Trend 6 – eHEALTH

INTRODUCTION

eHealth is a consumer-centred model of health care where stakeholders collaborate, utilizing information and communication technologies, including Internet technologies to manage health, arrange, deliver and account care, and manage the health care system. eHealth solutions are viewed as one of the key methods of modernizing the health care system, as they may be able to make care safer and more cost effective.[1] In 2009, 21.7 million Canadians aged 16 and older (80%), went online for personal reasons during the 12 months prior to the survey. Of those individuals, 70% used the Internet to search for medical or health-related information, up from 59% in 2007.[2] In Canada, 61% of consumers report wanting their physicians, hospitals and/or the government to provide them with a personal health record (PHR) or online medical record, while 6% of consumers already maintain one.[3] It is estimated that as soon as patients begin to bypass physical means of transferring and obtaining information, savings could be achieved.[4]

Health care experts, policymakers, payers, and consumers consider health information technologies, such as electronic health records and computerized provider order entry to be critical to transforming the health care industry.[5] Health information technology has also been shown to improve quality by increasing adherence to guidelines, enhancing disease surveillance, and decreasing medication errors.[6] Both the Romanow and Kirby Reports (2002) highlight the importance of electronic health records to the future of health care. However, concerns remain about the high costs of implementing an effective electronic health records system and patient privacy.[7, 8]

SUMMARY OF KEY FINDINGS

Growing Challenges:

- Implementing eHealth technology is costly and may account for as much as 20% of all spending increases.
- Health professionals may be resistant to using information technologies, particularly with high rates of failure.
- Concerns over the protection of personal health information are associated with implementing electronic health records.

Emerging Responses:

- The use of the internet to deliver health care is growing around the world. Various public health and chronic disease interventions are being tested and implemented to improve health outcomes and decrease costs.
- Telehealth programs are increasingly being adopted to deliver health care in various regions of Canada.
- An increasing number of private sector companies are developing products to address health information needs of patients and consumers.

GROWING CHALLENGES

High Implementation Costs

- Canada Health Infoway (Infoway) is working in partnership with the country's federal, provincial, and territorial governments to create and implement electronic health record (EHR) systems.
  - Support for Infoway was acknowledged in the 2009 federal budget with an additional $500 million designated for this initiative. This brings the Government of Canada's total commitment to $2.1 billion.[9]

Ontario

- o According to Infoway, achieving the full health "infostructure" vision over the next 10 years will require a total incremental investment of $10 billion to $12 billion in capital and $1.5 billion to $1.7 billion in annual operating costs. The upfront capital investment – approximately $350 per person – would bring Canada's spending in line with comparable systems in other jurisdictions (e.g., the UK and US). The elements of the vision are expected to deliver an estimated $6 billion in annual benefits.[10]
  - o Since its inception, Infoway has approved 293 projects involving all provinces and territories in Canada. At the end of the 2009/10 fiscal year, $1.63 billion or 75% of Infoway's $2.14 billion fund had been allocated for electronic health information systems projects.[11]
  - o A report by Booz Allen Hamilton estimated the cost of developing EHRs in Canada to be anywhere from $8 to 16 billion over a ten year period.[12]
- • As part of the economic stimulus package passed in 2009, US President Obama proposed to modernize health care by making all health records standardized and electronic within five years. The price tag for this ambitious plan was estimated between $75 million to $100 million but would create 212,000 jobs.[13]
  - o In order to be eligible for incentive payments, providers must implement EHRs and demonstrate their "meaningful use." In the first phase of the program (2011/12), meaningful use will be defined by meeting all 14 core objectives (e.g., maintain active medication list, record and chart changes in vital signs) and five of ten menu objectives of EHRs (e.g., perform medication reconciliation between care settings).[14]
  - o In 2009, 11.9% of US hospitals had adopted either basic or comprehensive EHR systems, however, only 2% of US hospitals

report having EHRs that would allow them to meet the meaningful use criteria.[15]

- • A 2004 survey of hospitals by PricewaterhouseCoopers found that US hospitals spend an average of 2.5% of their yearly operating budgets on health information technology, up from 2.2% in 2002.[16]
- • Budget filings by the US Veteran's Affairs Administration indicate an 18% annual increase in health care information technology spending from 2007 to 2009.[17, 18]
- • High implementation costs are consistent with the UK Auditor General report reviewing public infrastructure projects. The UK Auditor General found that IT projects are very risky with over 50% of successful projects requiring renegotiation of terms to better manage escalating costs.[19]
- • England's National Health Services (NHS) is spending nearly £13 billion to digitize their health system, Connecting for Health.[20] In January 2009 a parliamentary report concluded that the project was at least four years behind schedule and that the costs might soar.[21]

Slow Uptake and Resistance from Health Care Professionals
- • A 2008 US hospital survey found that less than 2% of acute care hospitals have a comprehensive electronic records system and between 8 and 12% have a basic electronic records system. It has been suggested that strategies to promote the adoption of EHRs by US hospitals should focus on financial support, interoperability, and training of information technology support staff.[22]
- • A review of national EHR programs in five countries identified six critical areas which commonly result in problems: 1) acceptance and change management, 2) demonstration of benefits and funding, 3) project management, 4) health-policy-related goals and implementation strategy, 5) basic legal conditions and data protection, and 6) technical solutions and standards. [23]

- In a 2008 study, only 4% of US physicians reported having an extensive, fully functional electronic records system, and only 13% reported having even a basic system.[24]
- A 2010 review of national EHR programs notes that Australia has implemented small regional EHR pilot projects with real data in several territories. [25] However, a recent news article describes that patients will have to wait at least two years before they can access and retrieve their personally controlled EHRs, available initially through a secure website or portal operated by Medicare.[26]
- According to one Canadian study, there is support from primary health care providers to deliver Internet-based chronic disease management in rural and remote regions of Canada; however the need for secure and stable electronic systems that are compatible with current electronic systems is essential before adoption of such technology will occur.[27]
- In 2002, staff forced Cedars Sinai Medical Center (Los Angeles) to stop the use of a $34 million Central Physician Order Entry system and revert back to paper-based records.[28]
- According to the National Health Information Network director, up to 30% of all EHR attempts have failed.[29] This poor success rate may be a contributing factor toward persistent reluctance and resistance to switch to electronic solutions.[30]
- Researchers at Vanderbilt University have found that failure to succeed with early system users is not only costly, but also discouraging to users and developers alike and may damage the reputation of the tools and systems across the organization.[31]
- Kaplan suggests that organizational factors and workflow are significant factors that must be addressed to increase the odds of success for implementation and use of electronic health solutions.[32]

Privacy Concerns
- Virginia Sharpe, medical ethicist with Veteran's Health Administration notes that a centralised database could increase the chances that health information would be misused and that "as patient records become the product of many users, any one provider's or institution's obligations to protect confidentiality could be eroded."[33]
- According to a national survey of 2,304 Canadian adults, 54% of consumers are concerned about information privacy related to the storage of online health information.[34] A public opinion survey of 2,469 Canadians in 2007 found that 77% of respondents would like audit trails that document access to their EHRs, 74% want strong penalties for unauthorised access, and 66% want clear privacy policies.[35]
- A US-based survey of 2,392 adults conducted in 2007 found that the majority of respondents did not believe current US law and organizational policies provide enough privacy protection.[36]

EMERGING RESPONSES
The Internet as Means of Delivering Care
- The use of the Internet to deliver health care is growing around the world. Various public health interventions are being tested and implemented in areas such as: smoking cessation,[37, 38, 39] health promotion information for pregnant women,[40] and alcohol reduction programs.[41]
  - One Internet smoking cessation study found that certain features, such as the use of interactive quitting tools and one-to-one messaging with other members of the online community, were associated with increased abstinence rates among users.[42]
- Internet-based chronic disease programs are also emerging for treating depression[43] and panic disorder,[44] and managing COPD[45] and hypertension.[46]
  - A recent Lancet study demonstrated the effectiveness of cognitive behavioral therapy (CBT) for depression when delivered online in real time by a therapist. Although there is strong evidence of CBT's effectiveness, it remains difficult to access because there is a need for trained therapists. The recent

randomized control trial of 297 patients in the UK found that after eight months, 42% in the online CBT group had recovered from depression, while only 26% of those in the control group who received usual care from their general practitioner had recovered.[47]

- Remote Patient Management (RPM) of chronic diseases is evolving steadily in the US to improve chronic care management while reducing net spending on chronic diseases. RPM relies upon a reorganization of care processes that include physiologic monitoring, protocol driven decision support, newly defined roles for clinical and non-clinical providers, and telecommunications that place patients at a distance from the providers of their care. RPM has been shown to support patient self-management, shift responsibilities to non-clinical providers, and reduce the use of emergency department and hospital services. This method of chronic care management has been broadly deployed in the Veteran's Health Administration (VHA) and in small trials elsewhere. It has been suggested that RPM technologies will be essential in meeting the dual challenges of an aging workforce and an aging population while offering a means of making care more affordable.[48]

Telemedicine

- The University of Ottawa Heart Institute hospital home monitoring program for heart patients is helping to save lives and money by reducing the number of hospital readmissions. After being discharged from the hospital, patients measure their own vital signs -- such as weight, heart rate, blood pressure and side-effects of medication -- before reporting the results to the institute through an automated calling system. A nurse follows up immediately if the numbers indicate a problem. Before home monitoring began, 69.4% of patients were readmitted at least once in six months. In the next six-month period, when the patients were being monitored, readmission fell to 14.8%.[49]

- Ontario operates Telehealth Ontario, a telephone service to provide health advice and general health information to Ontarians from a registered nurse. These types of interventions provide additional opportunities to access advice and potentially reduce unnecessary visits to the local emergency department.[50]

- The greater use of telehealth services in rural areas is one of Alberta's five goals in their Vision 2020 health strategy. Currently, Alberta has a telemental health program which has increased access to mental health services, especially in rural areas. Approximately 3,500 patients were seen in 2007/08 through telemental health and 96% of surveyed patients reported being satisfied with the session outcome.[51]

- In cases of suspected myocardial infarction in Chile, examinations of patients can be carried out in ambulatory settings, and the electrocardiogram can be transmitted immediately to a national centre where specialists confirm the diagnosis via fax or e-mail. This technology-facilitated consultation with experts allows rapid response and appropriate treatment where previously it was unavailable.[52]

- The growing market penetration and the communication properties of mobile phones create opportunities for innovation in promoting cardiovascular disease self-management in developing countries through support of lifestyle and behaviour modification. Mobile phones support various modes of communication and interaction, have fewer adoption barriers, and are more prevalent than other available technologies in developing countries. [53]

- Continua Health Alliance is a non-profit, open industry coalition of healthcare and technology companies that have joined together to improve the quality of personal healthcare.[54] Continua-compliant health management devices and online services have been designed to make it easier for consumers to manage their own health. Consumers can obtain electronic personal health data from a variety of Continua Certified devices (including weight scales,

blood pressure monitors, and personal computers). Individuals can manage their health from home by accessing their stored personal health data via the online services and applications. The first Continua-Certified mobile phone was unveiled in Japan in October 2010; the phone will manage and transfer health data collected by other Continua certified healthcare equipment.[55]

- A UK-based randomized control trial evaluated the use of Internet and mobile phone technology as a means of increasing physical activity. During the nine week trial, the experimental group increased physical activity an average of 2 hours and 18 minutes per week (compared to the control group) more than the control group. The test group also lost more body fat (2.18% vs. 0.17%) than the control group during the same period.[56]

Private Sector Ventures into eHealth

- In the spring of 2009, Telus announced they will be developing electronic health services that will allow individual Canadians to access and manage copies of their lab results, X-rays, and other medical information online and share it with different health care providers. Telus will be developing a system over the next year to import health data from partners such as doctors' offices, hospitals, and pharmacies into an online platform called Telus Health Space (similar to Google Health in the US) where patients will be able to use online tools to manage the data. [57]

- HealthPartners, a health care organization, partnered with a digital advertising agency, to develop software for a remote diagnostic service called Virtuwell that is available to all Minnesota residents and visitors to the state. The online portal invites users to fill out a questionnaire about current medications, health status, medical history, and symptoms. A nurse practitioner then reviews the questionnaire and responds within 30 minutes, providing the patient with personalized diagnoses, prescriptions for common ailments; and treatment recommendations. If responses to the questionnaire point to a serious medical condition, Virtuwell will direct the user to call 911 or seek care from the nearest emergency department. The service costs up to $40 per virtual consultation, compared with $53 at a retail clinic and approximately $115 at a primary care physician's office.[58]

- Intel has also announced the availability of the Intel Health Guide, a touch-screen computer that includes video conferencing capabilities and a multimedia health education library for patients. The device may initiate scheduled 'check-ups' with patients several times a day, asking health-related questions and collecting vital signs, which are sent digitally to medical providers."[59, 60]

- In June 2008, Bloomberg News reported an agreement between a large group of organizations advocating for the creation of personal health records. These organizations included health insurers, organizations representing physicians and consumers, electronic prescription benefit managers, government agencies, Google, Microsoft, Cisco Systems Inc., WebMD Health Corp., Intuit Inc. and Dossia. This group owns a comprehensive set of privacy protections. The agreed upon framework includes audit trails and policies distinct from existing federal requirements covering the exchange of information.[61]

- Medicine/Health 2.0 is a nascent area that utilizes many of the latest 'Web 2.0' Internet technologies that enable and encourage consumer-driven health care.[62] Hughes et al. examined the research in this area and concluded there is "an emerging body of research into Medicine 2.0" with many issues yet to be explored.[63]

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