



Telehealth Projects: A Practical Guide

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ABSTRACT

Telehealth is a term that broadly refers to the use of information and telecommunication technology to assist with the delivery of health information and services by facilitating the transmission of images, voice and other data over large and small distances. Telehealth can be viewed as a modality rather than a service itself - a tool used to support the delivery of health services and information.

Telehealth, telemedicine and **eHealth** are words that are often used interchangeably. **Telemedicine** typically reflects physician-based telehealth services, while **eHealth** most often refers to Internet-based telehealth services. **Telehealth** is the 'umbrella-term' under which the other two fall and is used throughout this document.

A telehealth system is made up of three components:

- **People** (i.e., the telehealth users and providers of health services);
- **Telehealth application technology** (i.e., the hardware, software and peripheral devices); and
- **Telecommunications and network links** (e.g., telephone lines, Internet, satellites and digital networks).

Through telehealth, health information and services become more accessible to both the consumers and the providers of health services, regardless of whether they are residing in urban, rural or remote communities. For example, telehealth provides British Columbians with ready access to reliable health information and advice from health professionals via the B.C. HealthGuide Online web site and 24-hour NurseLine call centre.

Technology is an important component of telehealth. However, technology is not what is at the heart of telehealth. The most critical factor for success lies in the skill, experience and enthusiasm of the people involved. Experience in Canada has revealed that an essential part of any telehealth project or program is the site coordinator, who plays an invaluable role in the day-to-day coordination of telehealth activities.

This document is intended to act as a practical guide to assist any organization or individual with the start-up and successful implementation of telehealth projects in British Columbia, and may be particularly useful for those personnel or organizations new to telehealth. It highlights a list of key considerations to be taken into account when developing telehealth projects in British Columbia and places an emphasis on the adoption of sound leadership, planning and management of telehealth projects.

A variety of telehealth project enablers and barriers are identified in this document, which is based on a review of lessons learned from telehealth projects to date. In preparation of this practical guide, knowledge was drawn from a variety of key telehealth experts in Canada in both the health care sector and the information technology industry. Included with the guide are a Telehealth Project Planning Framework (Appendix A) and a Telehealth Project Development Checklist (Appendix B). It is hoped that these tools and guidelines will aid those involved in the development of telehealth projects in creating successful and sustainable systems.

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1.0 Purpose of the Document

This document is intended to act as a practical guide to assist with the start-up and successful implementation of telehealth projects in British Columbia, and may be particularly useful for those individuals or organizations new to telehealth.

It highlights a list of key considerations to be taken into account when developing telehealth projects in British Columbia, and places an emphasis on the adoption of sound leadership, planning and management of telehealth projects.

Included in the document are a **Telehealth Project Planning Framework (Appendix A)** and a **Telehealth Project Development Checklist (Appendix B)**, tools designed to aid in the planning and development stages.

Telehealth Projects: A Practical Guide identifies a variety of telehealth project enablers and barriers, and is based on a review of lessons learned from telehealth projects to date. In preparation of this document, knowledge was drawn from a variety of key telehealth experts in Canada in both the health care sector and the information technology industry. Among others, contact was made with:

- Health Canada
- Provincial Health Care Ministries and other public bodies
- National and Provincial Health Professional Associations
- Health Information Industry
- University Faculties of Medicine and Health Research
- Health Professional Licensing Authorities
- Schools of Health Information Science and Technology
- The Health Association of British Columbia
- Telehealth Technology and Telecommunications Providers

2.0 Introduction

The introduction of health care reform and regionalization within British Columbia's health care system has increased the need for information sharing among health care partners. As a result, health professionals, administrators and consumers of health services are becoming more aware of the benefits of communication and information technologies and network infrastructures. One example of such is telehealth.

Telehealth is an emerging field that has the potential to benefit both the consumers and providers of health services. It can:

- help eliminate distance barriers and improve access to quality health services or information that otherwise are not available in rural communities.
- play an invaluable role in emergency and critical care situations where moving a patient may be undesirable and/or not feasible.
- facilitate patient and rural practitioners' access to specialist health services and support.
- provide the public with ways to access health information and advice from health professionals in their homes, schools, community centres or libraries, thereby enabling the public to be more active in the management of their own health.
- lessen the inconvenience and/or cost of patient transfers.
- reduce unnecessary travel time for health professionals and improve the ability to recruit and retain health professionals.
- reduce rural practice isolation by enhancing physician, nurse and allied health professional access to colleagues, specialists and education.

2.1 Telehealth, Telemedicine and eHealth – Meaning of Terms

Telehealth, telemedicine and eHealth are terms that are often used interchangeably. **Telehealth** can broadly be defined as:

The use of information and communications technologies to deliver health information and services over both long and short distances.

Telemedicine generally reflects the provision of physician-based telehealth services. **eHealth** refers to using the Internet, such as an open global network of interconnected commercial, educational and governmental computer networks, as the network communication channel for providing *telehealth* services. It is a term created as a result of the introduction of e-commerce and most frequently used by the business community and by consumers of Internet-based health services.

Please note that although telehealth, telemedicine and eHealth are often used interchangeably, the term telehealth is used throughout this document. It is the umbrella-term under which telemedicine and eHealth typically fall.

2.2 Provincial Vision Statement for Telehealth

“A health system in which telehealth technology is used effectively as a tool to improve the health of the people of the province, by enabling the delivery of accessible, affordable and efficient quality health services.” [Telehealth in British Columbia: A Vision for the 21st Century, British Columbia Ministry of Health, 1999]

3.0 Composition of a Telehealth System

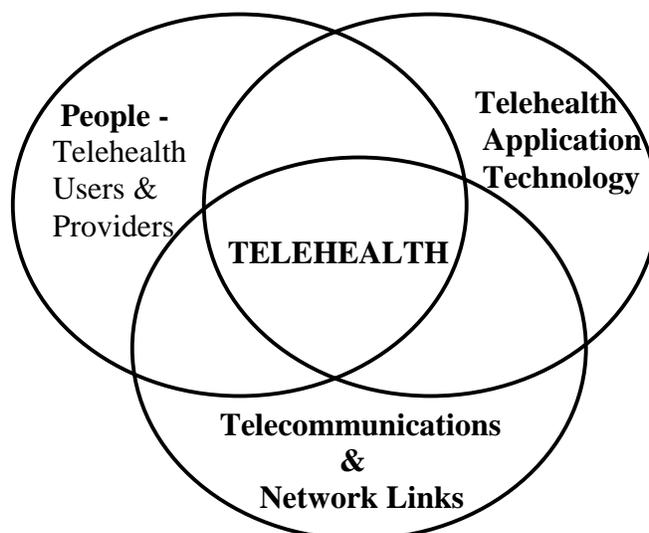
When people picture telehealth they tend to think of technology. However, technology is only one part of a telehealth system. Telehealth is a multidisciplinary undertaking that requires the support and cooperation of the people and communities involved in conjunction with expertise from telecommunications, health care and information technology sectors. Hence, telehealth is *not just about technology*. It is also about *people* and *organizations*.

Figure 1

MODEL OF A TELEHEALTH SYSTEM

A telehealth system can be divided into three different components:

1. **People - Telehealth Users & Providers** at remote and main location(s): health care providers, patients, communities, researchers and health administrators.
2. **Telehealth Application Technology** at remote and main location(s): hardware, software and peripheral devices.
3. **Telecommunications and Network Links** between remote and main location(s): plain old telephone systems, dial-up digital telephone lines (ISDN, Sw-56), Asynchronous transfer modes, Internet and virtual private networks.



3.1 People - Telehealth Users and Providers

Although technology is important, the users of the telehealth system are really its most important component. In the past, telehealth projects have failed for a variety of reasons including a lack of leadership, coordination and awareness of projects by health professionals; a reluctance to change current practices by users and providers; and a failure to provide sufficient health information technology training to health care providers.

Experience in Canada has shown that a telehealth project may be successful when:

- *project champions* have been identified at main and remote telehealth sites.
- *key and keen users* have been carefully recognized among health care providers and patients.
- *user training and support* has been provided and adapted to reflect cultural and linguistic diversity.

3.2 Telehealth Application Technology

The scope of telehealth applications is vast and ever changing with the continual introduction of new application technologies, and there is a wide range of telehealth application technologies on the market. These technologies can be classified into three components: hardware, software and peripheral devices. Together they provide a means to receive, capture, process, display and store input in either data, audio or real-time video format. Telehealth can make use of **different modes of delivery** including **real-time** interaction, **store and forward** interaction, or a combination of both.

➤ **Example of Store and Forward Interaction: Tele-Radiology**

- In a rural community telehealth site, a patient x-ray is scanned and captured as an electronic file.
- This file, including accompanying medical notes, is sent electronically to the physician in the tertiary care telehealth site.
- The radiologist in the tertiary care site opens the file and reviews the x-rays and notes in order to confirm and/or determine a diagnosis.
- The file and accompanying notes are then returned to the rural telehealth site.
- The patient is informed of diagnosis without having to meet the radiologist.

➤ **Example of Real-Time Interaction: Tele-Psychiatry**

- A patient is in the video conferencing room of a rural community telehealth site.
- At the same time the patient's psychiatrist is in the video conferencing room at the specialist centre for psychiatry.
- Live interactive consultation takes place between the patient and the psychiatrist.

➤ **Example of Combination of Store and Forward & Real-Time Interaction:
Tele-Dermatology**

- In a rural community telehealth site, a patient is diagnosed with a skin condition by a dermatologist located in a remote specialist centre using real-time interactive consultation and use of a camera.
- Following one week of treatment, the patient's skin condition has improved, and a staff member takes a new photographic image.
- The photographic image is forwarded to the dermatologist in the remote location for further follow-up and review.

3.3 Telecommunications and Network Links

Telecommunications technology networks provide the means to link telehealth sites and to transfer telehealth information from one telehealth site to another. Presently, telecommunications technology offers five standard media for transmitting information: copper wire, fibre optic cable, co-axial cable, satellite and microwave.

There are many types of telecommunications and network technologies, including:

Telephony

- Plain old telephone system (POTS), also known as analog telephone lines
- Narrowband dial-up digital telephone lines e.g. Integrated Service Digital Networks (ISDN) and Switched-56 (SW-56)

The Internet and Virtual Private Networks

- Modems
- Various Digital Subscriber Line (xDSL)
- Guaranteed and non-guaranteed bandwidth packet-switched networks

Broadband/High Speed Digital Networks

- Asynchronous Transfer Mode (ATM)
- Integrated Service Digital Networks (ISDN)
- Local Area Network (LAN)

Dedicated Point-to-Point Facilities

- Land lines and Satellite – Geo-synchronous and Low Earth Orbit (LEO)

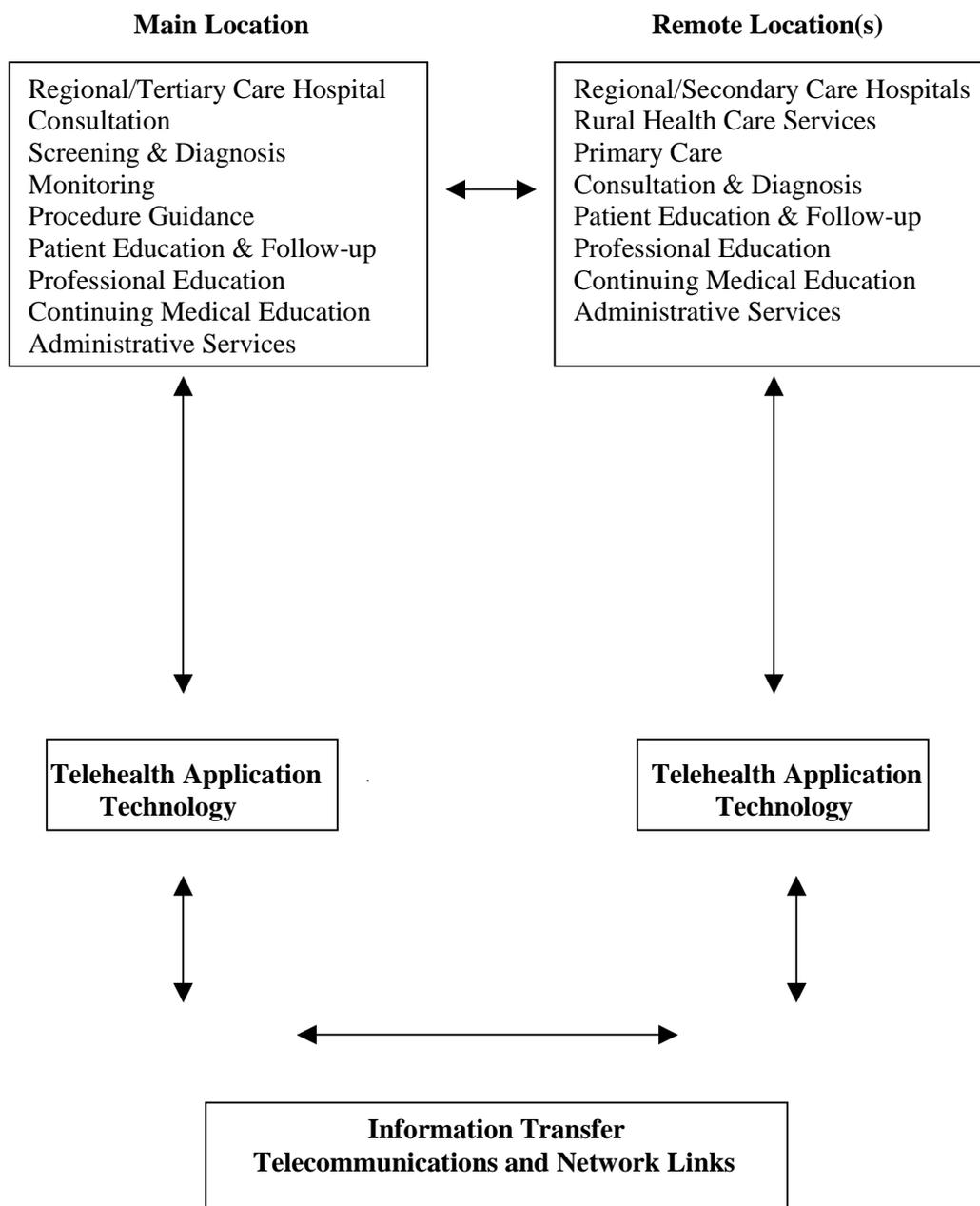
Note:

Links between telehealth sites can be *point-to-point* (one site interacts with another site), or *multi-point* (three or more sites interact at the same time).

Multi-point connections usually require the use of *a bridge* and/or *a gateway* (Review Section 6.5).

Figure 2

Outline of Telehealth Structure Between a Remote and a Main Health Location



4.0 Categorization of a Telehealth Project

There is no universally accepted method for the classification of telehealth projects. In general, telehealth projects within Canada have been loosely categorized according to the following:

- application of the technology - *clinical, educational and administrative*
- typology of the project by *process, specialty and sub-specialty* (e.g. tele-psychiatry)

In order to effectively describe telehealth projects, the following categories can be considered:

Telehealth projects by:

- Process (Figure 3)
- Application, Specialty and Subspecialty (Figure 4)
- Technical Equipment (Figure 5)
- Telecommunications and Network Link (Figure 6)
- Mode of Delivery (Figure 7)
- User & Provider (Figure 8)

**Figure 3
Telehealth Project by Process**

Tele-care (patient care and support) Tele-consultation Tele-diagnosis Tele-learning, mentoring and training Tele-monitoring Tele-meeting (clinical, educational, administrative) Tele-screening Tele-surgery

**Figure 4
Telehealth Projects by Application, Specialty and Subspecialty**

Clinical	Educational	Administrative
Examples:		
Tele-cardiology	Tele-education	Inter-Institutional Record
Tele-psychiatry	Research	Electronic Health Record
Tele-dermatology	CME*	Electronic Patient Record
Tele-oncology	Grand Rounds	
Tele-ophthalmology		
Tele-radiology		
Tele-ultrasound		
Tele-nursing		
Tele-nephrology		
Tele-pathology		
Tele-emergency and rescue services		*Continuing Medical Education

Figure 5
Telehealth Projects by Technical Equipment

- Clinical Workstation** - dedicated and/or PC based – interactive
- Videoconferencing Systems** – multimedia
- Image transfer – document and radiographic film digitizer
 - Medical imaging – ultrasound device
 - Processing Unit and keyboard
 - Audio Module – speakers, headphones, volume and base control
 - Camera - lens, image sensor, pixels, resolution, illumination range, video output signal, power zoom
 - Microphone
 - Monitor- resolution, speakers, signal type, dot pitch
 - Electrical specifications – central power switch, power requirements
 - Communication platform allowing compatibility with networks (WAN) – SW-56, ATM, ISDN, satellites, and networks (LAN) – Ethernet
 - Connector panel – LAN, WAN, phone network; audio and video input and output ports; radiographic film digitizer, CD-ROM etc.
- Peripheral Devices** – otoscope, dermatoscope, stethoscope, ophthalmoscope

Figure 6
Telehealth Projects by Telecommunications and Network Link

- Plain Old Telephone System (POTS) - analog telephone lines
- Dial-up Digital Telephone Lines - Integrated Service Digital Networks (ISDN) and Switched-56 (SW-56)
- Asynchronous Transfer Mode (ATM)
- Satellite – Geo-synchronous and Low Earth Orbit (LEO)
- Microwave
- Coaxial Cable, Fibre Optics
- Asymmetric Digital Subscriber Line (ADSL)
- Various Digital Subscriber Line (xDSL)
- World Wide Web (WWW) – Internet or Modem
- Virtual Private Networks
- Hospital and Regional Health Networks

Figure 7
Telehealth by Mode of Delivery

- **Store and Forward “Asynchronous”:**
Captured audio clips, video clips, still images and/or data that is transmitted at a later time (e-mail or delayed transmission)
- **Real Time “Synchronous”:**
Sends and receives audio, video and/or data simultaneously, with a fraction of a second delay
- **Combination of Store and Forward & Real -Time**

Figure 8
Telehealth Projects by User and Provider

- **Physicians** – General practitioners, specialists and medical students, etc.
- **Nurses** – Registered (RN), Licensed Practical Nurses (LPN) and nursing students
- **Allied Health Professionals** – occupational therapists, physiotherapists, etc.
- **Health Administrators, Educators and Researchers**
- **Technicians**
- **Patients and their Families, Informal Care Givers**
- **Telehealth Project Managers and Site Coordinators**

5.0 Telehealth Project Considerations

There are various elements that may serve to enable or reduce the likelihood of success in adopting, implementing and sustaining telehealth projects. Failure to consider each element may lead to the project not succeeding. In short, all telehealth projects must be based on identified needs. This section of the document is intended to highlight several key areas to be considered when contemplating, developing or reviewing a telehealth project proposal or activity.

5.1 Determine Resource Needs for the Project

The success of a telehealth project is dependent on a number of factors, including ensuring the appropriate resources to implement the project effectively and ensuring sustainability of the project.

Several areas to be considered when identifying and determining the resource needs for a particular telehealth project include the following four main components: human, technical, financial and organizational.

5.1.1 Human

The success of the telehealth project will largely depend on *human interaction* and interrelationships as opposed to reliance on *technical interaction*.

Considerations:

- Review lessons learned from other Canadian telehealth projects. The key is to identify and ask the appropriate candidates and ask if they would like to participate in the project?

- Consult with individuals managing similar telehealth projects/applications elsewhere in Canada and determine what human resources were needed.
- Discover what human resources are already available at the main and remote site(s) and identify people in the community who are interested in working on a telehealth project.
- Assess and determine:
 - Current health provider levels and turnover rates (locums, etc.)
 - Whether current staff are already working at capacity
 - Provider level of knowledge and experience working with telehealth projects
 - Number and type of new staff needed for the project and when they will be needed
 - Who needs training and who will provide it - vendor and/or site coordinators?
 - Type and format of training – web-based, follow-up or certification
 - Availability of training equipment, facilities and trainers
 - How training will be integrated into current workload schedules
 - User and provider prerequisites
 - Collective agreements and union requirements
- Assess the diversity of languages and cultures in the communities.
- Determine the measures needed to be taken if the technologies require change in terms of the conventional roles of health providers (e.g. transformation of a conventional home-care nursing program to a tele-home-care application).

5.1.2 Technical

The type of telehealth technology selected will be guided by the specific project application(s). It is very important to ensure the technology does not focus solely on the requirement to provide a service, but it also focuses on the needs of the users – patients, health care providers, administrators, and so on.

Avoid being technology driven. Find and/or build the best-fit technology solution required to answer the need. The project application may not require an investment in the latest, newest and most expensive technology available on the market.

Hardware, software and peripheral devices can vary among telehealth specialties. Some manufacturers have developed workstations that enable a variety of peripheral devices to be connected to them allowing images, video, sound and text to be captured and transmitted from a workstation at one telehealth site to another via a telecommunications or network link.

Based on the experience of operational telehealth projects and programs throughout Canada, five key factors can be considered when selecting or determining telehealth technologies and telecommunications linkages. They are:

Interoperability - the ability of different technology components and platforms to communicate with each one another and achieve predictable results;

Compatibility - the unanimity of earlier versions with newer versions of similar technologies;

Reliability - operational reliability and dependability, as well as technological effectiveness;

Scalability - the equipment has the ability to take on expanded capabilities without total replacement and is able to operate using a higher bandwidth than the level currently used;

Integration - the ability of new, complex technology to blend or fuse with existing systems (e.g. the integration of Picture Archiving and Communication Systems (PACS) into a radiology department).

Considerations:

- Prior to the purchase of any equipment, find out what telecommunications infrastructure is already in place. Contact the local phone company and long distance carrier(s) to understand all telecommunication options available in the areas to be served.
- Speak with individuals and/or visit sites that have used telehealth application technologies and networks for similar processes or clinical specialties. Determine the effectiveness of the technology in their situation and the lessons learned.
- Contract a telehealth consultant to make recommendations. As well as having knowledge of and experience with the Canadian health system, the consultant should also be independent and vendor neutral.
- Determine which specific telecommunications links will best suit the telehealth application.
- Determine if the project requires a dedicated video conferencing room and/or mobile units.
- Evaluate all sources of telehealth equipment closely on an ongoing basis, as the technologies continue to change.

5.1.3 Financial

Funding for a project will be based upon the provision of the estimated costs to the funding organization(s). It is therefore critical that these estimates be as inclusive and accurate as possible.

Considerations:

- Acquire estimates for the set-up and installation costs of the technology and telecommunications link(s) selected. Include costs for facility upgrades, testing, and initial education and training.

- The diversity of languages and cultures in our communities may make the set-up and provision of telehealth services relatively complex and more expensive.
- Estimate the direct project costs, including:
 - Capital costs:** labor (contractual staff), hardware, software, interfaces, peripherals, preliminary studies, re-engineering of hospital services, facility upgrades, one-time license fees, project assessments, and so on.
 - Other costs:** labor (project manager, telehealth coordinator, technicians and other full-time staff), office facilities, telecommunications (monthly connection fee, rate per minute), training and skill maintenance costs, power, insurance and administrative costs, provider remuneration adjustments, etc.
- Estimate sustainability costs – ongoing costs to support and operate the telehealth system including the source of the funding. Be cautious about commencing a project without having identified and committed funding sources to sustain it.
- Assess indirect project costs, considering the impact of competition for available funds in times of scarcity.
- Confirm the financial resources are adequate to support the life cycle of the project.
- Determine what non-quantifiable benefits may be expected as a result of the telehealth activity.
- Plan for the costs associated with the provision and maintenance of ongoing information privacy and security protection in order to meet the requirements of existing legislation such as the British Columbia Freedom of Information and Protection of Privacy Act (FOIPP), Bill C-6, and so on.
- Consider a unified development plan with related sectors to share the costs and/or other resource requirements of a telehealth project at the national, provincial or community level.
- While a full-fledged *feasibility study*, including a *cost-benefit analysis*, could in itself be costly and time-consuming, particularly in the absence of readily available necessary inputs, it will enable health service planners, administrators, government and/or alternative funding sources to better understand the telehealth project proposal and to support funding requests.

When conducting a cost-benefit analysis, the overall objectives of the telehealth project should be kept in mind. These may include meeting specific provincial or national objectives such as the provision of universal health care or the retention of health professionals in remote and rural regions.

An important factor to keep in mind when preparing a cost-benefit assessment is that telehealth is conducted in a complex and ever-changing social, economic and technological environment. Cost-benefit assumptions valid a year ago may or may not be valid today. As the cost of new technology declines, cost-benefit ratios can improve substantially. Projects that would not have been funded in the past may become feasible in the future and could be approved in due course.

Note:

Telecommunications can be a major component of a telehealth project's overall costs. These costs can be high. Because different telehealth applications require different technologies, assessing the costs for different combinations of technologies and infrastructures may be a difficult exercise.

5.1.4 Organizational

The success of a telehealth project will depend to the greatest degree on the development of positive human relationships and effective organizational infrastructure, as opposed to a reliance on technical interaction.

Considerations:

- Determine if telehealth already fits into the strategic plans, goals and objectives of the participant organization(s) – if not, assess how and what needs to be done
- Consider who needs to be involved to make the project work.
- Identify if there are policies in place to support a telehealth project or if policies will have to be incorporated or modified. Consider insurance, security, patient permission, ethics committee approval, etc.
- Consult with the health administrators of other health care organizations who have telehealth policies in place. Determine what worked and what needed to be done from an organizational perspective and what could be done to minimize undesirable impacts.
- Consider what credentialing mechanisms are to be established among the various participant organizations, taking into account different locations, organizations, facilities, technical requirements, and the particular personnel that will be involved in the telehealth activities.
- Determine organizational resources needed for project implementation and evaluation.
- Determine if there are organizational devices in place to self-govern a telehealth project. For example, is there a risk assessment, quality assurance, quality improvement committee to monitor the quality of care delivered through telehealth? How will the activities across multiple sites be monitored? Determine site-specific accountabilities, roles and responsibilities.
- Perform an impact analysis.

Examples of impact analysis questions include:

- What effect will the telehealth activity have on hospital resources?
- Will the telehealth activity affect organizational structures? Will it change information/patient/provider flow? In what ways? What re-organization will be necessary, desirable or undesirable?
- What is the potential number of patients who would be attracted to the hospital by the telehealth project?
- What potential numbers of physicians or nurses would be attracted to and/or retained at the hospital or rural community by the telehealth project?

- Are there any other telehealth projects providing the same services to the region?
 - How would the failure of the telehealth system affect organizational operations?
 - Who may resist the project?
 - How might the telehealth activity affect the professional/health care system values?
- Determine, prior to implementation, whether the technologies required to support the telehealth activities/systems necessitate an environmental assessment and approval. In most instances, this refers to the assessment of the impact of the activity on the existing environment of telecommunications infrastructure – an activity that would need to be considered and carried out by the organization involved in the installation of the telecommunications infrastructure.

Visit the British Columbia Environmental Assessment office at <http://www.eao.gov.bc.ca/> on the Internet.

5.2 Telehealth User and Provider Considerations

The success of a telehealth project will depend on how users such as patients, clients, doctors, nurses, allied health professionals and health administrators embrace it. Without their support the chances of project failure are high.

Patients and health care professionals who are accustomed to personal visits may be reluctant to alter the traditional methods of care. Common opinion is that telehealth must be user-oriented and focused on providing quality health services of benefit to both the patient and the provider.

5.2.1 Patients, Clients or Consumers of Health Services

The concept of telehealth may still be unfamiliar to many patients, clients or consumers of health services, but their awareness and education about the benefits and convenience of telehealth will undoubtedly hasten acceptance.

Studies based on the acceptability of telehealth among health care providers and rural patients have brought to light some interesting attitudes towards telehealth video conferencing consultations. Health providers observed how excited and interested patients were with the new method of delivering services. Patients reported enhanced patient-physician communication.

The introduction of the Internet and World Wide Web has played a significant role in raising public awareness about the conveniences of information and communication technologies and web-based programs, and has highlighted a growing public demand and interest to access web-based health services. At the same time, it is apparent that there is a need to ensure patients, clients, or consumers of health services are provided with quality services and access to reliable health information.

Considerations:

- The appropriateness of specific telehealth applications for individual patients should always be assessed. Adapt the technology as appropriate to the individual patient's needs and determine if those needs are being met through the specific project application.

- Ensure patients' families or caregivers have an enthusiastic attitude about telehealth and possess the necessary abilities and skills needed to use the telehealth system, where required. Training will need to be customized for each individual.
- Inform patients of the choices available regarding the use of telehealth. Consider patient privacy and ensure that standardized consent protocols are followed when engaging in various telehealth activities.
- When linking to a rural region, it is important to realize that the telehealth project is not just linking to individual patients but to a whole community. Providing community members with education and demonstrations of the telehealth application(s) will help them to fully understand what telehealth is about and the impact it may have on their community. Ensuring that key members of the community become part of the project team will also increase the likelihood of project success.
- Determine the design and type of client records that will be utilized taking into consideration end-usability, cultural diversity, languages and legal requirements.
- Patients and clients involved in telehealth activities must be provided with the opportunity to complete user satisfaction surveys on a routine basis. These will need to be designed and based on the needs of the particular participants, considering culture, language and the specific technologies involved.

5.2.2 Health Care Providers and Clinicians

Health care providers have been trained to provide hands-on health care and some may be skeptical of the concept of telehealth. To gain support from health clinicians to establish new patterns of practice, the project should have a real user and outcome focus.

Health care clinicians must also have *clinical confidence* in the ability of the technology to provide them with ample, high-quality information necessary for clinical decision making.

Considerations:

- Provide appropriate education and training, as well as technical and administrative support for health clinicians to help them to include telehealth sessions into their schedules.
- Determine how to best integrate telehealth into health care provider practice. Health care providers should be able to use telehealth in place of and not on top of their normal clinical workload.
- Consider placement of the telehealth equipment. Will it be positioned in a location that is convenient for the users? Will it be needed for emergency consultations? Is it mobile?
- Determine the design and type of client records that will be utilized by the health professionals providing telehealth services. Consider provider requirements, end-usability, quality assurance, evaluation and legal requirements.

- Determine when and how often provider satisfaction surveys will be carried out. Provider satisfaction surveys should be designed to capture and include measurements of satisfaction based on the needs of the various health professionals providing telehealth services, such as physicians, nurses, and occupational therapists. Very generic types of forms or surveys should be avoided.

5.2.3 Health Care Provider Telehealth Education and Training

This section is intended to highlight the importance of delivering appropriate education and training to the participants of the telehealth activity, and in particular to the health professionals.

Certainly not all health professionals realize the full potential of various telehealth applications or systems. As with any technology, individuals must acquire, achieve and practice competency in specific skills in order to use telehealth applications and systems effectively.

With the introduction of increasing numbers of clinical information systems and communication technologies in the health care field, there is growing need to ensure that all health professionals are trained to use these technologies effectively in their everyday practice.

In accordance with the demands of a dynamic health care system, universities, colleges and other educational institutions will need to work in close collaboration with the health authorities and the professional colleges and associations to continually review and revise their curricula. To ensure that health professionals develop and establish core competencies in specific telehealth activities and applications, there will need to be programs in place that to equip them with the necessary education and training to achieve the required knowledge, skill and attitudes.

Considerations:

- Health care providers delivering telehealth services should receive ongoing training and support on information technology, interview and communication skills. Local college, technical institute, or university staff may be able to facilitate the delivery of appropriate education and training.
- Actual use of the equipment during continuing education sessions may go a long way toward convincing health providers to use the technology.
- Prior to training, assess the health providers' levels of information technology knowledge, their expectations and concerns about the telehealth project, and how they see the future of telehealth in their health care practice area. Match the results to the training needs.

Assess:

- How they feel about using telehealth in their practice
- What impact they think telehealth will have on consultations
- If they think that telehealth will “de-humanize” health care
- If they think telehealth will affect their role or practice (referral patterns, scheduling, etc.)
- What concerns they have about privacy and confidentiality
- How they think their patients will feel about using telehealth
- If they have previous information technology training or experience

- A project bringing about change will often create uncertainty accompanied with considerable resistance to change. Management of a telehealth project that is new to an organization and its users requires an extra investment of time and effort, as well as education and training.
- In regions where there is high turnover of health care providers, ensure that telehealth education and training can be provided on an ongoing basis.
- Encourage health professionals to take health information technology training.

5.3 Administrative Considerations

Telehealth projects have been known to fail as a result of poor administration. The keys to a smooth implementation process are *effective planning and project management* (see section 5.9 and appendix A). Consider:

- Identify and set *tangible benchmarks* and *deliverables* at the beginning of the project to help maintain a measure of control over the project. Dividing the total timeline into various phases of the project's development will be the next step. While the schedule should be flexible enough to accommodate some unexpected delays, following the timeline from its initial stages through its subsequent phases is important. A *detailed and realistic schedule* will ensure that the implementation of the telehealth project is complete by a certain date. The schedule should be reviewed for inclusion of the following:
 - Partnership building
 - Facility upgrades or changes
 - Hiring, educating and training of project staff
 - Preparation and distribution of a Request for Proposal (RFP) to potential vendor(s)
 - Evaluation of vendor responses to the RFP
 - Physical implementation, equipment acquisition and installation, etc.
 - Initial implementation phase
 - Outcomes evaluation and measurement
- Consider a suitable schedule for project status reporting that matches various phases of project development and physical implementation, in keeping with general administrative reporting practices.
- Consider sharing administrative duties with the vendor such as technical evaluation audits and base line data collection. Note that this may also facilitate the evaluation process.
- Consider the implications for joint efforts involving telehealth projects and electronic health record initiatives. Determine what policies will need to be established and put in place prior to engaging in telehealth activities that cross multiple sites, organizations or provinces. For example, establish and define measures of individual and/or multi-site organizational accountability (legal, technical, and financial responsibilities), and clarify the expectations of all organizations and players involved in the telehealth activity at all sites.
- Determine administrative limitations and constraints imposed by:
 - Budget
 - Time
 - Resources

- Policies and regulation
- Ensure appropriate standards, policies and procedures are established prior to the implementation of electronic health records. Determine:
 - The feasibility for the organization to integrate conventional written format hard-copy medical records with new digital soft-copy medical records. Consider long-term and short-term costs (human, technical, legal, financial and organizational).
 - The policy and practice frameworks that need to be established when planning to accommodate the development and storage of electronic records across multiple sites.
 - The privacy, security, confidentiality, risk assessment, and quality assurance measures that need to be put in place to safeguard and manage information, including retrieval, accessibility and storage of electronic information.
- Determine administrative limitations and constraints imposed by other considerations such as:
 - Labour, technology and telecommunications costs, utilization reviews, health service demographics, disease outcomes, etc.
 - Project business structure
 - Contractual status of telehealth consultant, vendor, network, etc.
 - Region(s) to be served including unique regional attributes – geographic or demographic
 - Number and type of participant locations
 - Payment options, plan affiliations, reimbursement assumptions
 - Liability coverage
 - Handling and storage of record files – client/provider/quality assurance records
- Ensure sufficient telehealth liability insurance, including coverage for *vicarious liability*

5.4 Technical Considerations

The challenges and issues facing telehealth implementation include the need for the establishment of widely accepted standards for computer technology, image and transfer protocols, and platform interoperability.

5.4.1 Standards

Standard can be defined as:

“Common and repeated use, rules, guidelines or characteristics for activities or their results established by general agreement and approved by a recognized body, aimed to provide a benchmark below which performance is considered undesirable.”

(Adapted from the International Standards Organization)

Telehealth brings together many technologies including computer systems, peripheral devices, video technologies and telecommunications, all of which must work together. Particular attention must be paid to the interoperability of equipment between various sites.

Apart from the tele-radiology guidelines and practice standards that have been adopted by the Canadian Association of Radiologists, there are no official telehealth system standards. However, general standards are beginning to evolve and will continue to do so as telehealth technologies are developed and deployed.

➤ **Canadian Association of Radiologists**

[Online] Available: <http://www.car.ca/standards/teleradiology.htm>

Note:

While telehealth technology standards are evolving, it is important that the technology pass a clinical validation process to ensure confidence in its use by the clinicians, prior to equipment purchase. This is especially true for clinical application technology such as tele-dermatology.

Applicable technical standards to date for telehealth include:

Computer and Telecommunications Related Standards

Telecommunications: POTS, ISDN, SW-56, ATM, Satellite, Ethernet, Frame Relay

Network: TCP, IP, SNMP, UDP, RTP

Video conferencing: H.320, H.323, H.324

Multimedia: MPEG, MJPEG, MOV, AVI

General: HTML, JAVA

Database: SQL, ODBG

Images: PNG, GIF, TIFF, CGM, JPEG, Wavelett

Digital Imaging and Communication in Medicine (DICOM-3)

This is a standard for communications among digital medical imaging devices. It defines common formats for data generated by imaging equipment and routine actions that can be performed on images. DICOM provides a means by which users of imaging equipment may assess whether two devices claiming conformance will be able to exchange meaningful information. DICOM 3.0 is the current version.

Health Level 7 (HL7)

This is a computer application protocol for the electronic data exchange of health care information and is the basis for B.C. health information standards. It is a collection of standard formats specifying the interfaces to allow communication between computer applications from different vendors. HL7's information exchange protocol has been widely adopted by health providers and health software vendors worldwide. CIHI is the Canadian affiliate for HL7, HL7 Canada.

Health Level 7 Canada (HL7 Canada)

This is the forum for Canadian health information stakeholders to decide how HL7 is adopted and adapted for use in Canada.

➤ [Online] Available: <http://www.cihi.ca/hl7/hl7toc.shtml>

British Columbia Health Information Standards Council (BC HISC)

The role of the Council focuses on the identification of standards and guidelines, which promotes effective and efficient health information sharing. The Council is composed of an informed, experienced group of health system representatives who advise the British Columbia Ministry of Health on health information standards that should be adopted across the province. Visit the B.C. Health Information Standards Council Web site for additional information on standards and standards adoption in British Columbia.

- Information on British Columbia Health Information Standards Council (BC HISC)
[Online] Available: http://healthnet.hnet.bc.ca/hds/stds_council_general_info/index.html

Note: Please review the British Columbia Health Information Standards Manual for a complete list of approved standards and guidelines. For more detailed information on these standards, proposed standards and updates on current standards development projects in British Columbia, please visit the **Health Data Standards Dictionary (HDS)** Web site.

- [Online] Available: <http://healthnet.hnet.bc.ca/hds/index.html>

HealthNet/BC

The purpose of HealthNet/BC is to enhance communication and sharing of information and applications between health stakeholders throughout a regionalized health system by taking advantage of standards and network technology that allows a multitude of computers to communicate effectively.

- [Online] Available: <http://healthnet.hnet.bc.ca/index.html>

Canadian Institute for Health Information (CIHI)

CIHI is a federally chartered but independent, not-for-profit organization, responsible for coordinating the development and maintenance of the Canadian integrated health information system. Its mandate is based on collaborative planning with key stakeholder groups, including all provincial, territorial and federal governments, national health care agencies, and service providers. In 1996, CIHI launched the Partnership for Informatics/Telematics, which develops and promotes technical standards.

- [Online] Available: <http://www.cihi.ca>

Standards Council of Canada (SCC)

This is a federal crown corporation whose mission is to promote efficient and effective voluntary standardization. The Standards Council of Canada has the mandate to coordinate and oversee the efforts of the National Standards System, which includes organizations and individuals involved in voluntary standards development, promotion and implementation in Canada. The organization reports to Parliament through the Industry Minister.

- [Online] Available: <http://www.ccn.ca/>

For information on **International Organizations** dealing with standardization in healthcare and telehealth (Telematics) see this Web site:

- [Online] Available: <http://www.ehto.org/>

Note:

The Health Protection Branch of Health Canada is responsible for the regulation and registration of medical devices. However, some telehealth application components may not require registration as a medical device. An example would be a videophone that is transferring information from a home.

Software can be registered as a medical device. In recent years, as a result of concerns raised by reports of patients injured because of medical software defects, Health Canada has taken a special interest in computer and software issues as they relate to the clinical domains.

- Health Canada
[Online] Available: <http://strategis.ic.gc.ca>

5.4.2 Interoperability

Definition

“Interoperability refers to the ability of different telehealth technology components and platforms to communicate with one another and achieve predictable results when they exchange data.”
(Adapted from Alberta Research Council Telehealth Interoperability Laboratory)

Interoperability is an issue in telehealth because of:

- The wide range of technologies used, including computers, software applications, databases, network devices, multimedia technologies and communications networks;
- The ever-changing nature of technology;
- Limited telehealth-specific standards; and
- The need to ensure that a telehealth technology system receiving a “parcel of data” is able to “unwrap the parcel and translate the data” with predictable results, regardless of the sender and receiver locations.

Information about interoperability will promote better integration of telehealth applications, more flexibility in equipment selection, reduced cost of telehealth technology systems, and less technological obsolescence.

To address the need for telehealth interoperability, the **Alberta Research Council (ARC)** is working with national telehealth stakeholders to create guidelines to ensure that telehealth interoperability can be achieved, particularly in a multi-vendor environment. ARC has established a facility for testing telehealth equipment for compliance with technical interoperability standards.

- Information on Alberta Research Council Telehealth Interoperability Laboratory
[Online] Available: <http://www.telehealthlab.com>

Considerations:

- Ensure the telehealth equipment is compatible in terms of *interoperability*. This is of particular importance when connecting to other projects within the region or province, or at the national level;

- Consider if the selected telehealth technology systems can be tested against current, emerging or de facto standards, and determine who is responsible for ongoing testing;
- Determine any interoperability issues for real-time and store-forward systems; and
- Develop a communication strategy with external agencies to ensure interoperability.

5.5 Telecommunications Links

See also Section 3.3.

A large proportion of telehealth services can be implemented using plain old telephone lines or narrowband dial-up digital telephone lines and may not warrant the installation of more sophisticated telecommunications and network technologies.

Bandwidth is a measure of the capacity of a communications channel to carry information. In recent years the degree of available bandwidth has increased alongside the growing number of telehealth technology applications, which demand larger and faster amounts of data.

For the participant of a video conference, it is the combination of bandwidth capabilities and compression technologies that determines the quality of the picture.

Considerations:

- The best-fit telecommunications link for a telehealth application depends on a number of factors such as the *bandwidth* required for the application, the *cost* and the available telecommunication infrastructure at participant sites.
- Contact the main telecommunications provider(s) serving the project region(s). Determine if one operator can serve all of the participant sites. Find out whether other telehealth projects used this operator and if they were satisfied with the service they received.
- Match the telecommunications link with the needs of the chosen telehealth application.
- Explore the possibility of running the applications on *low cost links* prior to adopting high cost solutions (store and forward options as opposed to real-time).
- Ensure that the telecommunication provider:
 - Meets privacy and security considerations
 - Confirms minimal down-time (failure of network)
 - Provides adequate 24-hour back-up and support services
 - Has fulfilled environmental assessment requirements when installing the necessary telecommunications infrastructure required to support the proposed telehealth activities

- When negotiating a contract with the telecommunication provider consider:
 - Monthly connection fee
 - Rate per minute and/or flat rate depending on the specific project applications
 - Bridge link and rate, meaning a link between two or more network segments that use the same network technology.
 - Gateway connection and rate, meaning a connection between networks using different protocols and between a telecommunications carrier and information provider. It enables telehealth services to communicate with those not part of the network.
 - Need for class and/or individual licenses

Telecommunications Standards Advisory Council of Canada (TSACC)

An industry-government partnership, that aims to develop strategic directions for standardization in the information technology and telecommunications sectors. TSACC provides a bridge between the telecommunications and information technologies industries and related standards communities.

- [Online] Available: <http://www.tsacc.ic.gc.ca/>

5.6 Health Care Provider Considerations

This section highlights the importance of considering the impact on and concerns of the health professionals involved in the telehealth project.

Considerations:

- If the telehealth project will cross national and/or provincial borders:
 - Does the health care provider need to be licensed in all locations
 - If a community *standard of care* is to be upheld, determine which community standard applies
 - If the professional *standard of practice* is to be upheld, determine which professional standard of practice applies
- If telehealth services are available and a poor outcome results when these services are **not** used, does this constitute *malpractice* or *vicarious liability*? Did the health provider owe a *duty of care* to the patient? Vicarious liability may be readily apparent if injury to a patient occurs as a result of a telehealth technical malfunction.

Note: The employers of health professionals will need to consider the potential for vicarious liability among employees involved in telehealth activities and the consequences of such claims. The majority of health professionals are covered for liability under their professional college or association membership.

It is important that all health professionals engaged in telehealth activities confirm they have sufficient, appropriate liability coverage. For example, where does the locus of responsibility rest – at the remote or local site or at the patient or provider site? Does the liability insurance cover telehealth transactions occurring within or outside of British Columbia, in Canada or internationally?

- If engaging in telehealth activities that involve other jurisdictions, does the health professional have the appropriate *licensure* to carry out professional activities that cross jurisdictions?
- If telehealth services are being offered, will the consumers of health services be provided with the *informed consent* requirements of the *Health Care (Consent) and Care Facility (Admission) Act* that came into force on February 28, 2000? This Act demands that the health care provider provide the adult client information to understand and make a decision regarding the proposed health care intervention. This includes providing information about the nature of the proposed health care intervention, the risks and benefits of the intervention, and alternative courses of treatment (e.g. conventional treatment versus telehealth).

This legislation outlines the scope and elements of consent, the requirement for health care practitioners, including registered nurses, to seek consent prior to treatment, how consent is to be obtained and when. The Act affirms the right of a capable adult to give or refuse consent to his/her health care at any time and on any grounds, even if the refusal will result in death.

5.6.1 Physician Issues

Telehealth projects that enable access to medical information or treatment have the potential to transform the patient-physician relationship from that of a physician authority administering advice and treatment to that of a *shared decision-making process* between patient and physician.

In British Columbia, several substantial barriers remain before this new relationship can be fully realized. On the part of the physician, these include:

- acknowledgement of new methods of delivering health care
- acceptance of shared patient-physician decision making
- the ability and desire to change current practices
- a level of engagement in education and training in telehealth and in information and communication technologies
- suitability to acquire new skills required by various telehealth applications (interactive multimedia skills for video conferencing)

5.6.1.1 Reimbursement

With the exception of salary-paid physicians, reimbursement remains an issue for physician-driven projects in many provinces. To date, Alberta, Saskatchewan, Manitoba and Nova Scotia are the only provinces with fee codes in place for telehealth physician reimbursement. As an example, Alberta has a special fee code that pays the same fee as for an “in person encounter”.

The British Columbia Medical Association (BCMA) and Medical Services Plan (MSP) are investigating the development of specific fee code items for various telehealth applications.

Prior to project development and implementation, contact the Medical Services Plan to determine if the existing fee schedules are appropriate for use in telehealth, and assess the potential for the development of fee codes deemed suitable for use in telehealth.

- The British Columbia Medical Association
[Online] Available: <http://www.bcma.org>
Fee Schedule Manager: Voice (604) 736-5551
- The Canadian Medical Association
[Online] Available: <http://www.cma.ca>
- The Medical Services Plan
[Online] Available: <http://www.hlth.gov.bc.ca/msp/general/contacts.html>

5.6.1.2 Liability

It is important to be aware of the availability and limitations of the existing Canadian Medical Protective Association's (CMPA) assistance in Telehealth.

- The Canadian Medical Protective Association (CMPA)
[Online] Available: <http://www.cmpa.org>

Liability Assistance

The CMPA has stated that it “provides assistance exclusively to its physician members with medico-legal difficulties arising from the practice of their profession in Canada.”

Telehealth is well entrenched in the practice of medicine. A member encountering a medico-legal problem arising from a telehealth encounter should expect the association's assistance. This assistance covers British Columbia physicians practicing in the province or any other Canadian jurisdiction.

However, the CMPA has also stated that it does have limits on its assistance if a legal action is initiated against a member in a foreign jurisdiction. Such an event is a possibility if a telehealth practice extends beyond Canadian borders.

Note:

Absolute assurance of coverage for physicians involved in a foreign telehealth enterprise may necessitate acquiring commercial coverage or securing coverage under hospital or individual telehealth project liability plans.

Jurisdictional Liability

The technology upon which telehealth is based is borderless. The practice of medicine, however, is very jurisdictional. While the technology easily accommodates trans-border telehealth interactions, the medical licensing authorities that have jurisdictional control over the practice of medicine *do not* make special accommodations for telehealth.

This gives rise to two concerns which need to be addressed:

- Which jurisdiction has authority over the medical act when the interaction involves multiple jurisdictions
- If the physician is not licensed in other jurisdiction(s) then the issue of “practicing without a license” may pose a real risk

Considerations:

- Confirm which licensing arrangements are currently accepted. Contact the British Columbia College of Physicians and Surgeons for updates on this matter.
 - The British Columbia College of Physicians and Surgeons [Online] Available: <http://www.cpsbc.bc.ca/>
- Follow the recommendations of professional associations regarding telehealth practices
- If the consultation crosses provincial, territorial or international boundaries, verify whether the project participant physician(s) may incur liability in other countries for which the CMPA will not provide assistance
- Determine where the liability rests (i.e., at the provider’s side of the telehealth transaction or at the patient’s side), where the patient rests, and where the patient initiates the legal action
- Ensure that the scope of physician involvement in a patient’s care is clearly defined
- Obtain informed consent from patients for their participation in and use of telehealth interventions
- Ensure that sufficient audit trails are maintained for several years. The CMPA recommends that physicians ensure adequate records are kept for at least ten years and that date and billing codes alone are insufficient. It also recommends that electronic medical records must be printable and displayable, and include date, time and author.
- If telehealth interventions are available in a region and poor outcomes result when telehealth is not used, consider if this constitutes malpractice.

5.6.1.3 Licensure

Federation of Medical Licensing Authorities of Canada (FMLAC)

This is a non-statutory national umbrella organization whose members are the provincial medical licensing authorities. FMLAC assists in the sharing of information among local medical authorities and in the development and sponsoring of educational and policy-making activities.

In 1998, FMLAC established a working group to review the issue of telehealth licensure. Several proposals have been brought forward to the FMLAC Board of Directors with regard to telehealth medical licensure in Canada; however, the proposals have *not* received unanimous support from all of the licensing authorities. Hence, the Medical Licensing Authorities in Canada have not approached the jurisdictional issue in a uniform manner.

The basis of difference is that some licensing authorities are unable to agree as to where the physician should be considered to be practicing, whether it be where the patient is located or where the physician is located.

Note:

In Canada, most provinces and territories have declared that jurisdiction rests with the location of the patient. Quebec has declared that jurisdiction rests with the location of the physician.

Considerations:

- To determine which licensing arrangements are currently accepted by the British Columbia Medical Licensing Authority, contact the British Columbia College of Physicians and Surgeons.
- If the consultation crosses provincial, territorial or international boundaries, verify whether or not the licensing authorities require licensure in more than one jurisdiction.

Note:

To date all medical licensing authorities have agreed to deal with any complaints, whether generated in their jurisdiction or in another province/territory of Canada.

- The Federation of Medical Licensing Authorities of Canada
[Online] Available: <http://www.mcc.ca/fmlac>

The more challenging issue of dealing with telehealth practice by international practitioners remains unsettled.

5.6.1.4 Referral Patterns

Experience in Canada suggests that existing physician referral patterns should serve as a basis for planning and developing clinical applications.

Considerations:

- The willingness of both rural and urban-based physicians to change their referral patterns in order to engage in telehealth activities and save patient or provider travel
- Whether the technology can be implemented in such a way that it drives favorable changes in existing referral patterns *without* causing a conflict of interest (e.g. between the consumers and physician providers of the telehealth service, and the telehealth project)
- If the technology can be implemented in a manner that will not necessitate changes in existing physician referral patterns

- The need to encourage specialists to schedule telehealth consultations for patients who otherwise would have to travel significant distances for brief follow-up visits
- When developing telehealth projects that involve physician referrals, ensure that a physician is represented on the telehealth project planning and management team, who can fairly represent the participant physicians at both the local and the remote sites.

5.6.2 Nursing

Today the arena of health nursing practice, whether it is hospital or community-based, requires that the majority of nurses utilize health information systems in their daily routines. Accessing patient laboratory reports, looking up patient locations, booking health services for patients, and entering patient data are all part of a days work. Nursing knowledge of health information and communication technologies will continue to undergo dramatic change as new technologies in health care are developed and implemented in the workplace.

National and provincial shortages of nurses highlight the need to integrate telehealth into their daily workload in a manner that does not add to their existing workload, but which helps to maximize the use of these professional resources.

At this time, there are no generic nursing guidelines for telehealth practice in Canada. However, significant work is underway at the national level to develop such guidelines.

Considerations:

- Ensure that qualified nurses are employed for the various telehealth activities. For example, when setting up a telehealth call triage centre, registered nurses must be used to carry out the triage activities, such as providing telephone advice and assessments for clients utilizing the service.
- Ensure nurses engaging in telehealth activities continue to uphold the standards of practice established by the British Columbia nursing regulatory body - the Registered Nurses Association of British Columbia (RNABC).
- Determine how the project resource requirements can be aligned with existing contractual status arrangements and collective agreements.
- Determine what specialized competencies in telehealth technologies will be required for registered nurses and ensure that the nurses involved in telehealth activities receive the appropriate education and training in health information and telehealth application technology, prior to the implementation of a telehealth project. This will need to be planned and budgeted for.
- Include representation of registered nurses on the telehealth project team to ensure that nursing turnover rates, retention and recruitment strategies support the project and are supported by it

- Consider the value of having registered nurses placed in telehealth site coordinator positions. In rural areas, where backup health support services may be limited or not readily available, a registered nurse who has experience in rural health care practice can play a valuable role in assisting patients with telehealth activities.

In their profession, nurses are trained to understand the health needs of the clients they serve, to act as “the patient advocate,” and to communicate the needs of the patient to other health professionals. Residents of small rural or remote communities place great value and trust on nurses, many of who take on expanded roles of practice and may have little access to physician or other health support services.

- Consider establishing general competencies for using telehealth applications to augment but not replace existing practices. Include project-specific competencies that match project applications and incorporate these into institutional policies as standards of telehealth competencies.
 - Registered Nurses Association of British Columbia
[Online] Available: <http://www.rnabc.bc.ca>

5.6.2.1 Liability

Like their physician counterparts, it is important that nurses are aware of the availability and limitations of existing legal assistance within the context of providing telehealth-based nursing services (e.g., telephone triage centres, online Internet web-based nursing services).

Liability Assistance

The Registered Nurses Association of British Columbia (RNABC) has stated the following: “The RNABC provides liability assistance exclusively to nurses registered in British Columbia (practicing and non-practicing nurses), who hold a current RNABC nurse license, and who have an active membership with the Association”. Nurses registered in British Columbia through their RNABC liability insurance policy are “*protected anywhere in the world against a lawsuit as long as the lawsuit is brought forward in Canada.*”

- Registered Nurses Association of British Columbia
[Telephone] 1-800-565-6505 or (604) 736-7331
[Online] Available: http://www.rnabc.bc.ca/pracsupp/liab_con.htm

Note:

The Registered Nurses Association of British Columbia (RNABC) membership liability insurance protection is administered by RNABC Captive Insurance Corporation (CIC) and is managed outside of the association.

The Canadian Nurses Protective Society (CNPS) provides legal advice and liability insurance coverage related to nursing practice to eligible registered nurses. Currently, practicing members of the nurses’ associations of Alberta, Manitoba, Newfoundland & Labrador, Northwest Territories, Nova Scotia, Ontario, Prince Edward Island, Saskatchewan and Yukon are entitled to CNPS liability protection and services.

- Canadian Nurses Protective Society (CNPS)
[Telephone] 1-800-267-3390
[Online] Available: <http://www.cnps.ca>
- Canadian Nurses Association
[Online] Available: <http://www.cna-nurses.ca>

Jurisdictional Liability

The practice of nursing is very jurisdictional. Telehealth technology can easily assist with the delivery of trans-border nursing services and thus can easily accommodate nurse-patient interactions across jurisdictional boundaries.

This gives rise to two questions that need to be answered:

- Which jurisdiction has authority when the telehealth interaction between a nurse and a patient involves multiple jurisdictions – within and outside of Canada?
- When a liability issue arises involving a telehealth interaction between a nurse and a patient, where does the liability rest?

Note:

The Canadian Nurses Association has determined together with member associations that the responsibility rests at the location of the registered nurse and NOT the patient.

Considerations:

- Consider current and future liability coverage. At this time, both practicing and non-practicing nurses registered in British Columbia are insured for liability through an insurance policy wholly paid by the individual nurse's RNABC membership fee. However, this could change in the future and liability coverage may only be provided to those members who are *actively practicing*.
- Determine where the patient initiates a legal action and where the nurse was located at the time of providing the telehealth service to the patient.
- Ensure the nurses understand the scope of their professional responsibility with regards to the location where locus of responsibility has been determined to rest by the CNA and RNABC, noting that it may be the opposite to their physician counterparts.
- Keep up-to-date with recommendations made by the nursing associations which may affect the sites where the nurse-patient telehealth interactions are occurring

- If a practicing member is concerned about liability coverage or possible legal resulting from a telehealth nursing activity, the member should contact either:

A Nursing Practice Consultant at the:

- Registered Nurses Association of British Columbia
[Telephone] 1-800-565-6505 or (604) 736-7331
[Online] Available: <http://www.rnabc.bc.ca>

Or a Case Manager at the:

- RNABC Captive Insurance Corporation
[Telephone] 1-800-663-1724 or (604) 682-4995

5.6.2.2 Licensure

While the Canadian Nurses Association has determined with member associations that the responsibility rests at the location of the registered nurse and NOT the patient, it is still important to ensure compliance and understanding of licensure requirements in all jurisdictions, particularly in cases involving international telehealth activity (see section 5.6.1.3 for information on physician licensure).

Considerations:

- Confirm and verify that nurses registered in British Columbia who are deemed to be *practicing* telehealth nursing in the B.C. jurisdiction, hold a *current* practicing license with the RNABC.
- Ensure all nurses engaging in telehealth nursing activities involving British Columbia, but who may not be considered to be practicing in the B.C. jurisdiction, hold a *current* practicing license within their own jurisdiction.
- Keep up-to-date with recommendations made by nursing associations regarding licensure for nurses engaging in telehealth activities in multiple jurisdictions, within and outside of Canada.

5.6.3 Allied Health Professional Issues

Allied health professionals include a wide spectrum of health care providers whose activities may or may not be related to those carried out by other professionals, such as social workers, nutritionists, physiotherapists, occupational therapists, speech pathologists and clinical psychologists. It is anticipated that allied health professionals will increasingly engage in telehealth activities in the future. Like nurses, many allied health professionals may be expected to have an increasing level of competency in health information systems.

Considerations:

- Determine if the liability coverage is appropriate. As the majority of allied health professionals are employed by hospitals, home care and public health units, most will be covered for liability by their employer. However, some allied health professionals may be in private practice where the costs of their services are covered by individuals out-of-pocket or by private health insurance, requiring them to ensure they have appropriate liability coverage.
- Determine what licensure is required if telehealth activities cross multiple jurisdictions.
- Ensure allied health professionals engaging in telehealth activities have received appropriate education and training in health information and telehealth application technology. Review sections 5.2.2 and 5.2.3.
- Determine how telehealth project resource requirements could be aligned with existing contractual status arrangements and collective agreements.
- Ensure each allied health profession engaged in telehealth activities complies with the professional standards and core competencies required by the profession.

5.7 Privacy, Security and Confidentiality of Information

Privacy, confidentiality and security of information are all issues that will need to be considered when contemplating or implementing telehealth projects. The protection of privacy in the health care field is a growing international concern. This is largely due to public concerns about the potential for abuse of electronically recorded and stored patient data and personal information.

The potential for abuse is as great for manual records as it is for electronic records; however, there is one major difference between electronic and handwritten records that has raised public concern. This is the potential for abuse of electronic records at a site that is physically separate from the actual storage location of the records.

Hence, the desirability of information systems to permit medical record access from different locations simultaneously opens a new area of potential problems. If the electronic record is in any way connected to public telephone lines via modems or if communication of medical data takes place over the wire, cables or radiowaves, unauthorized access becomes a possibility.

Privacy is about controlling the collection, use, disclosure, retention and storage of personal information. Privacy is embodied in law, professional codes of conduct, accrediting and licensing standards, business practices and client influence. In Canada, federal, provincial and territorial governments share responsibility for information protection. In British Columbia, most health care bodies are required by law to protect privacy.

Security is about safeguarding the sharing of private information. This is achieved through establishing policies, procedures, physical means, technical services and mechanisms.

Confidentiality is about anonymity and the right of an individual to not have personally identifiable medical or other information disclosed to others without the individual's express informed consent. Confidentiality is violated when data or information passes into the wrong hands, either on purpose or accidentally, within or outside an organization.

The **British Columbia Freedom of Information and Protection of Privacy Act (FOIPP)** allows health care providers employed by a public body, such as hospitals and publicly funded clinics, to disclose the personal information of clients to third parties under certain circumstances.

- Office of the Information and Privacy Commissioner of British Columbia
[Online] Available: <http://www.oipcbc.org/>
- British Columbia Ministry of Health Information and Privacy Branch
[Online] Available: <http://www.hlth.gov.bc.ca/cpa/factsheet.html>

Note: The British Columbia *Freedom of Information and Protection of Privacy Act* (FOIPP) does not apply to health care providers in private practice. It only applies to health care providers in a public body. British Columbia is currently investigating the possibility of enacting similar legislation governing the private sector. For now, the Federal Government's Bill C-6 (formerly Bill C-54) is the object to reference until British Columbia enacts comparable legislation.

Bill C-6 (formerly Bill C-54)

The provisions of the Bill apply to the collection, use and disclosure of all identifiable personal information for any activity subject to the law, with some exclusions and exceptions.

Bill C-6 includes the following principles as set out in the national standard of Canada, entitled model code for the protection of personal information:

1. Accountability
 2. Identifying purposes
 3. Consent
 4. Limiting collection
 5. Limiting uses, retention and disclosure
 6. Accuracy
 7. Safeguards
 8. Openness
 9. Individual access
 10. Challenging compliance
- Bill C-6 Information:
[Online] Available: <http://www.privcom.gc.ca/>

Considerations:

- Perform a privacy impact assessment during all stages of the project from proposal to completion. This will evaluate the actual or potential effects that telehealth may have on patient privacy, and the ways in which any adverse effects may be mitigated. This assessment includes a review of the planned telehealth system's compliance with the privacy principles, and comments on its impacts and public perceptions. A format for conducting a privacy impact assessment can be found at:
 - **Office of the Information and Privacy Commissioner of British Columbia**
[Online] Available: <http://www.oipcbc.org/>
- Ensure that an appropriate infrastructure is in place if the telehealth project will be transmitting information across boundaries where different privacy laws or data ownership concepts and laws may apply.
- Consider how privacy protection and awareness will be incorporated into telehealth training, plus the responsibilities of the user.
- Ensure physicians, nurses and other health professionals are aware that any patient information reported using telehealth venues must adhere to the principles of privacy and confidentiality.
- Ensure privacy principles have been integrated into the technology and network.
- Keep abreast of legal and regulatory developments on privacy.
- Ensure that sufficient policies are in place to deal with user non-compliance and breach of organizational policies on privacy, confidentiality and security.
- Ensure patients using telehealth have a right to privacy that should not be infringed without express informed consent.
- Establish in-house information-handling policies that exceed legal requirements for clients who entrust the organization with personal data. The policies should outline what can be collected, how it can be used, who must verify accuracy, when will it be updated and so forth.
- Determine how security will be evaluated as part of a project evaluation framework.
- Establish how security protocols will be set up, including password protection, well-defined user privileges, user authentication, confidentiality, authorization and access control. Access will also depend on the intended use of the data or information, for example, reading, writing, editing, or deleting information.
- Determine a sufficient budget to ensure security, giving consideration to things such as the cost of installing of the various security protocols.
- Consider reviewing lessons learned with respect to security problems encountered by organizations with similar telehealth systems.

- Software trace subroutines should be implemented into the information systems used in telehealth activities, to record an audit trail of system access.
- Data encryption methods should be established and utilized for both transmission of files to computers and coding for storage at the local site

Note: B.C. physicians must adhere to the British Columbia Medical Association Privacy Code. For inter- provincial projects, Canadian physicians must adhere to the Canadian Medical Association Privacy Code.

- The British Columbia Medical Association
[Online] Available: <http://www.bcma.org>
- The Canadian Medical Association
[Online] Available: <http://www.cma.ca>

Additional reference sources on security and privacy issues include:

Canada’s Health Informatics Association (COACH) – Guidelines for Security & Privacy:

These guidelines provide a resource to help the health system minimize the risk of unauthorized collection, use, disclosure, modification or destruction of health data. They assist in maximizing the integrity and availability of health information, and protect the privacy of users and providers of health services. It is important to recognize that **provincial legislation takes precedence over these guidelines.**

- [Online] Available: <http://www.coachorg.com/>

Canadian Institute for Health Information Privacy and Confidentiality Guidelines:

- [Online] Available: <http://www.cihi.ca/weare/pcsmain.shtml>

Information, Science and Technology Agency (ISTA):

ISTA is involved in the establishment of strategies, policies and standards for government information management and information technology, and includes British Columbia Archives and Records Services, Information and Privacy Branch, and Enquiry BC.

- [Online] Available: <http://www.ista.gov.bc.ca/>

5.8 Ethical Considerations

Thought should be given to ensure the project uses the same ethical principles as those applied to “in person encounters.”

Considerations:

- Prior to the implementation of a telehealth project, each organization should consider establishing policies and protocols to ensure that each project adheres to ethical practices.

For example, health care organizations currently involved in telehealth projects may wish to establish a policy whereby all new telehealth project proposals would need to be approved by an ethics committee prior to their implementation. Organizations should also set up a protocol to ensure existing telehealth projects adhere to ethical practices. Such an initiative could occur either at the organizational or regional level.

- Encourage specialists to schedule telehealth consultations for patients who otherwise would have to travel significant distances for brief follow-up visits.
- Apply ethical principles when implementing a telehealth project such as beneficence, nonmaleficence, autonomy and justice.
- Clarify and understand values, belief systems and social expectations.
- Ensure privacy and security policies are in place and adhered to.
- Consider professional codes of ethics and conduct.
- Ensure the project utilizes appropriate health care provider qualifications, experience and knowledge base.
- Ensure health information provided is trustworthy, current and high quality.
- Determine processes for accountability consistent with organizational standards, professional responsibilities and standards of practice.

5.9 Project Management

Project management, in general, requires the utilization of a variety of effective control processes, specifying what needs to be done; when, how, and by whom it will be done; what constitutes good performance; and how well things are done.

The style of project management usually depends on the organizational culture and on the experience of personnel. However, when managing a telehealth project, it is very possible that the organizational cultures may be different at the local and remote sites, at the send and receive sites, and at the rural and urban sites.

Considerations:

- Employ a style of project management effective for diverse organizational cultures.
- Establish clear project management objectives. All of the participants engaged in the telehealth project will need to understand the scope of the project and learn how to set verifiable objectives for the project as a whole, and for each individual step. In this way, the team members located at various sites will better understand and be able to achieve project objectives.

- After setting objectives, the roles and responsibilities need to be determined. It is important that the project manager ensures personnel understand their roles and responsibilities, especially when dealing with participants in different organizational settings.
- Ensure roles and responsibilities are assigned to people who have a solid understanding of the needs of the sites. For example, a person who has never lived in a rural or urban community may not easily recognize or understand the differing needs of rural and urban communities, and as a result, may not be able to communicate effectively with the personnel in these communities.
- Develop an action plan that incorporates the various needs - human, financial, technical and organizational - of all sites involved in the project. For example, when scheduling the installation of technical devices in rural and remote locations, it is important that one sets realistic timelines to account for limited availability of technical support services in rural areas. More time may be required for technical installations in a remote area than in an urban setting.
- Develop contingency plans that provide suitable alternatives and readily available corrective actions should the project not perform as planned or required.

5.10 The Role of the Telehealth Site Coordinator

This section highlights the importance and role of the site coordinator, and provides information on the duties that site coordinators could perform, all vital to the success and maintenance of ongoing telehealth program operations.

Experience elsewhere in Canada has underlined the importance of utilizing telehealth site coordinators when initiating, implementing and maintaining ongoing telehealth activities, particularly when they involve multiple sites and rural communities.

Considerations:

- Ensure that the site coordinator has a clear understanding of the participants' different needs, issues and variables for both local and remote sites.
- The site coordinators can play a key role in successfully introducing and implementing telehealth in their communities by:
 - Managing the individual on-site day-to-day operations.
 - Working as team members in planning activities to ensure a successful and well-organized network of events occurs, such as scheduling activities that fit within the available timeframes of the providers/users.
 - Identifying and planning to meet the needs (e.g. resource demands) and understanding the perspectives of health professions, services, programs, and/or organizations engaged in providing/receiving telehealth services at a particular site. For example, the resource demands will vary significantly depending on whether the remote site or local site is connecting to a tertiary care centre, a regional hospital, a community care centre or an outpost station.

- Identifying and planning to meet the needs (e.g. cultural diversity, language, knowledge and acceptance of technology, economic factors and lifestyle arrangements) of the communities engaging in telehealth activities. The site coordinator can voice the concerns of the community or individual patient, such as client feedback, technical difficulties and difficulties in using the technology due to cognitive or language differences.
 - Engaging in telehealth project/program marketing activities by gathering and promoting stakeholder, organizational, community, consumer and provider “buy-in.”
 - Providing training for the users, which will depend on the baseline knowledge of the user and the reason the user will be utilizing the telehealth technology.
 - Developing appropriate protocols and processes for patient or client consultations, establishing standardized processes for booking clinics, patient appointments and education sessions.
 - Maintaining and ensuring effective communication channels between all parties of the telehealth activity including patients, families, referring and consulting physicians, community nurses, specialist nurse clinicians, physiotherapists and dieticians.
 - Setting up and operating the telehealth system for each event, having a strong understanding of the telehealth technology, and the ability to solve problems and overcome any minor technical difficulties that may be encountered during a telehealth session.
 - Conducting evaluations such as user satisfaction surveys and technical malfunctioning audits.
 - Engaging in quality assurance and budgetary activities.
- Ensure that the site coordinators have received appropriate education and training in telehealth.
 - Evaluate and review feedback by contacting the site coordinators both within and outside of British Columbia.
 - When hiring site coordinators, it is important to consider the characteristics of the site coordinator and those of the participant sites. This is particularly important when the site involves a rural and remote community where backup health professional and technical support services may not be readily available.

Consider:

- Availability of existing local health professional or technical support services and the need to hire a site coordinator with an appropriate health care background and technical abilities.
- Cultural diversity and the need to hire a site coordinator who understands the local cultures and who can communicate effectively with them in a culturally sensitive manner.
- Languages spoken and the need to utilize a translation service or hire a site coordinator who can speak the languages spoken at both the local and remote site
- Time and energy it takes to build strong trusting relationships and the need to hire a site coordinator who is committed to the project.

5.11 Information Management

Telehealth utilizes a wide variety of information technologies. These technologies often gather enormous quantities of “raw” data, which is later processed into a more meaningful form required to assist with clinical, financial and administrative decision-making, and with the management of client-related information. With the increase in the amount of “raw” data collected in each organization, increasing role of information management is being realized, highlighted and expected to continue to expand. Presently, information management pertains to the management of data collection, access and storage.

In a telehealth project, there are often many different stakeholders involved. Many will require information related to the telehealth project, as well as the ability to share this information with other stakeholders.

The Health Information Management Coordinating Council and the Ministry of Health have highlighted and acknowledged several critical success factors necessary for the management of health information in British Columbia, which include the ability to ensure:

- the privacy and confidentiality of personal information in accordance with legislation;
- information management activities are based on the adoption and use of standards;
- quality and accountability of information collected (e.g. a clear understanding of ownership and accountabilities for stewardship);
- appropriateness and usage of information collected and shared; and
- information is integrated across the health system where appropriate.

Considerations:

- Prior to implementing a computerized medical record system (electronic patient records or EPRs, electronic medical records or EMRs,) it is important to determine what standards, policies and procedures will need to be established or adapted in order to safeguard the management (e.g. data collection, access and storage) of all information within an electronic medical record or file.

For example, develop backup strategies if power outages or mechanical failures occur, preventing access to the system or retrieval of information.

- Review section 5.4.1 (Standards) and section 5.7 (Privacy, confidentiality and security of information). Strict policies will need to be in place to ensure and maintain privacy, confidentiality and security of information and to deal with inappropriate handling of private information.
- Determine how information will be safeguarded and appropriately managed when it crosses multiple sites, organizations and/or provinces.

- Consider threats to the integrity of images, voice and other data. Will the data sets be consistent? Can the contents of the data sets be corrupted? What measures need to be accomplished to reduce these threats and how can they be overcome if they occur? Data inconsistency may be due to various causes such as error in the telehealth software, a malfunction in the telehealth equipment, or operating errors.
- Explore the **Health Information Management (HIM)** web site, created by the Information Management Group at the British Columbia Ministry of Health. This site looks at the province's health information management issues and some of the plans, councils, projects and standards designed to support the effective management of health information.
 - [Online] Available: <http://www.hlth.gov.bc.ca/him/>
- When considering the storage of information, determine an appropriate off-site location where backup information, such as data, files, and records, can be stored safely and securely.
- When implementing new information systems, determine which strategies need to be in place to allow for the inclusion or blending of old information formats with new information formats.

For example, if implementing an electronic medical record, consider what needs to be done. Is it feasible or reasonable to integrate previous conventional hard copy or hand-written patient records with new electronic digital soft copy patient records? From an organizational and administrative perspective, consider both the long-term and short-term costs (human, financial, organizational, technical, legal) associated with decisions regarding the integration or blending of previous hard copy records into new electronic soft copy records.

5.12 Telehealth Projects and Aboriginal Communities

For telehealth activities involving Aboriginal peoples, it is important to understand that significant cultural diversity and pluralism exist among communities and individuals.

Considerations:

- Ensure participation in telehealth project is entirely voluntary and that community members, band councils and health care providers are involved in all stages of a telehealth project. For small communities of 500 people or less who are not affiliated with a tribal council, other options may need to be considered. As one option, a community could partner with nearby communities, regions or tribal councils to plan for the delivery of telehealth services.
- Conduct a needs assessment to determine the needs of the community. Consider if the community has the skill and resources to undertake its own needs assessment. This will ensure the community members, band councils and health providers have an opportunity to decide which telehealth applications will be implemented, and how, when and by whom they will be implemented.
- Consider the current health practices of the participant Aboriginal community, and determine if telehealth activities will fit within the context of these practices. For example, traditional medicine practices continue to play an important role for some Aboriginal peoples, which may prevent acceptance of telehealth medicine.

- Consider making arrangements for sharing telehealth equipment with other services, such as for provision of public health education. This could increase acceptance of and familiarity with the technology, and possibly defray a portion of the capital costs of the telehealth equipment.
- Consider the First Nations and Inuit Home and Community Care Program model that is currently utilized by Health Canada and that builds on existing health and other community-based services.

The goal of Health Canada is for First Nations clients to have access to services in a manner that is holistic and comprehensive in its approach and that maximizes resource utilization, both financial and human.

If using the Health Canada First Nations and Inuit Home and Community Care Program model, the delivery plans for the provision of telehealth services will need to be built on and link with other related services, such as existing community based health services.

- Explore Health Canada's First Nations Inuit and Health Branch (FNIHB) [Online] Available: <http://www.hc-sc.gc.ca/msb/fnihp/index.htm>
- Ensure the delivery plan for providing telehealth services is reviewed for adherence to regional health authority, tribal council or national First Nations criteria by the appropriate review processes established within the community or region.
- Consider the languages spoken within the Aboriginal community and the need to utilize interpreter/translation services, as well as the need to hire a site coordinator who can understand and speak the languages at both local and remote sites.
- Establish a suitable management structure for the telehealth project. Here are some examples:
 - *Delivering telehealth services at a regional level in partnership with the Aboriginal Community* – the community and/or regional health authority hire the site coordinator(s), technicians, health care providers/professionals; train and orient the staff and clients; implement the technology requirements; arrange for the delivery of telehealth services; administer the budget; monitor and evaluate the telehealth activities. These activities are carried out with full agreement from the First Nations communities involved.
 - *Delivering telehealth services at the First Nations Tribal Council level* – this means that the tribal council is responsible for the governance and management of the program. The tribal council hires the site coordinator(s), technicians, health care professionals; trains and orients staff and clients; implements the technology requirements; arranges for the delivery of telehealth services; administers the budget; monitors and evaluates the telehealth activities.
 - *Delivering telehealth services through an external telehealth service provider or agency* – many communities do not have the infrastructure or resources to operate a comprehensive telehealth project. Likewise, many health authorities and tribal councils do not have experience in managing telehealth activities. In these instances, it is advisable to consider contracting a telehealth service provider – an expert in the field of

managing and arranging for the delivery of telehealth services, preferably within the context of the Canadian health system and a First Nations community.

- Ensure that an evaluation framework has been built into the telehealth project. See section 6.0.
- Ensure the telehealth team members, including the project manager, site coordinator and health care providers, understand the diversity and pluralism among First Nations peoples, and are able to communicate effectively with the participant First Nations communities and/or Band Councils.
- Establish suitable protocols when obtaining informed consent, taking into consideration that Aboriginal peoples may balance the risks and benefits to the individual with the interests of the family and community.

For example, an individual may defer to the wisdom of an elder or elect to use a proxy decision-maker from the family in signing consent agreements or advance directives. This could impact the ability to deliver telehealth services to Aboriginal peoples who may approve of using the telehealth technology themselves, but who may have selected an elder as a decision-maker who has reservations about the use of such technology.

- Ensure appropriate communication approaches are utilized. Essential qualities of communication approaches involve:
 - Respecting the individual – it is important to show respect, especially for the elderly and for those with high status. Individual experiences and beliefs are viewed to be as valid and important as traditional or cultural norms.
 - Practicing conscious verbal and non-verbal communication – it is important that participants in the telehealth project listen actively to what is being said and be able to note positive or negative responses, both verbal and non-verbal.
 - Involving the family – realize that although they are closely bound to family and community in identity, Aboriginal individuals are recognized as having authority over their own health and “healing journey.”
 - Using interpreters – if there is any doubt about verbal understanding, an interpreter must be sought prior to engaging in any telehealth discussions or activities.
 - Recognizing that uncertainty in prognosis or disease progression is often more readily accepted among Aboriginal peoples.
- Consider whether the Aboriginal community is willing to accept the technology – some Aboriginal communities utilize technologies in their everyday lives while other communities are reluctant to engage in technological activities. Providing people with the opportunity to try telehealth is the first step.
- Determine the requirements for the implementation of technologies that could have an impact on the environment (e.g. telecommunications) and that would require an environmental assessment, prior to implementation.
 - Explore the First Nations Guide available on the British Columbia Environmental Assessment Office
[Online] Available: http://www.eao.gov.bc.ca/publicat/pro_guide2001/D/pre_intro.htm

- Determine the financial and technical feasibility of installing the technical infrastructure required to carry out telehealth activities. Many Aboriginal people reside in rural and remote communities in British Columbia, which have limited telecommunications infrastructure like single analog telephone lines.

If broadband telehealth telecommunications are needed for specific telehealth applications (e.g. tele-psychiatry video conferencing), then new infrastructure, such as a satellite link, may have to be brought into the community. Setting up a satellite connection for a single community is expensive; however, if a number of Aboriginal communities were interested in sharing the satellite service, they could also share the cost.

- Explore the following Web sites:

Aboriginal Health (British Columbia Ministry of Health)
[Online] Available: <http://www.hlth.gov.bc.ca/aboriginal/>

The Aboriginal Health Association of British Columbia
[Online] Available: <http://www.ahabc.bc.ca>

The National First Nations Telehealth Research Project
[Online] Available: http://www.hc-sc.gc.ca/main/hc/web/msb/fnihp/t_healthe.htm

The Aboriginal Nurses Association of Canada
<http://www.anac.on.ca>

6.0 Telehealth Evaluation

British Columbia health reform initiatives support the evaluation goals identified by Health and Welfare Canada which include: improve or maintain the health of Canadians; ensure the efficacy of the health care system; empower Canadians through involvement in health systems management; ensure responsiveness; ensure equity; and improve cost-effectiveness.

Evaluating telehealth projects can be complex, partly due to recent telehealth applications and technologies. Evaluations can also consider the benefits to rural health providers, such as reduced isolation, relationship with tertiary care specialists and access to education.

To date, telehealth literature indicates that several applications have been evaluated in an ad hoc manner. There is a need to ensure that all telehealth projects are evaluated in a consistent manner. Because of the complex nature of evaluations, prior to implementing a project, consultation with a telehealth evaluation expert is highly recommended.

Two approaches are generally used to evaluate telehealth services: Program Evaluation and Health Technology Assessment.

Program Evaluation

Program evaluation gathers information on the effectiveness of a service delivery program and the outcomes for clients.

Program evaluation can include many types of evaluation, such as needs assessments, accreditation, cost/benefit analysis, effectiveness and efficiency. Whatever the type, the following should be considered:

- Context of the service
- Resources required to provide the service. Is this the best use of resources?
- Outcomes of service delivery And how the project changes or enhances the clients quality of care, subsequent health status, and/or access to core service areas

Note: For further information on telehealth program evaluation explore:

- The **Health Telematics Unit**, Faculty of Medicine, University of Calgary
[Online] Available: <http://www.ucalgary.ca/md/TELEHEALTH>

Health Technology Assessment

This type of evaluation asks questions related to the:

- Safety and performance of the technology. Did the technology work the way it was supposed to? What were the best uses of the technology?
- Cost of the service delivery using the technology

Note: For further information on health technology assessment explore:

- **The British Columbia Office of Health Technology Assessment (BCOHTA)**
[Online] Available: <http://www.chspr.ubc.ca/bcohta/#Methods>
- **The Canadian Coordinating Office for Health Technology Assessment (CCOHTA)**
[Online] Available: <http://www.ccohta.ca/>

6.1 Purpose of Evaluation

The purpose of the evaluation helps to identify the key questions and areas for evaluation.

Determining the purpose of the evaluation with project stakeholders, those providing funding, patients and health providers, will prepare both the stakeholders and the evaluator to address potential issues. It is important to guard against setting too broad or too narrow objectives for the evaluation.

Examples of evaluation objectives include:

- Determine whether project goals and objectives were accomplished
- Determine which outcomes have been achieved
- Determine which aspects of the project worked well, which did not work and why
- Understand why original project expectations were not met, if applicable
- Identify future enhancements to the operation and provision of telehealth services

Note: Evaluation results may be used to compare the service(s) provided using telehealth to alternative health services in terms of **quality of care** and **health outcomes**; **access to health services**; **acceptability** by users like patients and clinicians; **cost effectiveness**; and **utilization of health services** (e.g. changes in waiting times for specialist appointments).

Examples of possible objectives for a specific telehealth project:

- To improve access to high quality health services in the community
- To improve the delivery of health services to the community in a cost-effective manner
- To reduce the number of unnecessary hospital stays outside of the community
- To provide reliable online health information, advice and education to community residents to assist them in making decisions about their personal, family and/or community health
- To reduce unnecessary patient/provider travel by delivering new services or providing new modes of service delivery to the community
- To increase community access to the advice and support of health care providers whom they may already know and trust
- To improve patient triage from tertiary care centres into the rural community
- To improve patient monitoring in the community following hospital discharge
- To provide opportunities for health care providers to access community-based training and education, which may assist with the recruitment and retention of health professionals in the community

6.2 Evaluation Considerations

When evaluating a project, the following key considerations should be addressed:

- Determine the purposes for doing an evaluation
- Identify the audiences for the evaluation information, such as patients health care providers, administrators, educators, provincial health-related agencies and funding sources
- Understand what kinds of information are needed
- Determine sources where the information can be collected like patients, health care providers, site coordinators or project managers
- Consider if the information can be collected in a reasonable manner using questionnaires, interviews or examining documentation
- Determine when the information is needed
- Consider available resources to collect the information

Note: Record enough information in the plan so that an individual outside of the organization can understand what is being evaluated and how. It is important not to limit the feedback and review process only to project staff. Project users at all sites and key stakeholders need to be included in the evaluation, feedback and review process.

The contents of the project evaluation plan should include:

- The evaluation goals
- Who is conducting the evaluation
- What information must be collected to achieve the evaluation goals
- How the information is collected, including tools such as questionnaires
- How information will be analyzed

- What information is to be reported
- To whom the information is to be reported and how it will be used

Post-Implementation Continuous Review

It is important to establish mechanisms that allow for continuous feedback, review and course correction of the project during its complete life cycle. Post-implementation evaluation cannot be over emphasized, especially when there is potential for the project to continue to develop and expand. It will also allow for ongoing enhancement and fine tuning.

The Institute of Medicine (IOM) Evaluation Framework:

The Institute of Medicine (IOM) in the United States has developed and published a document to assist with the evaluation of clinical telemedicine. This document includes many of the key evaluation concepts found in current literature. The document is broad in scope and could be a useful tool when examining the categories of quality, accessibility, cost and acceptability of clinical telehealth.

IOM defines **quality of care** as *"the degree to which health care services for individuals and populations increases the likelihood of desired health outcomes and is consistent with current professional knowledge."*

It refers to **access** as *"the timely receipt of appropriate care"*, to **cost** as *"the economic value of the resource use associated with the pursuit of defined objectives or outcomes"*, and to **acceptability** as the level to which *"patients, clinicians, or others are satisfied with a service or willing to use it."*

(Field, Marilyn J. *Telemedicine: A Guide to Assessing Telecommunications in Health Care*. Washington, D.C.: National Academy Press, 1996)

6.3 Evaluation Methods

There are many methods that can be used when conducting an evaluation. This section highlights a few methods of evaluation that are frequently used:

- Outcome evaluation
- Process evaluation
- Client health surveys
- Economic analysis

6.3.1 Outcome Evaluation

The shift towards evidence-based medicine and decision making highlights the importance of outcome evaluation. Health care reform of the health system emphasizes the importance of evaluating health service delivery outcomes, as a means to determine and improve the effectiveness, efficiency and responsiveness of the health system to meet the health needs of the population. As a result, there is an increasing need for defining outcomes and performance measures and for monitoring, evaluating and reporting outcomes of health service delivery.

Outcome evaluation considers the overall results of the health service program. It assesses the extent to which the health service program affects the target population.

Outcome evaluation can be done by identifying the project's goals, objectives and indicators, and by measuring outcomes.

Outcomes of telehealth services can be measured by asking questions such as:

- Are clients being better served? What were the effects of the service on immediate, intermediate and long-term health outcomes compared to the alternative service(s)?
- Are clients receiving the right service? Did the telehealth application provide a service that was diagnostically accurate, and did it do so in a timelier manner than before?
- What is the client's view of the service provided? Were patients satisfied with the telehealth service compared to the alternative(s)? Were attending clinicians satisfied with the telehealth application compared to the alternative(s)?
- Can the same quality of service (or some equivalent service) be provided at a lower resource cost?

6.3.2 Process Evaluation

Process evaluation measures how the project is operating and progressing toward meeting its goals and objectives. Process evaluation should start with project planning and design, and continue throughout the project life cycle. It helps to determine:

- Whether or not initial targets have been met
- What is needed to revise the project
- Which components of the project are most effective or ineffective
- What conclusions may be drawn about the project's operations and outcomes

6.3.3 Client Health Surveys

In addition to health status data, client health surveys can be used to accumulate a variety of information. They should be used when other data on health outcomes is unavailable or inappropriate, or as a supplement to other data.

A client health survey may be conducted in several ways, including questionnaires and face-to-face interviews. Consideration should be given to the kind of survey selected: will one kind of survey be suited to capture and gather both quantitative and qualitative data?

6.3.4 Economic Analysis

Economic evaluation is a useful tool to assist in health care decision making to minimize opportunity costs and to best use available resources. This is achieved by assessing, identifying, measuring and valuing, comparing costs or resources used, and determining consequences or outcomes of alternative courses of actions.

Costs and consequences of the conventional system and telehealth can be compared to determine which service represents the best use of resources. Costs and consequences are defined broadly and incorporate more than just monetary costs. For example, for teleradiology, costs would include all resources used and the value of those resources, including their market price plus all opportunities lost by not putting those resources to their best alternative use. Consequences would include all wanted and unwanted financial and health outcomes of that particular health service.

Two main types of economic analysis include Cost-Benefit Analysis and Cost-Effectiveness Analysis.

Cost-Benefit Analysis

Cost-benefit analysis is an economic method of evaluation used to determine efficiency of resource allocation. The analysis is done in terms of dollars, intangible social aspects and health services, which are translated into monetary values. Based on a comparison of costs and benefits, a cost-benefit analysis can help to determine:

- Which project applications, technical equipment, telecommunications links and/or network technologies have greater monetary value
- Which method of health service delivery has a greater monetary value (e.g., traditional radiology service delivery versus teleradiology)

Cost-Effectiveness Analysis

Cost-effectiveness analysis compares the cost of two interventions with a similar goal to determine which one provides more value for monies spent. Questions of technical efficiency can be addressed using this style of analysis.

Examples of cost inquiry questions include:

- What were the costs of the project application for patients compared to the alternative? Consider direct costs (travel, child care) or indirect costs (time off work).
- What were the costs of the project application for participant health providers compared to the alternative? Consider differences in cost per service or productivity.
- What were the costs of the project application for society compared to the alternative? Consider differences in total health-care costs.

Note: Very few comprehensive studies have been completed to date on whether or not telehealth delivers cost-effective, quality care and quantifiable benefits. However, patient feedback on telehealth services is very positive in terms of the benefits. This is particularly true of rural areas.

6.4 Telehealth Project Evaluation Framework

Rationale:

- To facilitate identification of possible outcomes
- To provide opportunity for recognition of potential issues
- To develop and maintain a consistent format for telehealth project evaluations

TELEHEALTH PROJECT EVALUATION FRAMEWORK

(Adapted from: *The Evaluation Framework Reference Guide*, BC Ministry of Health, 1996)

1. Purpose of Telehealth Project

2. Purpose of Evaluation:

- ◆ What do we want to know?
- ◆ Who is the audience?
- ◆ What might we accomplish with the information?

3. Resources Needed to Complete an Evaluation

4. Timeline(s) Required

5. Person(s) Conducting the Evaluation

Choose the Key Questions	What to Evaluate	How to Evaluate
What were we trying to accomplish and why?	Project Goals	<ul style="list-style-type: none"> ▪ Needs Assessment ▪ Mission Statement ▪ Measurable Objectives
How well did we manage the project?	Project Implementation <ul style="list-style-type: none"> ▪ Inputs ▪ Operation (Scheduling, ongoing training, and problem log) ▪ Outputs 	<ul style="list-style-type: none"> ▪ Process Evaluation Audit ▪ Comprehensive Audit ▪ Utilization Management ▪ Continuous Quality Improvement ▪ Quality Assurance ▪ Risk Assessment
Are users of the project benefiting?	Project Impacts <ul style="list-style-type: none"> ▪ Health Outcomes ▪ Satisfaction ▪ Quality ▪ Unintended Results 	<ul style="list-style-type: none"> ▪ Randomized Clinical Trial (RCT) ▪ Cost-Benefit Analysis ▪ Cost-Effectiveness or Cost Utility Analysis ▪ Quality Analysis ▪ Surveys of Health Status, Satisfaction and Acceptability
Is the population benefiting?	<ul style="list-style-type: none"> ▪ Population Health Outcomes 	<ul style="list-style-type: none"> ▪ Vital Statistics ▪ Community Health Report Cards ▪ Epidemiology Studies ▪ Cancer Registry

7.0 Conclusion

As it evolves, telehealth will improve and most likely change significantly, how health care is delivered in the future. There are two primary questions that face telehealth projects today: firstly, whether telehealth is the most appropriate mode of health service delivery; and secondly, where and by whom the investments should be made.

The solution lies in the public and private sector's ability to form partnerships based on a common vision and goal. Part of this vision and goal must be to ensure that an affordable telecommunications infrastructure, with interoperable software and hardware, is in place and that the true merits and cost benefits of telehealth are achieved in an appropriate manner.

It is hoped that the reader has gained a clearer understanding of telehealth and an awareness of potential project enablers and barriers. It is also hoped that the companion documents - the **Telehealth Project Planning Framework** (Appendix A) and the **Project Development Checklist** (Appendix B) will assist in the creation of successful telehealth projects.

Finally, as part of the document review process, we invite your comments and feedback.

Please direct your comments to:

Telehealth Coordinator
The Information Management Group
British Columbia Ministry of Health Services
5-3, 1515 Blanshard Street
Victoria, British Columbia V8W 3C8

Or by E-mail: TelehealthBC@moh.hnet.bc.ca

We value your contribution to the development of successful telehealth projects in British Columbia.

APPENDIX A

TELEHEALTH PROJECT PLANNING FRAMEWORK

The following telehealth project planning framework recognizes the need to address and incorporate three key elements required for any telehealth project:

People - decision-makers, service providers, patients, communities, including their values and attitudes towards change and telehealth

Processes - organizational structures and behaviors, project economics, societal and health industry issues

Technology - changing telehealth products and health service possibilities, as well as solutions to the challenges of changing service needs, and integration of old and new technologies

This framework is a road map that shows necessary checkpoints along the way to achieving successful planning and implementation of a telehealth project.

Review:

Project Management (Section 5.9)

A Telehealth Project Planning Framework (Figure 8)

Telehealth Planning and Management Issues (Figure 9)

Figure 9
A Telehealth Project Planning Framework

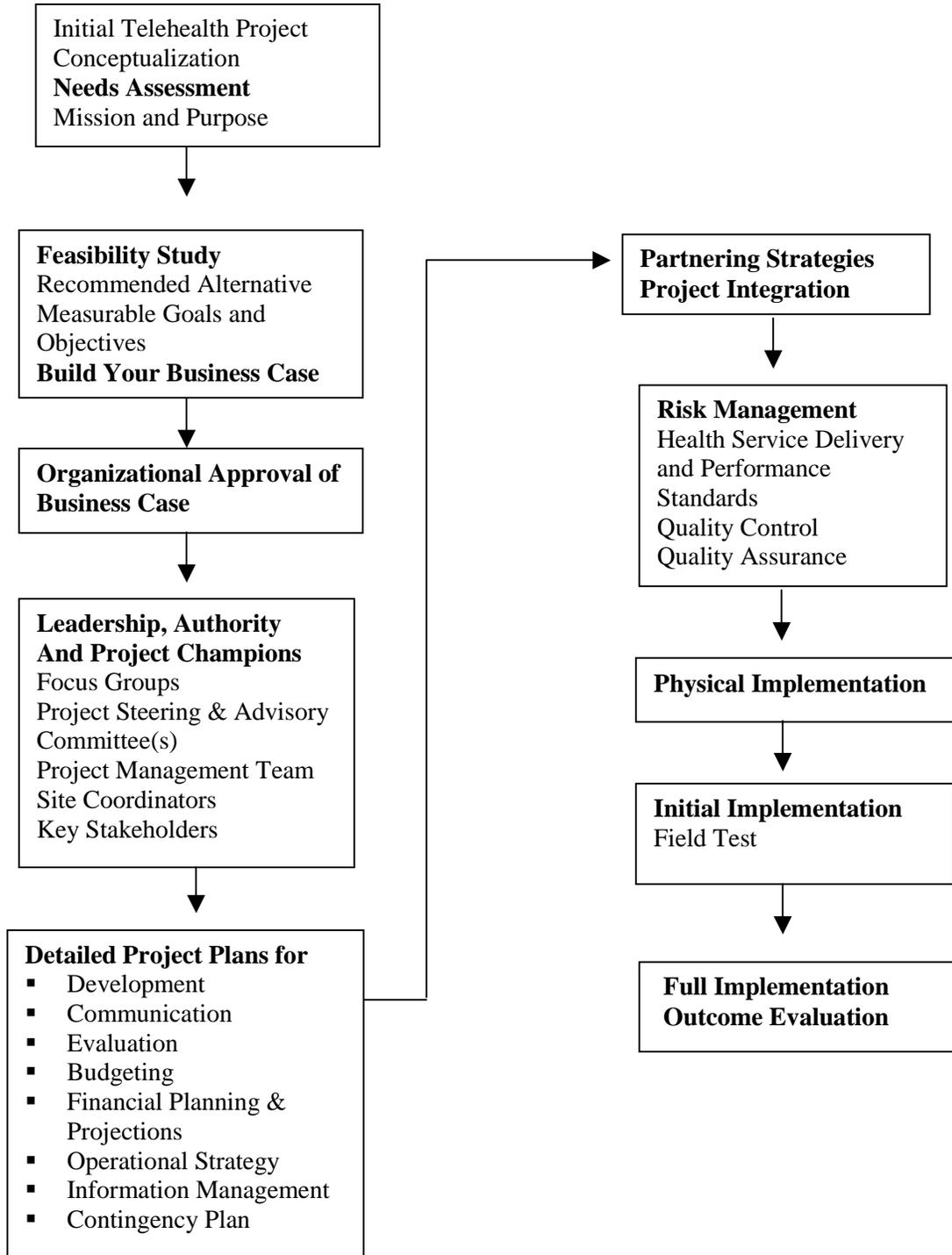
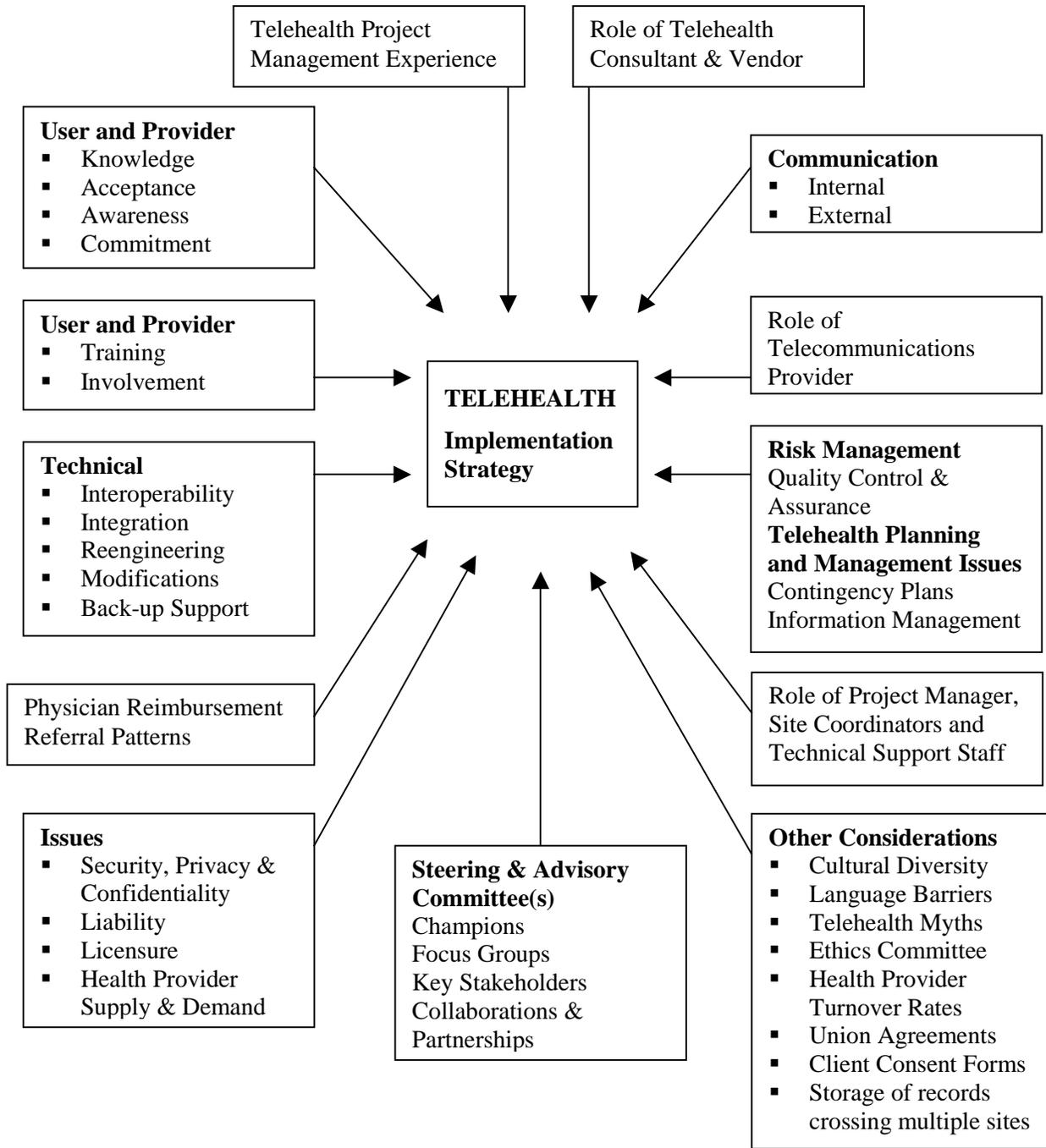


Figure 10

Telehealth Planning and Management Issues



Key Planning Considerations When Developing a Telehealth Project:

1. Needs Assessment

A needs assessment is the first step in the project planning process and assists in the development of long- and short-term plans for telehealth projects. The assessment of need is dependent on a definition of need. Often, need is defined in terms of deficiency from a norm, an ideal, a standard or a desired state. However need is defined, it is certain that need assessment is essential to enable sound project planning activity.

2. Project Mission

Given multidisciplinary aspects of telehealth, the project mission must plan to address and manage multiple focus areas for all project participants – including service delivery and growth, quality, institutional and professional development

3. Feasibility Study

A feasibility study, which supports the project as a viable alternative, will greatly assist selling and funding the project.

Section 5 of this document, ‘Telehealth Project Considerations,’ may be used as a guide to issues to be taken into account when conducting a feasibility study.

4. Financial Support

Once you have completed a feasibility study and have agreed that the telehealth project is a viable option, proceed to the next step and determine how to obtain funding to support the project. This may involve building and presenting a **business case** supported by the feasibility study, to possible sources of funding.

When presenting a business case to funding agencies, demonstrate that the project organization has a clear understanding of what the project wants to accomplish and why. This must be presented in a manner that is very clear to the audience.

5. Organizational Approval

Consider:

- internal audience – patient(s), management, project team, health care provider(s)
- external audience – provincial and federal government, regional health authorities, communities at participant sites, professional colleges and health associations, academic institutions, industry, project partners and the public at large

6. Project Steering and/or Advisory Committee(s)

The steering and advisory committee membership should include representation from:

- Regional health authorities and institutions directly affected by the project
- Key individuals within the health care provider organization(s) who can identify the organizational goals and evaluate the existing level of human and technological support available for the telehealth project
- Key individuals in the participant communities who represent the health needs of those communities
- Advisors and resource people (systems integrators, telehealth consultants, and so on)

7. Organizational Project Management

Determine a suitable style of project management – this may be dependent upon the organizational culture and on the depth of experienced personnel who are available to manage such a process

Appoint a project manager that *best fits* the organizational culture(s) involved at all sites and who is capable of successfully managing the project. In many instances project managers with technical and application knowledge of telehealth are extremely difficult to find, due to the nature of telehealth as an emerging field. As a result, outside consulting is generally recommended. Care must be taken to choose a consultant who has experience in dealing with telehealth projects within the context of the Canadian health care system and who is unbiased/vendor neutral.

It is important to consider the time needed to educate the telehealth consultant on specific situational and historical characteristics, both internally and externally

Project management should ensure that adequate human resources are assigned to the project, including a project manager, site coordinators, user representatives, technologists and analysts

Explore the **Health Information Management (HIM)** web site, created by the Information Management Group at the BC Ministry of Health. This site looks at the province's health information management issues and some of the plans, councils, projects, and standards designed to support the effective management of health information.

- [Online] Available: <http://www.hlth.gov.bc.ca/him/>

Consult with telehealth project managers and/or organizations involved in the operation and evaluation of other telehealth projects in Canada and review their *lessons learned*.

APPENDIX B

TELEHEALTH PROJECT DEVELOPMENT CHECKLIST

This checklist has been designed to provide guidance and assistance to those organizations planning to develop a telehealth project in British Columbia.

It includes a list of basic but essential ingredients to be considered when building telehealth projects, and has been organized into four categories –

1. **Determination of Needs**
2. **Confirmation that Telehealth is an Appropriate Option**
3. **Financial/Administrative Considerations**
4. **Evaluation**

Note: **Section 5** and **Section 6**, along with **Appendix A** of this document ‘**Telehealth Project Considerations**,’ may assist with the completion of the checklist.

DETERMINATION OF NEEDS

In developing the project consider the following:

- The clearly identified health care needs
- Anticipated health outcomes of the project
- Clinical and administrative needs of all parties involved
- Organizational infrastructure needs; for example, a facility upgrade and/or change to accommodate the project
- Human resource needs
- Financial resource needs
- Training and education requirements
- Technical infrastructure requirements – telehealth equipment, telecommunications and network technologies
- Performing a feasibility study to support the identified need and that telehealth is the appropriate option

CONFIRMATION THAT TELEHEALTH IS AN APPROPRIATE OPTION

Will the telehealth project:

- Be commensurate with requirements of British Columbia health care policy and directions?
- Address British Columbia Health Goals?
 - [Online] Available: <http://www.hlth.gov.bc.ca/pho/hlthgoal/index.html>
- Meet health authority and regional health plans?
- Meet specific national, provincial and regional objectives?
- Improve levels of health service delivered?
- Improve equity of access to health services?
- Improve the quality of health services delivered?
- Promote efficiency and effectiveness of health services delivered?
- Maintain or support existing referral patterns?
- Address rural practitioner recruitment, retention and support needs?
- Receive project support in principle from appropriate bodies (Ministry of Health, Hospital Administration, Regional Health Board, Community Health Council and/or Community Health Service Society, First Nations?)

Have you:

- Reviewed *lessons learned* from other Canadian telehealth project experiences?
- Identified project leaders and champions at all sites?
- Considered practitioner reimbursement, licensure and liability issues?
- Assessed existing telecommunication infrastructure and confirmed that appropriate access is/will be possible at all sites?
- Conducted a risk management assessment?
- Considered procedures to ensure quality assurance, control and improvement?
- Confirmed that the technologies to be used meet provincial, common and open standards?
 - Information on British Columbia Health Information Standards Council
[Online] Available: http://healthnet.hnet.bc.ca/hds/stds_council_general_info/index.html

- ❑ Considered whether the technologies to be used will contribute to the inter-connectivity and interoperability of a regional, provincial and national health technology infrastructure?
 - Information on Alberta Research Council Telehealth Interoperability Laboratory [Online] Available: <http://www.telehealthlab.com>
- ❑ Considered strategies to ensure privacy, confidentiality and security of information?
- ❑ Considered ethical, cultural and linguistic issues at all sites?
- ❑ Considered strategies to ensure informed consent?

FINANCIAL AND ADMINISTRATIVE CONSIDERATIONS

Have the following been addressed:

- ❑ Preparation and acceptance of a business case?
- ❑ A cost benefit and impact analysis?
- ❑ Potential partnerships?
- ❑ Identified funding sources?
- ❑ Project sustainability - can ongoing operational costs of the project be met from existing funding or is additional funding required?
- ❑ Membership for project steering and/or advisory committee?
- ❑ Development of a project-planning framework?
- ❑ Project budget established that identifies both implementation and ongoing operational costs?
- ❑ Implementation plan that identifies timelines and critical milestones?
- ❑ Development of a strategy for project communication?

EVALUATION

As part of the project evaluation requirements, has:

- ❑ A project evaluation framework been established?
- ❑ Base-line data against which the project can be quantifiably evaluated been collected?
- ❑ A technology assessment component been included in the evaluation?

APPENDIX C

BRITISH COLUMBIA MINISTRY of HEALTH SERVICES TELEHEALTH CONTACT

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