

# BSO-OTN Literature Scan

## Literature Scan

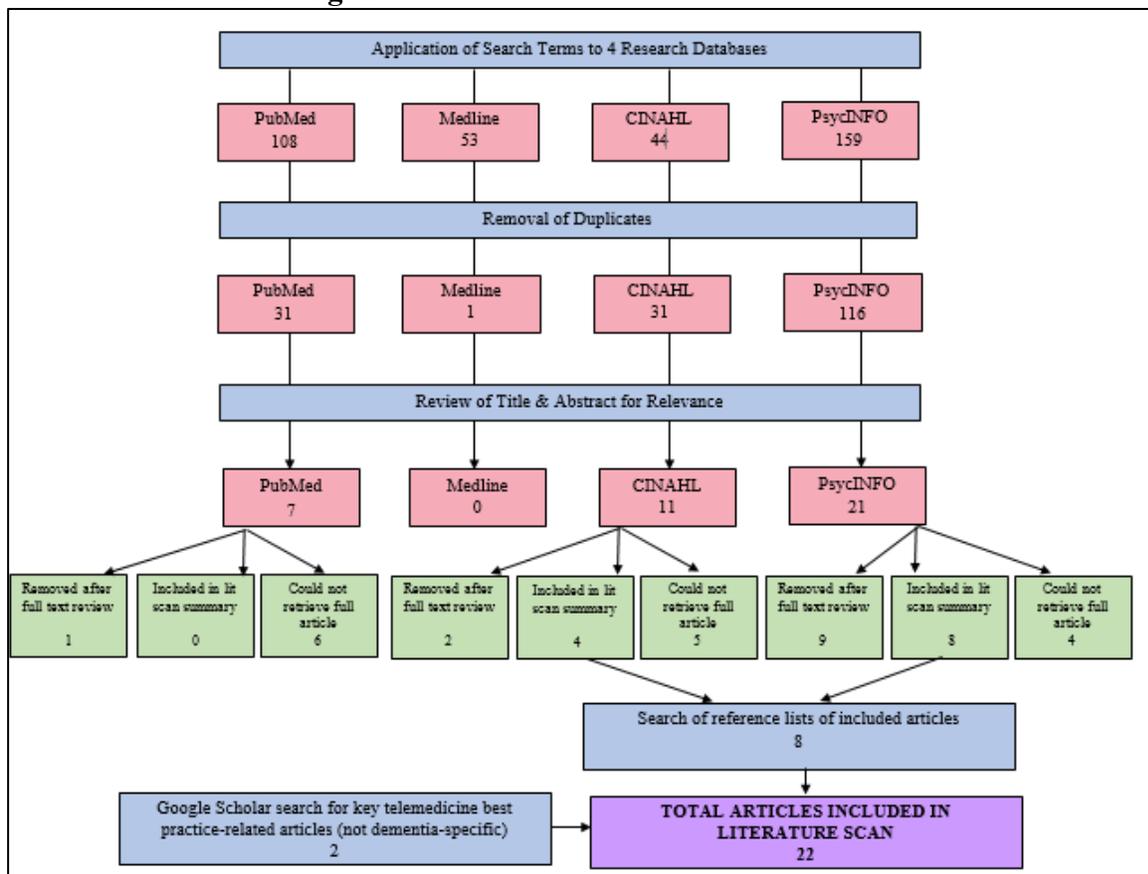
To date, there appears to be a lack of standardization as to how the term “telemedicine” is defined. Additionally, within both the published and grey literature, the terms “telemedicine”, “telehealth”, and “telecare” are often used interchangeably, however they can encompass different technology components and activities. In some circumstances “telemedicine” can simply refer to telephone consultation (auditory only), while in others it can refer to remote monitoring (visual only) of a behaviour (e.g., monitoring of the wandering behaviour of a person with dementia in their home). Of interest to us for the purpose of this literature scan, was the use of telemedicine that included a video-conferencing or video-consultation (auditory and visual) component in the delivery dementia-related care. Thus, for this literature scan, where it was possible to identify how “telemedicine” was defined, literature that denoted a “video” component were only included.

### 1. Literature Scan of Published Articles

#### a) Search Terms

Telemedicine	Telehealth	Telecare	Teleconsult*	
Senior*	Older Adult*	Elder*	Gerontol*	Geriatric*
Dementia	Alzheimer*	Responsive Behav*	Cognitive impair*	

#### b) Literature Scan Flow Diagram



## BSO-OTN Literature Scan

### c) Countries Represented in Included Articles

Country	Number of Articles
Canada	5
United States	4
United Kingdom	2
Sweden	2
Korea	1
Multiple Locations (Review Article)	8

### d) Summary of Results

<b>How is telemedicine being used (in Canada and internationally) to support patients, family members, and care teams who provide care and services for seniors? {across urban, small urban and rural areas}</b>
<ul style="list-style-type: none"> <li>• To provide real-time support to caregivers<sup>1,2</sup></li> <li>• To increase the availability and accessibility of dementia care for patients and their caregivers in rural and remote areas<sup>3-5</sup></li> <li>• To provide counselling/consultation and support to patients and caregivers who live in rural and remote areas with whom regular face-to-face visits are not feasible (e.g., via memory clinics)<sup>3-5, 22</sup>; because of time, location, and poor weather<sup>6</sup></li> <li>• To provide speciality services to patients in long term care<sup>7</sup></li> <li>• To “free-up” space within in-person clinics<sup>6</sup></li> <li>• To facilitate timely follow-up of patients<sup>6</sup></li> <li>• To allow patients and health care providers to communicate electronically to obtain follow-up of test results including laboratory and radiology results, ask questions, schedule appointments, renew prescriptions, and collect information before a visit<sup>1,6</sup></li> <li>• To simplify the busy day-to-day life of the typical dementia family caregiver, and improve the quality of health care that both patient and caregivers receive<sup>1</sup></li> <li>• To connect patients and caregivers with other patients and caregivers in disparate locations<sup>8</sup></li> <li>• To encourage the participation of families in the patient’s care<sup>3</sup></li> <li>• To promote ongoing, regular dialogue with remote patients<sup>3,6</sup></li> <li>• To advance intervention adherence<sup>9</sup></li> <li>• To extend the reach of self-management education programs to individuals with chronic illnesses and their caregivers<sup>9</sup></li> <li>• To provide better care coordination/continuity of care for the patient<sup>3</sup></li> <li>• To conduct psychometric and neurological examinations assessments<sup>3</sup></li> </ul>
<b>What are the promising practices/best practices to using telemedicine by physicians, specialists and care teams; as well as patients and families?</b>
<ul style="list-style-type: none"> <li>• There are currently no available specific best practices to using telemedicine in dementia care. However, the American Telemedicine Association has developed a number of practice guidelines, and continues to produce more. Important highlights include “Core Standards for Telemedicine Operations”, “Expert Consensus Recommendation for Videoconferencing-Based Telepresenting”, and dedicated specialty guidelines for teledermatology, telepathology, tele-home health, tele-mental</li> </ul>

## BSO-OTN Literature Scan

health, tele-rehabilitation and tele-ophthalmology. Other professional societies have also developed guidelines for telemedicine, including the American College of Radiology, the American Academy of Dermatology, and the American Medical Association. There are also many international guidelines, such as the European Code of Practice for Telehealth, all of which are based on research efforts that validated the technologies being used, assessed practice protocols, and examined relative costs and benefits.<sup>10</sup>

- The scarcity of guidelines and standards suggests that telemedicine is not yet routine use. If an international telemedicine organization were to take responsibility for guidelines, under the direction of clinicians with appropriate telemedicine experience, this might speed up their development.<sup>11</sup>

### **What are the challenges/barriers to using telemedicine by physicians, specialists and care teams; as well as patients and families?**

#### **Attitudes of Health Care Providers**

- There is a reluctance among healthcare professionals to accept the advantages that telemedicine offers – many have doubts about the use of telemedicine in elder care<sup>12</sup>
  - Health care providers are unwilling to provide care or advice without face-to-face contact<sup>13</sup>
  - For doctors, the uncertainty and reluctance may arise from less clinical control, and a change in the power relationships when working remotely with nurses<sup>13</sup>
  - Health care providers raised the issue of superficial and genuine care in the use of information and communication technology. Superficial care was described as being linked to superficial relationships<sup>12</sup>
  - Health care providers had trouble in accepting that advanced telemedicine applications should be used to cut down on staff<sup>12</sup>
  - Clinician users of telemedicine systems often reported dissatisfaction or uncertainty. The higher degree of clinician uncertainty is predictable and may be inevitable with a single episode of clinical contact, but can be alleviated by ensuring that the ongoing management responsibility and plans are clear<sup>13</sup>
  - The risks of becoming dissociated when using telemedicine applications were connected to the risk of health care providers choosing the easiest solution and choosing remote communication or remote monitoring instead of physically being with the older people. It was realized that to be close and affectionate with an older person whose needs were not always easy to interpret demanded a highly motivated staff member, and less motivated staff could easily choose remote monitoring instead of personal contact<sup>12</sup>
  - Health care providers expressed a general fear that the use of telemedicine applications would contribute to a caring situation for older people where the closeness and intimacy of face-to-face communication were reduced and replaced by a remote form of communication characterized by superficiality in the personal relationship. Good care for older people was described as being linked to genuine relationships and social interaction. Physical closeness was considered important for interaction with many older people<sup>12</sup>
  - The demands of northern nursing practice limited health care provider's ability to attend educational events and to collaborate with other health professionals. One participant said that telehealth was a useful tool for continuing education but that most sessions had to be videotaped as few RNs were able to attend the live presentations. However, resistance to learning about new communication methods and integrating technology into practice routines were perceived as barriers to expanding the use of technology in the north<sup>14</sup>
  - As the history of telemedicine so clearly shows, governments can provide the technology for

## BSO-OTN Literature Scan

telemedicine, but unless health professionals are persuaded, the equipment will not be used. In a study comparing adopters and non-adopters of tele-medicine, the number of telemedicine referrals made by adopters was significantly correlated with adopters' perceptions of the advantages<sup>15</sup>

- Without exception, physicians who participated in this study noted that telemedicine consultations can be useful for follow-up care, but none recommended it for the initial patient consultation. They stated that the telemedicine consultation was useful because they had an existing relationship with the patient and felt that telemedicine visits would be difficult without first having seen the patient in-person<sup>7</sup>

### Cost & Resources:

- There are challenges related to the amount of up-front staff time, on top of routine clinical care responsibilities, that is required in order for staff to be certified in telehealth. In one study, for key team members, certification was accomplished in part by staff using nights and weekend time to become proficient in the use of the technology<sup>4</sup>
- Important to take into account the matching of technology to the needs of the consumer with respect to cost. A substantial proportion of persons with severe disabilities are economically disadvantaged and thus, may be unable to afford the cost of purchasing computer equipment and monthly Internet service provider costs<sup>9</sup>
- A specialist cognitive service was able to show that standardised screening tools appear to perform reliably when used in video-conference to diagnose dementia, but this selected patient group required a clinician at the remote location, to enable specialist clinician assessment<sup>13</sup>
- Clinician reimbursement and legal/regulatory issues are claimed to be the most common barriers explaining the diffusion trends for many telemedicine applications<sup>15</sup>
- Work force problems can be a concern for organizations implementing telemedicine programs. During this project, existing staff at both sites were required to take on new duties. If televisits are to be used to replace healthcare services previously provided in a clinic setting, there are functions that staff at the remote site must perform to organize information and present it to the consulting physician. This causes a shift in workload to the remote site. Training of staff at the remote site is required for patient presentation. Staff at all sites needed training on using and troubleshooting the equipment. Someone had to be available in the room with the physician at the hospital site to provide hands-on assistance, have charts and other paperwork available, and operate the equipment so that the physician could focus on the patient<sup>7</sup>
- Inability to elicit physical examination findings is a frequently stated issue limiting the utility of remote assessments. This has been overcome in previous neurology and emergency department studies by employing a junior doctor with the patient to elicit clinical signs, under direct observation by the remote physician. This strategy increases costs substantially over the use of a nurse or other health worker to chaperone the process, although these workers may become as effective as a junior doctor in these tasks with specific training<sup>13</sup>
- One factor affecting the widespread adoption of telemedicine can be assumed: the evidence that it is a cost-effective method of practice. Without information on the costs and effectiveness of interventions, decision makers – and thus adopters – run the risk of introducing services that are not cost-effective for society. It has been claimed that there is no good evidence that telemedicine is a cost-effective means of delivering healthcare. Although there is evidence of the cost-effectiveness of telemedicine in certain situations, its widespread adoption has not occurred. The main implication is that evidence of cost-effectiveness is a necessary but not sufficient condition for adoption<sup>10,15</sup>
  - A comprehensive literature search of cost related articles on telemedicine identified more

## BSO-OTN Literature Scan

than 600 articles, but only 9% contained any cost benefit data<sup>16</sup>

### Technology Requirements:

- Special accommodations need to be made to address issues related to privacy and confidentiality. Patients need to be assured of the privacy of the provider area in the televideo room at each session. Patients should be responsible for determining if the speaker volume in their home offers them privacy and headphones should be provided if needed. In this study, the audio and video communication between the patient and providers went through a secured tunnel, which assures the confidentiality of the communication, and nothing was recorded<sup>4</sup>
- There is a need for assistance with technical support. In one study, without a project coordinator who also was responsible for technical support, the number of home visits was not reduced. The psychologist was responsible for technical support and made additional visits to the veteran's home to address technical difficulties beyond routine care. A project coordinator would have had more time available to learn about the intricacies of the technology to facilitate problem solving technical issues over the phone, reducing the number of visits needed by the provider<sup>4</sup>
- Living in rural settings also required additional equipment, such as surge protectors, to protect equipment and reduce the likelihood of the equipment needing to be reset. Rural participants also had to learn how to reset the equipment to decrease the need for providers to make a home visit specific to technical support. The technology works well but involves expertise and dedication of staff to trouble shoot problems<sup>4</sup>
- Technical limitations such as connection difficulty, images freezing, delays in establishing connections, and connections being lost did impact on overall satisfaction with telemedicine. However, these issues arose infrequently and are continually being addressed as the technology advances<sup>6</sup>

### Functioning of the User:

- Cognitive function is an important component of comprehensive geriatric assessment - but more impaired patients are less likely to tolerate unfamiliar technology, unless supported by skilled staff at the time, as in the nursing home experience. When there is a possibility of cognitive impairment, the capacity of the patient to cope with the technology becomes a confounding factor<sup>13</sup>
- Patient factors such as hearing and visual deficits and cognitive ability must be considered<sup>7</sup>
- The use of videoconference was reported as acceptable for patients with mild dementia, but its utility is likely to decline as the patient is less able to comprehend the interview, or has significant sensory impairment<sup>13</sup>

### Other:

- Where the clinical interaction is most dependent on physical contact with the patient, remote assessment will remain problematic<sup>13</sup>
- In the telemedicine literature there is very little quantitative information about the adoption of telemedicine as a method of routine delivery<sup>15</sup>
- Different technical barriers and the assumed negative attitudes among older people, values, and attitudes among staff were found to be an important cause of the slowness in introduction of telemedicine in the health care of older people<sup>12</sup>
- Other barriers include technology integration, interoperability, standardization, security, lack of time and financing available<sup>15</sup>
- Predictors of discontinuing follow-up via telemedicine are greater distance to telehealth, old-age patient, lower telehealth satisfaction, and lower caregiver burden<sup>2</sup>

**What are strategies/practical ideas about how to overcome potential challenges/barriers?**

**Getting “Buy-In” From Health Care Providers & Organizations:**

- Health professionals’ perceptions, together with organisational and cultural structures affecting health, legal issues, technical difficulties, time, convenience, cost, training and familiarity with the equipment, have been claimed to be facilitators for the adoption of telemedicine<sup>15</sup>
- Advantages for users are the crucial determinant of the speed of adoption of technology in healthcare. The rapid growth of two major imaging technologies, CT and MRI, shows clearly that health technologies are adopted if users, especially health professionals, want them (i.e. if they perceive that those technologies substantially improve the way they can practice). We thus believe that these considerations should be taken into account in future studies addressing the adoption of telemedicine<sup>15</sup>
- Initially, physicians resisted participation using interactive video to see residents. The approach used was to assure them this was a test of feasibility and they would not be required to see residents in this way routinely. Using that approach, almost all of the physicians who were approached participated, and satisfaction ratings were high<sup>7</sup>
- Relative advantage represents the degree to which a technology is perceived to be better than the existing alternatives. Research shows that relative advantage is the most important factor for the adoption of technology<sup>15</sup>
- The provider is the most important initial gatekeeper for the deployment of telemedicine, and that project managers must keep providers’ needs (ease of use and incentives) in mind when designing a telemedicine system<sup>15</sup>
- In one study, some differences in attitudes to telemedicine were found between users and non-users. In particular, health professionals who used telemedicine in their work had more positive attitudes towards it<sup>15</sup>
- Telemedicine is successful, and therefore adopted into routine practice, when it is perceived as a benefit and as a solution to political and medical issues<sup>15</sup>
- Different parties in telemedicine are likely to have very different perspectives, which may influence their decisions about adoption. For example, health professionals at remote sites frequently view telemedicine as having a relative advantage, while those at hub sites often view it as offering no relative advantage and requiring changes to their existing practices and roles<sup>15</sup>
- A crucial factor in the adoption of telemedicine is the attitude of the health professionals on the ground. Since most telemedicine applications require additional effort and technical expertise, the use of telemedicine is almost always more time and trouble than practising in the ordinary way. We believe that before health professionals will seriously consider the use of telemedicine, there must be some personal advantage to the user, in addition to the general advantages to society<sup>15</sup>
- The provider is the most important initial gatekeeper for telemedicine, and therefore incentives should be kept in mind when implementing telemedicine applications. Evidence is crucial to prove the advantages of telemedicine to society, but advantages to health professionals in the form of personal incentives are also needed for the widespread adoption of telemedicine to occur. Governments can provide health professionals with the technology, but the majority of potential users need to perceive compelling relative advantages of tele- medicine over existing practices in order to adopt it. We believe that research is also required to identify suitable financial and professional incentives for potential telemedicine users and understand their importance for widespread adoption<sup>15</sup>
  - Incentives could include financial incentives and professional incentives. Financial incentives

## BSO-OTN Literature Scan

in healthcare may take the form of direct payments to health professionals (e.g. fee-for-service) or indirect payments (e.g. income to spend on clinical activities, flexibility over a cash-limited budget). A systematic review of the impact of financial incentives for health professionals has shown evidence that these do affect their behaviour. Financial incentives have also been considered as important factors in helping communicate the relative advantages of telemedicine to potential adopters, thus motivating health professionals to use it. In addition, professional incentives can be employed in order to influence health professionals. Examples include status, congeniality of work, career progression, client differentiation, clinical profile and public recognition (e.g. report cards). The high initial physician time costs have sometimes been seen as a major barrier to adoption of new technologies<sup>15</sup>

- Support for organisational changes to health professionals, including training, educational material and technical support, can help them to carry out a time-consuming workflow more efficiently<sup>15</sup>
- Training, appropriate personnel, support, research ability and knowledge translation involved in frequent remote interactions have been claimed to motivate health professionals to use telemedicine and to speed up its implementation<sup>15</sup>
- Interdisciplinary clinical relationships are more difficult to establish over greater distances, but the successful introduction of a service may be enhanced by deliberate emphasis on the people as well as the technology, until the service is well established, and always emphasising the ongoing clinical relationship between the patient and the local health worker<sup>13</sup>
- A recent review recommends that to overcome the image that telemedicine is for ‘early adopters’ and enthusiasts, research projects should be linked to medical education where there is more acceptance of remote learning. It is also suggested that partnerships with health authorities will be essential to ensure access to the infrastructure. Clinicians may also be reassured by the many reports of high satisfaction levels from patient surveys, but levels are generally high and most studies may be criticised on size and methods<sup>13</sup>
- Implementation of telemedicine services depends on: (1) Positive link with a (local or national) policy level sponsor; (2) Adoption of telemedicine systems in service depends on successful structural integration so that development of organizational structures takes place; (3) Translation of telemedicine technologies into clinical practice depends on the enrolment of cohesive, cooperative groups; (4) Stabilization of telemedicine systems in practice depends on integration at the level of professional knowledge and practice, where clinicians are able to accommodate telemedicine through the development of new procedures and protocols<sup>17</sup>.

### **Addressing Patient Factors:**

- Patient factors such as hearing and visual deficits and cognitive ability must be considered. Upon finding that some LTC residents had difficulty hearing and seeing the physician consultant, a larger monitor was installed, and the patient was positioned closer to the video unit. Initial concerns were that the LTC residents’ perceptions of being seen on TV would be viewed as less personal, intrusive, or as providing a lower quality of care. The data indicate that this was not the case, and most residents appreciated being able to avoid the trip to one of the acute care settings<sup>7</sup>

### **Considering the Needs of the User:**

- Because technology literacy and preferences tend to vary, it is crucial that telehealth investigators and providers collaborate with the person with the disability and family caregiver to ensure that the telehealth technologies are tailored to their specific needs. The prerequisite task for achieving the appropriate balance of supports and accommodations is a comprehensive evaluation of the

## BSO-OTN Literature Scan

characteristics of the technology, the individual, and the relevant environments that may affect the match between the consumer and an assistive device<sup>9</sup>

### **Training of Staff:**

- Telemedical interventions require coordinated processes among participating health care providers as well as education on new techniques and communication [80]. In only few articles was it mentioned that training of the participating staff and the adjustment of organizational structures is an important prerequisite for the integration of telemedical concept into health care<sup>18</sup>

### **Access to Telemedicine:**

- Important to have telehealth sites located in as many communities as possible, and recognize the diminishing benefit of telehealth when it is not easily accessible<sup>2</sup>

### **What are examples of success stories and benefits to physicians, care teams, patients, families, system as a whole for using telemedicine?**

#### **Benefits of Telemedicine to Patients & Caregivers:**

- These technologies are robust, low-cost, and widely available in facilitating access to health care services, and are capable of overcoming geographic and time barriers<sup>9</sup>
- Reduction in travel time and distance for patients<sup>3,7,9</sup> (e.g., one-way travel saved by conducting the appointment by telehealth was approximately 462km for remote patients and 192km for rural patients<sup>3</sup>)
- Reduce barriers related to: long wait times for appointments at rural clinics to see a specialist; the stresses of driving to and in an unfamiliar city or location; and financial constraints for many older persons who are on a fixed income<sup>6</sup>
- Reduce stress of family caregivers<sup>1</sup>
- Promote optional coping of family caregivers<sup>1</sup>
- Improve the mental health status of the caregivers<sup>1</sup>
- Patients and caregivers report high satisfaction and convenience ratings with the use of telehealth<sup>3,6,19,20</sup>
- Allow older people to remain in their homes longer and be able to choose independent living<sup>12</sup>
- Telehealth is a viable and innovative alternative to manage the ongoing care and recovery of individuals with severe disability and their caregivers who reside in communities where there is limited to no rehabilitation services or to consumers who lack transportation to urban-based rehabilitation<sup>9</sup>
- Video conferencing has the potential to enhance family participation in the care of the patient<sup>7</sup>

#### **Benefits of Telemedicine to Health Care Providers/Health Care System:**

- Reduce the number of home visits and increase number of carers that can be helped in one day<sup>1</sup>
- Even though genuine care was related to physical presence and 'face-to-face' communication, health care providers described situations where the use of telemedicine applications could contribute to a genuinely caring relationship with older people living isolated in their homes through the possibility of maintaining a remote dialogue<sup>12</sup>
- One study found that technology-based delivery of self-care programs for managing chronic illnesses (e.g., diabetes and cardiac disorders) were significantly more effective than routine, in-person

## BSO-OTN Literature Scan

medical care<sup>9</sup>

- In investigations comparing the same self-care management programs, in-person versus telehealth-based all four studies showed positive and similar improvement between groups on a variety of health outcomes<sup>9</sup>
- Physicians' ratings of telemedicine were 78% good to excellent for usefulness in developing a diagnosis, 87% good to excellent for usefulness in developing a treatment plan, 79% good to excellent for quality of transmission, and 86% good to excellent satisfaction with the consult format. Overall, 72% of residents were satisfied with the consult format, and 92% felt that it was easier to obtain medical care via telemedicine. Nurses felt that the telemedicine clinics were a good use of their time and skills (100%)<sup>7</sup>
- Findings indicate that it is feasible to deliver specialist physician care to LTC residents via video conferencing; it not only increases access to needed specialty services, but also can provide better care coordination because the physician can communicate directly with the patient's primary nurse. Conversely, the primary nurse is able to provide information directly to the physician, information that is often not available if the patient is transported to the clinic setting<sup>7</sup>.
- Care delivered to residents of LTC settings via video conferencing offers a number of advantages, including avoidance of travel over long distance for patient and provider and potentially greater continuity of care. There is the potential to include nursing staff from the patient setting during the consultation session. Not only can the nurse provide valuable information about the patient to the physician, but there also may be greater accountability and follow-through on recommendations<sup>7</sup>
- Video conferencing allows a specialist provider the opportunity to offer specialty services to multiple LTC sites from a single location, increasing access to these services for the frail elderly<sup>7</sup>
- There was a high rate of physician, patient, and nurse satisfaction with interactive video conferencing. Care delivered to residents of LTC settings via video conferencing offers a number of potential advantages, including potentially greater continuity of care<sup>7</sup>
- The utility of telemedicine in the diagnosis of dementia and follow-up in the literature appears to be very promising<sup>6</sup>
- Telemedicine provides an acceptable means of assessing mental status of patients in remote areas<sup>6</sup>
- The findings do show that the telemedicine follow-up clinic provided a number of favourable results such as timely access to a follow-up clinic in the patient's own community, fewer cancelled clinics, access to a geriatric specialist, and enhanced care transitions between the follow-up clinic and primary care with the support of the Case Manager/Assessor<sup>6</sup>
- The technology ensured that specialist medical follow-up was available to this complex, geographically dispersed, patient population<sup>6</sup>
- The telemedicine initiative also freed up spaces within the "in-person" clinics, allowing these clinics to focus more on new assessments<sup>6</sup>
- The utility of telemedicine in the diagnosis of dementia and subsequent follow-up appears promising in the literature, as it provides a viable means of assessing cognition in patients in remote areas with limited access to medical specialists<sup>6</sup>

### Success Stories:

- Inter-professional Rural and Remote Memory Clinic (Saskatchewan) - Findings show that telehealth coordinators rated 85% of patients and 92% of caregivers as comfortable or very comfortable during telehealth. On average, telehealth appointments reduce participants' travel by 426 km per round trip. Telehealth videoconferencing is a feasible and acceptable strategy for delivering preclinic assessment and follow-up appointments within a rural and remote memory clinic. Team clinicians, who have been providing service in the clinic since its inception, report that the telehealth component works

## BSO-OTN Literature Scan

well from their perspective. As a result of these formal evaluation results, and the requests of patients and caregivers to change in-person appointments to telehealth, we now offer telehealth for all follow-up appointments. We are looking at other opportunities to use telehealth to expand services to rural and remote patients and family members. For example, the clinic's neuro- psychology team has recently implemented a pilot study to evaluate a telehealth support group for spouses of clinic patients diagnosed with atypical early-onset dementias (e.g., variants of frontotemporal dementia, Huntington's Disease), and the clinic physical therapist is leading an initiative to study the efficacy of telehealth to deliver a physical fitness program to our patients. Much of the success of the telehealth component of the clinic is due to the excellent infrastructure support provided by the Telehealth Saskatchewan network. The reliability of the telehealth network, including the equipment and personnel, has greatly facilitated the services provided by the memory clinic. The clinic is now integrated into their program and is often highlighted as an example of a successful application of telehealth in the province<sup>2</sup>

- "3millionlives" program (<http://www.3millionlives.co.uk>) (United Kingdom) - The Program was launched to extend the implementation of telehealth and telecare following the successful Department of Health funded "Whole System Demonstrator" project in which hospital admissions and mortality were reduced for those in receipt of the telehealth and telecare interventions. The evaluation was the largest investigation into telehealth and telecare in the world, involving over 6000 participants. The target groups in the study were people with long-term conditions such as diabetes and included people with dementia and their family carers<sup>1</sup>
- The ACTION (Assisting Carers using Telematics Interventions to meet Older People's Needs) information and communication technology-based service (West Sweden) – this service developed with family carers and frail older people living at home to provide them with early information, education, and support. ACTION consists of a program helping families using technology, a range of multimedia caring programs accessed via a personal computer, a videophone for contact with other participant families and practitioners at a dedicated call centre, and internet facilitates. Key benefits include improvements in family caregiving skills and carer confidence and reduced social isolation for participant families<sup>8</sup>
- The LifeView system by American TeleCare (rural Oklahoma) - The clinical video capability allowed clinicians to provide unique home-based services such as telemental health and OT exercise sessions. The user-friendly system combined video telehealth and remote monitoring of vitals and related health symptoms. When the provider and patient stations are connected, an interactive video and audio visit can be conducted between the patient and the provider. This allows for standard psychotherapy, no different from a face-to-face session, to be conducted remotely. Rather than traveling to rural areas to conduct a psychotherapy session every week, the psychologist would travel once a month and conduct weekly videophone sessions<sup>4</sup>
- Dementia Telemedicine Center (Korea) - The reliability of the center, which provides telemedicine, tele-education, and telecounseling services, was tested by comparing assessment via our system with in-person assessment, and the clinical outcome was assessed by rating the changes of behavioral symptoms. There have been 140 registered patients for 2 years. The general acceptance of our system by the patients and caregivers was good, and the consistency rates between the assessment via our telemedicine system and in-person assessment ranged from 76% to 89%. A considerable proportion of dementia patients in nursing homes (46%) showed relative clinical improvements through our service. Our telemedicine system seems to be reliable and effective for the assessment and care of dementia patients. Our future direction is to promote our system as a core model of the home-based care system for dementia patient. The home-based care system for dementia patients, which is our final goal, could be established by way of efficient links and communications among different medical and social resources. The telemedicine system can provide flexible and rapid access to

## BSO-OTN Literature Scan

remote medical expertise and resources, regardless of where the patients or relevant resources are located<sup>21</sup>

- In Hong Kong, community-based geriatric assessment teams are used to provide services to residential care institutions. In one study, video conferencing was used to provide geriatric outreach and assessment services for nursing home residents. As a result, more clients were served, and follow-up intervals were shortened. Costs were reduced, and providers and residents found video conferencing acceptable. In another study in Hong Kong, a geriatric specialty nurse working with a geriatrics assessment team provided patient education on and assessments for inhaler technique, wound management, falls assessment, infirmary placement, and swallowing using video conferencing. Residents and nursing home staff found video conferencing acceptable and did not regard it as inferior to face-to-face consultations. The geriatric specialty nurse was able to increase the number of residents seen each month, and 89% of the nurse's services could be delivered via video conferencing; only 11% of the consultations required on-site visits. Other investigators in Hong Kong<sup>7</sup> used video conferencing to provide 149 hospital-based psychiatric assessments to 45 residents of a care and attention home. Video conferencing was acceptable to residents and physicians and was more cost-effective than on-site care<sup>7</sup>
- In Korea, hospital-based psychiatrists successfully used video conferencing to provide care to residents with dementia residing in the community or in a nursing home. Almost half (46%) of the nursing home residents showed clinical improvement over a 2-year period after video conferencing was implemented<sup>7</sup>
- A Hong Kong experience linking community geriatric assessment teams to a local nursing home to provide management advice instead of a clinic or outreach visit, resulted in 9% fewer ED attendances and 11% fewer utilised hospital days<sup>13</sup>
- In the United States, use of video conferencing to provide psychiatric services in a LTC setting was found to be feasible. Residents were seen more promptly, and travel time was reduced<sup>7</sup>
- Providing non-urgent advice and opinions from allied health practitioners has been reported from Australia where videoconference links to nursing homes were used [23]. The outcomes were reported in terms of user satisfaction and also adequacy of assessment, by five disciplines. The workers were often uneasy about the clinical assessment, but the opportunity to revise recommendations after seeing the patient in person resulted in only minor changes to plans<sup>13</sup>
- Neurology clinic reports from Northern Ireland demonstrate feasibility and efficacy, but that telemedicine may generate more investigations. In further work, they were able to show that costs of the service were critically dependent on the type of consultant, telecommunication charges and the locally based health worker's time. The cost-efficiency emerged when the service was compared with a broader usual care group, in 'everyday practice', and increased as the distance increased<sup>13</sup>
- Champlain CCAC Memory Disorder Clinic (Cornwall, Ontario) – This study explored the feasibility of introducing a telemedicine memory disorder follow-up clinic in a rural community. The evaluation of 32 clinic sessions found high levels of satisfaction, with over 90% of physicians and patients indicating that they'd be willing to use video conferencing again. Physicians overwhelmingly felt the sessions provided enough information to assist in clinical decision-making (96%), and patients and CCAC Case Managers/Geriatric Assessors felt able to present the same information by video conferencing as in person (92% for both groups). The telemedicine clinic provided a number of favourable results such as: timely access to specialist care in the patient's own community; fewer cancelled clinics; enhanced care transitions between the follow-up clinic and primary care with the support of a case manager/ geriatric assessor; and enhanced follow-up for a complex patient population. In addition, the telemedicine initiative freed up spaces for "in-person" clinics. This allowed them to focus on new patient assessments<sup>6</sup>

## BSO-OTN Literature Scan

- One patient commented, “This is a great way to serve the people of Cornwall—neither they nor the doctor need to drive to Ottawa for a follow-up”<sup>6</sup>
- Clients felt they were understood by the onsite nurse (96%) and the physician who was being teleconferenced (94%). Almost all patients agreed that their privacy and confidentiality were respected (98%), although a small number stated they would have preferred to see their doctor alone (16%)<sup>6</sup>
- In terms of their sense of involvement in their care, most patients felt that their questions were answered by the doctor (98%), that the video conference session ran smoothly (98%), and that the appointment provided enough time to deal with everything that needed to be covered (92%)<sup>6</sup>
- Items with the greatest variability in responses were those related to patient preferences. While most felt that they were able to present the same information they would have provided in person (92%), a slightly smaller number said that they felt as confident about the doctor’s assessment through video as they would an in-person assessment (88%). Thirty percent stated that they were more anxious with the video session than if they had seen the doctor in person, and over one-quarter (28%) felt that they would have preferred to see their doctor in person<sup>6</sup>
- CCAC Case Managers spent an average of 51 minutes: setting up/taking down equipment (12 min); explaining video conferencing to patients and providing reassurance (22 min); debriefing patients at the end of their session (13 min); and 4 minutes on other clinic activities. Three clinics encountered technical problems that required significantly more time on the part of the CCAC Assessor. The CCAC Assessors were generally more conservative than patients in their rankings of the clinic experience, with 79% agreeing or strongly agreeing that they were satisfied with the sessions. It was not surprising to find a strong correlation between the Assessors’ satisfaction with the clinic and their perception as to whether it ran smoothly<sup>6</sup>
- Physicians provided feedback on 30 of the 32 clinics, and for the most part felt that the clinic ran smoothly (88%). They indicated that 17 of the 30 clinics would likely have been cancelled had the Geriatrician needed to travel to the clinic site. This was most often due to time constraints. This is an important finding, given that the objective of providing telemedicine to the target population was to provide more timely access to care. Minor technical problems were identified by the Geriatrician for 7 of the 30 clinics. On two occasions the video link did not work at all and cases were discussed by phone instead. In addition to rating the clinic experience, physicians also provided feedback on their session with each patient, for 91 of the 99 patients. Physicians agreed or strongly agreed that video conferencing provided them with opportunities to ask the patient/CCAC Assessor questions (100%). They generally felt that the appointments met their needs (96%), and that they were able to get enough relevant information to assist in clinical decision-making (96%). For the most part, they agreed that “video conferencing met the patient’s needs” (96%), and that “the patient was comfortable talking about his/her problems using video conferencing” (93%). Another significant challenge, especially with this older population, was the issue of hearing loss, which was identified as a problem for seven patients<sup>6</sup>

### What does the future of telemedicine look like in supporting seniors’ care?

- Geriatric medical expertise is not universally available, even in industrialised countries. This is usually a result of inadequate supply of practitioners or remoteness. In rural or remote communities, there may be insufficient caseload to warrant the full-time presence of a geriatrician. As a consequence, this important capability is often not available. Telemedicine strategies have been

## BSO-OTN Literature Scan

applied in response to similar challenges in other medical disciplines. Telemedicine has the possible advantage of being able to offer a service at marginally increased cost, depending on volume, and eliminating travel costs for the doctor and the patient<sup>13</sup>

- In areas where geriatrician expertise is currently unavailable, telemedicine has the capacity to allow remote consultation, which can be supported by a trained health worker locally, using a protocol for comprehensive geriatric assessment. It may be more feasible than relying on recruitment of a local geriatrician but overall geriatrician numbers will continue to limit the availability of expertise. In chronic disease management, there are many reports of improved efficacy and patient satisfaction when compared with usual care. Geriatricians and other health workers can expect increasing use of telemedicine in this area as an enhancement of existing systems. It seems likely to improve clinical relationships, treatment efficacy and productivity, but further evaluation in the elderly is needed<sup>13</sup>
- Some studies examining the use of telecommunications technology with older patients suggest that geriatric patients are comfortable using telehealth equipment, but others have argued that more research is needed to determine how age-related declines in sensory, motor, and cognitive abilities affect interactions between older patients and health care providers when technology is used<sup>2</sup>
- Future research questions that need to be explored:
  - What types of consultation are suitable for teleconsulting? Is it suitable for initial consultations, or do patients find it more acceptable to use telemedicine technology just for follow up appointments?<sup>19</sup>
  - What are the effects of this mode of healthcare delivery on the doctor-patient relationship? Examining patient perceptions would help to address the reasons why patients liked or disliked a service and help healthcare providers to better understand patients' subjective definitions of acceptability and utility<sup>19</sup>
  - How do communicative issues affect the delivery of health care via telemedicine? We need to better understand the effects of telemedicine on consultations in order to improve the services we provide through this medium<sup>19</sup>
  - What are the possible limitations of telemedicine in clinical practice?<sup>19</sup>

### e) Reference List

1. Gallagher-Thompson, Dolores, et al. "International perspectives on nonpharmacological best practices for dementia family caregivers: a review." *Clinical Gerontologist* 35.4 (2012): 316-355.
2. Morgan, Debra G., et al. "Evaluation of telehealth for preclinic assessment and follow-up in an interprofessional rural and remote memory clinic." *Journal of Applied Gerontology* (2010).
3. Morgan, Debra G., et al. "Improving access to dementia care: development and evaluation of a rural and remote memory clinic." *Aging and Mental Health* 13.1 (2009): 17-30.
4. Sorocco, Kristen H., et al. "Integrating care coordination home telehealth and home based primary care in rural Oklahoma: A pilot study." *Psychological services* 10.3 (2013): 350.
5. Marziali, Elsa, and Peter Donahue. "Caring for others: Internet video-conferencing group intervention for family caregivers of older adults with neurodegenerative disease." *The Gerontologist* 46.3 (2006): 398-403.
6. Azad, Nahid, et al. "Telemedicine in a Rural Memory Disorder Clinic—Remote Management of Patients with Dementia." *Canadian Geriatrics Journal* 15.4 (2012): 96.

## BSO-OTN Literature Scan

7. Wakefield, Bonnie J., et al. "Interactive Video Specialty Consultations in Long-Term Care." *Journal of the American Geriatrics Society* 52.5 (2004): 789-793.
8. Hanson, Elizabeth, et al. "Working together with persons with early stage dementia and their family members to design a user-friendly technology-based support service." *Dementia* 6.3 (2007): 411-434.
9. Forducey, Pamela G., et al. "Telehealth for persons with severe functional disabilities and their caregivers: facilitating self-care management in the home setting." *Psychological services* 9.2 (2012): 144.
10. Krupinski, Elizabeth A., and Jordana Bernard. "Standards and Guidelines in Telemedicine and Telehealth." *Healthcare*. Vol. 2. No. 1. Multidisciplinary Digital Publishing Institute, 2014.
11. Loane, M., and Richard Wootton. "A review of guidelines and standards for telemedicine." *Journal of telemedicine and telecare* 8.2 (2002): 63-71.
12. Sävenstedt, Stefan, Per-Olof Sandman, and Karin Zingmark. "The duality in using information and communication technology in elder care." *Journal of Advanced Nursing* 56.1 (2006): 17-25.
13. Brignell, Michael, Richard Wootton, and Len Gray. "The application of telemedicine to geriatric medicine." *Age and ageing* 36.4 (2007): 369-374.
14. Andrews, Mary Ellen, Debra G. Morgan, and Norma J. Stewart. "Dementia awareness in northern nursing practice." *CJNR (Canadian Journal of Nursing Research)* 42.1 (2010): 56-73.
15. Zanaboni, Paolo, and Richard Wootton. "Adoption of telemedicine: from pilot stage to routine delivery." *BMC medical informatics and decision making* 12.1 (2012): 1.
16. Whitten, Pamela S., et al. "Systematic review of cost effectiveness studies of telemedicine interventions." *Bmj* 324.7351 (2002): 1434-1437.
17. May, Carl, et al. "Understanding the normalization of telemedicine services through qualitative evaluation." *Journal of the American Medical Informatics Association* 10.6 (2003): 596-604.
18. van den Berg, Neeltje, et al. "Telemedicine and telecare for older patients—a systematic review." *Maturitas* 73.2 (2012): 94-114.
19. Mair, Frances, and Pamela Whitten. "Systematic review of studies of patient satisfaction with telemedicine." *Bmj* 320.7248 (2000): 1517-1520.
20. Collins, K., P. Nicolson, and I. Bowns. "Patient satisfaction in telemedicine." *Health Informatics Journal* 6.2 (2000): 81-85.
21. Lee, Jung H., et al. "A telemedicine system as a care modality for dementia patients in Korea." *Alzheimer Disease & Associated Disorders* 14.2 (2000): 94-10.

## BSO-OTN Literature Scan

22. Barton, Cynthia, et al. "Video-telemedicine in a memory disorders clinic: evaluation and management of rural elders with cognitive impairment." *Telemedicine and e-Health* 17.10 (2011): 789-793.