cost them over $500, while four (9.1 %) indicated that they would not have been able to afford to travel to the CCI, regardless of cost.

Satisfaction

Forty-four surveys were completed by patients and family caregivers. They indicated a high degree of satisfaction with various aspects of the Virtual Clinic (Table 2). Only three (6.8 %) expressed discomfort with the telehealth equipment or format.

Nineteen surveys were returned by rural physicians, out of a possible 44 (response rate 43.2 %). All agreed or strongly agreed that their patients received a beneficial service that otherwise would have been difficult to access, and would refer future patients. Eighteen (94.7 %) were satisfied with the Virtual Clinic, planned to implement all clinic recommendations, and would recommend the clinic to a colleague. Fourteen (73.7 %) felt that their awareness of

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<th>Table 1 Patient characteristics (n=44)</th>
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<td>Median age (range)</td>
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<td>Male/female</td>
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<td>Outpatient/inpatient</td>
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<td>Cancer diagnosis</td>
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<td>• Genitourinary</td>
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<td>• Hematological</td>
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<tr>
<td>• Other</td>
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<tr>
<td>MMSE &lt; normal</td>
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<tr>
<td>CAGE ≥2</td>
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<tr>
<td>Median PPS (range)</td>
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<td>Median KPS (range)</td>
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*MMSE* Folstein Minimental State Examination (cut-off for normal adjusted for age and education), *CAGE* screening tool for alcoholism (score ≥ 2 indicates probable diagnosis of alcoholism), *PPS* Palliative Performance Scale (0 = death, 100 = normal ambulation, normal activity and work, no evidence of disease, full self-care, normal intake, and full conscious level), *KPS* Karnofsky Performance Status (0 = dead, 100 = normal, no complaints, no evidence of disease)
symptom management issues had increased as a result of their patients’ participation, and 16 felt that their patients’ wait for the Virtual Clinic was shorter than for a face-to-face consultation at the CCI.

Discussion

In this pilot project, we have demonstrated the feasibility of providing specialist multidisciplinary PC consultation to cancer patients in rural areas by videoconferencing. This novel model of service delivery resulted in cost savings to patients and families relative to traveling to the tertiary cancer center for in-person consultation and was received by patients and their physicians with a high level of satisfaction. Our results regarding symptom palliation should be interpreted with caution, given the small number of patients who had a follow-up appointment in the clinic and the varying timelines of the first follow-up visit.

To our knowledge, this is the first report of the use of videoconferencing for direct patient consultation in PC. Reviews of telehealth applications in oncology and PC have described the use of videoconferencing for oncology consultation, case conferencing, home hospice nursing visits, team meetings, and education of health care professionals [8, 29]. The cost savings to patients reported here are consistent with the results of a randomized controlled crossover trial of videoconference versus in-person visits for patients being followed at a chronic pain clinic; direct costs of travel for patients and indirect costs from loss of productivity for accompanying persons were significantly lower with videoconference visits [30]. Economic evaluation of oncology videoconsultation has suggested that, from a systems perspective, total costs are comparable to or less than for in-person consultation [8]. Our findings on patient satisfaction are also concordant with studies of oncology videoconsultation, in which patients cited convenience, reduced travel time and costs, reduced wait time for consultation, enhanced access to care, perceived ability to communicate effectively with the provider, and overall ease of use and quality of the picture and sound [8].

Facilitators to the success of the Virtual Clinic included an existing telehealth infrastructure within the provincial health care system, the availability of a dedicated multidisciplinary team at the tertiary cancer center, and rural nurses trained in PC assessment. Nonetheless, multiple challenges

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<th>Survey question</th>
<th>Number who agreed or strongly agreed (%)</th>
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<tr>
<td>The number of team members present was not overwhelming</td>
<td>43 (97.7 %)</td>
</tr>
<tr>
<td>I would recommend the Telehealth Clinic to someone in a similar situation</td>
<td>38 (86.4 %)</td>
</tr>
<tr>
<td>I am satisfied overall with my Telehealth Clinic experience</td>
<td>37 (84.1 %)</td>
</tr>
<tr>
<td>I received enough information on what to expect before taking part in the Telehealth Clinic</td>
<td>37 (84.0 %)</td>
</tr>
<tr>
<td>I would like my next health care provider visit to occur via Telehealth</td>
<td>35 (79.5 %)</td>
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Fig. 2 Mean ESAS scores at initial consultation and first follow-up visit (n=19). ESAS - Edmonton Symptom Assessment System. *p<0.01, **p=0.03
were encountered. Awareness of the clinic among rural family physicians was limited, despite advertising efforts via fax, telephone, internet, and local media. Implementation of clinic recommendations was sometimes delayed, as family physicians were not always immediately available. Technical difficulties were occasionally encountered; in one instance, the interview of a patient had to be completed by telephone. Arranging telehealth appointments was more time-consuming compared to in-person appointments, requiring coordination of the rural nurses, CCI team, telehealth facilities, and family physicians. Some patients still needed to travel significant distances to reach the telehealth site. Although the clinic was originally intended to also provide palliative RT consultation, this service was not frequently used since patients experiencing symptoms amenable to RT on initial telephone assessment were instead brought to the CCI for consultation, simulation, and treatment, usually concurrently with in-person PC consultation.

This study is limited by a lack of control group and the small number of patients. Follow-up data were not obtained in all cases. The tools used to collect patient and physician satisfaction data were not validated. Finally, the cost analysis did not examine impact on the health care system, such as costs of establishing the clinic, purchasing and maintaining technology, and training people to use technology.

In summary, specialist multidisciplinary PC consultation by videoconferencing for rural patients is feasible, results in travel and cost savings to patients, and is satisfactory to users. This model could potentially be applied to other settings where distance is a barrier to accessing specialist PC. Future studies should further examine impact on clinical outcomes and cost to the health care system, as well as the feasibility of conducting videoconference consultation in patients’ homes.

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Conflict of interest There are no conflicts of interest to declare. The authors have full control of all primary data which may be reviewed by the journal if requested.

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