Chapter 28
Enabling Technologies and Challenges for the Future of Ubiquitous Health:
The Interoperability Framework

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ABSTRACT

Web 2.0 and Web 3.0 emerge at a time when health care reforms are stymied. Current barriers to an effectively functioning health care system are linked to the historical, political and social institutions and processes that are preventing health system interoperability causing issues with access (to service and information), continuity of care, safety and the assessment of program delivery. An interoperability framework, identifying citizens, providers, policy makers and researchers is developed and related to the improvement of understanding, access, trust, discourse, and practice for the purpose of moving toward a high performing health care system. Web 2.0 and Web 3.0 offer great promise as an eHealth platform to synergistically catalyze significant improvements to health care delivery, however, caution is advised about uncritical adoption. Barriers to progress and opportunities for advancement are identified and questions for future research are posited.

INTRODUCTION

Canada lags other nations in the introduction and use of the electronic medical record (EMR) and the electronic health record (EHR). Progress is slow and Canada ranks last in EMR adoption compared to many other countries (Davis, Doty, Shea, & Stremikis, 2009). Two primary reasons for the lack of progress are a slow rate of adoption

and system interoperability (Archer, 2009). The federal government made a commitment to Canada Health Infoway to advance the adoption of the EMR and EHR with funding of $1.6 billion in 2001 and another $500 million in 2009. In addition to these funds the provincial and territorial governments have leveraged national funds with commitments of their own to advance the eHealth agenda. Some successes have been achieved but as of 2006 only 23% of Canadians have an EMR (Davis, Doty, Shea, & Stremikis, 2009, p. 241). Should we be

concerned with lack of progress in Canada? What are the barriers to interoperability and adoption? What are some of the ingredients for success? How can they be achieved?

This chapter is based on the premise that the constituent elements of the health care system must be effectively interoperative for electronic interoperability to be achieved. Political, social and policy interoperability of the health system's functioning are factors for improving electronic interoperability. The emergence of Web 2.0 and the attendant initiatives Health 2.0 and Medicine 2.0® look promising and are stimulating discussion in the field because they advance the concept of the patient at the center of care and the personal health record (PHR) as a way to accelerate adoption and interoperability. Despite how much money is spent on eHealth in Canada the process of health care delivery must be integrated and coordinated so that the relationships and interactions among physicians, hospitals, home care services and pharmacies, to name a few, are working together on behalf of the patient in order for electronic interoperability to be achieved. The question of whether Web 2.0 offers more promise than peril, value rather than vapor, and hope rather than hype is currently being contested. This chapter will address these questions. It will critically describe and analyze barriers to the advancement of eHealth and health reforms generally as they relate to the creation, use and exchange of electronic data, information and knowledge. Its focus will be to determine whether and how Web 2.0 and its successor Web 3.0 can catalyze and stimulate the changes necessary to achieve interoperability of the health care systems on the one hand and information interoperability on the other. Although Canada may be a laggard in the advancement of the eHealth agenda the emergence of Web 2.0 may be timely to catalyze and stimulate progress in the near future and leapfrog Canada to catch up to its European counterparts (Archer, 2009).

The objectives of this chapter are to:

- Provide a background to health care reform and identify the contemporary challenges of system interoperability;
- Describe and define Web 2.0, Web 3.0, Health 2.0 and Medicine 2.0;
- Develop a framework for thinking about advancing health care reforms through interoperability and identify potential opportunities offered by Web 2.0;
- Describe and critically review the issues arising from Web 2.0 enabling new and emerging technologies and systems in health care;
- Propose areas for future research in Web 2.0, interoperability, health informatics, health technology assessment, and health care policy.

BACKGROUND

The emergence of new technologies and techniques in health care intervention, delivery and systems is a two edged sword; they often make remarkable contributions to the successful treatment of disease but they also raise new social, political and ethical issues. Technologies and their purveyors can unwittingly create the illusion that technology alone can remedy contemporary health care issues. The EHR and EMR are perfect examples and are victims of having over promised and under delivered. The EHR and EMR alone cannot facilitate health care reforms to achieve coordination and integration of health care services however they can be important tools to help governance, management, and policy makers achieve a high performing health care system.

In 2004 Coiera identified that all of the technical improvements in health informatics were not sufficient to successfully achieve the required health care reforms. Information and communication technologies were necessary but they alone were not sufficient to achieve the reforms. Coiera professed:

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