



The Value of Investing in the Electronic Medical Record (EMR)

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Introduction

The [US] government's 10-year strategy to have most Americans using electronic health records will fail unless small physician offices adopt technology. I can't get to that goal without getting to the small physician practices ... "David Brailer, MD, National Coordinator for Health Information Technology¹

"... we recognize the urgent need to drive physician adoption of health information technologies. Studies in other countries have shown the critical importance of connecting physician offices to electronic record systems ..." Richard Alvarez, President and CEO, Canada Health Infoway²

While Brailer and Alvarez see the need to automate physician offices as an essential part of the information technology (IT) agenda, many of the key decision-makers in Canada at the provincial, territorial or health authority levels still have not committed any resources to physician office automation. The reasons given are lack of funds, different priorities, and in some cases a belief that the benefits accrue to physicians and not the health care system (and therefore physicians should bear the costs). In this article I want to provide information that challenges these assumptions and supports the need for the provision of direct support to physicians for automation.

Is There a Business Case for Investing in Electronic Medical Records (EMRs) and Electronic Health Records (EHRs)?

Do investments by jurisdictions in EMRs and EHRs provide a return on value (ROV) to justify further

investments in information technologies? Our assessment is yes. Over the last year three studies – two by the Center for Information Technology Leadership (CITL) and one by Canada Health Infoway – have estimated the benefits of building a country-wide IT infrastructure to support the health care sector.

CITL³ has completed a study on the benefits to be derived from investing in a standardized health care information exchange that would facilitate electronic data flow among providers (hospitals and medical group practices), and between these providers and five stakeholders with whom information is commonly exchanged: independent laboratories, radiology centres, pharmacies, payers and public health departments.

Analyzing those elements of interoperability for which costs could be assigned, researchers estimated that net savings from a national implementation could reach \$395 billion over 12 years and yield \$87 billion annually, or approximately 5% of the projected \$1.661 trillion spent on US health care in 2003. The cumulative breakeven point would occur in year 5 of the implementation. Although the CITL model did not quantify all costs and benefits, researchers stated that the clinical payoff in improved patient safety and quality of care could dwarf the projected financial benefits to be derived from redundancies that are avoided and administrative time saved. As Dr. Blackford Middleton stated, "our research shows conclusively that there are strong financial reasons for the nation to invest in standardized health care information exchange."⁵

The second study carried out by CITL, entitled *The Value of Computerized Provider Order Entry in Ambulatory Settings*,⁶ attempted to comprehensively

¹Healthcare IT News, April 7, 2005

²Healthcare Information Management and Communications Canada, Vol. 19(2) April 2005

Note: David Brailer (United States) and Richard Alvarez (Canada) have been charged with building electronic health record capability in their respective countries. Both have declared in these references and in numerous public forums that physician offices will need to be automated and connected to the rest of the health care delivery system in order to achieve the expected benefits of integrating information technology in the health sector.

³CITL is a Boston-based, non-profit research organization established in 2002 to guide the health care community in making more informed strategic IT investment decisions.

⁴Jan Walker et al., "The Value of Health Care Information Exchange and Interoperability", Health Affairs, January 19, 2005.

⁵CITL press release February 23, 2004, at the HIMSS Conference.

⁶Center for Information Technology Leadership, "The Value of Computerized Provider Order Entry in Ambulatory Settings", February 2003.

analyze the potential of CPOE in ambulatory settings to help transform US health care.

The overall assessment was that the US health care system will benefit significantly from widespread adoption of advanced CPOE in ambulatory settings. More specifically, the authors estimate the elimination of more than two million adverse drug events and more than 190,000 hospitalizations per year. They also predict a saving of \$44 billion per year in reduced medication (\$27 billion), radiology (\$10.3 billion), laboratory (\$4.8 billion) and expenditures related to adverse drug events (\$1.9 billion).

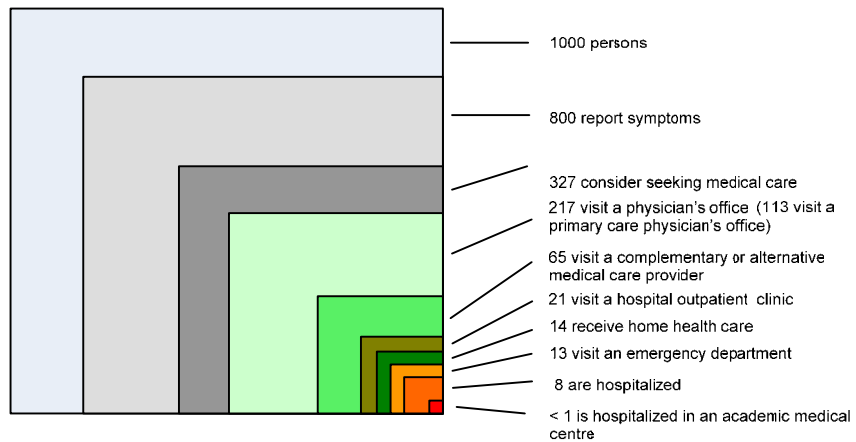
Canada Health Infoway commissioned the US consulting firm Booz Allen Hamilton Inc. to provide a strategic approach to implementing an interoperable pan-Canadian electronic health record, and to project the costs and benefits of such an implementation.⁷ Booz Allen used the model developed by CITL to estimate costs and benefits.

The assessment was based on a 10-year implementation plan. The overall cost for a pan-Canadian EHR is estimated to be \$9.9 billion with the 10-year total cost of ownership, which includes both acquisition and recurring costs, estimated to be \$22.7 billion. The benefits over 20 years include: a reduction of an estimated 29 million adverse drug events, which yield a cost saving of \$48.3 billion; a reduction of duplicate and unnecessary radiology tests, estimated to yield savings of \$3.6 billion; and a reduction of duplicate and unnecessary laboratory tests, estimated to yield savings of \$10.4 billion

The return on investment (ROI) is estimated to have gross benefits exceeding investment dollars by an 8:1 margin, and a net savings of \$39.8 billion over a 20-year period. It is estimated that a net positive cash flow would occur in Year 7 of implementation, and an investment breakeven by Year 11, resulting in an annual net benefit of \$6.1 billion.

The more important observation made in the Booz, Allen Hamilton study was that in addition to these quantifiable financial benefits, significant qualitative benefits will likely be realized. Evidence suggests that quality and processes of health care will be greatly improved, leading to a more patient-centric care environment and improved patient and staff satisfaction. Perhaps the most compelling benefits however are the anticipated improvements in patient safety. Although the financial benefits are significant,

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one could argue that the qualitative benefits, particularly in lives saved, create a moral imperative for this initiative.

The Importance of Community-Based Care

On the question of priorities or where to invest to achieve the largest impacts on healthcare outcomes, our analysis demonstrates that this should occur in the community care setting.

To date provincial and territorial investment has focused on building large applications for drug databases, laboratory databases, digital imaging databases, registries, public health surveillance and telehealth networks. Other than in Alberta and Ontario, and potentially in British Columbia, no programs exist to finance physician office automation in non-institutional settings. However, without connectivity and automation of family physicians' offices, the large IT applications are of little or no use to clinicians at the point of care.

The issue of where health care transactions occur was explored in a study first published in the *New England Journal of Medicine* in 1961. The article, entitled "The Ecology of Medical Care"⁸, provided a framework for thinking about the organization of health care (i.e., transaction points). The conceptual diagram, based in part on reporting by British practitioners, suggested that in a population of 1000 adults over 16 years of age, in an average month, 750 reported an illness, 250 consulted a physician, nine were hospitalized, five were referred to another physician, and one was referred to a university medical centre.

A US-based research team updated this study in 2001 to include persons of all ages.⁹ Researchers found minor variations in the model, but reported overall stability of the relationships proposed more than 40 years earlier, despite significant changes in medical care.

⁸KL White, TF Williams, BG Greenberg, "The Ecology of Medical Care", *New England Journal of Medicine*, 1961; 265:885-92

⁹LA Green, GE Fryer Jr, BP Yawn, D Lanier, SM Dovey, "The Ecology of Medical Care Revisited". *New England Journal of Medicine*, 2001; 344:2021-25

⁷Canada Health Infoway, "End User Acceptance Strategy – Current State Assessment, May 5, 2005". Accessed at http://www.infoway-inforoute.ca/pdf/EndUserAcceptance_CSAv10_2005MAY05.pdf

The observation to draw from both assessments of health care delivery is that the majority of care originates and is provided within the community and not in health care institutions. The physicians consulted estimate that 80% of health care is delivered at the community level – i.e., outside acute care institutions. The majority of encounters, the majority of the prescriptions issued,¹⁰ the majority of the laboratory tests requested, and the majority of referrals for patients to see other health care providers, originate in the community. The CITL report⁷ supports this viewpoint and its authors comment that the majority of US health care is delivered in ambulatory clinical settings and the sheer volume of outpatient encounters suggests that IT could have a profound impact on care.

Consultations with family physicians in every province who have already automated the clinical side of their offices indicate that the benefits to patients, the physicians, and the broader health care system are achieved in a matter of months, not years. These physicians estimate that even without being connected to the rest of the health care system, they are achieving 50%-60% of the expected benefits by integrating IT into their health care delivery processes. These benefits include cost avoidance, better patient management and better health care outcomes.

Arguably the provinces and territories have their investment priorities in the wrong sequence if they want to generate health outcome benefits as early as possible from their IT strategies.

Who Benefits

An examination of current literature and of anecdotal information points to a benefit sharing from investments in information technology between physicians and provinces/territories of 20:80. Both CITL studies assumed hospitals and medical group practices would pay to automate their offices, and that these providers would realize substantial benefits (approximately 35%) from the introduction of IT into clinical practices. The benefit estimates cannot be extrapolated into Canada, since the payment models are different. At the 2005 Healthcare Information and Management Systems Society (HIMSS) conference in Dallas, one speaker¹¹ estimated that Canadian physicians would realize 20% of the benefits from IT, with the rest of the benefit - 80% - accruing to governments.

An examination of the cost avoidance identified in the CHI funded Booz, Allen, Hamilton study showing a positive ROI in year 7 clearly indicates this accrues to the system managers (provinces and health authorities) through reductions in adverse drug events and duplicate and unnecessary radiology and laboratory tests.

However, most community-based physicians in Canada have no incentive to automate their practices and become connected to the larger systems being developed. They face a number of immediate expenses and change management issues in doing so with no concomitant prospect of immediate benefits.

Given the benefit ratio outlined above, the Canadian Medical Association and its provincial divisions feel strongly that physicians must be given direct financial support for IT if the benefits of automation are to be realized.

Moving Forward

In September of 2004 all First Ministers agreed to a new Health Accord that would help address a wide range of issues in the health care sector. First Ministers agreed that access to timely care across Canada was our biggest concern and a national priority. In addition they also agreed to a complementary set of priorities: home care, primary care reform, access to care in the North, a national pharmaceutical strategy and an increased focus on prevention, promotion and public health, amongst other things.

Building connectivity amongst all points of care and putting in place the means to digitally capture health encounter information creates the supporting foundation that facilitates all of the following: speeding up access for patients with medical conditions through a better management of facility capacity; creating a means to provide medical and home care services to the frail elderly; allowing for a more aggressive use of tele-health to provide health care services to Canadians in all parts of this country; improving patient safety through better and timely information in the hands of the provider at the time of care; creating a national system to help providers of public health respond to crises such as SARS; and providing health care providers with tools to place more emphasis on prevention and promotion activities.

The CMA believes that information technology can be an enabler to achieve these challenging priorities but only if physicians in Canada are engaged in an early, meaningful and ongoing manner and only if they are assisted in integrating information technology into their clinical operations. A case does exist for more information technology investment that provides funding for community-based clinicians to automate their offices. ●

¹⁰2004 Canadian Institute for Health Information (CIHI) Forecast, National Health Expenditure Trends 1975-2004, indicates \$23.1 billion in total drug expenditures with \$21.8 billion in retail (community) drug spending and \$1.3 billion in hospital drug spending.

¹¹The speaker was Anthony J. Schueth, Managing Partner, Point-of-Care Partners, LLC, at the HIMSS annual conference, February 2005.