First Nations Tele-health:
A Primer for Strategic Planners

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National Aboriginal Health Organization (NAHO)
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Introduction

This publication follows from a commitment made by the First Nations Centre (FNC) of the National Aboriginal Health Organization (NAHO) at the First Nations and Inuit Tele-health Conference, held September 22-23, 2005 in Winnipeg. This commitment was to produce a list of tele-health applications for use by First Nations (FN) planners engaged in developing regional tele-health strategic plans.

This is a discussion and reference document for strategic planners, not a tool kit. It is not meant to guide First Nations through the tele-health strategic planning processes, but it should help make that planning more informed.

Our objective is to make it easier to see what tele-health can offer and what "big picture" tele-health issues should be discussed at the outset of tele-health implementation planning. Armed with such information, communities can then decide which issues are more important for them and where priorities should go.

This document has three sections to help planners make better decisions:

1. Summary of the Main Tele-health Applications
   What can tele-health offer my community?

2. Policy and Financial Questions for the Tele-health Strategic Planner
   What are some of the "big picture" issues for us to consider?

3. Glossary of Technical Terms in FN Tele-health
   What do the most common technical terms mean?

Tele-health terminology can be confusing even for health professionals who use tele-health equipment and technology. The problem is twofold. First, there are many highly technical terms, and sometimes they have the same meaning, or differences between them are subtle. The second reason for confusion is a tendency to apply the prefix "tele-" to applications or services whether or not it makes good sense.

We hear of tele-consultations, tele-ophthalmology, tele-orthopedics, tele-medicine, tele-psychiatry, tele-nursing, tele-home care, tele-geriatrics, and so on. To the person unaccustomed to this technical debate, it may seem from all these "tele" words that tele-health is the answer to all problems in the health sector. Indeed it is *not*. We try to explain both the scope and the limits of tele-health.

Finally, tele-health is *not* a replacement for in-person attendance by a health professional, and must not be perceived that way. In-person attendance must always be the first choice. However, when that is impossible, tele-health sometimes offers an acceptable alternative.

Summary of the Main Tele-health Applications
(What can tele-health offer my community?)

Application	Definition / Description	Remarks
Clinical decision support	The long-distance provision of tools and expertise not available locally, to support local health professionals in making the best clinical decisions about their patients. See also Tele-rounds and Tele-nursing.	Clinical decision support is the main role of tele-health in the FN community. This support is in one of two main forms. (a) A long-distance specialist, in a call centre, reviews data about the patient. Then he or she writes up the results or diagnosis. The local practitioner, who is dealing with the patient directly, uses this in making his/her diagnosis or intervention plan. (b) A long-distance specialist reviews data sent to him/her and works interactively with the local practitioner, via videoconference or telephone, to help the local practitioner decide the diagnosis and plan. Clinical decision support often supposes that there is someone locally, working with the patient, who is qualified to make medical decisions. There are also cases where the local contact has no authority to make medical decisions at all. In such a case, the local contact conducts tests on the patient at the direction of the call-centre medical practitioner. This practitioner is present via videoconferencing. The local contact carries out interventions or other assignments as directed. In such cases, tele-health is providing the call-centre practitioner with clinical decision support. Clinical decision support can be a strong incentive for attracting and retaining doctors and nurses to remote clinics. The decision-making backup that it provides can increase their comfort level, especially when, without it, they would be on their own in making life-or-death decisions.

| Electronic exchange of patient health information records (EHR) | The electronic transmission of patient medical information. The term for these electronic patient files is electronic health records or EHR.

In the tele-health context this mainly involves

(a) Exchange of limited data, such as digital X-rays, which are stored in a patient file in the receiving health facility.

(b) Exchange of entire patient files between health facilities.

(c) Long-distance access by health facilities to electronic patient files held by another health facility. In other words, there is a "master chart" for each patient that can be remotely accessed. | Many people imagine that tele-health means replacing a patient's paper-based medical files ("charts") with electronic equivalents of the same. Tele-health does not have to involve the complete replacement of paper records with electronic health records (EHR). However, it always involves the electronic exchange of at least some data on the patient.

Contemporary tele-health often involves a videoconference or telephone call (which is usually not recorded) and is mainly about exchanging *some* patient information––*not* the master file on the patient.

Some provinces are already conducting experiments about EHR's as they are often called. This may not be an issue for FN planning a tele-health system today. Except for some pioneering experimental projects, tele-health in Canada today still involves each partner facility keeping its own paper-based patient charts. These are guarded by strict confidentiality regulations. Any electronic additions to these records (e.g., digital X-rays, which may or may not be printed at all) are also closely guarded.

It is foreseeable that, someday, paper records will be replaced by electronic records. This will have many practical advantages. One of the most positive advantages is that the attending physician will be able to see the patient's entire health history. Many FN patients have separate charts in several community clinics and in several off-reserve facilities. For these people, the eventual move towards all-electronic records will reduce the chances of regrettable medical decisions that were based on knowing only part of the picture.

Long-distance access to patient charts by another health facility could take place in several ways, but a basic tele-health system does not need to allow a facility to "read from" the patient files of another facility. Instead, only certain data are shared between health facilities as required. This is no different than today when, for example, X-ray films are mailed or lab results are faxed. |

		At present, the main electronic data-transfer issue for FN planning a tele-health system is putting in place the equipment to support secure videoconferencing and transfer specific diagnostic data, such as digital X-ray images, digital ultrasound images, vital signs data (heart, blood pressure, etc.), and sometimes laboratory or other results. These are generally the same data now being exchanged in paper through the mail or attached to the gurney when a patient is being transferred. Note that most FN health facilities already exchange with non-FN facilities some data in electronic form via e-mail or physical exchange of data disks. A formal tele-health system is mainly a faster, more efficient way of doing things that occur already. Sensitive electronic data sent via tele-health can be encrypted—and often are encrypted—so that unintended recipients can make no sense of it. The tangible risk, if any, concerns how or whether a non-FN supporting health facility will use these convenient electronic data for research purposes. This is a question of OCAP (ownership, control, access, and possession). FN should be broadly comfortable with electronic records transfer before they sign on to tele-health. One way to accomplish this is for them to make sure that the agreement satisfies their own implementation of the OCAP principles.
Support to administration through virtual meetings	Videoconferencing, usually using tele-health equipment, by health administrators and professionals.	Tele-administration is more than the common multiparty telephone conference that is so common in health administration. Tele-administration in the context of tele-health requires a high-speed, high-volume data connection. This connection can support two-way video equipment. When not used for direct medical purposes, this videoconferencing equipment can be used to hold long-distance management and staff meetings, and even to interview job applicants. Planning is needed if the tele-health video equipment will be used for virtual administrative meetings. For example, group meetings cannot be conducted from an examination room or a cubicle reserved for tele-consultations with a patient. A suitable meeting room is necessary.

		Consider also that television monitors and sound equipment located elsewhere in the community can also transmit and receive over the data line(s) used for tele-health. This not only can benefit other organizations operating in the community, but also may reduce the raw capital costs associated with telehealth infrastructure.
Tele-care	Long-distance access by the public to health personnel via telephone or Internet. See also tele-triage.	Tele-care is simply when the physician, nurse or other health professional electronically communicates with the caregiver or patient outside the clinic or hospital. This is almost always by telephone and usually through a phone-in centre. For instance, many hospitals answer routine health questions via a phone-in centre. This is often a tele-triage activity, which sorts high priority cases from low priority ones. Public health offices also deal directly with their clientele by telephone. Suicide hot lines also do tele-triage. Besides offering counselling, they can connect persons at risk with physicians, police and others able to intervene directly. In most provinces, dialing 9-1-1 gets priority access to an emergency physician in case of poisonings or life-threatening injuries. Tele-care can also involve routine long-distance support to caregivers and patients in their homes. The idea is simple. People with questions can simply call for answers. Calls can also be scheduled. Tele-care is an optional but potentially important element of a tele-health system. To most FN communities, the most important tele-health function will be long-distance support of clinical decisions made about patients in the local health facility. In designing a basic tele-health system to provide clinical decision support, it is prudent to build in tele-care, if possible. Some provincial and territorial tele-care services already exist. Fo The question then is whether, and how, these can be made easily available to the community within an overall tele-health strategy. Tele-care can also involve a FN phone-in help system or a Web site where answers to non-urgent health questions can be found.

		Tele-care, like tele-medicine, may be a double-edged sword for a FN community. The more that can be offered long distance, the less that will be offered locally.
Tele-consultation	General term for long-distance consultations between health professionals, and between health professionals and their patients.	Tele-consultation that involves patients implies, at a minimum, a two-way video link between a health professional and patient. Tele-consultations with patients typically occur with a nurse or other health professional in the same room as the patient, with a "lead" practitioner attending by long distance.
Tele-counselling	Long-distance psychological or other counselling by a qualified counsellor.	Tele-counselling is the conduction or supervision of an individual or group counselling session via video link. The exchange of diagnostic data (such as lab results) is seldom involved. Tele-counselling involves long-distance attendance by a range of professionals, such as psychiatrists, psychologists, drug and alcohol workers, other social workers, and/or even traditional healers. Tele-counselling can provide a professional opinion, in support of local health or social services personnel, about whether a patient or client appears at risk. This improves the potential for avoiding situations such as violence and even suicide. Tele-counselling offers a means to monitor the progress of persons diagnosed with psychiatric disorders. It is all too common in FN communities, where access to psychological services is often poor, that personal difficulties spiral until a crisis is reached and the patient must be transported for psychiatric diagnosis and attention. Tele-counselling can provide part of the follow-up needed in cases such as this. Tele-counselling is an aid to counselling and therapy. It is not a replacement for human interaction. It is seldom, if ever, as effective as personal attendance in counselling or therapy. As a means to ensure continuity between in-person meetings, however, it can be quite valuable. Perhaps most important, tele-counselling offers someone in crisis rapid

		access to confidential and professional advice. Even if this is only a first step leading to an in-person appointment, this opportunity can prevent circumstances from worsening.
Tele-education or tele-learning	The long-distance delivery of educational material through videoconferencing, the Internet or another form of communications technology.	Tele-education can be a spin-off benefit of having a tele-health centre in a community. The equipment used for health consultations and exchanging health data can be used for training purposes. This can also be achieved using separate cameras, for example, in another place, and utilizing infrastructure that may have originally been put in place for tele-health. Tele-education can consist of long-distance training for health professionals in a video-classroom setting. This is especially useful for professional development. Tele-education can also involve seminars, classes or tutorials for patients or students delivered by a far-off health instructor. An example of tele-education for patients is a seminar for Type 2 Diabetes Mellitus (DM2) cases on a new technique to self-monitor blood glucose (sugar) level. Alternatively, a public health official could address a class of schoolchildren on some health promotion or health prevention topic. Provided the video equipment is not needed for health purposes, there is no argument against tele-education in non-health subject areas.
Tele-health	Delivery of health care activities, educational activities or exchange of public health information over distance using electronic information and communications technology.	Tele-health must be understood in proper context. First, it is not a substitute for in-person health care (or at least it is not supposed to be). Tele-health is a supplement to on-site health resources, whose main benefit is bringing professional expertise to settings where the long-distance professional would be unable to attend.
Tele-home care	The delivery of home care services at a distance through telephone lines or other forms of telecommunication.	Although correct, the accepted definition shown to the left can be very misleading. Tele-home care is not about reducing or replacing the caregiver. It is simply a situation in which a patient at home, who experiences some loss of autonomy, is somehow assisted by a long-

		distance health professional.
		This professional can direct the caregiver and answer questions from the caregiver or the patient. The long-distance professional can also supervise the patient's progress and, to some extent, also supervise the caregiver.
Tele-medicine	The delivery of medicine and medical expertise at a distance using communications and information technology.	Tele-medicine is the aspect of tele-health that involves long-distance attendance by a physician or a nurse-practitioner, the only persons authorized by law to practice western medicine.
		Except in the direst emergencies, tele-medicine provides medical direction to a health professional who deals directly with the patient. The main exception concerns health problems that occur in the bush, where a doctor or nurse directs a layperson. "Bush kit" programs have been going on a long time by radio.
		In an emergency situation, tele-medicine can provide nursing staff or a general practitioner with instructions from a physician specialist about how to stablize a patient before transport to a hospital. This can amount to a significant improvement in first-response capability at the local level.
		Tele-medicine can relieve some of the stresses on the outpost nurse, either between scheduled doctors' visits, or when there is no schedule of visits and especially when a crisis occurs. The presence of tele-medicine capability may attract other heath care workers (in a support role) to a community.
		Tele-medicine is not new. For many decades, nurses in isolated posts have sought direction, especially in emergency cases, from far-off physicians. Initially this was done by radio, then telephone, and now with tele-health equipment, by means of video link and electronic transmission of diagnostic data.
		It is widely said that tele-medicine is not a replacement for a doctor. Reality can be somewhat different. Tele-medicine can be a reason

		against a part-time or full-time doctor being assigned to a small community. Examples have arisen when, say, a full-time physician post has been downgraded to part-time because tele-medicine had become possible. Government officials who fund FN medical services will take the availability of tele-medicine into account when they receive requests for a full-time doctor, a part-time doctor or even an increase in the frequency of visits by medical doctors (MDs) and specialists.
Tele-nursing	Tele-nursing involves the long-distance attendance of a nurse in two scenarios: (1) The nurse supervises a lay-nurse, a trained dispenser, or in an emergency, an untrained person. (2) The nurse directs or advises a patient or caregiver in the home.	Nurses are limited in what they can do in terms of providing care. Only nurse-practitioners can actually practice medicine, and even their authority is limited. Although tele-nursing has little potential in making decisions —with regard to actual medical procedures or the administration of medication—, tele-nursing can be particularly valuable in very small communities with a dispensary rather than a nursing station. Tele-nursing allows a nurse, who visits periodically, to provide assistance between visits, especially if a problem arises. This can be particularly good support for a locally trained dispenser. If an emergency occurs, the nurse will normally defer to a physician who will take over. Tele-nursing also has much potential as a "virtual home visit" in cases of the chronically ill. The nurse can give the caregiver basic instructions, answer questions and, in particular, monitor the patient's progress.
Tele-monitoring	General term referring to health (or social work) professionals being able to monitor their patients or clients by long distance.	Tele-monitoring can involve contact with the patient, or contact only with a local professional who is dealing with the patient. It may or may not involve the exchange of diagnostic data. One of the most perplexing problems facing FN health professionals is high caseloads. Combined with other difficulties, this makes routine monitoring of cases difficult or impossible. For health professionals, tele-monitoring is mainly about connecting them with patients whose acute or chronic condition needs to be

closely followed. In the case of a diabetes patient on a dialysis day, for example, it can be as simple as a 10-minute video session with a nephrologist who is monitoring the patient's kidney function. In another instance, the patient might visit the local dispensary for a tele-session with a nurse. In this case a lay-dispenser or CHR would take vital signs and perform other tests needed by the nurse.

As technology advances, we can expect that tele-monitoring will include outpatients going about their lives while transmitting diagnostic information to a health professional assigned to monitor his or her condition. Technologies are being developed to make this possible, such as answerable monitor-transmitters and at-home diagnostic stations that send reports by telephone.

Tele-monitoring is already able to connect supervisors and residents at chronic residential facilities with a local clinic or a far-away facility. In this way, an alarm can be raised when a patient's condition changes. However, so far it is mainly a means for simple tests performed by a trained staff member to be received by someone qualified to analyze the results.

Tele-radiology	Local administration of electromagnetic tests, such as X-rays, with the actual interpretation of the test results being done by a qualified person elsewhere.	Tele-radiology is often thought of as sending X-rays electronically to a doctor somewhere else. In fact, it now includes long-distance interpretation of "ray-type" diagnostic tools, including ultrasounds and even CAT scans. Tele-radiology allows a local doctor or nurse to get a specialist's diagnosis of test results. For instance, a pregnant woman can have a routine ultrasound taken locally at her clinic. One of the nurses or a CHR can be trained to do this. The test results are then sent to her obstetrician, who may follow up with local health staff, schedule a video session with the patient or schedule an in-person appointment. This is an example of how tele-radiology can avoid the bother, cost and risk associated with what could be a long air or road journey. Tele-radiology can help a local doctor practice his or her trade to the fullest potential. For instance, the average MD can competently set

| | | simple fractures, and is more likely to do so if a colleague or specialist confirms the nature and remedy of the break.

Tele-radiology involves radiograms in digital form, which may be printed or viewed on a screen. Unlike, say, an X-ray film or an ultrasound photograph, none of the data are lost in printing. The doctor can easily "zoom in" and explore areas in greater detail. Sometimes this is a very useful capability.

Tele-radiology requires that diagnostic machines be available locally. This, in turn, requires local people competent to use these machines. It also requires scanners, printers and other equipment to provide the long-distance physician with complete and perfect copies of the images. |
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| **Tele-rounds** | Tele-rounds consists of long-distance "brainstorming" by physicians who seek the input of their colleagues in diagnosing or treating patients.

See also clinical decision support. | Physicians, especially ones working in hospitals, have what are called "rounds." These are occasional or special meetings of colleagues to share views on diagnosis and treatment. Rounds are considered very important. More than simply a second medical opinion, they are group problem-solving.

First, tele-rounds allow specialists to brainstorm with other specialists across the country, sharing experiences and offering advice. Second, tele-rounds give the doctor in a small community the views of a team of colleagues in a hospital setting. This connection can relieve the sense of isolation and pressure felt by the community physician, while providing the patient with better-informed medical decisions. Tele-rounds is also an important way for local doctors (or nurses) to stay current within their professional circles. |
| **Tele-surgery** | Surgical procedures undertaken with the lead surgeon attending by long-distance.

The surgeon observes the patient by means of advanced, high-resolution cameras while an on-site surgical team—with a surgeon—monitors diagnostics and | Tele-surgery is an experimental approach that cannot replace the general surgeon or surgical team. Its purpose is to permit a specialist, who could not possibly attend in person, to conduct the procedure. A surgeon must still be present in the operating room.

Tele-surgery has allowed super-specialized surgeons to participate in surgeries from across oceans. This has particular value in exceptional |

	carries out the lead surgeon's instructions. The lead surgeon may actually work on the patient by means of robotic "arms" and other robotic devices under his direct control.	cases when a radical or experimental procedure is required and the expertise is concentrated far away. Tele-surgery is a future issue for the few FN-controlled hospitals that exist today.
Tele-psychiatry	See tele-counselling.	A psychiatrist is a physician who specializes in treating mental illnesses through therapy and psychoactive medications. Tele-psychiatry is long-distance attendance by a psychiatrist. Tele-psychiatry allows the psychiatrist to stay in contact with a patient who has returned to his or her community between appointments. These sessions, coupled with reports and assistance from local health professionals, can, for instance, suggest when a patient has gone off meds, when meds need to be altered or when the risk profile has changed. It is incorrect to think that tele-psychiatry will ever replace one-on-one psychiatry and the familiar psychiatrist's couch.
Tele-psychology	See tele-psychiatry and tele-counselling.	A psychologist is a type of counsellor or therapist who is not authorized to prescribe medications. Tele-health allows them to deal directly with patients by long distance for purposes of counselling or assessment. Some psychologists administer psychological tests to determine mental condition. Psychologists can therefore be useful in detecting change of condition. In some cases they can advise local health staff that the patient is at risk of violence or suicide.
Tele-training	Long-distance training of health staff using electronic communications. See also tele-education.	Tele-training is usually by means of the same videoconferencing equipment used in tele-health generally and tele-medicine in particular.
Tele-triage	Triage involves the ranking of patients according to their urgency so that the more urgent cases get the earliest and greater attention.	Triage is simply the sorting out of urgent and less urgent demands for medical intervention. Triage can be seen in operation in every hospital emergency ward, where the highest-risk patients get the highest priority for attention.

	See also tele-care.	Tele-care is an efficient way to do some triage by telephone. For example, someone calls a tele-care centre. A tele-care centre representative makes a triage decision based on the seriousness of the situation. The call is then re-routed elsewhere—to an emergency ward, say—or an attempt made to resolve less pressing issues on the spot.
Tele-visitation	The virtual visiting of a patient by a family member, friend, elder, or other support person.	Tele-visitation involves videoconferencing. It can connect the patient to his or her social network when in-person visits are impossible.

Tele-visitation is not a replacement for patient escorts or for, say, a birth attendant of the mother's choice. However, tele-visitation can bring patients and their support people together easily, cheaply and more often than when travel is involved. It is especially valuable in keeping elders, who often have difficulties travelling, connected with other family and community members involved in the healing process. |

Policy and Financial Questions for the Tele-health Strategic Planner

What are some of the "big picture" issues for us to consider?

This section lists some key policy and financial questions that FN need to consider in strategic planning for tele-heath. A complete list of questions would be very large. Our intent is merely to initiate informed discussions.

Policy Questions and Issues

Area	Question	Remarks or Further Questions
Local policy	What local policies are needed before tele-health can be implemented?	FN will have different local policy needs. Examples are 1. Policies about the actual use by health professionals, and maintenance, of tele-health equipment. 2. Policies about the use of tele-health equipment in complementary but non-patient-centred circumstances; for example, governance meetings, education, research, and health administration. 3. Policies about local storage and safekeeping of electronic patient data, especially in the absence of provincial or federal guidelines. 4. Policies about research that may be done with electronic patient data.
External policy	What policies regarding relations with external tele-health partners are needed before tele-health can be implemented?	As with local policies, the need will vary. Examples are 1. Policies to set out expectations about working relationships in agreements with tele-health partners and, particularly, call centres.

		2. Policies to set out expectations about the sharing of electronic patient data by the call centres that directly support FN health facilities.
		3. Policies to set out what research may be done with patient health data held by call centres. (Note: At least some of these data will unavoidably be used by the institution hosting the call centre for purposes of billing costs and planning services. This sort of research, which is anonymous, is already a normal part of the operations of health facilities, especially hospitals.)
		4. Policies to set out access by the community to health data on the FN population that is collected by its tele-health partners.
Patient confidentiality	Does tele-health give FN greater reason for concern over patient information getting into the wrong hands?	1. Strict patient confidentiality rules apply to all health professionals. These are legislated by provincial and territorial governments and mandated by health professional colleges. These rules apply no less under tele-health.
		2. Patient confidentiality is an issue in the planning phase because secure, and perhaps encrypted, means are necessary to transmit patient data.
		3. Inadvertent breach of patient data has always occurred, such as when charts or X-rays accompanying a patient go missing, or when medical documents are lost in the mail.
		4. Tele-health does not imply collecting more patient information than is already done today. The difference is that most of this information is in electronic form. This will be protected under the same sort of privacy rules as currently exist.
Patient safety	In using tele-health in place of actual attendance by a health professional, is patient safety being compromised?	1. The risk of incorrect diagnosis will be higher if the local health professional lacks all the necessary training and equipment. In particular, the local professional normally does electronic tests as a supplement to the familiar judgmental tests, such as eye

		and ear inspection, checking for swelling and tenderness, reflex and sensitivity, and assessing sores and wounds. The directing person in the call centre relies heavily on these on-site assessments. Therefore, tele-health makes sense to a FN clinic only if the standard of training and experience are solid.
		2. Theoretically, tele-health involves some degree of higher risk to patient safety. Besides misdiagnosis, which also occurs in-person, the main risk occurs when a tele-health professional tries to solve a problem that should have been remedied by an in-person meeting with the health professional.
Institutional or government risk and liability	By using tele-health in place of actual attendance by a health professional, is risk to the health system increased?	1. As per point (2) above, the slightly higher risk to patient safety implies elevated liability upon the health system and particularly upon a physician in a call centre. Some physicians are uncomfortable with these risks and refuse to practice medicine via tele-health. 2. Increased personal and institutional liabilities in tele-health are offset by the ability of tele-health to determine problems and intervene in situations where help would otherwise be unavailable. 3. By and large, tele-health is considered strongly positive in terms of improved access to services. The ability, say, to have a long-distance doctor attend immediately is obviously better than waiting for an emergency transport to arrive before the doctor can attend.
Aboriginal rights	If tele-health requires working with an off-reserve supporting health facility that is part of the provincial health system, is erosion of the federal treaty or fiduciary role taking place?	The answer to this is usually "yes," but the extent and the need for concern will vary: 1. Any provincial and territorial health facility whose call centre directly supports health services on-reserve can be claimed to be getting into the business of provincial health delivery on-reserve. In some provinces and territories this may create

		concerns over precedent. Some provincial or territorial governments may refuse to allow this kind of involvement unless Health Canada (HC) or the FN pays for the provincial costs.
		2. Partnerships between on-reserve FN and off-reserve provincial or territorial tele-health partners suit the federal objective of getting out of the FN health-funding and delivery business.
		3. HC has announced no plans to fund provincial or territorial facilities to provide tele-health support to FN communities. In particular, the question of who pays the attending physician's salary is open.
		Note: The federal position, in the courts, is that the provinces have health jurisdiction and therefore the same fiscal responsibilities on reserve as off reserve. Canada admits no fiscal or delivery responsibilities of health or other programs to FN people, on or off reserves. Canada claims that its funding of FN health and other programs is on the basis of policy rather than obligation, on "humanitarian" grounds because the provinces (and in some cases the territories) refuse to pay. This issue is one that has still not been adequately addressed and needs more attention.
	If tele-health requires requesting or accepting provincial or territorial funding, is erosion of the federal treaty or fiduciary role taking place?	The answer to this is "yes" in most cases, but the extent and need for concern will vary:
		1. Technically speaking, any approach by a FN to a province for health services goes against the position that Canada should be providing, or just paying for, the service both on and off reserve. The main exceptions to this would be communities under the James Bay and Northern Quebec Agreement. This agreement assigns the province the fiscal lead in health.
		2. The federal government might use acceptance of provincial or territorial funding in a legal defence if it were sued over breach of federal obligations in health. Whether this is an

		overwhelming concern is another matter in light of the benefits of tele-health services.
		3. Health Canada has announced no plans to fund federal or FN-run facilities to support tele-health initiatives in FN communities. It seems unlikely that it will fund these initiatives if the provinces or territories agree to do so. This might be construed as federal avoidance of responsibility.

Financial Questions and Issues

Area	Question or Issue	Remarks / Further Questions
Strategic planning costs	Source of funds for FN-level tele-health strategic planning?	1. Is funding available from federal sources regionally (e.g., regional office of Indian and Northern Affairs Canada [INAC] or HC)? 2. Is funding available from provincial or territoriasources? 3. Does this require new money, or is it cost-neutral or within an existing local program activity? 4. Could the private sector be engaged?
	Source of funds for regional tele-health strategic planning?	1. Is the $50,000 per region adequate for the regional plan? 2. If there is talk of distributing the $50,000 to FN, would this distribution (a) provide enough to have meaningful effect or (b) would it mean no regional plan or a sketchy regional plan?
	Quality and comprehensiveness of the planning.	1. Given the time and resources available, is the resulting strategic plan good enough to justify the financial risks of proceeding with implementation?
Implementation costs	At the time of writing (December 2005), Canada Health Infoway (CHI) can provide 50 per cent of tele-health implementation costs.	1. Tele-health implementation should match the CHI funding requirements. Therefore, it is beneficial to: (a) review community needs; (b) review the CHI funding requirements; and (c) parallel (as much as possible) 50 per cent of community tele-health needs with the requirements outlined in the CHI proposal for funding. 2. Where will the other 50 per cent come from?

		3. Will HC guarantee it provides the cost-matching (a regional and national lobbying question)?
	The 50 per cent from CHI is released after the funds are spent.	1. Source of bridge-funding for this 50 per cent? 2. Is the spend-first rule written in stone?
	Internet capability (broadband) must exist in the community in order to support tele-health.	1. If this does not exist yet, is there funding to make it happen? (INAC may be a partial source.) 2. Private venture with private capital? (FN corporations have built infrastructure in some areas, and non-FN corporations might be interested in bringing in the service.)
	Policies and procedures development funding.	1. Costs of policy and procedures development? 2. Are there policies and procedures that can be adapted from established FN tele-health systems?
	Local human resources funding	Besides the challenges of establishing broadband Internet capability, there is also the issue of getting the tele-health machines (e.g. digital X-ray, videoconference equipment), and other practical matters. 1. Do we have the local health professionals needed to use this equipment, and if not, what would the cost be to hire such professionals? 2. What user training is needed and at what cost? 3. What information technology and other technical support is needed to implement and maintain the equipment and/or system?
Costs of services	Who pays for the administrative costs	1. If this is a federal facility (which only some would be), would

provided by the long-distance support facility	incurred by the long-distance support facility?	this facility's administration costs be an issue at all? 2. If this is a provincial or territiorial facility (which only some would be), would this facility want to charge back the administration costs? (These costs might not ordinarily be charged back to a provincial or territorial user facility.)
	Who pays the salary or fee of general practitioners or specialists assisting by long-distance in the support facility?	1. If the call centre is FN or federally run, will there be a cost chargeback arrangement? 2. If the call centre is in a provincia or territorial facility or a private practice, who will pay the attending physician's salary or fee? (Note: off-reserve, non-federal physicians are on salary or they bill their costs back to the provincial or territorial health system on a fee-per-service basis. Can we expect a province or territory to cover these tele-health-related costs that are arguably "on reserve"?)
Fiscal impacts on other program areas	Potential for savings in other program areas.	1. Projected savings in other health sector areas, like patient transportation? 2. Is it possible to retain and reprofile any health sector savings (a funding agreements question)? 3. Who will feel any health sector savings? (FN level or perhaps HC regional office level.) 4. Ask the above questions about non-health sector use of tele-health equipment (e.g., training, education, conduct of governance meetings by videoconference).
	Potential for additional costs in other program areas.	1. What if tele-health results in higher rates of, say, doctor-authorized patient travel or medications costs? (This has happened on occasion.) 2. If the FN administers patient transportation, what are the

		forecast impacts in this area most directly affected by the establishment of tele-health? 3. Do funding agreements take into account unexpected cost or volume pressures that might result from tele-health?
	Potential for funding cuts in other aspects of the health sector.	1. Will tele-health create expectations from funding agencies that cost reduction targets in other core health activities must be met? 2. Will funding agencies reduce or limit health funding in areas where they expect tele-health to create savings?
	Potential for non-investment by funding agencies in other aspects of the health sector.	1. Will tele-health become a reason or excuse to avoid bringing health professionals into the community, either on a permanent or visiting basis? 2. Will tele-health become a reason or excuse not to replace health professionals such as doctors who, say, leave for unrelated reasons? (For example, might the authorized medical or nursing manpower plans be revised downwards?) 3. Will tele-health become a reason or excuse to deny new positions or new services that should be physically present in the community, rather than virtually present by long distance?
	Accountability of health funding agencies.	1. Will there be any mechanism for tele-health-related savings to be identified by health funding agencies and reported to FN for possible reinvestment?
Sustainability	Where will funding to cover operations and maintenance (O&M) costs come from?	1. Need to identify all these hard and soft costs, then locate funding sources. 2. Tele-health equipment will need renewal in three to five years, depending on the equipment. Upgrades may be needed sooner than that. The costs of renewal must be factored into budgets.

		3. Because capital acquisition is usually the hardest type of funding to obtain, financial insecurity about renewal and upgrades has the potential to shut down the system. 4. Already some FN have had to mothball tele-health equipment because O&M and capital renewal funding ran out.
Financial risk mitigation	Is tele-health worth the long-term financial risks, taking into account the pros and the cons? Is it possible to limit or mitigate financial risk if tele-health becomes unsustainable?	1. Given the time and resources available for planning, and given any uncertainties about how tele-health will be financially supported on an ongoing basis, are the financial risks of the ongoing costs tolerable? 2. Is it possible to somehow limit or terminate the tele-health project if the financial cons outweigh the pros? 3. Will funding be available for a return to former ways of doing business?

Glossary of Technical Terms in FN Tele-Health

Application	Type of tele-health activity or service (like tele-consultation, tele-education, tele-administration, tele-home care, tele-triage, etc.)
Bandwidth	The capacity at which information can be carried over a communications channel per unit of time, usually measured in kilobits per second (kbps). The greater the bandwidth, the more information can be transmitted per second.
Broadband	"Broadband" is high-capacity, two-way communication between an end user and access network suppliers capable of supporting full-motion, interactive video applications.
Call Centre	Place where public inquiries about health services are answered, usually by telephone but also via the Internet. **(Do not confuse with tele-centre.)**
Chat Room	An electronic address, usually on the Internet, that people can access in order to exchange text messages with others.
Confidential	In order for information to be confidential, access to it should be controlled. It is necessary for those controlling access to the information to closely monitor and strictly limit access and disclosure.
CME or CNE (Continuing Medical or Nursing Education)	Education accessed by physicians or nurses who are already practicing their profession. This form of education enables professionals to stay in touch with new developments (research and technology) in their field and to update or refresh their skills and knowledge.
Connectivity	The ability of computer networks and systems to interact on a local, regional, national, or international scale.
Consent	Voluntary agreement with what is being done or proposed. Consent can be either expressed or implied. Expressed consent is clearly given, either verbally or in writing. Expressed consent is indisputable and does not require any guessing on the part of the organization seeking consent. Implied consent occurs when consent may be inferred (understood) from the action or inaction of the individual. Scheduling an appointment with a nurse or physician, for example, suggests that the client wants to receive medical care. There is an obligation to ensure that the person consenting understands what he or she is doing.
Convergence	The merging of communications, information technologies and data. The coming together of telecommunications, computers and information.
Cost-benefit Analysis	A method used in tele-health evaluations that focuses on studying the economic impact of tele-health. Although conducted similarly to the cost-effectiveness analysis, it expresses costs and intangible social aspects and health impacts (i.e., benefits) in monetary terms. It can be used to determine which project applications, technical equipment, telecommunications link, etc., has greater monetary value.

Cost-effectiveness Analysis	A method used in tele-health evaluations that focuses on studying its economic impact. It compares costs and health impacts (such as years of life gained or cases of disease prevented) of a minimum of two alternatives, such as a tele-health consultation and a face-to-face meeting.
Data	Information that is collected, aggregated and analyzed for research, administrative or other purposes.
Database	An electronic system that collects information, and cross-references and analyzes it for easy referral, storage and study.
Digital	Information coded in discrete numerical values ("0" and "1"). Digital data streams are less vulnerable to interference than analogue data streams ("Analog" meaning a continuous signal in contrast with digital, which breaks everything into numbers. For example, Telephones turn voice vibrations into electrical vibrations of the same shape). Also, because they are made up of 0s and 1s (also known as "bits"), they can be easily manipulated and integrated with other data streams (voice/video/text).
E-health	The use in the health sector of digital data—transmitted, stored and retrieved electronically—for clinical, educational and administrative purposes, both at the local site and at a distance.
Electronic Health/Patient/ Medical Record	A patient record captured, stored and transmitted by computers. Often called "EHR" for Electronic Health Record. This may or may not be a patient's master "chart" (as health files on individuals are called).
Electronic Mail or E-mail	Messages are sent and received using electronic personal mailboxes in a computer network (like the Internet or an Intranet). E-mail is one facet of tele-health that health professionals in FN communities already use extensively.
Encryption	A mathematical scrambling of a computer file or data stream so that it cannot be deciphered at the receiving end without the proper key. Encryption is a security mechanism that ensures only those authorized to participate in a videoconference of information exchange can do so.
Firewall	A security barrier erected between a public computer network like the Internet and a local private computer network.
Health Information Networks	An electronic communications network that links health care, educational, research, and government facilities to share health and patient information or databases, and to provide tele-consultations.
Informatics	The combination of computers and information for the management and processing of data, information and knowledge.
Information and Communications Technology	Information technology refers to computer components, such as software and hardware. Communications technology refers to media such as telephone, radio, broadcast television, satellite, microwave, fibre optic, and other types of devices that foster telecommunication (i.e., communications across distance). The acronym ICT is frequently used in policy and industry documents.
Information Highway	The information and communications technology infrastructure through which information is transmitted. A popular term for the modern world-wide system for instantaneous mass movement of electronic data. The communications and knowledge infrastructure through which (and

Infostructure	according to which) information is collected, stored, transmitted, analyzed, etc. The Canadian Advisory Council on Health Infostructure defines it as the application of communications and information technology in the health sector, allowing the people of Canada (the general public, patients and caregivers, as well as health care providers, health managers, health policymakers and health researchers) to communicate with each other and make informed decisions about their own health, the health of others and Canada's health system.
Internet	The world's largest and fastest-growing international computer network. This system is used to send the videoconference data, diagnostic test data and other information needed to make tele-health possible. Note: Tele-health does *not* involve the posting of patient health data on public Web sites or anywhere that hackers can easily break into and steal or corrupt the data. The role today of the Internet in tele-health is to provide a conduit, like a telephone line, for health data to go from one authorized point to another.
Interoperability	The capacity of different systems to work and link together smoothly and predictably. A FN clinic and its long-distance support facility must have good interoperability or tele-health potential will be wasted.
IP (Internet Protocol)	The main protocol (i.e., communications rules and language) used by computer networks that make up the Internet.
ISDN (Integrated Services Digital Network)	A low-to-medium speed technology that uses digital instead of analogue telephone lines. Because it uses digital lines and it uses multiples of 64 kbps (more than twice as fast as ordinary telephone lines), it allows for the integrated transmission of voice, video and data.
LAN (Local Area Network)	A data communication network that is limited geographically to, for instance, a single building.
Modem	Modulator or demodulator that enables the transmission of digital data (by transforming it to and from analogue format) over standard analogue telephone lines and cable video systems.
Network	Interconnected communications equipment used to transmit voice, video or data. Examples include LANs and WANs. —A WAN is a Wide Area Network. The concept of "area" made good sense when it was created because a key distinction between a LAN(see glossary) and a WAN involves the physical distance that the network spans.
Ownership, Control, Access, and Possession (OCAP)	*Ownership* refers to the relationship of an Aboriginal community to its cultural knowledge, data and/or information. The principle states that a community or group owns information collectively in the same way that an individual owns his or her personal information. This differs from stewardship (see definition). The stewardship or caretaking of data or information by an institution that is accountable to the group is a mechanism by which ownership is realized. *Control* asserts that Aboriginal people, their communities and representative bodies are within their rights in seeking to control all aspects of research and information management processes that impact them. *Access* refers to the right of Aboriginal communities and organizations to manage and make decisions on access to their collective information. They should also have access to information and data about them that is

held in a wide range of locations.

Possession is a mechanism by which ownership can be asserted and protected. When data owned by one party is in the possession of another, there is risk of breach or mistrust.

Note: OCAP should be balanced with the needs of the patients for tele-health services (i.e., in the sense that it should help and not hinder people from getting better health care). While OCAP is an important and needed policy tool, ultimately, people must come ahead of policy. For example, in an emergency where a person(s) life is at stake and a community has not yet implemented some form of OCAP, sharing of FN information may be necessary to save the person(s) life. This does not, however, suggest an either/or situation. Often tele-health will involve no new OCAP concerns. In other instances, negotiation will solve concerns.

Platforms	Refers to the type of computer machinery and connections necessary in tele-health. Telecommunications technologies include cable-based platforms (ISDN, coaxial cable, ADSL, POTS, fibre optic and frame relay) and wireless-based platforms (terrestrial broadcasting, satellite, microwave and cellular mobile systems) that deliver information.
Privacy	The right to be left alone, free from intrusion or interruption. It can include elements such as physical privacy, communications privacy and information privacy. Privacy is linked to other fundamental human rights such as freedom and personal autonomy. Information privacy relates to the right of an individual to control who has access to his or her personal health information and under what circumstances. Privacy may be an issue for individuals but privacy can also be a concern for groups of individuals such as communities.
Security	A set of safeguards in and around an information system that protect access to the system and the information it contains. FN planning tele-health systems can choose from, or adapt, established sets of safeguards that have proven secure.
Server	A computer on a network that stores commonly used resources, such as data or programs, and makes these available on demand to clients on the network.
Standard	A requirement or technical specification established by a recognized organization such as the Canadian Standards Association or the International Organization for Standardization. Standards provide rules, guidelines or characteristics of activities to achieve the best performance in a given context. They are based on consolidated results of science, technology and experience. FN planning a tele-health system today would use the standards already developed for things like intercomputer communication, electronic file format and encryption of electronic health data to guard against use by unintended recipients.
Stewardship	A steward is a data centre whose job it is to control and manage health information data banks. Guided by a code of ethics, the data steward makes information available for a variety of purposes and ensures that data is not released in a form that would violate personal or collective community privacy. The concept of a data steward implies much more than warehousing of information. The steward also functions as an information gatekeeper and must ensure that data banks are promoted and available for

	those who require them. Archiving, control of confidential individual information records and the capacity to produce data releases are key functions of stewardship.
Tele-centres	Facilities managed by communities where people can access computers and other technologies for educational, professional or entertainment purposes, usually on a cost-recovery basis.
	Do not confuse these with call centres or with health facilities that provide long-distance health care support to FN-run health systems.
Telecommunications	A system of communication that differs from broadcast communication because it typically supports private rather than public airways. Present-day telecommunications technology offers five standard media over which to transmit information: copper wire, fibre optic cable, coaxial cable, satellite and microwave.
Tele-imaging	The transmission of images from one location to another through an electronic communications system. Examples are sending digital images of mammograms or ultrasounds.
Telematics	The use of communications technology to deliver expert advice and/or patient information at a distance in order to provide health care or health education.
Tele-training	The delivery of training material at a distance through videoconferencing, the Internet or another form of communications technology.
Tele-triage	The intervention of a trained health professional who delivers expert advice over a telephone help line. The location of the trained health professional is commonly referred to as a call centre. "Tele-triage" is a way of separating urgent from non-urgent demands for service, and dealing with the least urgent ones by telephone or Internet. For instance, a 9-1-1 centre would direct a trauma report to an emergency ward, which, besides helping to stabilize the patient, would dispatch an ambulance.
Transmission Speed	The speed at which a message is transmitted over communications technology. Due to the often larger volumes of information transmitted, tele-health requires much higher data transmission speeds than are possible over ordinary dial-up telephone lines.
Videoconferencing or Interactive TV	A communications technology that delivers two-way, real-time transmission of video and audio images between two (point-to-point) or more (multipoint) locations.
Virtual Reality	A simulated experience created by using virtual technologies and products such as three-dimensional and stereoscopic simulation, Total Sensory Presence, and interactivity and virtual environments. Tele-health that involves virtual reality is highly experimental and unlikely to be a concern for FN planning a tele-health system today.
WAN	A WAN is a Wide Area Network. The concept of "area" made good sense when it was created because a key distinction between a LAN (see glossary) and a WAN involves the physical distance that the network spans.
World Wide Web (WWW)	An Internet tool for retrieving and distributing information that uses a system of linking pages (Web sites) of related information together (data in hypertext). It acts as a global publishing system.