National Telehealth Interoperability Workshop Report

February 5th- 6th, 2001

Calgary, Alberta, Canada

Canadian Society of Telehealth / Société Canadienne de Télésanté

Executive Summary

Interoperability is the ability of two or more systems to interact with one another and exchange information in order to achieve predictable results. Interoperability issues affect the success of telehealth programs, and act as a major barrier to the sustainability of telehealth in both urban and rural regions throughout Canada.

The serious nature of this issue was addressed in a two-day intensive Workshop on Telehealth Interoperability held at the Alberta Research Council on February 4-6, 2001 in Calgary Alberta. The organization of this Workshop was spearheaded by a Steering Committee consisting of individuals from Alberta Research Council, alberta we//net, University of Calgary, TecKnowledge, Hospital for Sick Children, NORtelehealth network, and HealthWorks TMS. This event was supported by Health Canada, the Telehealth Working Group (TWG) of the Advisory Committee on Health Infostructure, and the Canadian Society for Telehealth. It brought together sixty participants from the public and private sectors to discuss the operational (human), clinical, and technical issues of telehealth interoperability, and to develop recommendations to move the Canadian approach to interoperability forward.

The Workshop opened with a review of the major telehealth interoperability issues in the Clinical, Technical, and Operational domains. Workshop participants initially expanded on these issues, and then worked to identify the areas of interoperability which were deemed core to telehealth programs. Operationally these included ease of use, cost-benefit, privacy, and human resource/education. Clinically, priority interoperability issues included licensure, patient records, risk management, and remuneration. Interoperability issues within the technical theme included connectivity, technical standards, peripherals, and security *(Section 5, Table 5.1 for details on key issues)*. The organisations currently examining these issues were explored *(Section 6, Table 6.1)*. The barriers to interoperability, which included funding, legislation, communication, complexity, and lack of a business case were discussed *(Section 7, Table 7.1)*.

It was determined that some core interoperability elements (such as licensure, remuneration, and security) were already being addressed. However, optimal communications between groups with vested interests in telehealth interoperability was not happening *(Section 8)*. Possible solutions to interoperability issues, including improvements in communications, were discussed. It was determined that a model approach which provides both top-down and bottom-up strategies is needed, with strong leadership and co-ordination to ensure that all groups will be moving towards a common goal.

Key recommendations *(Section 9, Table 9.2)* from this Workshop included:

Selection of Leadership and Coordination

With over forty organisations involved in different aspects of telehealth interoperability, there is a real need for leadership. It was recommended that major roles in leadership and support be provided by the Federal/Provincial/Territorial Working Group on Telehealth (FPT-TWG) and Health Canada's Office of Health and the Information Highway. It was suggested that the Canadian Society of Telehealth / Société Canadienne de Télésanté would make an appropriate choice for a co-ordinating body based on its broad ties to the telehealth community *(Section 9, Figure 3).*

Resources Planning and Business Planning

Resources are required to move this process forward. There was a recommendation that an inventory of telehealth interoperability activities across Canada be compiled. Specific recommendations were made regarding the activities and resources of a number of the organisations already involved in telehealth interoperability issues *(Section 9, Table 9.1).* These stakeholders *(Section 6, Table 6.1),* with either ownership or interest in small pieces of the interoperability puzzle, need to be approached to identify and confirm the core telehealth interoperability issues. This information will provide a foundation for a Telehealth Interoperability Business Plan, which is recommended to be in place by the end of 2001.

Development of an Interoperability Framework

It was recommended that the collection and synthesis of the telehealth interoperability elements be compiled into a Framework to address Telehealth Interoperability Implementation and Sustainability. This Framework will provide interoperability guidelines and recommend standards to assist health care providers in their implementation and use of telehealth systems. These common sets of telehealth standards and protocols will support collaborative telehealth activity, and encourage development of the evolving telehealth industry. It was recommended that the Framework be in place by 2002.

This report offers recommendations and action steps that highlight the vital need for all potential stakeholders to move together in a concerted effort. This Workshop provided a starting point for future activity, encouraged action, and set the groundwork for a potential mechanism to both implement and sustain a Telehealth Interoperability Framework for Canada.

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1.0 Preamble

Issues surrounding Interoperability, including appropriate requirements, guidelines and standards, present a major barrier to the sustained success of national and international telehealth programs. A ***National Telehealth Interoperability Workshop*** examined these issues, and through a consensus process, offered suggestions on how interoperability issues might be addressed.

This two-day Workshop was held at the Alberta Research Council (ARC) in Calgary from February 5th to February 6th, 2001. The organization of this Workshop was spearheaded by a Steering Committee consisting of representatives from the Alberta Research Council, alberta we//net, University of Calgary, TecKnowledge, Hospital for Sick Children, NORtelehealth Network, and HealthWorks TMS. Approximately sixty participants from across Canada with expertise in interoperability, telehealth, and the Canadian Health System participated in the workshop (Appendix A). Three background papers were prepared and pre-circulated to attendees (Appendix B). These papers addressed three specific areas of interoperability: operational/human issues, clinical, and technical.

Designated speakers included Dr. Ed Brown, Dr. Bob Filler, Dr. Sarah Muttitt, and Mr. Dale Bergman. Dr. Mo Watanabe provided welcoming remarks. Ms. Linda Weaver, Dr. Trevor Cradduck and Ms. Andrea Battcock chaired the sessions, and Dr. Trevor Cradduck and Mr. Ralph Ulmer provided workshop facilitation.

Attendees, divided into three groups (Appendix C), participated in four BreakOut sessions entitled: “Making the Case”, “Key Issues”, “Who Does What”, and “Let’s Make It Happen”. Participant groups were asked to consider a number of questions pertaining to each session, and to prepare a report. These BreakOut reports were presented to the group as a whole. Dr. Penny Jennett was asked to summarise activities and discussion after the first day.

Definitions

Interoperability: ***Interoperability refers to the ability of two or more systems* to interact with one another and exchange information in order to achieve predictable results (*refers to more than technical systems) (Bergman, 2000[1]). There are three types of interoperability: human/operational; clinical; and technical.***

Telehealth: ***The use of advanced telecommunications technologies to exchange health information and provide health care services across the geographic, time, social, and cultural barriers (Reid, 1996[2]).***

Standards: ***Standards are the accepted or approved example against which other things may be judged or measured; a measure to which others must conform (Bergman, 2000[1]). Standards are a means by which interoperability is achieved. Therefore, without standards that address the specific interoperability issues related to telehealth the reality of interoperable telehealth systems will not be achieved***

Requirements: ***Interoperability requirements are developed to define the level of interoperability to which different vendors or suppliers of telehealth equipment must communicate and exchange health related information. (Bergman, 2000[1])***

Conformance: ***Conformance to standards refers to the ability of a system to perform to a set of functions according to well-defined specifications that are defined within a standard (Bergman, 2000[1]).***

A wine and cheese evening reception, sponsored by HealthWorks TMS, preceded the workshop. This reception was held at the Telematics Unit, Health Sciences Centre, Faculty of Medicine, University of Calgary.

Health Canada acted as the contracting agency for the workshop on behalf of the Telehealth Working Group of the Advisory Committee on Health Infostructure (ACHI). The ACHI reports to the Conference of Deputy Ministers of Health. The mandate of the TWG is to identify, address, and develop recommendations on key issues in order to support the integration of telehealth into the health system. The ACHI Telehealth Working Group had identified interoperability as one of its priority areas for study. The Interoperability Workshop Project Team of the Canadian Society for Telehealth served as the Program and Organization committee.

[1] *Bergman, D. (2000). Telehealth Technical Interoperability Standards. Alberta Research Council.*

[2] *Reid, J. (1996). A Telemedicine Primer: Understanding the issues. Billings, Montana: Artcraft Printers.*

2.0 Goals, Objectives, and Definitions

2.1 Workshop Objectives

To contribute to the broader acceptance and use of telehealth services by recommending a common set of interoperability standards and policies that facilitate telehealth use, acceptance and investment. To develop a set of guidelines/standards that will assist health care providers to implement and utilize telehealth systems by building on the experience of others using nationally accepted standards.

2.2 Workshop Goals

The goals included:

- solicitation of broad input to reach consensus and support for telehealth interoperability guidelines and their adoption within the health care community
- production of a report recommending a process to develop interoperability guidelines and/or standards to facilitate the interoperability of telehealth systems at the technical, clinical, and operational levels
- indication of issues, barriers, and challenges associated with achieving interoperability in each of the three areas above
- recommendation of a process whereby the resulting preliminary guidelines/standards can be subject to discussion and develop into a set of formal guidelines/standards
- recommendation of a process for the continued evolution of the guidelines/standards together with their ‘ownership’ and ‘guardianship’

3.0 Presentations

3.1 Operational and Human Issues - Dr. Bob Filler & Dr. Ed Brown (complete details – Appendix B)

Dr. Filler and Dr. Brown outlined the Operational and Human issues concerning telehealth interoperability. The issues were diverse, including licensure/jurisdiction, remuneration, consent, liability, accreditation, confidentiality, business case, funding challenges, First Nations, environments, levels of regional integration, referral patterns, health professional issues, the adoption of innovation and political environments.

To achieve operational interoperability, a number of practical steps were recommended. These included: interoperability testing of equipment, clarification on clinical approaches, completion of business arrangements, provider agreements, and education of providers regarding the uses and limitations of the technologies. In addition to these steps, they suggested that operational interoperability requires buy-in from the participating organizations, technical support, training of both users and staff, and detailed scheduling procedures.

Also needed are a description and process for remuneration of health professionals, security and confidentiality guidelines, a prescription fulfillment process, an integration of clinical teleconsultations with other electronic data such as imaging and health records, as well as documented availability of personnel, with published appropriate contact information. A help desk with operational manuals, preferably in electronic format, were also recommended as essential.

All these elements are vital to telehealth success, and helped clarify the complexity of operational interoperability.

3.2 Clinical Issues – Dr. Sarah Muttitt (complete details – Appendix B)

Dr. Sarah Muttit outlined the clinical issues pertaining to telehealth interoperability. Clinical issues presented included: the development of clinical standards and care maps, the use of benchmarking, best practices, validation and evaluation. She recommended guidelines for the development of clinical telehealth standards (Table 3.1, next page).

In her view, the planning for clinical standards follows a service-modelling process, which should examine financial, clinical, infrastructure, needs, process and workflow, roles and responsibilities, support, scheduling, information flow and documentation, technology, training, and validation requirements. Protocols/guidelines/algorithms do not replace clinical judgement and are not a substitute for in-person health care.

Table 3.1:
Guidelines for development of clinical telehealth standards.

- Quality of health service
- Compliance with the Canadian Health Act
- Full disclosure (verbal)
- Security and privacy
- Safety
- Risk management
- Backup systems for technical failure
- Evaluation
- Education and promotion
- Reimbursement
- Equivalent standard of care
- Maintenance of existing patterns
- Local champions; dedicated staff
- Turnkey Technology management
- Central management
- Integrated system

3.3 Technical Issues - Dale Bergman
(complete details – Appendix B)

Mr. Bergman presented definitions specific to interoperability, telehealth, and standards. He outlined the steps within the telehealth interoperability process (Table 3.2) noting that a number of technologies are involved; i.e. multimedia, information system technologies, computer system technologies, and communications technologies. Communication modes are both synchronous (real time) and asynchronous (store and forward).

Table 3.2:
Telehealth Interoperability Process: Steps

- System requirements
- System conformance tests (performance testing)
- Interoperability requirements
- Interoperability conformance tests (performance testing)-qualitative
- Quantificative Conformance and interoperability tests

The benefits of the telehealth interoperability process are that it standardizes system and interoperability requirements for each application, vendors can then design systems to meet these requirements. This process provides a template for the evaluation, and allows for standardisation in testing and verification.

Mr. Bergman emphasized the importance of articulating the details of the clinical, operational and technical requirements, and the need to validate these requirements through tests. Vendors can design telehealth systems to meet requirements, but require them to be explicit. Interoperability standards and guidelines are being developed by focusing on specific applications, e.g., teleradiology, teledermatology, telepsychiatry.

4.0 BreakOut Session: "Making the Case"

Details were outlined specific to the benefits of, and rationale for, interoperability guidelines or standards (Tables 4.1, 4.2), as well as how interoperability could contribute to a broader acceptance and use of telehealth. Participants were also asked to identify the major telehealth interoperability issues facing patients, caregivers, government, funders, and vendors (Table 4.3).

There was a general consensus that telehealth standards are required, and that their application would support telehealth development, but caution was also given. There was concern that imposed standards could limit creativity, restrict choice, change the patient/provider relationship, be slow to develop/time-consuming, restrict excellence by establishing a baseline at the lowest common denominator, distract from needs (that is, will be skewed more to a formula and less to local needs), adversely change the competitive environment for vendors, and lead to compliance issues.

Table 4.1: Benefits of Interoperability Guidelines or Standards:
- improve the ease of using equipment (standardized equipment so transferable from place to place)
- remove worries about connectivity
- allow for client recognition throughout the system
- improve integration with other health care initiatives (e.g. electronic health records, pharmacology system)
- encourage local, national and international integration
- easier clinical interaction; image sharing, data sharing
- valuable marketing tool; aids manufacturers or designers in meeting specific needs
- increase acceptance of telehealth
- ease the integration of new applications/programs
- allow better collaboration
- support stronger business case
- decrease equipment costs
- increase seamlessness
- increase the standard of health care in terms of systems, evaluation and documentation
- decrease costs
- improve access
- increase simplicity – easier communications and understanding
- bring users and developers together
- provide a direction to follow
- create an environment of certainty, certain amount of stability
- contribute to credibility and maturity
- reduce risk of dead end technology; reduce risk of investment in telehealth
- create an exportable product/service by ensuring standardisation
- force the debate on jurisdictional/political/licensure issues
- shorten the learning curve for new procedures and equipment

Table 4.2: Why are standards required in the development of telehealth?
- common vocabulary; consistent communications
- common outcomes
- collaboration, increased teamwork
- set basic requirements (but not too high, as that will stifle the industry)
- ensure compliance with the Canadian Health Act
- support procurement and economies of scale
- support move to the e-health model
- prepare for new, different clinical care delivery models; potential to work well with new healthcare strategies
- allow manufacturers to develop better standardised products
- share knowledge / aggregate data; more informed evaluative approaches and outcome data
- efficiency
- cheaper, affordable access
- service and technology integration
- better continuity of care (patient focused)
- scalability
- encourage funding
- integration of different infrastructures
- leveraging what exists
- cross-sectoral uses
- portability
- maximise use of increasingly limited human resources
- provide a foothold for the telehealth industry
- create confidence
- accountability

Table 4.3: What are the major issues of patients, caregivers, government, funders and vendors?				
Patient	**Caregiver**	**Government**	**Funders**	**Vendors**
simplicity	ease of use	funding	access	money
access	simplicity	connectivity	confidence	connectivity
privacy	decreased learning curve	access	funding	knowledge
confidentiality	confidence in operation	knowledge	connectivity	integration
confidence in technology	access	integration	knowledge	
improved , timely access	consistency in quality	quality of care	integration	
minimal impact of change	lack of awareness		cost effective and real	
education	lack of time		measurable benefits	
funding	connectivity			
knowledge	knowledge			
wait times	increased quality of care			
communication with doctor	accountability to patient			
want high level of	licensure and liability			
satisfaction	communication with patient			
	reliability			
	transparency			
	access to education			
	access to resources			
	recruitment/ retention			

There was general agreement that addressing interoperability issues would lead to decreased equipment costs and market growth, seamless operations, an increased acceptance of telehealth, and would facilitate inter-jurisdictional programs and services. There was consensus that interoperability would provide the stable environment needed to encourage the development of telehealth. Key barriers within the policy, cost collaboration, and needs areas were consistent concerns for all the groups.

Policy issues were viewed as major barriers to interoperability, particularly when it is not clear who are the authoritative regulatory bodies accountable in telehealth interoperability. A definite need for strong leadership and champions was expressed. In terms of **costs**, there was concern that funding would be required to implement telehealth interoperability, and that there is a need to know, or at least estimate, the costs for this implementation. As well, the costs to sustain telehealth interoperability must also be examined. Human resource costs were also discussed, as telehealth interoperability requires trained, dedicated personnel. Another significant issue was the

overall **lack of collaboration**, both at the international and national levels. There was concern that the industry/vendor community is weak, and that interoperability standards could help create a national procurement framework which would allow vendors to build on known requirements. However, such a framework would have to provide the structure to support interoperability, and be flexible enough that rapidly developed standards could be accommodated. Lastly, and most importantly, a key issue was keeping patients and communities at the front of our priority list. The discussion regularly returned to the concept of "needs", and that a clear **understanding of health care needs** would support interoperability, and help maintain a client-focus on recommendations.

5.0 BreakOut Session: "Key Issues"

While the first session described a very broad expanse of issues as related to interoperability, the second BreakOut session focused on the key interoperability issues across the three domains of Operational, Clinical, and Technical interoperability. As well it looked at possible shared areas which would define an "interoperability" core.

Table 5.1: Interoperability Key Issues

Operational and Human	Clinical / Services	Technical
- Promotion/Marketing/ Education re: Interoperability - Resistance to Change (Change management) - Cost/Benefit/Value/Evaluation/ Business case - Adaptation/Education - Privacy/Confidentiality - Human Resources/Training - Ease of Use - Remuneration - Role understanding; cultures - Access and storage of records	- Reimbursement - Licensure - Expectations/management - Access to reliable Patient Information/record - Quality of Practice, best practices, evidence-based practices - Risk Management — consent/confidentiality/safety/ documentation - Meeting Needs, needs assessment - Cost/Value - Benchmarking—appropriateness - Impact on medical practice - Collaboration - Facilities/Communities - Traditional referral patterns	- Universal Connectivity (equipment) - Access to Bandwidth - Costs of existing technology suites - Migration to the Future - Clinical/Operational Requirements - Integrated Framework/Architecture - Identification of Standards—open standards - Interfacing peripherals - Security - Support needed for manufacturers

An appropriate funding structure, along with defining roles, ownership, and accountability were overarching issues deemed as essential to move the agenda forward.

5.1 Core Interoperability Issues

Over the course of the first day a number of important telehealth interoperability issues were identified. This diversity posed a significant challenge as participants began the task of identifying those issues that could be considered *core* interoperability issues (Figure 1). The close correlation between factors impacting interoperability and those affecting the implementation and acceptance of telehealth in general validated the importance of addressing the interoperability issue.

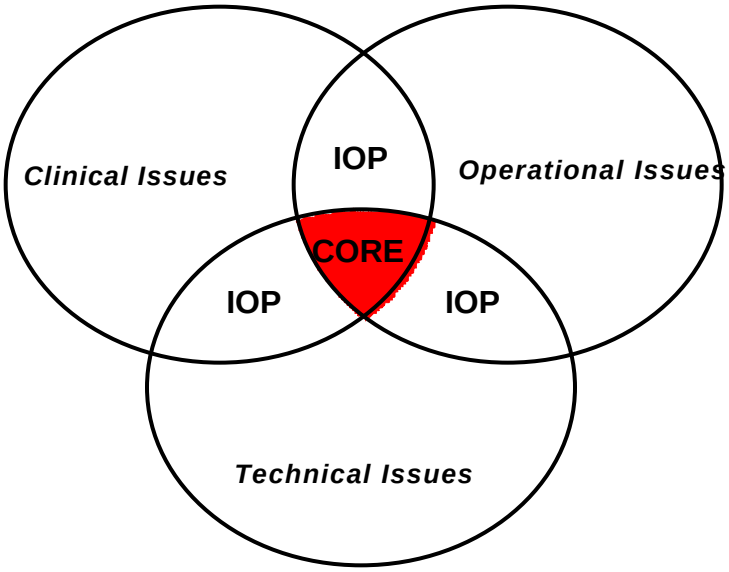

Figure 1: Core Interoperability (IOP=interoperability)

Telehealth interoperability was recognised as **multidisciplinary**, with paradigms that varied between different applications. It was also clear that terminology and processes are not the same between all areas. Telehealth interoperability should coincide with the normal practice of organizations and clinical models as much as possible. And while interoperability is more than just "operations", it became clear that addressing telehealth interoperability could positively impact the operations of health care services.

It was recognised that key interoperability issues may show variation between the rural/remote and urban communities. Caution was recommended to ensure that decisions and agendas would not be defined by an urban-bias. It was suggested that urban answers to rural telehealth interoperability issues are going to be treated with

some scepticism unless there is a legitimate effort to incorporate these differences. There is a definite need for both **cultural and regional sensitivity** when addressing telehealth interoperability.

Participants pointed out the issue of **non-compliance** needed to be considered. It was thought that an incentive system could be created to facilitate developers/vendors to compete and participate. Footprint projects could help move the agenda forward. We need to be inventive and take a risk opportunity to start implementing telehealth interoperability. Since organisations and the people within them are generally resistant to change, there is a need to be sensitive while persistent.

Finally, it was noted that **political interoperability** is of relevance to the telehealth interoperability, and the ability to process change through various jurisdictions. All groups voiced concern over issues of **authority, accountability, ownership, and decision-making**. It was felt that there was need for a well articulated national vision to guide interoperability discussions

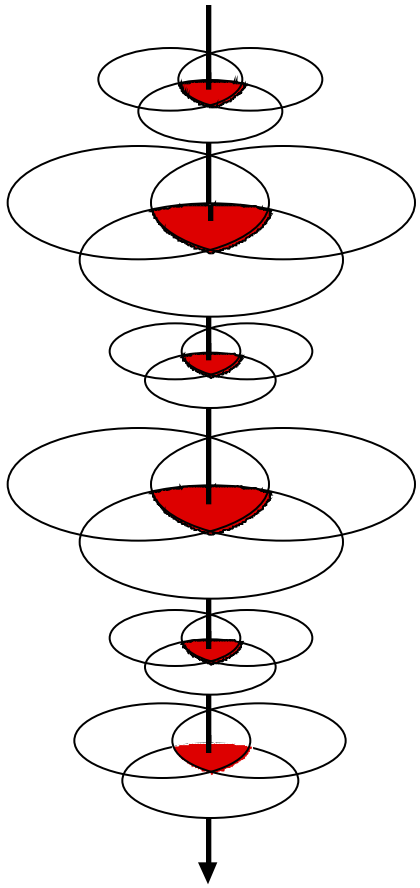

Figure 2:
Common Core/Interface Within the Health System

Interoperability is a complex milieu of clinical, operational, and technical challenges which cross applications, disciplines, regions, and jurisdictions.

*Participants agreed that identifying the core interoperability issues that exist in **all** telehealth systems, regardless of jurisdiction or program size, was a complex necessity.*

These core interoperability themes thread throughout all telehealth activities—big, small, regional, federal—and provide the foundation for a system-wide interoperability approach.

6.0 BreakOut Session: Who does What?

The multidisciplinary nature, complexity, and depth of the issues covered when considering telehealth interoperability concern a broad range of organisations, institutions, governing bodies, and agencies. Several organisations have begun to address elements of interoperability that are directly pertinent to telehealth (Appendix D). Of the many initiatives underway, some of the better known ones include the Office of Health and the Information Highway's Electronic Health Records study, the Canadian Institution for Health Information work on Privacy and Confidentiality, the Reimbursement Report from Laurentian University, and Industry Canada's Broadband Report. The benefit of this cross-organizational interest is that there are activities and processes that can be leveraged when developing a national telehealth interoperability structure. However, in order for issues of telehealth interoperability to move forward, clarification as to questions of ownership, authority must be addressed.

6.1 Organizations Concerned with Technical Interoperability

Technical issues are often the first ones considered when discussing telehealth interoperability. The Canadian Standards Organization (CSA), International Standards Organization (ISO), International Telecommunications Union (ITU), the Alberta Research Council (ARC), and the Institute of Electrical and Electronic Engineers (IEEE) have all been examining issues specific to technical standards. The development of a technical measure to which all equipment must conform would assist greatly in technical interoperability.

Issues around universal connectivity are being addressed nationally by the Broadband Taskforce, which has been spearheaded by Industry Canada's Information Highway Applications Branch (IHAB), with the involvement of CANARIE. At another level, connectivity work is underway at the ARC in Alberta and in Quebec at RISQ (although the work in Quebec is focused solely on bandwidth, and not interoperability issues).

Issues sometimes cross over the defined interoperability domains, such as the federal/provincial/territorial Advisory Committee on Health Infostructure (ACHI) Working Groups on Telehealth, Electronic Health Records, and the Protection of Personal Health Information. These issues have technical, clinical, and operational interoperability aspects. The Office of Health and the Information Highway (OHIH), a Directorate within the Information, Analysis and Connectivity Branch of Health Canada, participates in these Working Groups and also provides Secretariat support. The Canadian Society for Telehealth (CST), while not developing standards,

actively promotes and advocates their development, particularly through their recently developed Policy Committee.

6.2 Organizations Concerned with Operational Interoperability

Operational interoperability can often involve aspects of both clinical and technical interoperability, since these factors can directly impact the function of an organization. However key Operational issues include organizational change management, cost issues, privacy/confidentiality, human resource issues, and policies on remuneration and on the access/storage of records.

The Advisory Committee on Health Infostructure, the Advisory Committee on Health Services, and the Advisory Committee on Health Information Resources are examining policy, frameworks and operational issues at the Federal/Provincial/Territorial government levels. The Canadian Institution for Health Information (CIHI) is also mandated by the health ministries to examine telehealth. While ACHI and its affiliates work primarily at the Ministerial level, regional examination of interoperability issues is happening at the level of individual Health Districts and Regional Health Authorities. The OHIH is also interested in addressing some of these operational issues, and have had working groups looking at policy, harmonization, and electronic health records. Members of the CST Policy Committee are compiling related documentation.

6.3 Organizations Concerned with Clinical Interoperability

Clinical telehealth interoperability focuses on issues of impact to the practitioner and the client/patient. As expected, many of the professional bodies have started to examine issues around licensure including the Federation of Medical Licensing Authorities of Canada (FMLAC), the Royal College of Physicians, and Surgeons and the Canadian Nurses Association. Clinical impact, benchmarks, and quality of practice are also being examined by the respective Professional associations and by groups like the CST. The concept of “risk management” is being looked at by the Canadian Healthcare Association and other professional bodies. As well, the Advisory Committee on Health Services (ACHS), which reports to the Conference of Deputy Ministers, has a Working Group on Selfcare/Telecare, which has interest in interoperability issues as they pertain to homecare.

Privacy, consent, and confidentiality are clinical interoperability issues, but are also being examined from the operational and technical aspects. There are number of groups looking at these issues (not always specifically from a telehealth viewpoint), including associations such as COACH, CIHI and the CST. Further, at national,

and provincial/territorial levels, the issues are influenced by the Freedom of Information and Protection of Privacy Acts, as well as by a number of "privacy groups" which are looking at patient-practitioner confidentiality. It is likely that the reports and activities of these groups will have significant impact on clinical telehealth interoperability.

Table 6.1: Who is Addressing Interoperability Issues

Operational and Human	Clinical / Services	Technical
ACHI	ACHI	Alberta Research Council
ACHS	Canadian Healthcare Association	ACHI (Federal, Provincial, Territorial)
ACHHR	CIHI	Broadband Taskforce
CIHI	COACH	CANARIE
District/Regional Health Authorities	FOIP (Federal)	Canadian Standards Association
OHIH, Health Canada	Licensing Bodies	IEEE
Other Federal, Provincial,	OHIH, Health Canada	IHAB, Industry Canada
Territorial Govt. Agencies/Departments	Professional Associations	ISO
	- Royal College of Physicians/Surgeons	OHIH, Health Canada
	- Canadian College of Family Practice	RISQ (Quebec)
	- CNA	
	Provincial Authorities	

(See ***Appendix E: Organizations Involved in Interoperability Issues*** for full names of organizations listed in Table 6.1)

7.0 BreakOut Session: Let's Make It Happen

Recognition of barriers to telehealth interoperability across all domains was thought to be the next step towards identifying solutions, as these barriers will impact all future strategies and guidelines. The focus groups recognized both specific and general barriers, as well as long and short-term challenges.

7.1 Barriers to Clinical/Service Interoperability

Clinical/Service interoperability faces significant issues regarding policy and procedure oriented decisions. These included non-uniform approaches to remuneration, legislation variations between jurisdictions, and lack of practice standards.

Lack of education/training was identified as a barrier. While much of the discussion focused on the lack of training/programming materials, geographical discrepancies in training availability were also discussed. Rural and remote communities were identified as being particularly at risk.

Communication was a core concern throughout all the interoperability domains. In the case of clinical/service interoperability, concern was expressed over the lack of appropriate, and open, discussion among groups. Two main reasons for this communication failure were suggested: 1) lack of knowledge among participants of related activities, and 2) active isolation driven by balkanisation and protectionism. These two issues present difficulties in the ability to share information on interoperability.

Finally, access to available and sufficient finances was seen as a barrier to successful interoperability. This fiscal barrier was considered to affect all domains.

7.2 Barriers to Technical Interoperability

Again barriers of available financing and lack of communication were cited. Communications barriers were focused specifically on the diversity and fragmentation of the stakeholder community. Since technical interoperability is the domain that most obviously involves the commercial telehealth market, there are discrepancies between the motivations and interests in the public and private sector players. The variation in the approach and profile of telehealth between these sectors was seen as a possible barrier.

Lack of adopted standards, or legislation to impose standards, was seen as a major barrier in technical interoperability. Although, those present recognized that setting standards legislation may not be sufficient to guarantee compliance with a specific standard.

7.3 Barriers to Operational Interoperability

Again the core barriers of money and communication appeared, in this case these barriers were compounded by the complexity that comes with operational structures, and the resultant difficulties in being able to share or generalize.

Nationally, there is huge variance in the operational approach to care delivery. In addition to the north/south variation previously described, the focus groups also were concerned about the diversity that occurs across regions. For example, health care delivery in Calgary is much different from that in Cape Dorset. This variation poses a challenge to the generalizability of telehealth interoperability guidelines.

7.4 General Threats and Barriers to Telehealth Interoperability

In developing telehealth interoperability there are a number of barriers that impede the process in general. The most pressing of these general barriers is *time*. Telehealth is a rapidly developing field—the requirements for interoperability can radically change over a relatively short period of time. As well, time becomes a barrier when the individuals and organisations that need to address interoperability often are dealing with other internal time management issues. Further, the lack of information on the tangible benefits of telehealth interoperability makes the issue difficult to prioritise, as does the lack of funding specifically targeted for this activity.

Another barrier is lack of commitment from stakeholders who are looking for some indication of the return on their investment (ROI) in the development of interoperability guidelines. This process demands significant sharing of time, resources, and energy. The lack of a business case, vision, plan, or blueprint is not only an ROI issue, but also indicative of problems within co-ordination, collaboration, and ownership. The process for developing interoperability is very immature and fragmented. As such, there is a lack of clarity on accountability, governance, and mandates.

Table 7.1: Barriers to Action

Clinical/Services	Technical	Operational	General
• Insufficient funding • Lack of Education/training • Communication • Lack of Legislation • Multiple player disciplines • Lack of practice standards • Non-uniform remuneration	• Insufficient funding • Lack of communication • Number of stakeholders • Conflicting private/public responsibilities • Lack of standards • Low profile of telehealth	• Insufficient funding • Lack of communication • Complexity • Regional Variance • Difficulties in ability to share	• Time • Lack of co-ordination / collaboration • Lack of business case / ROI • Sharing • Lack of committed HR • Lack of a vision • Ownership, accountability • Lack of clarity regarding mandates • Insufficient funding

8.0 How Do We Move Forward? Solutions to Interoperability Issues

8.1 Addressing Clinical/Service—Licensure, Remuneration, Needs

Interoperability with respect to Licensure does not exist in Canada. However, there are a number of groups involved in this issue (for example, RCPS, FMLAC, CNA, CMA), many of which hold influence in addressing the Licensure barrier. With multiple player disciplines and various practice jurisdictions involved, it is important to have open discussion on these issues, particularly when there is uncertainty regarding boundaries. When necessary, consensus may be required between jurisdictions to ensure a fair and equitable solution is applied. Participants felt it particularly important that the CMA and CNA share similar solutions.

Remuneration is another key barrier to clinical/service interoperability. By addressing problems in the fee code and payment jurisdictions it is possible to address this challenge. The fee code for service needs to be addressed in *all* provinces/territories, although it is possible to use the existing reciprocity agreement structures for cross-jurisdictional billing. Remuneration is being examined at all levels of government. The ACHI report on remuneration will have influence on the ministries of health. However, it was deemed important that these ministries be aware of all factors that can impact telehealth remuneration, and thus telehealth interoperability.

For clinical/service telehealth interoperability there are both individual and community needs that must be met. Community issues are often represented by organisations responsible for operational management such as regional health authorities, First Nations authorities, and district health councils. The participation of these groups in discussions and decisions regarding interoperability is paramount to addressing the barrier of communication.

Quality of Practice, Clinical Operational Requirements, Risk Management and Meeting Needs go together when considering best practices. These are critical benchmarks needed for the development of an interoperability strategy. Best practices in the clinical environment can be found in the clinical community and their associations. As well, Health Canada is making efforts through groups like OHIH to collect this information, and is in particular spearheading a Telehealth Initiatives Database which profiles best practices in telehealth. The collection and dissemination of this information is vital to the success of telehealth interoperability.

8.2 Addressing the Technical Standards

Ideally the goal is to develop an interoperability infostructure that is inclusive, and not just applicable to small pockets of telehealth activities. Communication between provinces/territories is vital. Currently, discussion amongst the jurisdictions is viewed as limited. To address this barrier in communications, it is necessary to create an architecture that brings together the many diverse groups involved in technical interoperability. There is significant activity in both the public and private sectors, it is vital to have a mechanism to keep on top of what is happening and be able to share that information between the participating organisations.

8.3 Addressing Funding

There is an absolute need for dedicated resources to make things move forward. However, the funding environment is inherently competitive and is not conducive to the collaboration or sharing of best practices. While some recent funding cycles have encouraged collaborative applications, it was stated that these still were not inclusive of all interested parties. The competitive grant structure generally encourages the promotion of individual cases, as opposed to moving forward on a larger scale. Funding is a barrier to the development of a telehealth interoperability framework. Piecemeal approaches are failing to move this issue forward, and collaboration is not being supported. Leadership is required here.

8.4 Addressing Vision

However, before funding can be released, the value of telehealth interoperability needs to be proposed. A business case or cost/benefit/value proposition would allow for a common vision to be voiced. This document would also provide the reasons why interoperability and standardisation can move telehealth forward. The case must be made nationally, and be inclusive of both the public and private sector.

8.5 Addressing Ownership, Accountability and Leadership

There is an overwhelming need for leadership. There are over forty organizations involved in different aspects of telehealth interoperability, they all have ownership over small pieces of the interoperability puzzle. At present, there is no cohesive vision or mandate to ensure that interoperability is reached. A hierarchy needs to be developed that can provide the mandate to move forward and be a champion to all involved. Leadership must be taken by an organisation (or organisations) with both the internal mandate to fund telehealth interoperability, as well as with some level of accountability for seeing an interoperability framework in place.

9.0 Next Steps: Recommendations and Action Steps

To move forward there must be a shift from the current reflective phase (which is limited to a descriptive examination of the issues) to an active phase of implementation and adoption. The following action steps and strategies were recommended to achieve success within telehealth interoperability.

9.1 Model of Approach—Mandate to Move Forward

An integration of all the various activities impacting telehealth interoperability is required. The model for this framework could take many forms ranging from a top-down federal/provincial mandated process to a bottom-up industry motivated itinerary. It was decided that a combination of a top-down and bottom-up strategy, with strong lateral communication of information, would most likely be successful (figure 3).

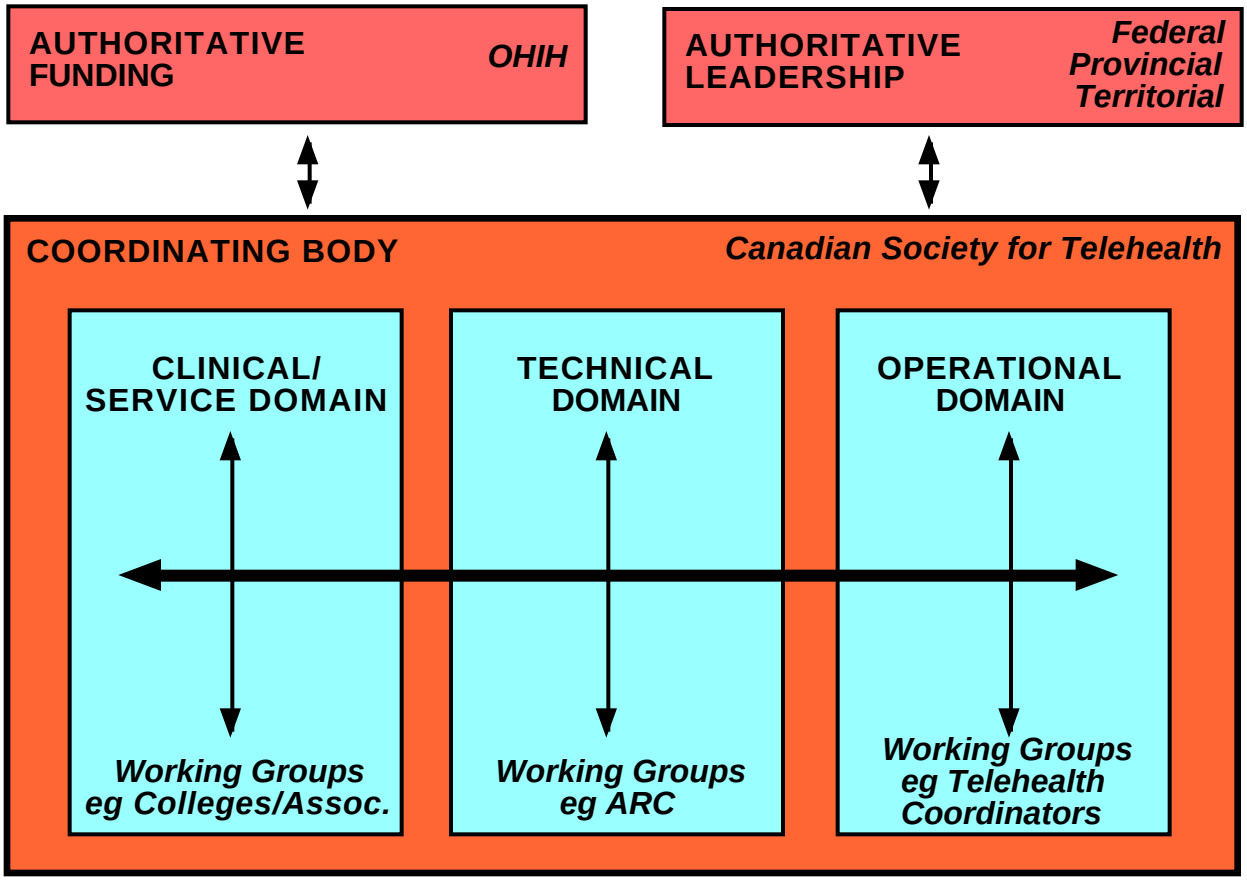

Figure 3: Model for Approach to Telehealth Interoperability

Leadership is an absolute requirement at this point of the process. Further work must be mandated at a level that is considered authoritative for all the potential participants. This both legitimizes and focuses the process. Since health care is both federally and regionally mandated, it was felt that accountability and leadership for telehealth interoperability sits at the federal/provincial/territorial level. It was suggested that the Federal/Provincial/Territorial Telehealth Working Group may be the appropriate body to oversee the development of a telehealth interoperability framework. This group has ties to all levels of government, including the decision-makers within health ministries.

It is expected that this level of governance will provide both leadership, as well as fiscal, support. As such, it was recommended that the provision of a cost/benefit/value plan is required before more aggressive work can occur, or can be approved for funding. At the federal level, it was suggested that the OHIH entertain a proposal to support the development of such a value plan since examination of telehealth interoperability fits within the OHIH's mandate to act as integrator within telehealth, and its focus is on supporting policy and applied research. The OHIH could provide the necessary funding. It was felt that the OHIH has a mandate for a number of relevant areas; however participants were not sure if this organisation had the skills and competencies to achieve needed goals.

It was recommended that overall coordination between the domains and up to the governing funding body be provided by the CST. With government, professional, academic, and industrial members, the CST has the representation to communicate in all telehealth sectors, and has a mandate to act as an "advocate for telehealth in Canada for the benefit of health for all Canadians". While the CST has no jurisdictional powers, its broad focused telehealth advocacy role, along with the expertise and knowledge base of its membership, makes the CST an appropriate choice for this coordination role. It was recommended that resources be identified/sourced to allow the CST to coordinate efforts and to look at requirements within the three domains of interoperability. For example, the CST may elect a sub-group, such as the ARC, to coordinate the technical domain however, the CST would be responsible for overseeing this activity and its deliverables.

Since there is a need to develop consensus over three very broad domains of interoperability, a strong lateral plinth of communication between the columns of domains will provide stability to the process. The need for communication both within and between the domains is paramount. This will help prevent the current practice of multiple isolated activities within interoperability.

9.2 Action Steps for Organisations

While the previous section described a recommended model for the overall approach to developing a framework for telehealth interoperability, there were also specific recommendations made for a number of the organizations already involved in telehealth interoperability issues.

While no individual organisation was mandated to move these recommendations forward to the appropriate organisations, it was suggested that the CST would make an appropriate choice as messenger, as would be in keeping with the recommendation that the CST act as a coordinating body for the overall model.

Table 9.1: Action Steps / Recommendations to Organisations

Organisation	Action
ACHI (Advisory Committee on Health Infostructure)	The ACHI should make recommendations to the deputy ministers regarding standard policies for clinical interactions that can serve all provinces and territories. These recommendations should be made immediately. Recommend to the ACHI that ***all*** professionals have to be reimbursed for telehealth practice, and that the ACHI should forward this recommendation on to deputy ministers, and forward it to ACHHR which is responsible for reimbursement. Carry on with current mandates, but more aggressively. Recommend an ex-officio on the ACHI to bring telehealth expertise into the FPT-TWG.
CST (Canadian Society of Telehealth)	Set up taskforce for clinical, technical and operational interoperability requirements. Organise a national forum of telehealth coordinators at the next annual CST meeting (October '01). Create a CST taskforce to work on the OHIH database of telehealth activity in Canada. The CST has the responsibility to define the interoperability planning process and core elements. The CST needs to coordinate and put together a strategic vision to coordinate other groups. The CST needs to be funded with staff that can go out and work on issues, needs to be more than an informal volunteer group. A program manager is needed to organise interoperability activities. The CST should talk to the FPT-TWG regarding human resource interoperability issues, and licensure issues. The CST should recruit the ARC to act as a standing body on technical interoperability. CST representation is needed on the Broadband working group (CST members are on this group, but not as representatives of the CST).

	The CST should ask the FPR-TWG or the OHIH to fund the creation of the interoperability plan. Develop a list of the things we need to do a policy paper etc. The CST should take on a temporary 2-year mandate to articulate and develop the plan. At the next CST Annual Meeting, the CST should report how it has, or will be, dealing with the report coming out of this workshop.
Federal/Provincial/ **Territorial Governments**	Each level of government needs to develop a vision statement regarding telehealth and regarding telehealth interoperability.
Health Canada	Health Canada should move forward on the recommendations already made in the Health Infoway report, in particular it should work on defining the clinical and planning process for telehealth. Health Canada is identifying the current practices regarding reimbursement practices. This work will point out problems, and identify which jurisdictions have moved ahead and which are lagging. This information should be used as a platform for an informed discussion. CHIPP recipients should be requested to collectively report on their experiences related to interoperability. These findings should be shared with the larger community, and should contain both short and long-term observations.
IHAB (Industry Canada Highway Applications Branch) **Broadband Taskforce**	The Broadband Taskforce should mandate rural, remote and urban broadband connectivity into all health facilities/clinics.
OHIH (Office of Health and the Information Highway)	The OHIH should fund/contract the CST to move the interoperability issue forward. The OHIH is encouraged to continue with its proposed website. The OHIH should fund a specific inventory of telehealth interoperability activities across the country. This action step should be immediate. The OHIH needs to develop a model that specifically helps to channel telehealth information to themselves, a plan to improve their profile as an information repository. Carry on with current mandates, but more aggressively. The OHIH should promote the officer responsible for telehealth, and if possible dedicate an officer to this activity. The OHIH should insure that its role is complementary to that of the CST (as opposed to repetitive).

FMLAC (Federation of Medical Licensing Authorities of Canada) ***(College of Physicians and Surgeons)***	The FMLAC needs to become better informed about all regulated health professions dealing with telehealth licensure issues, and it needs to act to resolve this issue. The FMLAC should recommend and facilitate a minimal telehealth licensure, and move the agenda of the licensing authorities along. Licensing bodies should address the issue of inter-provincial licensure of physicians, at least aim for a marginal/temporary license that any physician can get in any other province. The CST recommends that various colleges resolve the issue of licensure
Universities / Colleges	Universities, medical schools, colleges, and any other institutes training people in health care should attempt to offer some level of training specifically in telehealth.

9.3 Next Steps and Timelines

There were a number of suggested milestones/tasks. There was less discussion regarding the timelines, hence only approximated dates are offered.

Table 9.2: Potential Timelines

Project Task (and recommended lead/source)	Approximate Date
Delivery of Interoperability Report	March 2001
Workshop results to be presented to members of ACHI	April 2001
Workshop results to be presented at the Conference of Deputy Ministers of Health	June 2001
Panel summary of outcomes at HEALtelehealth 2001 – Toronto	May 2001
Net 2001 - Calgary	2001
Develop an inventory of Telehealth Interoperability Activities across Canada (OHIH – funded)	2001
Identification of the core telehealth interoperability elements (OHIH-funded)	2001
Secure resources for Business Plan development (OHIH - funded)	2001
Delivery of Business Plan, including confirmed model for IO framework (CST - lead)	2001
Approval to Move Forward (F/P/T groups – authority, mandate)	2001
Build Stakeholder Network (CST - coordinate)	2002
Identification of issues and discussions around recommendations (CST - coordinate)	2002
Data Collection and Synthesis (CST - coordinate)	2002
Interoperability Implementation and Sustainability Plan/Framework (CST - coordinate)	2002

10.0 Conclusions

The participants at the Telehealth Interoperability Workshop had a number of issues to address within their two-day discussions. Despite the complexity of the issues, they developed some initial steps to move the solution forward. By initiating an examination of the core components of telehealth interoperability, the participants began to address the complexity of the issue.

The process and next-step recommendations to move forward focused heavily on the need for leadership and championship. While a number of processes and organisations were identified as moving towards a common goal, there was little evidence of co-ordination or structure to this effort. This fragmentation of effort requires an authoritative voice to act as governance for interoperability discussions. The participants suggested that since governance over telehealth happens at federal, provincial, and territorial levels, the governance of interoperability issues must also reflect that constitution. Thus, the Federal/Provincial/Territorial Working Group on Telehealth (FPT-TWG) was suggested as a possible overseer. Funding is also required to move this process forward. Health Canada's Office of Health and the Information Highway was recommended as an appropriate source to support this process. The OHIH has significant interest in telehealth and in the sharing of best practice information on interoperability.

While the FTP-TWG can act as an upper level contact it was felt that they were not the appropriate body for co-ordinating the activity. While the FTP-TWG maintains strong ties to ministerial decision-making groups, they may be too distant to some of the ground-level participants active in telehealth interoperability. It was recommended that the Canadian Society of Telehealth / Société Canadienne de Télésanté (CST) might make an appropriate choice for a co-ordinating body based on their broad ties to the telehealth community (including the clinical, operational and technical domains), their research expertise, and their previous support of the interoperability issue. The official sanction of a higher governance body, such as the FPT-TWG and Health Canada, could endow the CST with the necessary authority to co-ordinate the stakeholder communities interested in telehealth interoperability. Once that authority is given, it was recommended that the CST secure funding to move forward on the interoperability issue.

As soon as the governance, co-ordination, and funding are in place, it was recommended that work begin immediately on developing an inventory of telehealth interoperability activities, and identification of the core telehealth interoperability elements. These will provide a foundation for a Telehealth Interoperability Business Plan, which is recommended be in place by the end of 2001. This document will set in motion the steps needed to achieve a complete Interoperability Implementation and Sustainability Framework.

The Interoperability Implementation and Sustainability Framework will provide guidelines and recommend standards to assist health care providers in their implementation and use of telehealth systems. This Framework will include recommendations in the clinical (eg. reimbursement, licensure), operational (eg. training, record storage protocols), and technical (eg. peripheral standards, privacy) domains of telehealth. This common set of telehealth standards and protocols will support collaborative activity, and encourage development of the evolving telehealth industry. It was recommended that this Framework be in place within 2002.

This Workshop provided a preliminary address on the status of telehealth interoperability in Canada, and highlighted the vital need for all potential stakeholders to move together in a concerted effort. This movement forward must happen effectively and rapidly as both industry and the public health care sector are witnessing interoperability as a barrier to the sustenance and expansion of their efforts. This Workshop provided a starting point for future activity, and encouraged all involved to take action.

Appendix A: Participants of the National Telehealth Interoperability Workshop

NATIONAL TELEHEALTH INTEROPERABILITY WORKSHOP

CALGARY, ALBERTA

FEBRUARY 4 – 6, 2001

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Appendix B: Pre-Workshop Papers

Telehealth Interoperability—Clinical Standards.

Dr. Sarah Muttitt, TecKnowledge Healthcare Systems Inc.

Telehealth Technical Interoperability Standards.

Dale Bergman, P.Eng., Alberta Research Council

Operational and Human Issues for Telehealth Interoperability.

Dr Ed Brown and Dr. Robert Filler.

Appendix C: Questions From the BreakOut Sessions

Making the Case

How will Interoperability contribute to a broader acceptance and use of telehealth?

Why are these standards required in the development of telehealth?

What are the major issues of patients, caregivers, government (funders), vendors?

Key Issues

What are the key issues in each of the areas (identify 3 each)?

How do the three areas interact?

Do you support the approach and recommendations in the papers?

Is there anything you wish to add/change/delete?

Who Does What

What processes, structure and organizations exist that can be leveraged?

What are the major impediments to implementing these suggestions?

Who should be the guardian/owner of the standards?

How should the guidelines/standards be continuously enhanced and updated?

Who is responsible for addressing the barriers?

How can these barriers be overcome?

Let's Make it Happen

What are next steps? Strategy?

What should be the follow-up to this workshop?

How can these guidelines be adopted by the Health Community:

- *in the very short term*
- *in the longer term*

How do we reach a national consensus on these guidelines?

Who are the key stakeholders in advancing the guidelines?

How should they be involved?

Appendix D: List of Participants by BreakOut Group

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Jim Snelgrove – CDC, AB

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Bob Wood - Norstan, AB

Ralph Ulmer – ARC, AB

Appendix E: Organizations Involved in Interoperability Issues (Referenced at the Workshop)

ACHI – Advisory Committee on Health Infostructure

ACHS – Advisory Committee on Health Services

ACHHR – Advisory Committee on Health Human Resources

ARC – Alberta Research Council

Broadband Taskforce

CANARIE - Canadian Network for the Advancement of Research/Industry and Education

Canada Health Network

CHTA – Canadian Health Technology Assessment

CIHI – Canadian Institute for Health Information

CMPA – Canadian Medical Protective Association

CMA – Canadian Medical Association

CNA – Canadian Nurses Association

COACH - Canada's Informatics Association

CRTC – Canadian Radio-television and Telecommunications Commission

CSA – Canadian Standards Association

CST – Canadian Society of Telehealth

FMLAC – Federation of Medical Licensing Authorities of Canada

First Nations Health System

FOIP – Freedom of Information and Protection of Privacy

FPT-TWG—Federal/Provincial/Territorial Telehealth Working Group

Health Canada

HRDC—Human Resources and Development Canada

IEEE – Institute of Electrical and Electronic Engineers (Working Group – 172 Standards Groups)

IHAB – Industry Canada Highway Applications Branch

Industry Canada

ISO - International Standards Organization

ITU - International Telecommunications Union

IVEY—The Richard Ivey Foundation

JCAHO – Joint Commission on Accreditation of Healthcare Organizations

National Health Information Surveillance Program

NRC – National Research Council

OHIH—Office of Health and the Information Highway (Health Canada)

Provincial Ministries of Health

RISQ—Le Réseau d'informations scientifiques du Québec

Appendix F: Members of the Steering Committee

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Mamoru Watanabe, University of Calgary

Linda Weaver, TecKnowledge

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NORTH Network
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albertawe//net
AETHRA

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