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Santé
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Office of Health and the Information Highway

A large, stylized graphic in shades of blue. It depicts a human figure with a circular head and a body that tapers into a long, flowing, curved shape that extends towards the bottom right. The background features several broad, curved bands of varying shades of blue, suggesting movement or a path.

*Virtual Integration for
Better Health:
from Concept to Reality*

Canada

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Office of Health and the Information Highway
Health Canada

September 1998

Our mission is to help the people of Canada
maintain and improve their health.

Health Canada

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This publication can be made available in/on computer diskette, large print, audio-cassette
or braille upon request.

Également disponible en français sous le titre :
L'intégration virtuelle pour une amélioration de la santé : du concept à la réalité

ACKNOWLEDGMENTS

The Office of Health and the Information Highway would like to acknowledge the
assistance of Mr. Stephen Vail for reviewing this paper, Ms. Judith Whitehead for English
editing, and Ms. Hélène Vigeant for providing communications support.

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BENEFITS OF HEALTH INFOSTRUCTURE

Health infostructure is an integrated network of computer and communication networks that virtually connect physical infrastructure, health professionals, facilities, communities and patients to enhance health care delivery and the sharing of health-related knowledge for the better health of Canadians.

When fully implemented, the health infostructure will drastically extend the reach of effective health care. The health infostructure is expected to enable people to better maintain their health, reduce costs of health care and improve its quality.

The health infostructure will enable effective medical care at patients' homes and remote rural areas. It will also improve accessibility of specialized care. Patients will be able to perform specialized tests at homes and transmit data from electronic sensors via telecommunication networks. Post-surgical patients would wear wireless sensors, continuously transmitting physiological information to their physician's office. This information would be continuously analyzed by a computer, which would alert a physician to significant deviations.

Using telehealth links with two-way audio and video capabilities, major medical centers will be connected with general practitioners and nurse-practitioners in remote communities, assisting them in appropriate diagnosis and treatment of patients.

The quality of medical care will be improved dramatically by bringing reliable information to physicians, through national data on treatment outcomes and extended information on the effectiveness of previous treatment received by a patient. The patient file will provide medical professionals not only with descriptive information, but also with most of the previous X-rays, Magnetic Resonance Imaging (MRIs) and detailed biochemical analyses. This information will naturally prove to be life saving in emergencies, when survival, often determined by minutes, depends on availability of essential data (e.g., blood type or known allergies).

These are only the most obvious benefits of the health infostructure that is currently emerging in North America. Some of the described applications are already operational in large urban hospitals. The emerging goal is interconnecting current systems and creating a seamless network of the telecommunications-based health care system of the 21st century.

BENEFITS OF TRANSFERRING HEALTH INFORMATION BETWEEN JURISDICTIONS

First, we have to ask ourselves a question: what kind of benefits and for whom?

Electronic transfer of health information between jurisdictions could result in a range of direct and indirect benefits for patients, health professionals, public health and health care administrators. Major direct benefits can be divided into epidemiological, clinical, economic, social, technological and managerial. Indirect benefits of a national health infostructure could result from a macroeconomic effect on the development of information and communication industries, health care industries and educational institutions.

Clinical and Epidemiological Benefits

Medicine is a complex science, which requires consultations among professionals on a regular basis. As a 1995 restatement of the Hippocratic Oath¹ declared, *“I will seek the counsel of particularly skilled physicians where indicated for the benefit of my patient.”* Possibility of transferring health information between different provinces and territories will most definitely enrich and stimulate such consultations, by enabling physicians in rural areas of the country to consult with their colleagues anywhere in the country, without limiting this process to a particular province. The ability to provide consulting physicians with real-time vital signs of the patient will dramatically improve the very process of consultation. The ultimate winner of such a system would be every individual patient.

Enabling transfer of medical information between the provinces and territories is comparable to the managerial design of the Just-In-Time system in the industrial environment. For health professionals, there is a great value attached to the ability to access patients' medical history when necessary, especially in an emergency. It is a reality of our lives that patients are very mobile and are moving from one area of the country to another. Many people work on contract and visit their client companies in different provinces. Many people travel. Ability to transfer health information would enable local physicians and nurses to access the visiting patient's records on an as-needed basis. At the same time, in the foreseeable future it could be at a patient's discretion to visit a local doctor or to connect via a fast ATM² line to his or her own family doctor. In this case, the national health infostructure would enable patients to transfer their encrypted vital signs

¹ Physician Oaths and Codes, University of Chicago, MacLean Center for Clinical Medical Ethics, Available at <http://ccme-mac4.bsd.uchicago.edu/CCMEPolicies/MedCodes/Hippo>

² Asynchronous Transmission Mode

data to a health professional, who would be able to make informed decisions and suggest the best course of action to the patient. Overall, by supporting mobility of patients within the country, interjurisdictional transfer of health information has the potential to improve coordination and continuity of patient care.

There is concern that the ability of physicians and nurses from one province to engage in treatment and consultation of patients from another province would require a fundamental overhaul of the licensing system in Canada. However, this reform appears to be rather overdue, and could have a very positive effect on the overall process of professional credentialing in Canada. The issue that should draw more attention from the health professionals' side is that advances in information and communication technologies are enabling exporting health services across international borders. This poses more serious questions than the virtual integration of the Canadian health care system.

Much of the medical progress in the last 200 years can be attributed to the public health system and control of communicable diseases. Information exchange is the core of public health and epidemiology. We should not forget that the history of health information is directly linked to the history of epidemics in Europe. It is utterly vital for the well-being of the populace that reliable public health surveillance information be communicated among different countries, provinces and territories. Diseases do not abide by jurisdictions, nor should the information about them.

The ability to transfer health information between jurisdictions also holds vast potential for facilitating research by groups of biomedical scientists working in different parts of the country. The results of such research would benefit all people of Canada.

Economic, Technological and Social Benefits

The Canadian federal government is a major provider and purchaser of health care services through its health care responsibilities for military personnel, public service, veterans, immigrants and First Nations. Implementation of interoperable health records systems across the country could enable both the federal government and the local providers of health care to decrease expenditures through decreasing duplication of records and eliminating excessive paperwork.

Unrestricted flow of health information between jurisdictions, enhanced by unique identification of patients and providers, would enable fraud detection, and therefore save considerable costs.

The economic benefits of interjurisdictional transfer of health information could be realized mainly through the replacement of existing paper flow between the provinces and territories by electronic technology. In addition, should provinces decide to jointly participate in the design and implementation of the national health information infrastructure, economy of scope could be realized.

In terms of technological benefits, federal/provincial/territorial collaboration in the development of the health infostructure would facilitate diffusion of new technologies and result in comparable technological capacity for transmitting multimedia health information between jurisdictions. It would also contribute to the faster development of interoperability standards between federal/provincial/territorial information system platforms.

A national health infostructure could contribute to the elimination of sharp differences in social and health care infrastructures of rural and urban areas of different provinces and territories. Interjurisdictional transfers of health information could drastically improve access to health information by patients and health professionals. A national health infostructure could also facilitate the development of the virtual health care environment extending over provincial and territorial borders and enable true portability of health care. This environment would make possible the effective maintenance of virtual networks of health specialists across the country, thus resolving the issue of relative professional isolation in rural areas. This could have a positive effect on human resource issues in remote communities of different provinces and territories.

Management and Policy Benefits

Sharing health and economic outcomes information across the country could enable continuous cost-effectiveness analysis and analysis of quality of life indicators on a national scale, thus facilitating the sharing of best practices.

In addition, management issues posed by the increasing rate of change, demographic shifts, technological revolution, etc., are roughly the same across the country. The capacity to exchange hard data on organizational levels between similar facilities in different jurisdictions and discuss management issues and solutions would enhance the quality of health care management.

The development of the national health infostructure could consolidate and *virtually integrate* provincial and territorial health care systems into a new, more efficient and streamlined national health care system, without actually interfering with the management and delivery of services by provincial/territorial health care systems.

