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A program management model for the Nova Scotia telemedicine network

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[résumé]

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Contents

- Abstract
- Résumé
- Introduction
- Three critical factors
- Discussion
- Bibliography

Abstract

Sustainable telemedicine networks are not the norm but rather the exception. Unless a formal program management model is in place, telemedicine cannot be integrated successfully into the mainstream of modern health care delivery. Critical factors in achieving sustainable telemedicine have been identified. The program management model, developed for the Nova Scotia Telemedicine Network, incorporated the following tools: a telemedicine self-assessment indicator, service modelling, technical design and integration, application development and validation, scheduling, ongoing network management and evaluation.

[Contents]

Résumé

Les réseaux viables de télémédecine sont l'exception plutôt que la norme. À moins de mettre en place un modèle structuré de gestion de programme, on ne réussira pas à intégrer pleinement la télémédecine dans la prestation des soins de santé. On a dégagé les facteurs critiques qui permettraient de se doter d'une télémédecine viable. Le modèle de gestion de programme conçu pour le réseau de télémédecine de Nouvelle-Écosse comprend les outils suivants : un indicateur d'autoévaluation de la élémédecine, un modèle de service, une conception technique intégrée, l'élaboration et la validation d'applications, l'ordonnancement, et la gestion et l'évaluation continues.

[Contents]

Health care restructuring has placed new requirements on service delivery models, which are already strained, yet demand continues to grow as information becomes a commodity shared by many, regardless of where they live. To those who have deployed telemedicine networks to support clinical services, it is clear that sustainable telemedicine is not only about computers, it is also about people and relationships. To define the proper solution to any problem, the problem must be determined by those in need and understood by the solution provider. Health care delivery models work best when the stakeholder is involved in the planning process. If the process is to be productive, the participants must all participate. Education, provided by peers, becomes a cornerstone in creating the environment for successful telemedicine.

The history of telemedicine is characterized by many systems that have failed or have only lasted a short time. Typically, enthusiastic physicians and other health care providers have promoted and sustained single point-to-point applications and, in rare cases, networks, offering 1 or 2 specific

services. Clearly, the evolution of technology has now made telemedicine possible as a solution for mainstream health care delivery problems. Improved access to health care will become the cause célèbre of stakeholders who feel marginalized by health care restructuring. Those who understand its limitations see telemedicine for what it is — a means of improving access to care for those who are denied it, either because of geography or limited resources, or both. Notwithstanding the above observation, the Achilles heel of any telemedicine initiative is the failure to recognize that it is a clinical service delivered via a nontraditional medium. A service delivery structure needs to be incorporated into the health care model that will address the needs of all stakeholders.

[Contents]

Three critical factors

There are 3 critical factors for achieving successful telemedicine.

1. Process guidelines. Foremost is the need to establish a process to identify essential stakeholders. This is closely followed by the need for a steering committee where all stakeholders are able to participate in the process to outline the goals of the project. Some principles guiding the committee are:
    - avoid central decision-making
    - avoid setting up a central bureaucracy
    - locate a local champion to lead the process
    - choose technology based on clinical needs
    - establish training protocols for both users and providers
    - incorporate evaluation criteria in all goals and objectives.
2. Telemedicine self-assessment indicators. Conducting a telemedicine self-assessment indicators analysis is largely about goal setting. Before setting out on any new endeavour there will be some expectations about what will be accomplished. In the current health care environment, a good deal more than that must be known before anyone is willing to spend the money on the endeavour. A well thought-out process will identify all the details and present the problems, possible solutions, outcomes and benefits to be gained. The essential points to determine if telemedicine has a part to play in meeting the needs of stakeholders will be flushed out. Critical to the success of any network is the fact that the expectations-setting process must be addressed to keep a program focused. Having identified the challenges, the team starts by considering potential solutions. A thorough understanding of telemedicine technologies should guide the process so that the proposed solutions are truly representative of telemedicine's capabilities. This is achieved by:
    - maximizing the expected results while minimizing expenditures
    - identifying personnel willing to commit their time and energy
    - identifying the financial and human resources needed to implement the program

- setting evaluation criteria
- ensuring that both clinical and technical personnel serve on the same team
- ensuring an open and flexible approach, but with a rigorous format designed to capture the perceived health care services needs that vary from provider to provider, facility to facility and community to community.

3. Service modelling. The risks of introducing information technologies and new modalities of communications on the health care sector must be clearly identified. Operational policies and procedures that are often rigid characterize this sector. At present, most of the difficulties in implementing the technologies required in telemedicine are not with the technology itself, but the impact that its use has on the day-to-day practices of the users. To implement telemedicine successfully, the impact must be considered in advance; it must then be quantified and accounted for in the planning and implementation of new systems. Change management becomes the driving force for successful telemedicine. Service modelling provides a structured environment for this to take place. The goal of telemedicine service modelling is to identify and quantify aspects of the delivery of health services via telemedicine. The output of this modelling will provide valuable information regarding the costing, planning and implementation processes involving:
   - organizational design and major job functions
   - financial considerations (capital and operating)
   - operational considerations (e.g., scheduling, support, protocols and standards)
   - functional technology architectures (interactive or store and forward)
   - policy issues (e.g., licensure and reimbursement).

   In addition, a simulated service model will provide details and rationale to the strategic planning process including:
   - communications strategy for service providers and users
   - implementation strategy on a provincial (state) and regional basis
   - most effective use of capital and operating funding and
   - potential benefits of particular service configurations.

   The benefits of telemedicine service modelling are:
   - it provides an understanding of the environment. The model answers the questions: "What do I do?" and "What resources do I need to do what I do?"
   - it provides a means for communicating and presenting results since: everyone is looking at the same model, everyone is using the same definitions and everyone is talking about the same thing.
   - it provides a tool for managing the environment by: providing structure for a team organization, enforcing a step-by-step approach, tracking the evolution from problem to solution and generating documentation.
   - it identifies opportunities for improvements by revealing flow relationships, incongruities and redundant activities.

The Nova Scotia Telemedicine Network (NSTN) is unique, not only for its innovative and technically superior design but also because it has adopted a formal management structure outside the Department of Health administrative structure. The model is built on a cooperative

relationship between partners: the telecommunication provider, MT&T; the provider of some of the clinical services and evaluation, Dalhousie University; the funding agency, the Nova Scotia Department of Health and TecKnowledge Health Care Systems Inc. The organizational chart (Fig. 1) outlines the reporting structure of the program management model (PMM). A Program Director is responsible for the overall project. Because telemedicine demands that stakeholders re-think how they will interact with the health care system, tremendous barriers can be overcome if credible people are chosen to fill the positions outlined in the PMM. We have adopted the philosophy that peers are more apt to be able to establish the relationships to not only effect change but sustain it through the formative periods.

Operational telemedicine functions in a different environment than pilot projects. The impact of possible changes to traditional work-flow patterns is paid little or no attention in a pilot, but in an operational situation every aspect of the interactions between patient and health care provider must fit into a grid. Service modelling, if done well, will identify barriers. The process is designed to mitigate gridlock; the PMM is designed to deal with gridlock by devising strategies to overcome the impasse, if it occurs. Only people with intimate knowledge of the workplace, the health care industry, the power (and limitations) of the technology and the motivational factors that permit most health care providers to function, can attend to the detail required to integrate telemedicine into mainstream health care.

The PMM has incorporated strategic people into an organizational structure. The Site Coordinator is the critical person in the organizational structure. This person must champion the cause of telemedicine in the institution. To achieve this, a high level of credibility with colleagues is essential, given that there is significant skepticism about telemedicine among pragmatic health care providers. Only positive experiences with the technique will change this attitude. Scheduling, evaluation and maintenance of the network from a manpower perspective are challenges implicit in telemedicine networks that can be overcome by an effective Site Coordinator.

Experience with the NSTN supports the observation that telemedicine has matured beyond the early adopter stage to the stage of mainstream health care use. Stakeholders expect the technology to be seamless and user friendly. Traditional telemedicine projects have not emphasized the need to have the clinical people closely integrated with the technical team. A PMM requires the representation of information technology, information services and telecommunication personnel integrated into a team environment where a knowledge transfer can occur easily between clinical and technical people. The Advisory Committee, representing the partners listed above and the community at large, provides the PMM with an accountability relationship. The pilot study that preceded the NSTN was successful in proving that telemedicine can be beneficial to rural stakeholders. We realized that a successful province-wide deployment would require a new paradigm to overcome the many operational issues identified in the pilot. Work-flow analysis, assuring user involvement and developing validation protocols (to ensure that clinical personnel have confidence in the proposed solution), requires the participation of health care professionals.

The Clinical Director, Regional Coordinator and Program Director positions are designated as clinical positions, critical not only to creating an environment of trust and support in the user group but also to providing a level of confidence for the payer group. Telemedicine is supposed to help close the gap in health care between stakeholders: the patient whose access to health care may be compromised by distance or limited resources and the provider of care whose ability to deliver services may be limited by misallocation of resources. This may take the form of a sole regionally-based nephrologist unable to reach patients in need of dialysis or a rural practitioner unable to access knowledge because of time or distance.

[Contents]

Discussion

The Nova Scotia Telemedicine Network will connect 43 facilities to regional centres, tertiary care centres and to each other. The applications approved on the network are radiology, continuing medical education (CME), dermatology, psychiatry and emergency medicine. Table 1 outlines the transactions between the first 16 sites from April to August 1998 and the projected transactions from September to December 1998, and for 1999. The remaining sites are expected to be operational by Mar. 31, 1999.

Activity on the network is dependent on the infrastructure available. For example, a sustainable dermatology clinic cannot occur unless the Regional Coordinator is able to schedule multiple sites to feed into the tertiary centre in a manner that will assure the efficient use of the dermatologists' time. Service modelling will prepare everyone, from the general practitioner's secretary to medical records personnel, to anticipate work loads and the challenges inherent in delivering the clinical service. The PMM adopted by the NSTN has overcome the barriers around work flow. However, the experience gained over the last 8 months continues to refine the skills required to bring telemedicine into environments often less than enthusiastic about welcoming new health care delivery models. A major lesson which we have learned is the realization that simple work-flow issues can stall implementation of a telemedicine solution for any clinical problem. Despite rapid processors, slick interfaces and committed designers, if the proposed solution does not take into consideration work-flow issues, unique to each institution, the resistance from the clinical personnel will be tremendous.

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[Contents]

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