



Videoconferencing And Wheelchair Positioning Telerehabilitation Pilot Study

**Part Of The
Patient And Community Support Network Project Of The Holland Center
June, 2002**

**An initiative of Ghislaine Prata,
Executive Director of the Constance-Lethbridge Rehabilitation Center**

Research Team

Principal investigator: Genevieve Lefebvre, B.Sc.(O.T.)

Research consultant: Catherine S. Fichten, Ph.D.

Research team members: Gerard Fontaine, M.B.A., Lucie Germain, B.O.T., Julie Lagacé, B.O.T., Daniel Rock, TOP

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EXECUTIVE SUMMARY

The present pilot investigation was conducted by the Constance-Lethbridge Rehabilitation Center in collaboration with the CHSLD Bayview Center. This study is part of the Patient and Community Support Network Project. The goal of this larger project is to improve health and social services for English-speaking individuals in primarily francophone locales by providing services through videoconferencing.

The Patient and Community Support Network Project is a collaboration between the Holland Resource Development Corporation in Quebec City and a variety of organizations. Health Canada Population Health Fund is the granting agency. The area of specialisation for the present pilot investigation is evaluation of the suitability of videoconferencing in a selected aspect of rehabilitation services, namely wheelchair seating and positioning.

The literature indicates that there are many anglophones needing services in remote locations, and that receiving services in English is often difficult (e.g., Staff Writers, 2002). Videoconferencing, which involves the use of a television, a video camera, and a high speed ISDN line, can provide services to remote regions in a timely way. The literature suggests that videoconferencing in many health contexts is a safe, well-received form of intervention that is cost-effective.

The current face-to-face practice when carrying out wheelchair seating and positioning within the two experimental locales involves a site visit by the two person Constance-Lethbridge Rehabilitation Center wheelchair team (a specially trained occupational therapist and a positioning technician) to the CHSLD Bayview Center, a long-term chronic care residential facility. There they meet with the client and a CHSLD Bayview Center occupational therapist and take measurements. One or more follow-up visits are frequently necessary when the client receives the wheelchair or positioning aid. This involves considerable travel time.

To conduct this pilot study, the senior occupational therapist, with the assistance of a second occupational therapist at the remote site (CHSLD Bayview Center) carried out all stages of wheelchair measuring and positioning using videoconferencing with the two person wheelchair team of the host site, the Constance-Lethbridge Rehabilitation Center. To evaluate the linguistic component, the bilingual team

from Constance-Lethbridge Rehabilitation Center spoke in English with the English-speaking client and in French with the CHSLD Bayview Center occupational therapists.

Three aspects of the videoconferencing process were evaluated: (1) quality of the work carried out, satisfaction with the process and outcomes as evaluated (2) by clients and (3) by rehabilitation clinicians. This pilot investigation provides data based on the experiences of 6 multiply impaired older adults who underwent up to 3 sessions of simple wheelchair positioning and on the experiences of 4 clinicians (2 specialists from the host site and 2 occupational therapists from the remote site). Clients provided data for 14 discrete videoconferencing sessions. Clinicians provided 51 instances of evaluation data for the 14 sessions.

Results indicate that all clients were very highly satisfied with the services they received, and that this was true for all sessions, including their very first experience with videoconferencing. In general, both host and remote clinicians were also pleased with videoconferencing. Nevertheless, there were minor equipment malfunctions on 4 of the 14 videoconferencing sessions (29%). This usually involved temporarily losing the signal and having to reinitialize the system. No session was cancelled due to equipment problems.

In addition, this investigation identified some problems related to audio, video, and codes of behavior. Problems with the audio included difficulties hearing clients' whose voice was low or who mumbled. In addition, there were sufficient time delays so that clients and clinicians often "spoke over" each other. There were also issues related to the video component. Large body movements on the part of the host clinical team members had to be somewhat restricted as these were distracting. The color of clients' dress, including socks and shoes was an important issue which sometimes made it difficult to see the position of the client in the wheelchair. There were also issues related to codes of behavior concerning how to begin and end sessions, and the need to perform formal introductions. Because much of the dialogue was between remote and host clinicians, clients sometimes "tuned out" during evaluation sessions. This meant that when questions were directed toward them, occasionally these were ignored or answered only in part. Suggestions concerning how such problems could be resolved are detailed in the Recommendations section.

The mean duration of sessions (on-line time) was approximately 1 hour. First sessions generally took the longest (approximately 1-1/2 hours), while third sessions were the shortest (approximately 15 minutes). In addition, clinicians spent an average of approximately 1/2 hour "off-line" performing tasks related to the client and the evaluation session. It was necessary for a Constance-Lethbridge Rehabilitation Center mechanic to make a face-to-face visit to make an adjustment for 2 clients. In addition, it is likely that face-to-face evaluations take less time. An extensive cost effectiveness calculation is necessary to determine the conditions under which videoconferencing is economically justified.

Before instituting broad-based programs, further evaluation should be carried out on a larger number of clients with a wider range of diagnoses with comparative data from face-to-face evaluations. Also, accuracy of evaluations should be determined by having the Constance-Lethbridge Rehabilitation Center wheelchair team re-assess all clients whose evaluations were made using videoconferencing to determine accuracy of measurements. Site visits to other locales where telerehabilitation has been well established should also be considered.

In summary, the results indicate that videoconferencing holds strong potential to provide rehabilitation services for English-speaking individuals in primarily francophone locales in Québec. That this was true for older adults with a mean age of 69 adds to the potential of the technique. The evaluation also helped with identification of requirements for long-term sustainability of videoconferencing services and programs in rehabilitation and allowed formulation of recommendations regarding elements essential for further development and evaluation of telerehabilitation services using videoconferencing in Québec.

BACKGROUND

A review of the literature indicates substantial interest in the use of videoconferencing in many aspects of health care delivery in an emerging field variously referred to as telehealth or telemedicine. Some authors working in rehabilitation refer to the field as telerehabilitation (e.g., Burns et al., 1998; Cooper et al., 2001; Scheideman-Miller, 2002). In general, distance conferencing technology, most often videoconferencing, is used to provide access to specialty services for clients in remote areas that are not well served with specialists or medical care (e.g., Liss et al., 2002).

There are several excellent reviews of the literature (e.g., Cooper et al., 2000; Glueckauf et al., 2001; Liss et al., 2002; Mair & Whitten, 2000; Miller, 2001). Case studies (e.g., Burns et al., 1998) and web pages (e.g., Rehab anywhere, undated; Rosen, undated) abound and there are numerous listings and evaluations of the types of equipment available and of the applications of telemedicine (e.g., Glueckauf et al., 2001; Scheideman-Miller, 2002).

Videoconferencing has been evaluated in controlled investigations in fields as diverse as assessment of orthopedic outpatients (Haukipuro, et al., 2002), dermatology (Nordal et al., 2000), neuropsychological evaluation (Schopp et al., 2000), surgery consultation (Aarnio et al., 2000), and rehabilitation (Lemaire, et al., 2001). In general, these controlled empirical studies suggest that videoconferencing is, in many instances, a satisfactory and cost effective means of delivering clinical services to many clients. Cost effectiveness, in particular, shows very substantial benefits (e.g., Haukipuro et al., 2002; Schopp et al., 2001).

Although there are no generally agreed upon guidelines for most areas of telehealth application, videoconferencing is seen as appropriate only for a subset of cases – generally, for diagnoses which are common or where simple rather than complex diagnostic issues are involved (e.g., Aarnio et al., 2000; Nordal et al., 2000). The presence of a clinician at the remote site is often seen as an advantage (e.g., Aarnio et al., 2000; Nordal et al., 2000).

Most studies show that clinicians prefer face-to-face evaluations to videoconferencing (e.g., Aarnio et al., 2000; Haukipuro et al., 2002; Nordal et al., 2001; Schopp et al., 2000). Nevertheless, differences between clinicians' evaluations of face-to-face and videoconferencing, while significant, tend not to be substantial. Common problems include difficulties with voice and video quality as well as technical malfunctions which appear to occur between 17% and 40% of the time (e.g., Haukipuro et al., 2002; Nordal et al., 2001). Problematic voice quality seems more important than problematic video (e.g., Aarnio et al., 2000). It is also worth noting that the specialist clinicians who are responsible for the evaluations tend to be less satisfied than the clinicians who are present with the clients at the remote sites (e.g., Haukipuro et al., 2002; Schopp, et al., 2000). Some investigators point out that a benefit of videoconferencing not seen with face-face evaluations is education of remote clinicians (Aarnio et al., 2000).

One important criterion for evaluating the utility of videoconferencing in diagnostic evaluations is the extent to which diagnoses made face-to-face and via videoconferencing are concordant. In the Nordal et al. (2001) study two dermatologists diagnosed the same clients: one diagnosed face-to-face while the other did this through videoconferencing. In their study, "The demarcation between partial agreement and disagreement was drawn where the different diagnoses would imply different treatments." (p. 259). Using this definition, in their study 13% of diagnoses were discordant, although they indicate that "no serious condition was missed" (p. 259). What is not clear is the reliability of diagnoses between these two individuals if they had both done the diagnosis face-to-face or what the level of concordance would have been had it been the same dermatologist making the diagnoses in both face-to-face and videoconferencing conditions. Nevertheless, there is some concern about diagnostic accuracy even when this occurs in a relatively small proportion of cases.

The literature indicates that videoconferencing clients tend to be as satisfied as clients receiving face-to-face evaluations (Haukipuro et al., 2002; Schopp et al., 2000). Clients tend to like videoconferencing because it is available closer to home, is less expensive, requires no extensive travel time, and provides access to premium quality care otherwise not available (Aarnio et al., 2000; Nordal et al., 2001; Schopp et al., 2000). Telehealth clients are generally more likely indicate that they would opt for evaluation using videoconferencing again (Schopp et al., 2000), although the data also suggest that older clients may be more likely to prefer face-to-face evaluations. This could, in part, be due to difficulties some older adults experience hearing the remote clinician (Nordal et al., 2001).

Present Investigation

The objective of the present investigation was to determine the feasibility of providing wheelchair evaluation and positioning services using videoconferencing in Québec to English speaking older adults located in French speaking areas where rehabilitation services in English are not readily available.

METHOD

Overview

In this four month pilot project six CHSLD Bayview Center clients were fitted and supplied with a wheelchair and/or with positioning aids. This involved up to three videoconferencing sessions approximately two weeks apart. The sessions reflect the current face-to-face procedure, which typically involves up to three evaluations: measurement, fitting, and follow-up. The senior occupational therapist, with the assistance of a second occupational therapist at the remote site (CHSLD Bayview Center) carried out all stages of wheelchair measuring and positioning using videoconferencing with the two person wheelchair team (a specially trained occupational therapist and a wheelchair technician) of the host site, the Constance-Lethbridge Rehabilitation Center.

All videoconferencing sessions were followed by completion of brief evaluation measures by the client and by the clinicians present. Communication between the Constance-Lethbridge Rehabilitation Center wheelchair team and the client took place in English. Communication with the CHSLD Bayview Center occupational therapist took place in French. Where possible, sessions were videotaped.

Measures

It should be noted that there are no well accepted standardized measures to evaluate user satisfaction and client outcomes in telehealth (cf. Aarnio et al., 2000; Mair, & Whitten, 2000). Generally, simple, measures are designed by the investigators specifically for the research carried out. These usually evaluate topics on an item-by-item basis. Thus, there are no norms or validation data, forcing investigators to use others' measures to permit a basis for comparison. When it comes to client satisfaction and evaluations, it has been proposed that standardized measures that are used to evaluate other forms of evaluation and intervention be used in telehealth research as well (Stamm & Perednia, 2000). Given this state of affairs, in the present investigation we administered an oft used standardized measure to evaluate client satisfaction (Larsen, et al.'s 1979 Client Satisfaction Questionnaire) and we used others' measures of telehealth evaluation to permit comparisons of clinicians' ratings (i.e., questions from Lemaire et al.'s (2001) and Aarnio et al.'s (2000) studies). A single question form Lemaire et al.'s study was also used as a basis of comparison for clients. All measures are enclosed in Appendix A.

Videoconferencing and Wheelchair Project Client Characteristics Form / Projet d'évaluation de fauteuil roulant par vidéoconférence : Formulaire des caractéristiques du client. This 9 item form was compiled specifically for this project. It is a brief version of a form completed on a routine basis for all CHSLD Bayview Center residents who need wheelchair positioning services. The form provides demographic information such as sex, age, and living situation as well as information relevant to assessment and intervention (e.g., diagnosis, type of intervention, wheelchair and positioning characteristics). An open-ended section for additional comments is provided. In the present investigation it was completed by the CHSLD Bayview Center occupational therapists for each client.

Client Satisfaction Questionnaire - Brief Version. This measure, which is provided in large print (Arial 17), contains 4 items which evaluate client satisfaction with the proceedings and the intervention. Items 1 to 3 from the Brief Version of Larsen, Attkinson, Hargreaves, and Nguyen's (1979) well known Client Satisfaction Questionnaire measure. Scores on the items, which range from 1 to 4 with higher scores indicating greater satisfaction, are summed to provide a global satisfaction score. An open-ended section for additional comments is provided. As the scale's authors indicate, the 3 items that comprise the Brief Version may be combined and used instead of the full scale. Psychometric characteristics of both the full scale as well as the Brief Version reported by the scale's authors indicate good internal consistency and concurrent validity. The measure has been used with various populations, including older adults.

An additional 5 point Likert-type question (item 4: 1= poor, 5 = excellent) deals with satisfaction with the videoconferencing session. This item is adapted from Lemaire, Boudrias, and Greene (2001), who evaluated videoconferencing in a Canadian rehabilitation setting. Lemaire et al. scored client satisfaction on an item by item basis. This allows for a direct comparison of scores on item 4 with scores from their study.

Videoconferencing And Wheelchair Project Clinician Form / Projet d'évaluation de fauteuil roulant par vidéoconférence : Formulaire du clinicien. This 15 item, 2 page measure contains 6 items related to administrative aspects of the videoconferencing experience (e.g., session start and end times, equipment malfunctions). Eight of the items used by Lemaire et al. (2001) to evaluate aspects of the videoconferencing procedure and clinicians' satisfaction with the videoconference experience in a rehabilitation setting are included. Item 15, which evaluates satisfaction with the outcome of the health intervention using videoconferencing, is adapted from Aarnio, Rudenberg, Ellonen, and Jaatinen (2000). An open-ended section for additional comments is provided.

Equipment

Videoconferencing equipment consisted of ADCOM's Polycom ViewStation 512 (Quad BRI ViewStation h.323), including a video camera (wide angle conversion lens) with accompanying accessories (remote, etc.), a 32" monitor (Sony TV, with s-video and composite input), and an ADCOM 27"-36" monitor stand for the equipment. One Polycom extended microphone per institution was provided. The communication port was a triple NT-1 ISDN line termination unit (Polycom, 2002). Access was provided using ISDN lines at both institutions. This equipment is located both at the Constance-Lethbridge Rehabilitation Center as well as at the CHSLD Bayview Center. Approximately 2 hours of training for the project staff were provided by ADCOM Videoconferencing (ADCOM, 2002). A conventional video cassette recorder (VCR) was connected to the equipment to allow for videotaping of sessions.

Participants

Six volunteer residents of the CHSLD Bayview Center, a chronic care residential facility participated (3 men and 3 women, mean age = 69, median = 71, range = 38-91). The senior occupational therapist of the CHSLD Bayview Center compiled a list of potential participants who meet the following selection criteria: eligible to receive the designated services and equipment according to government of Québec (RAMQ) criteria; prefer to receive services in English; "simple" rather than "complex" wheelchair positioning required; sufficient cognitive skills to provide informed consent and complete the measures. Cognitive ability was determined by clinical interview with the senior Bayview occupational therapist. Mean score of participants on the Modified Mini-Mental State Examination (Folstein, 1975; Teng & Chui, 1987), in routine use at the CHSLD Bayview Center, was 25 (median = 26, range = 19-30). Diagnoses were varied and included a variety of neurological conditions and arthritis. Specific primary and secondary diagnoses of the 6 participants are as follows: 3 participants were diagnosed with stroke and osteoarthritis; 1 with Parkinson's disease and inflammatory polyarthritis; 1 with a cerebellar aneurysm and stroke; and 1 with Becker's dystrophy. All participants were expected to use a wheelchair on a daily and permanent basis.

The 4 clinician participants include the host site's two person Constance-Lethbridge Rehabilitation Center wheelchair team (a specially trained occupational therapist and a positioning technician) and 2 occupational therapists, one senior and one junior, from the CHSLD Bayview Center (the remote site).

Procedure

Ethics considerations. Prospective volunteers were approached by one of the CHSLD Bayview Center occupational therapists. They were informed about the nature and requirements of the research project. They were told that participation is voluntary and that confidentiality would be maintained (e.g., identification by a code number in research documents). They were also told about the purpose of the project, risks and benefits envisaged, task requirements, the right to withdraw at any time without penalty, and the measures taken to ensure confidentiality. They were informed that they may discuss any questions or concerns about this study with the Principal Investigator, Genevieve Lefebvre (514-487-1891, extension 351) or with the CHSLD Bayview Center Director of Hospital Services, Barbara Guillon (514-695-9384 extension 241). Participants read and signed a detailed Information and Consent Form approved by the Constance-Lethbridge Rehabilitation Center Ethics Committee (Certificat d'éthique attached in Appendix B). A copy of the Information and Consent Form, in large print, was given to all participants.

All volunteers were also asked for permission to videotape their sessions and to indicate the possible contexts in which the videotapes may be used. This was done using the standard Québec government authorized form "Authorisation for: Photographs, Films, Tape-Recordings, Videotapes And Other Documents (AH-217A-2 (rev. 87-12))." A copy of this form, which is attached in Appendix B, was given to participants in large print. All clients consented to being videotaped.

Clients may wish to please the therapist or be motivated to be "good patients." Therefore, we asked clients to complete the questionnaires by themselves (or to have a family member complete it with them). If this was not possible, a nurse who was not involved in the project was asked to assist them. Participants were told to place their responses in a sealed, self-addressed envelope. They were asked to sign on the seal, where possible, and were informed that their individual responses would not be seen by the CHSLD Bayview Center occupational therapist.

Assessment, intervention and evaluation. As in the case of face-to-face wheelchair positioning, participants were seen up to three times for measurement, fitting, and follow-up. All sessions were conducted using videoconferencing, with the Constance-Lethbridge Rehabilitation Center being the host site and the CHSLD Bayview Center being the remote site. Videotapes were made when participants authorized this. During all sessions communication between the Constance-Lethbridge Rehabilitation Center wheelchair team and the client took place in English. Communication with the CHSLD Bayview Center occupational therapists took place in French. Clients were informed of the rationale for this. Sessions were held approximately 2 weeks apart.

The procedure was pre-tested by a pilot participant, who was evaluated 1 week earlier than other participants. The "pilot participant" was selected for good cognitive and social skills in order to provide the team with appropriate feedback on the procedure before conducting videoconferencing and evaluation with the remaining participants. This way, needed adjustments could be made on the fly, a requirement necessitated by the 4 month time frame of the project.

Prior to Session 1, both occupational therapists from CHSLD Bayview Center were given a 1 hour training session on wheelchair measurement. At that time, measuring equipment (wheelchair with tilting back, Vernier ruler, etc.) were loaned to the CHSLD Bayview Center. As in the case of face-to-face evaluations, all required forms (medical prescription and initial evaluation) for all participants were completed by the CHSLD Bayview Center personnel and sent to the Constance-Lethbridge Rehabilitation Center occupational therapist. Eligibility for services and equipment from the Québec government (RAMQ) was determined at the Constance-Lethbridge Rehabilitation Center. In addition, the Videoconferencing and Wheelchair Project Client Characteristics Form / Projet d'évaluation de fauteuil roulant par vidéoconférence : Formulaire des caractéristiques du client was completed by the CHSLD Bayview Center occupational therapist prior to Session 1.

All sessions were carried out using videoconferencing. At the end of each session the client completed the Client Satisfaction Questionnaire - Brief Version and each clinician completed the Videoconferencing And Wheelchair Project Clinician Form / Projet d'évaluation de fauteuil roulant par vidéoconférence : Formulaire du clinicien. If there was any question about the quality of the work carried out through videoconferencing the Constance-Lethbridge Rehabilitation Center wheelchair team or a specially trained wheelchair mechanic made a face-to-face visit to the client. Several times during the course of the study project clinicians met, using videoconferencing, to discuss aspects of the videoconference experience. A typical sequence of testing sessions is as follows.

Session 1. During this session the wheelchair team from the Constance-Lethbridge Rehabilitation Center, with the assistance of the occupational therapist from CHSLD Bayview Center, obtained the needed measurements to fit or modify a wheelchair (i.e., they completed the standard forms used in face-to-face evaluation).

Session 2. Two to 3 weeks later clients typically received their wheelchair or positioning aid. At this time some adjustments to the wheelchair were made to better the fit the client.

Session 3. Where necessary and feasible within the time frame of the study, 2 to 3 weeks after clients received their new wheelchair or positioning aid they were asked how well it worked for them. Clinicians conducted their standard follow-up evaluation protocol. If there were problems, adjustments were made at this time.

RESULTS

A variety of process and outcome aspects were evaluated. These include: the procedure; the quality of the clinical outcomes; the equipment; and the outcome criteria related to client and clinician perspectives. These were evaluated using both qualitative and quantitative methods.

Criteria related to outcome and client and clinician satisfaction were evaluated using the measures described above. Both quantitative and qualitative data were examined for all participants. The basic experimental design is that of an uncontrolled series of case studies with up to 3 testing times (Sessions 1-3) and 5 Perspectives (client / occupational therapist from the Constance-Lethbridge Rehabilitation Center / wheelchair technician from the Constance-Lethbridge Rehabilitation Center / senior occupational therapist from the remote site / junior occupational therapist from the remote site). Because the small number of clients and clinicians is not sufficient for inferential statistical analyses, descriptive statistics in both tabular and graphic form are presented. Clinician scores from each site are combined. Where appropriate, mean scores from the present investigation were compared to results of others.

Comparisons of measures of central tendency in the present investigation showed that means and medians were very similar. Therefore, only means are reported for most analyses.

Clients

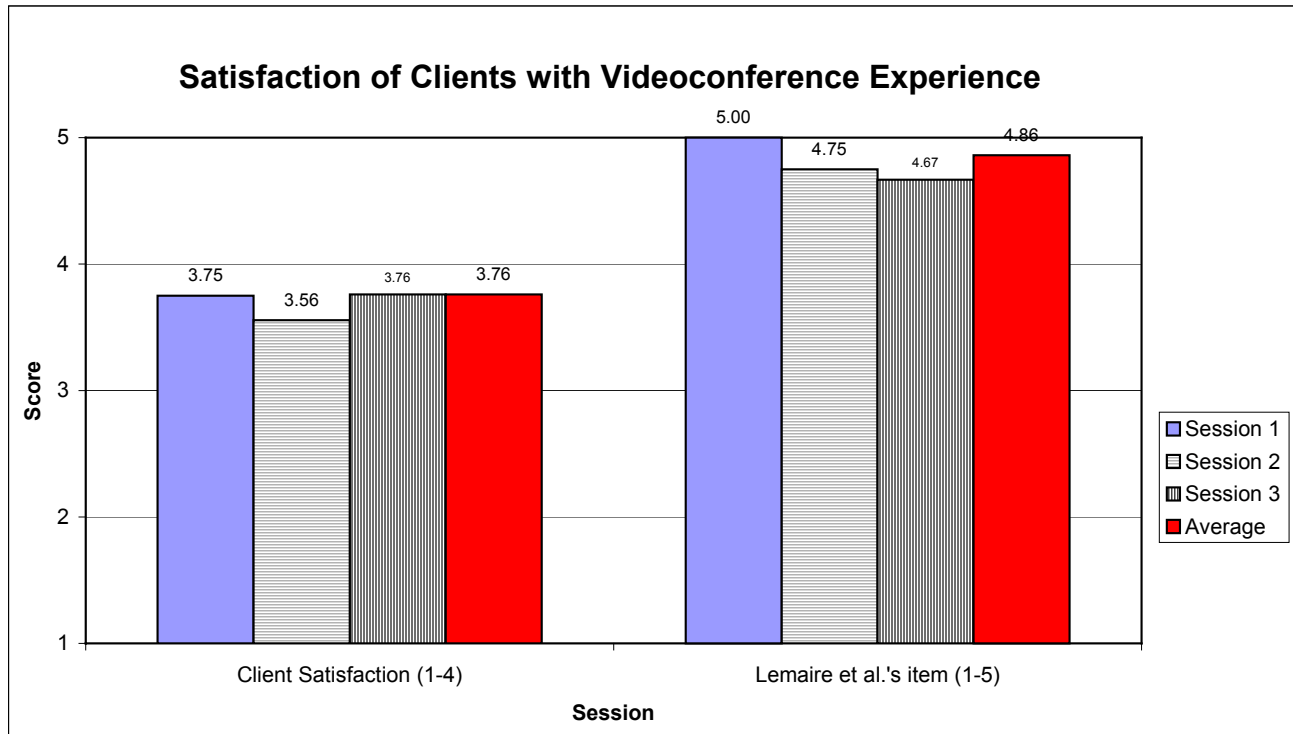
Client characteristics. Of the 6 participants, 1 required revision of a new wheelchair and 4 required a replacement wheelchair. One client unexpectedly required a new battery powered wheelchair with complex positioning. This client was seen only once. Two clients were seen twice and 3 clients were seen 3 times.

Services received. This was their first wheelchair for 2 of the clients. The table below indicates the nature of the wheelchair positioning services the 6 clients received.

Positioning Services Received By The 6 Clients	Service Received	Service Not Necessary
1. manual or power tilt	1	5
2. adjustable angle of seat and backrest unit	0	6
3. modular backrest	0	6
4. shaped backrest	3	3
5. special cushion	3	3
6. pelvic seatbelt	4	2
7. seatbelt tied in the back	1	5
8. table	2	4
9. forearm support	1	5
10. headrest	3	3
11. Other services	2	4

Client satisfaction. It can be seen in Figure 1 below that clients were very highly satisfied with the services they received, and that this was true for all sessions, including their very first experience with videoconferencing. No score fell below the mid-point of the scale and scores on both rating scales compare favorably with normative samples. For example, Lemaire et al.'s (2001) 24 rehabilitation clients scored an average of 3.38 on the 5 point scale, compared to a mean of 4.86 (median = 5) for the present sample.

Figure 1



Videoconferencing Sessions

The wheelchair positioning for 1 client was deemed unsuccessful, as this client needs complex positioning of a power wheelchair. The scores for this client are, however, included in the data. In addition, it was necessary for a Constance-Lethbridge Rehabilitation Center mechanic to make a face-to-face visit to make an adjustment on two occasions (once for each of 2 clients).

It can be seen in Table 2 that 1 client was seen only once (this client was deemed to need face-to-face evaluation) while 2 clients were seen twice and 3 clients were seen 3 times. The average elapsed time between visits was 21 days (range 14-56 days).

Table 2	
Number of Videoconferencing Sessions	
Number of Sessions	Number of Clients
1	1
2	2
3	3
Total = 14	Total = 6

Equipment

Malfunctions. Of the 14 sessions, there were minor equipment malfunctions on 4 occasions (29%). This usually involved temporarily losing the signal and having to reinitialize the system. No session was cancelled due to equipment problems. Time needed to reinstate communication is included in the “online” time calculations.

Problems related to audio, video, and codes of behavior. Solutions to the problems related to audio, video, and codes of behavior were proposed and implemented during team meetings. These are detailed in the Recommendations section below.

Problems related to audio. Examination of clinicians’ comments and team meetings held periodically among clinicians indicates that there were problems related to both the audio as well as the video component of the videoconference experience. Problems with the audio included difficulties hearing clients whose voice was low or who mumbled. In addition, there were sufficient time delays so that clients and clinicians often “spoke over” each other. The remote clinicians were very helpful in noting client verbalizations and pointing these out to the host clinicians.

Problems related to video. There were also issues related to the video component. Although the time lag was noticeable here as well, it did not pose the same difficulties as the audio time lag. Large body movements on the part of the host clinical team members had to be somewhat restricted as these were distracting. The color of clients’ dress, including socks and shoes, was an important issue which sometimes made it difficult to see the position of the client in the wheelchair.

Problems related to codes of behavior. There were also issues related to codes of behavior concerning how to begin and end sessions, and the need to perform formal introductions. Because much of the dialogue was between remote and host clinicians, clients sometimes “tuned out” during evaluation sessions. This meant that when questions were directed toward them, occasionally these were ignored or answered only in part.

Duration of Sessions

It can be seen in Table 3, which provides clinician data averaged for all clinicians, that the mean duration of sessions (on-line time) was approximately 1 hour (range 10 minutes to 2 hours), and that the first sessions generally took the longest, while the third sessions were the shortest. In addition, clinicians spent an average of approximately ½ hour “off-line” performing tasks related to the client and the evaluation session. Again, first sessions occupied more time than second or third sessions. It can be seen in Tables 4 and 5 that the remote clinicians (CHSLD Bayview Center) spent more time than the host clinicians (Constance-Lethbridge Rehabilitation Center).

Clinicians

Clinician evaluations of satisfaction: ratings of satisfaction and outcomes. Table 3 provides summary scores on the Videoconferencing and Wheelchair Project Clinician Form for all clinicians combined. This table also provides “norms” (i.e., scores from Lemaire et al.’s (2001) and Aarnio’ et al.’s (2000) studies). Tables 4 and 5 provide this information for “host” and “remote” clinicians, respectively.

Table 3: All Clinicians

Clinician Ratings: Mean Scores Of All Clinicians					
Item	"Norms" ¹	Mean: All Sessions	Session 1	Session 2	Session 3
On-line time. The number of minutes from initiating the communication session to terminating the communication session	41.65	58.49	85.50	36.11	15.45
Off-line time. The number of minutes spent performing tasks not directly related to the communication session. This includes looking up information, breaks, etc.	27.70	32.57	41.43	30.29	20.45
Ease of use (1-5 rating). The ease of accomplishing the tasks related to this communication session over the videoconference system. (1 = unacceptable, 2 = poor, 3 = acceptable, 4 = good, 5 = excellent)	3.97	4.29	4.32	4.29	4.45
Ability to understand the remote person (1-5 rating). The ease of communication with the other person over the videoconference system (i.e. understand what they want, understand their responses, etc.). (1 = cannot understand, 2 = understand a little, 3 = understand most things, 4 = understand almost everything, 5 = understand everything)	4.28	4.68	4.64	4.72	4.91
Ease of assessment (1-5 rating). The ease of assessing the client over the videoconference system. (1 = much worse than a manual assessment, 2 = worse than a manual assessment, 3 = as easy as a manual assessment, 4 = better than a manual assessment, 5 = much better than a manual assessment)	3.04	2.80	2.77	2.89	3.00
Confidence in assessment results (1-5 rating). The level at which you are sure that the correct assessment was made. (1 = much less confidence than in a manual assessment, 2 = less confidence than in a manual assessment, 3 = as much confidence as in a manual assessment, 4 = more confidence than in a manual assessment, 5 = much more confidence than in a manual assessment)	3.29	2.86	2.86	2.83	3.00
Satisfaction with assessment (1-5 rating). Clinician satisfaction with the client assessment. (1 = unsatisfied (must redo assessment), 2 = poor, 3 = average, 4 = good, 5 = excellent)	3.78	4.02	3.91	4.17	4.36
Outcome (1-4 rating). The decisions were as good as they would have been in the usual way.(1 = fully disagree, 2 = disagree, 3 = agree, 4 = fully agree)	3.92	3.11	3.10	3.17	3.55

¹ Questions are from Lemaire, et al., 2001. The last question is adapted from Aarnio, et al., 2000.

In general, the results show that both host and remote clinicians were generally pleased with videoconferencing and that scores from the present study are similar to those of others. For example, it can be seen in Table 3 that scores of clinicians in this study are somewhat higher on 3 of the 6 items evaluated (Ease of Use, Ability To Understand The Remote Person, and Satisfaction With The Assessment) and somewhat worse on the remaining 3 (Ease Of Assessment, Confidence In The Assessment Results, and Outcome).

It can be seen in Table 4 that Lemaire et al.'s (2001) findings suggest that specialist clinicians are somewhat less satisfied with telehealth evaluations than remote clinicians. Our data in Tables 4 and 5, however, do not indicate any such trend as host clinicians (Table 4) had somewhat higher scores on 3 of the 6 variables while remote clinicians (Table 5) had higher scores on the remaining 3 variables.

Table 4: Host Clinicians

Clinician Ratings: Mean Scores Of "Specialist" Host Clinicians At The Constance-Lethbridge Rehabilitation Center					
Item	"Norms" ¹	Mean: All Sessions	Session 1	Session 2	Session 3
On-line time. The number of minutes from initiating the communication session to terminating the communication session	42.00	59.47	83.83	37.00	15.00
Off-line time. The number of minutes spent performing tasks not directly related to the communication session. This includes looking up information, breaks, etc.	25.70	20.90	27.08	21.00	11.67
Ease of use (1-5 rating). The ease of accomplishing the tasks related to this communication session over the videoconference system. (1 = unacceptable, 2 = poor, 3 = acceptable, 4 = good, 5 = excellent)	3.70	4.36	4.33	4.40	4.50
Ability to understand the remote person (1-5 rating). The ease of communication with the other person over the videoconference system (i.e. understand what they want, understand their responses, etc.). (1 = cannot understand, 2 = understand a little, 3 = understand most things, 4 = understand almost everything, 5 = understand everything)	4.01	4.54	4.58	4.30	4.83
Ease of assessment (1-5 rating). The ease of assessing the client over the videoconference system. (1 = much worse than a manual assessment, 2 = worse than a manual assessment, 3 = as easy as a manual assessment, 4 = better than a manual assessment, 5 = much better than a manual assessment)	2.48	2.81	2.75	3.00	3.00
Confidence in assessment results (1-5 rating). The level at which you are sure that the correct assessment was made. (1 = much less confidence than in a manual assessment, 2 = less confidence than in a manual assessment, 3 = as much confidence as in a manual assessment, 4 = more confidence than in a manual assessment, 5 = much more confidence than in a manual assessment)	2.80	2.89	2.83	3.00	3.00
Satisfaction with assessment (1-5 rating). Clinician satisfaction with the client assessment. (1 = unsatisfied (must redo assessment), 2 = poor, 3 = average, 4 = good, 5 = excellent)	3.34	3.89	3.83	4.20	4.17
Outcome (1-4 rating). The decisions were as good as they would have been in the usual way.(1 = fully disagree, 2 = disagree, 3 = agree, 4 = fully agree)	3.90	2.94	2.92	3.20	3.17

¹ Questions are from Lemaire, et al., 2001. The last question is adapted from Aarnio, et al., 2000.

Table 5: Remote Clinicians

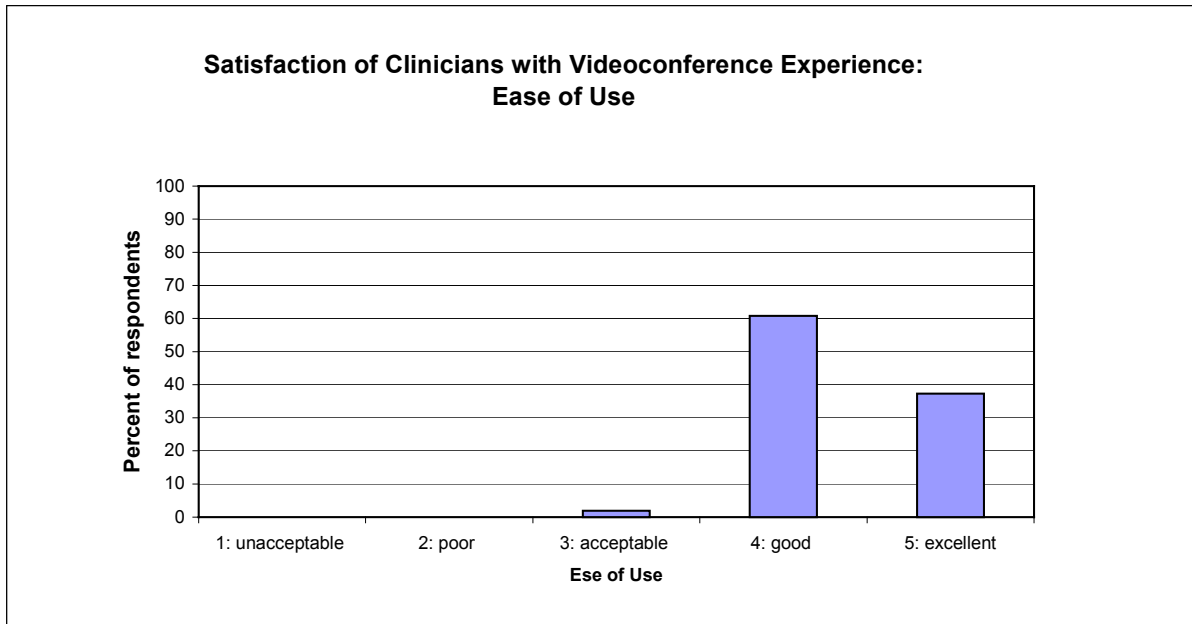
Clinician Ratings: Mean Scores Of Remote Clinicians At The CHSLD Bayview Center					
Item	"Norms" ¹	Mean: All Sessions	Session 1	Session 2	Session 3
On-line time. The number of minutes from initiating the communication session to terminating the communication session	41.30	60.14	86.67	37.00	15.00
Off-line time. The number of minutes spent performing tasks not directly related to the communication session. This includes looking up information, breaks, etc.	29.70	49.03	61.67	43.00	35.83
Ease of use (1-5 rating). The ease of accomplishing the tasks related to this communication session over the videoconference system. (1 = unacceptable, 2 = poor, 3 = acceptable, 4 = good, 5 = excellent)	4.23	4.19	4.33	4.20	4.50
Ability to understand the remote person (1-5 rating). The ease of communication with the other person over the videoconference system (i.e. understand what they want, understand their responses, etc.). (1 = cannot understand, 2 = understand a little, 3 = understand most things, 4 = understand almost everything, 5 = understand everything)	4.55	4.85	4.75	4.90	5.00
Ease of assessment (1-5 rating). The ease of assessing the client over the videoconference system. (1 = much worse than a manual assessment, 2 = worse than a manual assessment, 3 = as easy as a manual assessment, 4 = better than a manual assessment, 5 = much better than a manual assessment)	3.59	2.72	2.67	2.80	3.00
Confidence in assessment results (1-5 rating). The level at which you are sure that the correct assessment was made. (1 = much less confidence than in a manual assessment, 2 = less confidence than in a manual assessment, 3 = as much confidence as in a manual assessment, 4 = more confidence than in a manual assessment, 5 = much more confidence than in a manual assessment)	3.77	2.85	2.92	2.70	3.00
Satisfaction with assessment (1-5 rating). Clinician satisfaction with the client assessment. (1 = unsatisfied (must redo assessment), 2 = poor, 3 = average, 4 = good, 5 = excellent)	4.22	4.24	4.08	4.30	4.67
Outcome (1-4 rating). The decisions were as good as they would have been in the usual way. (1 = fully disagree, 2 = disagree, 3 = agree, 4 = fully agree)	3.94	3.35	3.42	3.30	4.00

¹ Questions are from Lemaire, et al., 2001. The last question is adapted from Aarnio, et al., 2000.

Clinician evaluations of satisfaction: frequency ratings. Among the 4 clinicians who were involved in the 14 videoconferencing evaluation sessions, data for 51 completed evaluations are available. In the case of the remaining 5 sessions one or more of the clinicians were not present at a session or the data are not available.

It can be seen in Figure 2 that on “Ease of Use” most sessions were deemed either good or excellent.

Figure 2



On “Ability to Understand the Remote Person,” it can be seen in Figure 3 that in most instances clinicians understood almost everything said by clients and clinicians at the other location. Nevertheless, on 20% of occasions clinicians indicated that they missed some of the things said by clients and clinicians at the other site.

Figure 3

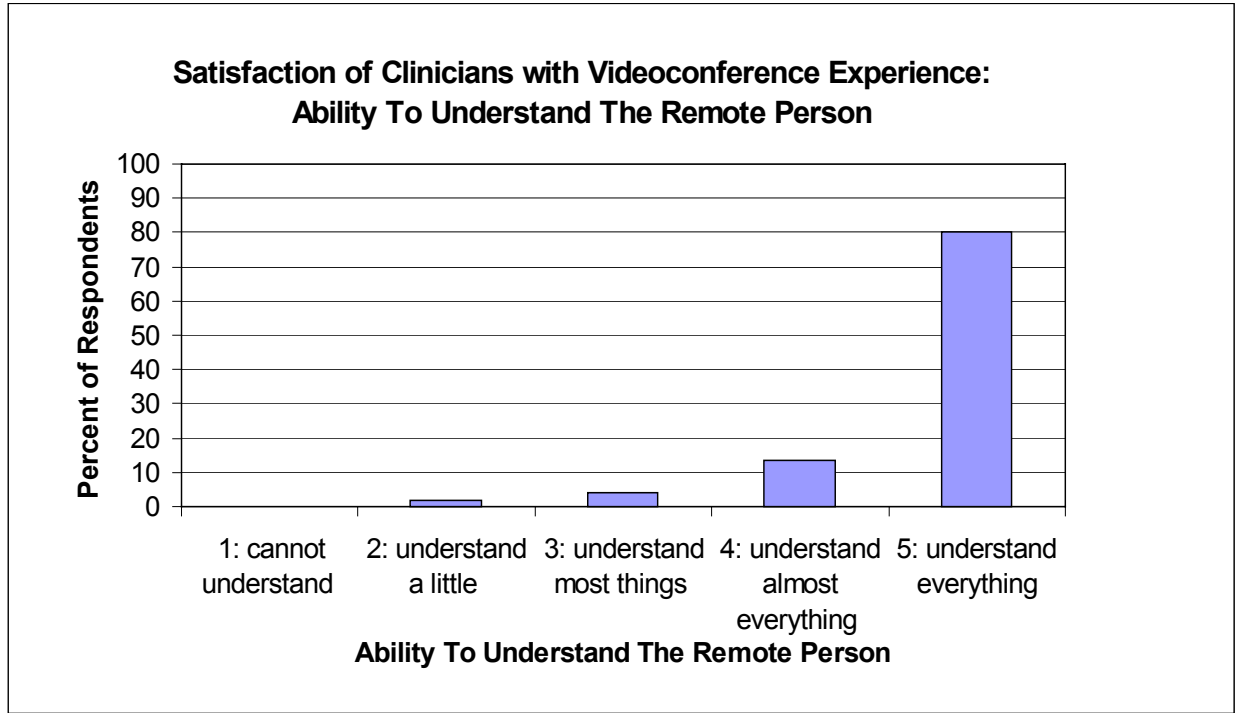
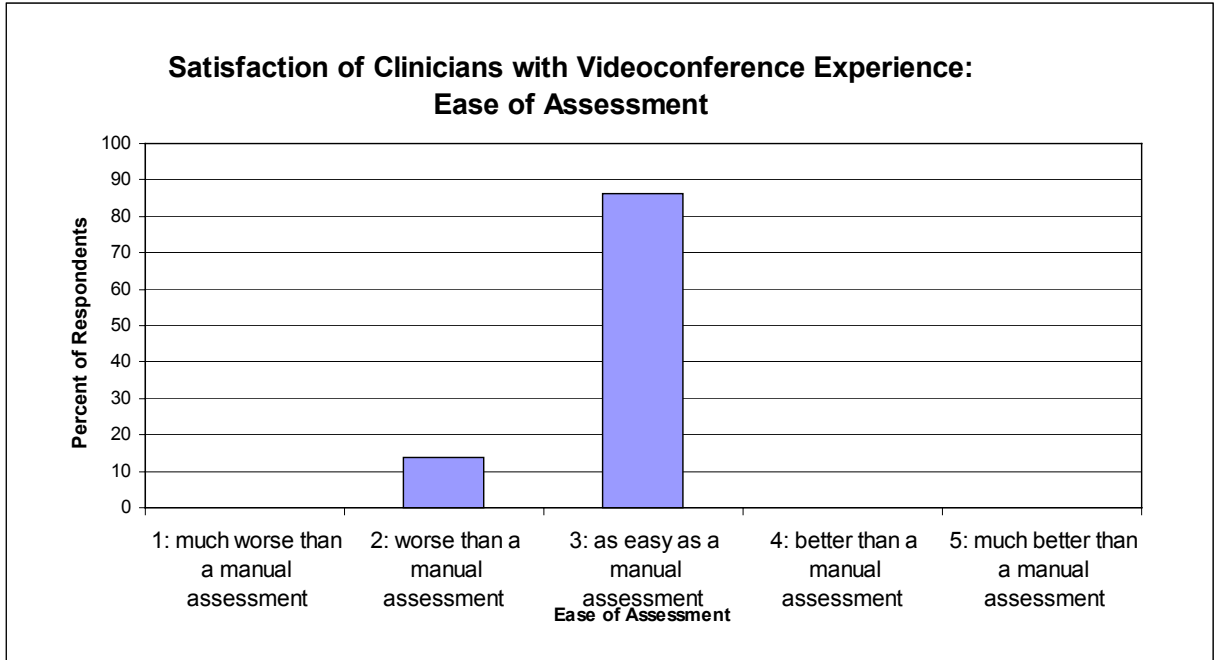


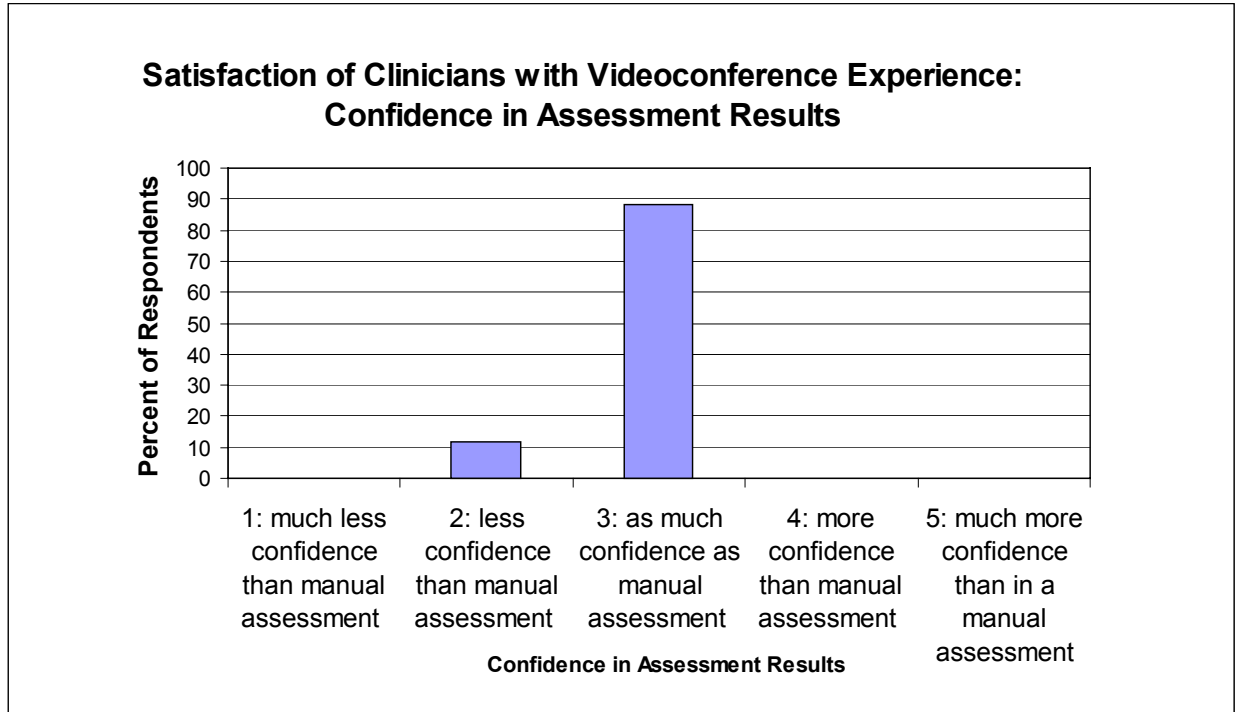
Figure 4 shows that in most cases clinicians felt that “Ease of Assessment” using videoconferencing was equivalent to face-to-face manual assessment. However, in no cases did a clinician feel that it was easier and in a little over 10% of instances they felt that it was worse.

Figure 4



The results are similar for “Confidence In Assessment Results,” as can be seen in Figure 5.

Figure 5



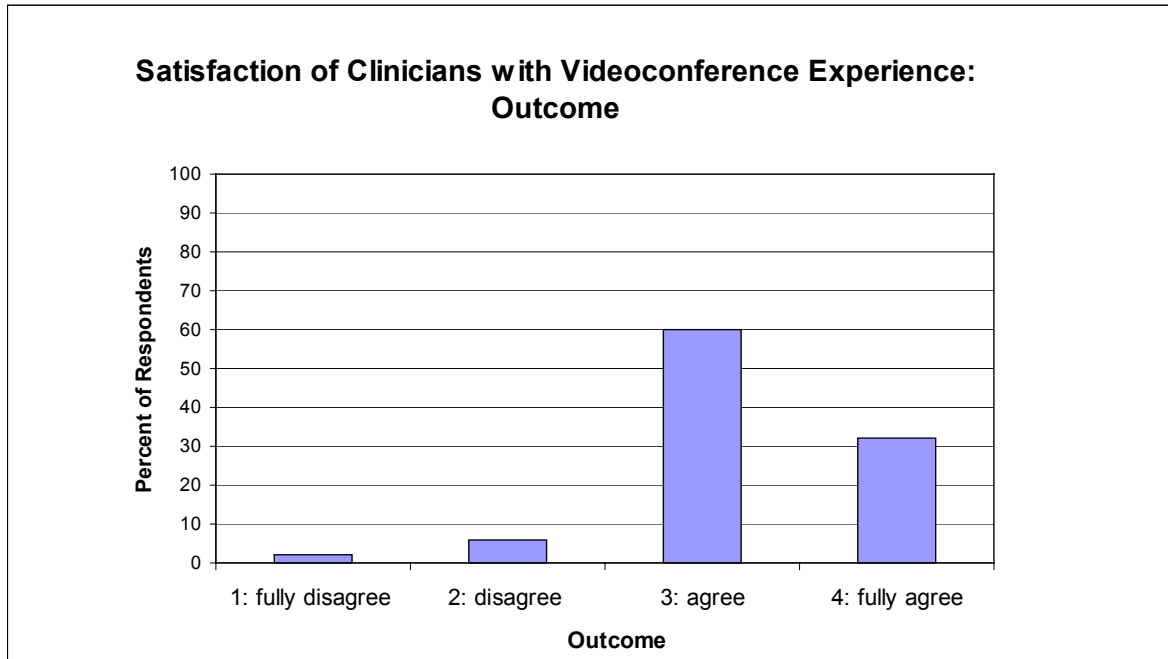
When it came to “Satisfaction with Assessment” (Figure 6), in most cases the score indicated “good.” Approximately equal numbers of instances were deemed excellent and average.

Figure 6



As for clinicians' satisfaction with the "Outcome" of assessments, Figure 7 shows that approximately 90% of decisions were seen to be as good as they would have been had the assessment been done in a face-to-face manner. Nevertheless, close to 10% of decisions were seen as worse.

Figure 7



DISCUSSION

Overall, the results of this preliminary investigation suggest that videoconferencing is a promising technique in the delivery of simple wheelchair positioning rehabilitation services to English speaking clients in French speaking milieux. Clients indicated that they were satisfied with the experience and both specialist and remote clinicians generally felt satisfied and comfortable with the procedures. Only two of the 14 sessions required a face-to-face visit by a mechanic.

Nevertheless, the sample was small, mainly “simple” wheelchair positing was carried out, and the participants were carefully selected. No data were collected about the comparative amount of time that would have been spent in face-to-face evaluations, nor were measurements conducted on the same clients on a face-to-face basis to assess the accuracy of evaluations. In addition, preliminary impressions suggest that sessions using videoconferencing took longer than face-to-face sessions because of the need to explain how to do things to the remote clinicians. Some concern was expressed that “complex” evaluations using videoconferencing may be problematic.

On the positive side, it is worth noting that clinicians may have become better at dialoging with clients because they had to explain the procedures very clearly. Perhaps most important, the present evaluation was conducted on older adults with multiple physical and intellectual impairments. If videoconferencing was seen as successful by both clients and clinicians in such an older and impaired group, the potential of using videoconferencing for younger and more intellectually functional individuals seems truly promising.

Recommendations

Before instituting more broad-based programs, further evaluation should be carried out on a larger number of clients with a wider range of diagnoses. Comparative data from face-to-face evaluations should be obtained. Also, accuracy of evaluations should be determined by having the Constance-Lethbridge Rehabilitation Center wheelchair team re-assess all clients whose evaluations were made using videoconferencing to determine the accuracy of measurements. In addition, an extensive cost effectiveness calculation is necessary to determine the conditions under which videoconferencing is economically justified. Site visits to other locales where telerehabilitation has been well established should also be considered.

It has been pointed out that the videoconferencing environment in telehealth is a new one that is experienced differently than face-to-face interactions. Thus, different rules and cues become important. Jerome and Zaylor (2000) divide these into three groupings. Communication factors involve aspects such as asynchrony between video and audio, interruptions in conversation, and poor audio and delays. As noted in the Results section, such equipment problems were present in our investigation as well. Environmental factors involve the fact that the televised image is two dimensional. This affects depth perception, a crucial concern in wheelchair positioning. Also, lighting is very important as is the distance between the interactants and the camera. Also, movement, which is hardly noticed in a face-to-face environments, can be very distracting on video. Human factors include seeing only what the camera sees, lack of information about what the other side sees, and no well established codes of behavior concerning how to begin and end a videoconference health consultation.

To assist with the delivery of telehealth services a variety of guidelines have been proposed (e.g., Reed at al., 2000; Shaw et. al., 2001; Simpson et al., 2001; Stamm & Perednia, 2000). There are even videoconferencing “etiquette” tips (e.g., Howard, undated). Such guidelines are well worth investigating.

The following list provides a preliminary listing of factors that need to be considered when conducting wheelchair positioning using videoconferencing with older adult clients. These reflect discussions among clinician members or the research team.

Communication factors

- The camera should be located approximately 1 meter from the ground to one side of the monitor.
- The monitor and the camera should be located approximately 2 meters from the client.
- The microphone should be located near the client. The possibility of a separate microphone, to be attached to the clothing of the client, should be considered.
- Because of audio delays and occasional jerky video quality, a faster connection should be considered.

Environmental factors

- Equipment at the remote site should be located in a room suitable for wheelchair positioning (e.g., smooth, non-carpeted floor, easy accessibility).
- The location and wiring of the equipment at the remote site needs to be flexible for different configurations. Long cables and wires are a possibility.
- The room at the remote site needs to have adequate lighting, and a pastel wall. The client in his or her wheelchair needs to be located close to the wall.
- Clothing worn by the client should include very light colors (to contrast with the black of most wheelchairs) or bright colors such as red, yellow, orange, and green. This should include the client's socks and, if possible, footwear.
- To enhance visibility, it may be necessary to cover portions of the wheelchair at the remote site. Pastel blue worked well.

Human factors

- Because of the large number of people, formal introductions need to take place at the beginning of each session and the role of each person needs to be explained to the client.
- Host clinicians should avoid speaking at the same time.
- A longer pause than in conventional speech should be considered after the client is asked a question or when a response is expected from the client.
- When asking the client a question, it may help to preface this by his or her name to call attention to the fact that it is the client rather than a remote clinician who is being addressed.
- It is recommended that when all other activities are completed that the client be asked something to the effect, "Mrs. X, is there anything else you would like to tell us or is there anything else you would like us to explain."
- During pauses in positioning the client, the client should be facing the television monitor.
- The client should be informed about what is happening and what the remote occupational therapists(s) will be doing.
- The remote occupational therapist needs to be sensitive to vocalizations and nonverbal cues and gestures of the client because these may not appear on the screen of the specialist host team. The remote occupational therapist may need to prompt the host team to query the client about these (e.g., when the client mumbles or looks puzzled by a question posed by the specialist host team).
- Provision needs to be made to conduct face-to-face evaluations when this is recommended by the clinicians.

CONCLUSIONS

This preliminary evaluation helped show that aspects of the overall project objectives were met and that videoconferencing holds strong potential to provide rehabilitation services for English-speaking individuals in primarily francophone locales in Québec. The evaluation also helped with the identification of requirements for long-term sustainability of videoconferencing services and programs in rehabilitation and allowed formulation of recommendations regarding elements essential for further development and evaluation of telerehabilitation services using videoconferencing.

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APPENDICES

Appendix A: Measures

- Client Satisfaction Questionnaire - Brief Version
- Videoconferencing And Wheelchair Project Clinician Form / Projet d'évaluation de fauteuil roulant par vidéoconférence : Formulaire du clinicien
- Videoconferencing and Wheelchair Project Client Characteristics Form / Projet d'évaluation de fauteuil roulant par vidéoconférence : Formulaire des caractéristiques du client

Client Satisfaction Questionnaire - Brief Version

Please help us improve our program by answering some questions about the services you have received today.

Please circle your answer.

Name: _____ **Date:** _____

1. To what extent has our program met your needs?

1 None of my needs have been met	2 Only a few of my needs have been met	3 Most of my needs have been met	4 Almost all of my needs have been met
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2. In an overall, general sense, how satisfied are you with the service you received?

1 Quite dissatisfied	2 Indifferent or mildly satisfied	3 Mostly satisfied	4 Very satisfied
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3. If you were to seek help again, would you come back to our program?

1 No, definitely not	2 No, I don't think so	3 Yes, I think so	4 Yes, definitely
-------------------------	---------------------------	----------------------	----------------------

4. Please rate your satisfaction with this videoconferencing session.

1 Poor	2 Below average	3 Average	4 Above average	5 Excellent
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5. Please tell us how you felt about the television experience. Write your comments on the back.

Vide Conferencing and Wheelchair Project Clinician Form

1. **Date** _____

2. **Clinician's name** _____

3. **Client's name** _____

4. **Session**

1. Measurement
2. Fitting
3. Follow-up
4. Other (specify) _____

5. **Start.**¹ When did the videoconferencing session start? _____

6. **End.**¹ When did it end? _____

____ min. 7. **On-line time.**¹ The number of minutes from initiating the communication session to terminating the communication session (Question 6 - Question 5 in minutes)

____ min. 8. **Off-line time.**¹ The number of minutes spent performing tasks not directly related to the communication session. This includes looking up information, breaks, etc.

____ 9. **Videoconferencing malfunctions (yes = 1 or no = 2).** Indicate if a videoconferencing problem occurs during the communication session. This includes losing the communication line, program crashing, inability to access a program feature because of a hardware or software problem, etc. Please indicate yes or no and describe the problem.

____ 10. **Ease of use (1-5 rating).** The ease of accomplishing the tasks related to this communication session over the videoconference system. Please enter 1 to 5 where:

- 1 = unacceptable
- 2 = poor
- 3 = acceptable
- 4 = good
- 5 = excellent

____ 11. **Ability to understand the remote person (1-5 rating).** The ease of communication with the other person over the videoconference system (i.e. understand what they want, understand their responses, etc.). Please enter 1 to 5 where:

- 1 = cannot understand
- 2 = understand a little
- 3 = understand most things
- 4 = understand almost everything
- 5 = understand everything

¹ All of the time, including the calibration of the video equipment and time spent discussing clients prior to their arrival as well as the videoconferenced wrap-up among clinicians is counted. If other issues related to the research or to other matters not related to the client or his/her videoconferencing session are discussed, that time is excluded. Lost time due to equipment/connection malfunctions is counted as part of the videoconferencing "on-line time."

- _____ 12. **Ease of assessment (1-5 rating).** The ease of assessing the client over the videoconference system. Please enter 1 to 5 where:
- 1 = much worse than a manual assessment
 - 2 = worse than a manual assessment
 - 3 = as easy as a manual assessment
 - 4 = better than a manual assessment
 - 5 = much better than a manual assessment
- _____ 13. **Confidence in assessment results (1-5 rating).** The level at which you are sure that the correct assessment was made. Please enter 1 to 5 where:
- 1 = much less confidence than in a manual assessment
 - 2 = less confidence than in a manual assessment
 - 3 = as much confidence as in a manual assessment
 - 4 = more confidence than in a manual assessment
 - 5 = much more confidence than in a manual assessment
- _____ 14. **Satisfaction with assessment (1-5 rating).** Clinician satisfaction with the client assessment. Please enter 1 to 5 where:
- 1 = unsatisfied (must redo assessment)
 - 2 = poor
 - 3 = average
 - 4 = good
 - 5 = excellent
- _____ 15. **Outcome (1-4 rating).** The decisions were as good as they would have been in the usual way.
- 1 = fully disagree
 - 2 = disagree
 - 3 = agree
 - 4 = fully agree

Comments:

(Questions 7-14 are from Lemaire, E.D., Boudrias, Y. & Greene, G. (2001). Low-bandwidth, internet based videoconferencing for physical rehabilitation consultations. *Journal of Telemedicine and Telecare*, 7, 82-89. Question 15 is adapted from Aarnio, P., Rudenberg, H., Ellonen, M., & Jaatinen, P. (2000). User satisfaction with teleconsultations for surgery. *Journal of Telemedicine & Telecare*, 6(4), 237-241.)

Projet d'évaluation de fauteuil roulant par vidéoconférence : Formulaire du clinicien

1. **Date** _____

2. **Nom du clinicien** _____

3 **Nom du client** _____

4. **Session**

1. Prise de mesures
2. Essai
3. Suivi
4. Autre (spécifier) _____

5. **Début.**¹ À quelle heure a débuté la session de vidéoconférence? _____

6. **Fin.**¹ À quelle heure s'est terminée la session de vidéoconférence?

___ min. 7. **Temps direct.**¹ Nombre de minutes du début à la fin de la communication par vidéoconférence (Question 6 - Question 5 en minutes)

___ min. 8. **Temps indirect.**¹ Nombre de minutes passées à faire des tâches non reliées à la communication par vidéoconférence. Par exemple chercher de l'information, pause, etc.

___ 9. **Défaillance de la vidéoconférence (oui = 1 ou non = 2).** Indiquer s'il y a eu défaillance durant la communication par vidéoconférence. Par exemple, perdre la communication, incapacité à utiliser certaines fonctions, etc. SVP indiquer oui ou non et décrire le problème.

___ 10. **Facilité d'utilisation (échelle de 1 à 5).** Facilité à accomplir les tâches reliées à cette session de vidéoconférence. SVP indiquer la réponse de 1 à 5 selon l'échelle suivante:

- 1 = inacceptable
- 2 = pauvre
- 3 = acceptable
- 4 = bon
- 5 = excellent

___ 11. **Capacité à comprendre l'interlocuteur à distance (échelle de 1 à 5)** Facilité de communication avec l'autre personne par vidéoconférence. (ex; comprendre ce qu'elle veut, comprendre sa réponse, etc.). SVP indiquer la réponse selon l'échelle suivante:

- 1 = ne comprend rien
- 2 = comprend un peu
- 3 = comprend la majorité
- 4 = comprend presque tout
- 5 = comprend tout

¹ Tout le temps est compté, incluant le calibrage de l'équipement vidéo et le temps utilisé à discuter les clients avant leur arrivée ainsi que les discussions entre cliniciens après les rencontre avec les clients. Lorsque d'autres questions reliés au projet de recherche ou d'autre sujets non relié aux clients ou à leurs sessions de vidéoconférence sont discutés, ce temps est exclu. Le temps perdu en raison d'une défaillance de l'équipement ou de la liaison est compté en temps direct.

- _____ 12. **Facilité d'évaluation (échelle de 1 à 5).** Facilité d'évaluer le client par vidéoconférence : SVP indiquer la réponse selon l'échelle suivante
- 1 = bien pire qu'une évaluation standard
 - 2 = pire qu'une évaluation standard
 - 3 = aussi facile qu'une évaluation standard
 - 4 = mieux qu'une évaluation standard
 - 5 = bien mieux qu'une évaluation standard
- _____ 13. **Confiance aux résultats de l'évaluation (échelle de 1 à 5).** Niveau de certitude que l'évaluation a été correct : SVP indiquer la réponse selon l'échelle suivante
- 1 = bien moins confiance qu'une évaluation standard
 - 2 = moins confiance qu'une évaluation standard
 - 3 = aussi confiance qu'une évaluation standard
 - 4 = moins confiance qu'une évaluation standard
 - 5 = bien plus confiance qu'une évaluation standard
- _____ 14. **Satisfaction de l'évaluation (échelle de 1 à 5).** Satisfaction du clinicien en regard de l'évaluation du client
- 1 = insatisfait (doit refaire l'évaluation)
 - 2 = pauvre
 - 3 = moyen
 - 4 = bon
 - 5 = excellent
- _____ 15. **Résultats (échelle de 1 à 4). Les décisions sont aussi bonnes qu'elles l'auraient été de la façon habituelle.**
- 1 = complètement en désaccord
 - 2 = désaccord
 - 3 = d'accord
 - 4 = complètement en accord

Commentaires:

(Les questions 7-14 proviennent de Lemaire, E.D., Boudrias, Y. & Greene, G. (2001). Low-bandwidth, internet based videoconferencing for physical rehabilitation consultations. *Journal of Telemedicine and Telecare*, 7, 82-89. La question 15 est adaptée de Aarnio, P., Rudenberg, H., Ellonen, M., & Jaatinen, P. (2000). User satisfaction with teleconsultations for surgery. *Journal of Telemedicine & Telecare*, 6(4), 237-241.)

Videoconferencing and Wheelchair Project Client Characteristics Form

1. **Client's name** _____

2. **Sex**

1= Female

2 =Male

3. **Age** _____

4. **Cognitive competency:**

_____ Modified MMSE (Date: _____)

_____ CASE (Date: _____)

5. **Residence**

1. apartment or house
2. assisted living arrangement
3. nursing or chronic care facility
4. other (specify) _____

6. **Diagnosis**

7. **Interventions**

1. revision of positioning aid
2. new wheelchair without positioning
3. new wheelchair with positioning - simple
4. new wheelchair with positioning - complex
5. repairs
6. other (specify) _____

8. **Wheelchair**

1. first
2. replacement of wheelchair

9. **Type**

1. manual
2. motorized
3. wheeled base

10. **Positioning**

1. manual or power tilt
2. adjustable angle of seat and backrest unit
3. modular backrest
4. shaped backrest
5. special cushion
6. pelvic seatbelt
7. seatbelt tied in the back
8. table
9. forearm support
10. headrest
11. others (specify) _____

Comments. Please make any additional comments on the back of this page.

Projet d'évaluation de fauteuil roulant par vidéoconférence : Formulaire des caractéristiques du client

1. **Nom du client** _____

2. **Sexe**

1= Féminin

2 =Masculin

3. **Âge** _____

4. **Compétences cognitives:**

_____ MMSE Modifié (Date: _____)

_____ PEPCA-2R (Date: _____)

5. **Résidence**

1. appartement ou maison
2. logement supervisé
3. centre hospitalier de soins de longues durées
4. autre (spécifier) _____

6. **Diagnostic**

7. **Interventions**

1. révision de positionnement
2. nouveau fauteuil roulant sans positionnement
3. nouveau fauteuil roulant avec positionnement - simple
4. nouveau fauteuil roulant avec positionnement - complexe
5. réparations
6. autre (spécifier) _____

8. **fauteuil roulant**

1. premier
2. remplacement du fauteuil roulant

9. **Type**

1. manuel
2. motorisé
3. base roulante de positionnement

10. **Positionnement**

1. bascule manuelle ou motorisée
2. angle siège-dossier ajustable
3. dossier modulaire
4. dossier formé
5. coussin spécial
6. ceinture pelvienne
7. ceinture attachée à l'arrière
8. table
9. gouttière
10. appui-tête
11. autres (spécifier) _____

Commentaires. SVP inclure tout commentaire additionnel au verso de cette page.

Appendix B: Ethics Approval and Consent Forms

- Constance-Lethbridge Rehabilitation Center : Certificat d'éthique
- Information and Consent Form
- Authorisation for: Photographs, Films, Tape-Recordings, Videotapes And Other Documents (AH-217A-2 (rev. 87-12))

Centre de réadaptation
Constance-Lethbridge
Rehabilitation Centre

CERTIFICAT D'ÉTHIQUE

La présente est pour certifier que le projet :

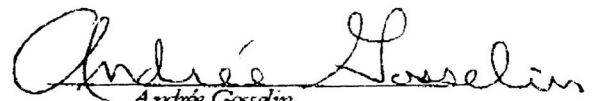
***Videoconferencing and Wheelchair Positioning Pilot
Study Protocol Proposal***

Présenté par :

*Madame Geneviève Lefebvre, chercheuse principale et
Madame Catherine S. Fichten, chercheuse consultante*

*a été étudié et a reçu l'approbation du comité d'éthique du
Centre de réadaptation Constance-Lethbridge*

AG/km


Andrée Gosselin
Responsable du Comité de recherche
et du Comité d'éthique

Date: 3 mai 2002



**INFORMATION AND CONSENT FORM
VIDEOCONFERENCING AND WHEELCHAIR PROJECT
Principal Investigator: Genevieve Lefebvre, B.Sc. (O.T.)**

INTRODUCTION

The overall goal of this project is to evaluate the delivery of rehabilitation services to English speaking clients in francophone locations with the help of videoconferencing. Videoconferencing involves the use of a television and a video camera.

You are being asked to take part in this study which involves fitting your wheelchair by the Bayview occupational therapist with the help of videoconferencing with the wheelchair team from the Constance-Lethbridge Rehabilitation Center. The team from Constance-Lethbridge will communicate with you in English and with the Bayview occupational therapist in French.

Some information, such as your age and diagnosis, will be gathered from your Bayview file.

STUDY PROCEDURES

Step 1: You and the occupational therapist at Bayview Center will discuss your needs with the wheelchair team from the Constance-Lethbridge Rehabilitation Center using videoconferencing. You will then be measured for your wheelchair and for any positioning aids you may need. You will be asked to answer some questions about the experience of being evaluated in this way. The whole process will take approximately 1 hour.

Step 2: About 2 weeks later you will receive your wheelchair. At this time some adjustments to the wheelchair will be made to better fit you. This will also be carried out with the assistance of videoconferencing. Again, you will be asked to answer some questions related to the experience. This step will take between 1/2 hour to 1 hour.

Step 3: About 2 weeks after you receive your wheelchair you will be asked how well it works for you. If there are problems, adjustments will be made at this time. This will also be carried out with the assistance of videoconferencing. Again, you will be asked to answer some questions related to the experience. This step will take between 1/2 hour to 1 hour.

POTENTIAL BENEFITS AND RISKS

Potential Benefits: Participation in this study will probably mean that you will receive your wheelchair and positioning aids more quickly.

Risks: Although published studies suggest that there are no risks associated with fitting your wheelchair in this way, there exists the possibility that your wheelchair will not fit you as well as it should. If this should be the case, your wheelchair will be fitted by the Constance Lethbridge wheelchair team in the traditional face-to-face way.

YOUR RIGHTS

Participation in this research will be confidential. Your rights to receive needed equipment and care will not, in any way, be jeopardized by your participation in this study.

If results of this study are published, your part in the study will be completely anonymous and your privacy will be protected.

Later, you will be asked for permission to videotape the sessions with you. You do not need to agree to be videotaped in order to participate in this study. If you do agree to be videotaped by signing a separate form to authorize videotaping, you should specify how your videotape may be used on the authorization form. This may place limits on your anonymity.

You have the right to request an interview with a senior member of the team to discuss any problem you may be experiencing related to this study. You may ask questions of the occupational therapist at the Bayview Center. You may also discuss any questions or concerns you have about this study with the Principal Investigator, Genevieve Lefebvre (514-487-1891, extension 351) or with the Bayview Center Director of Hospital Services, Barbara Guillon (514-695-9384 extension 241).

You have the right to withdraw from the study at this or any other time, without affecting your medical care.

SIGNATURES

The study has been explained to me and my questions have been answered to my satisfaction. I have been given a copy of this form and I agree to participate in this study conducted at the Bayview Center.

Date: _____

Participant's signature: _____

Witness' signature: _____

Authorization for: Photographs, Films, Tape-Recordings, Videotapes And Other Documents

Name : _____

Medicare number : _____

I, the undersigned, _____

Authorize the establishment _____

To make the :	Yes	No
Photographs	<input type="checkbox"/>	<input type="checkbox"/>
Films	<input type="checkbox"/>	<input type="checkbox"/>
Tape-recordings	<input type="checkbox"/>	<input type="checkbox"/>
Videotapes	<input type="checkbox"/>	<input type="checkbox"/>
Other documents (specify)	<input type="checkbox"/>	<input type="checkbox"/>

Requested by _____

and to utilize and publish them for the following medical, scientific or

educational purposes : _____

I authorize the utilization and publication of the photographs, films, tape-recordings and other documents in the following manner :

a) preserving anonymity

or

b) permitting identification

Signatory: beneficiary or authorized person

Date: year, month, day

Witness to the signature

Date: year, month, day