

# Ontario's e-Health Journey – Assessing the Path Forward

## Part One

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### Introduction

On Monday, May 16, 2011, at The Canadian Club in Toronto, Greg Reed, President and CEO of eHealth Ontario, delivered “Improving Front-Line Healthcare,” a long-awaited update of eHealth Ontario’s strategy for implementing a province-wide electronic health record (EHR) (The Canadian Club of Toronto 2011). The central focus of Mr. Reed’s review was his announcement of the agency’s plan to implement three regional connecting hubs covering the entire province that will allow all participating health service providers to access and send patient healthcare data. By employing health information access layer (HIAL) technology to overlay and connect electronic healthcare solutions at the region’s healthcare service providers, the three regional hubs will be the next-to-last step in eHealth Ontario’s strategy for creating a province-wide interoperable electronic health record (iEHR) in collaboration with, and employing the existing electronic systems of, the province’s healthcare delivery organizations. Once the three regional HIAL hubs are live and operational, the last step will be to connect them through a province-wide HIAL in order to implement Ontario’s iEHR.

Earlier, at the end of April, HIMSS Analytics published the first results of its 2011 acute care hospital data collection efforts in the form of Q1 Hospital Electronic Medical Record Adoption Model (EMRAM) scores for Canadian acute care facilities (Figure 1). Included were EMRAM scores for 124 Ontario acute care hospitals. As a measurement of levels of

electronic clinical solutions implementation, Ontario EMRAM scores offer valuable insight into the ways Ontario’s acute care facilities are prepared to participate in an iEHR. During the development phase of regional HIAL hubs by eHealth Ontario and its collaborative partners, understanding the status of electronic clinical implementation progress at the province’s acute care facilities can provide valuable information illuminating the conditions required for successful use of HIAL hubs to connect diverse hospital health information systems, which contribute to a robust EHR for all Ontarians.

What follows is the first in an ongoing series of updates on HIMSS Analytics’ EMRAM scores for acute care hospitals participating in the annual Ontario Hospital Association – HIMSS Analytics Technologies and Applications Study. Ontario’s acute care hospitals are key stakeholders in the province’s e-Health strategy of developing regional HIAL hubs that connect the clinical systems of Ontario’s healthcare service providers across the continuum of care.

### eHealth Ontario’s Strategy Going Forward

As Allan O’dette, past-president of The Canadian Club, indicated at the conclusion of Greg Reed’s presentation, it was an overdue update about eHealth Ontario’s plans, for which everyone present and those listening to the podcast were very grateful. Reed posed three questions about the relation of

**FIGURE 1.****Canada EMR Adoption Model<sup>SM</sup> 2010 Final – Q1 2011**

		<b>2010 Final</b>	<b>Q1 2011</b>
Stage 7	Complete EMR; CCD transactions to share data; data warehousing; data continuity with ED, ambulatory, OP	0.0%	0.0%
Stage 6	Physician documentation (structured templates), full CDSS (variance and compliance), full R-PACS	0.2%	0.5%
Stage 5	Closed loop medication administration	0.2%	0.0%
Stage 4	CPOE, Clinical Decision Support (clinical protocols)	2.2%	2.2%
Stage 3	Nursing/clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology	33.0%	33.0%
Stage 2	CDR, Controlled Medical Vocabulary, CDS, may have document imaging; HIE capable	23.5%	23.8%
Stage 1	Ancillaries – Lab, Rad, Pharmacy – all installed	12.1%	11.9%
Stage 0	All three ancillaries not installed	29.0%	28.6%

Data from HIMSS Analytics™ Database.

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eHealth Ontario to the future of improved healthcare services for Ontario's 13 million residents: What is electronic healthcare, and why is it so important? What is eHealth Ontario's strategy for trying to implement electronic healthcare in the province? And, finally, what will patients see and when? In summary, what's next for electronic healthcare from the agency?

In short order, Reed reviewed eHealth Ontario's mandate and challenges inherited from the past. The provincial e-Health organization is charged with harnessing technology information and innovation to enhance outcomes for patient access, care and safety.<sup>1</sup> In the aftermath of the controversies of 2008 surrounding eHealth Ontario and the Ministry of Health and Long-Term Care (MOHLTC), which culminated in a formal audit by the province's Auditor General and a change in leadership at the arm's-length organization, expectations about outcomes and skepticism about future success still abound.

Reed readily acknowledged that advancing Ontario's healthcare, which includes enhancing information technology (IT)-enabled healthcare delivery, can be accomplished only through his organization's collaboration with many partners, especially the province's full range of healthcare service providers. At the same time, he reiterated that eHealth Ontario's mandate includes responsibility for oversight of all directly provincially funded IT initiatives supporting the healthcare profession and patient care delivery. Reed reinforced the growing recognition that IT is a necessity – not a luxury – for improving healthcare

by tying implementation of the province's core strategy for improving healthcare to development and implementation of an effective e-Health strategy. With these words, Reed implied that failure to implement effectively is not an option for Ontario's e-Health project, if the province is to deliver on its promise to improve overall healthcare delivery for all residents.

The starting point for Reed's announcement of eHealth Ontario's updated strategy for connecting the province's health service providers is his observation that the province is awash in electronic records for the same patient created by multiple organizations, and these records are not accessible in a single unified

patient EHR for easy access by all health service providers. Not only do most (though not all) hospitals create patient records that cannot be read in other facilities, but also there is currently no viable way of assembling a comprehensive and accurate healthcare view of any one patient anywhere in the province.

The key to eHealth Ontario's strategy of developing three regional HIALs for overcoming the existing silos of electronic patient information is its adoption of a servant-leader approach to the process for implementing a province-wide iEHR.

- First, the provincial organization must listen to all stakeholders involved in the regional HIALs, especially the health service providers who deliver care to and understand the needs of end-user patients.
- Second, eHealth Ontario must configure the regional HIAL hubs to accommodate the extensive innovative work on electronic connectivity that is already under way in various clusters of hospitals, physician groups and health teams throughout the province.
- Third, eHealth Ontario recognizes that implementation of the connecting HIAL hubs is a massive outsourcing operations project involving public-private partnerships; such as best-of-breed clinical environments, healthcare providers, their IT departments and their technology partners.
- Fourth, in the aftermath of the procurement controversies

of 2008, eHealth Ontario must operate as a cost-effective strategic investor by investing in projects that are scalable, can be leveraged in future repetitions of the original HIAL hub project and must be implemented across the province.

- Fifth, once common standards of interoperability have been developed regionally, in the light of leveraging experience acquired through the ConnectingGTA (Greater Toronto Area) project, thereafter eHealth Ontario must assume responsibility for enforcing common standards to ensure that the EHR being implemented is safe and accurate for both providers and patients.

### **... eHealth Ontario** understands the benefits of working with regional clusters of actual inter-hospital electronic healthcare systems connectivity

Evidence that eHealth Ontario understands the benefits of working with regional clusters of existing inter-hospital electronic healthcare systems is its decision to organize future development of the province's iEHR around three HIAL integration hubs that connect health service providers, including groupings of hospitals already participating in patient data-sharing initiatives. Reed mentioned seven such existing clusters that should serve as the foundational members of one or another regional HIAL hub. The seven electronically connected hospital groupings are located around Toronto, London, Sudbury and Thunder Bay as well as Barrie, Ottawa and Hamilton. Starting with natural referral patterns as a sound foundation for building integrated patient health records, Reed announced that plans are under way for developing three regional HIAL integration hubs. These include a Toronto-based ConnectingGTA HIAL hub, a south-west HIAL hub, and an HIAL hub connecting Northern and Eastern Ontario healthcare service areas.

### **HIMSS Analytics EMRAM and Canada Q1 Hospital 2011 Scores**

The strategy of integrating Ontario's patient EHRs through three HIAL hubs aims at sharing patient health information across the full continuum of health service providers, including acute facilities; ambulatory clinics; physician offices; and Community Care Access Centres, which serve as connectors for patients to home care, long-term care and other local healthcare services, as well as other sources of patient health records. In the instance of the ConnectingGTA project, this will involve connecting 700 service providers across five local health integration networks (LHINs). The initial data to be shared will include clinical reports, diagnostic images, drug information and laboratory test results received from and accessed by all these health service providers.

Although the service providers to be connected include substantially more organizations than merely acute hospitals (such as primary care settings that provide drug and laboratory information), the clinical data repositories of hospitals belonging to each regional HIAL hub are important sources of readily available and rich electronic patient information. Moreover, while the province's e-Health strategy places a premium on strengthening primary and non-acute health care, as the front-line approach to appropriate health care delivery for most Ontarians at most times, the participation of acute care hospitals delivering health care with the assistance of electronic clinical suites is an indispensable and fruitful component of the local and regional continuum of care, and in the development of complete and integrated patient EHRs that are sharable within regions and across the province. For this reason, the probability of early wins in developing robust EHR sharing across all participating service providers connected through a regional HIAL hub is tied in large part to implementation of electronic clinical solutions at participating acute hospitals. The EMRAM helps us understand to what extent hospitals demonstrate sufficiently mature health information technology for participating in the HIAL in the near term. This clinical IT information should prove useful in understanding the gaps that exist between where Ontario hospitals are today and where they need to be when their regional HIAL is ready for them to "plug in."

For this reason, it is necessary and important to inventory and measure the kinds and stages of electronic clinical connectivity at Ontario's acute hospitals in order to evaluate the probable outcomes and benefits of employing an HIAL hub approach to creating regional EHRs. Being able to assess the kind and mode of EPR capacity that is currently operational at participating acute facilities can educate stakeholders about the ways in which the investment of extensive efforts in and funding of eHealth Ontario's strategy will result in meaningful use of the proposed regional HIAL hubs.

HIMSS Analytics' EMRAM scoring system, which inventories and measures acute care facilities' electronic clinical capabilities, is an accurate and useful method for assessing the preparedness of Ontario's acute care service providers for participating in EHR initiatives such as local inter-hospital patient-data-sharing arrangements of the kinds described below and that of eHealth Ontario's planned regional HIAL projects. To be sure, a combination of additional e-Health solution maturity models, including HIMSS Analytics' soon-to-debut Ambulatory EMRAM, is needed in order to assess the e-Health capabilities and utility of the entire continuum of healthcare delivery in Ontario, not just the acute care environment.

As well, reliance on the EMRAM scoring system by individual acute care hospitals enhances these providers' ability to assess how they will benefit from an HIAL in terms of their own capacity for securing patient clinical and safety value

from their health information technology implementations. The higher stages of the EMRAM – involving error checking, closed loop, advanced analytics, etc. – enable the integration of a wider (HIAL driven) set of patient information in the clinical decision-making process that matures the probabilities of establishing meaningful correlations between levels of IT capacity and measurements of clinical and safety outcomes.

HIMSS Analytics' hospital EMRAM score measures levels of acute care EMR/EPR capabilities<sup>2</sup> on a continuum of eight stages from zero to seven, ranging from limited ancillary department systems to a fully paperless electronic environment.<sup>3</sup> For US acute care facilities, most of which operate as stand-alone facilities, it is normally only at Stage 7 that clinical information – such as laboratory, drug and diagnostic imaging results – can be readily shared with other organizations via electronic transactions or exchange of electronic records through participation in what is in the US termed a *health information exchange* (HIE), which often operates on HIAL technology similar to that being employed by eHealth Ontario in constructing regional EHRs. By contrast, in Ontario, and likewise in other Canadian provinces and territories, there is often early development of province-wide patient information initiatives, such as Ontario's efforts to establish the Drug Profile Viewer (DPV) System, Ontario Laboratories Information System (OLIS) and Diagnostic Imaging Repositories (DI-r). These pan-provincial databases provide acute care facilities that have implemented all three ancillary solutions in Stage 1 with access to and sharing of a significant subset of the basic patient information anticipated for inclusion in the HIAL, as early as Stage 2 in the EMRAM model.

Ontario Acute Hospitals and Q1 2011 EMRAM Scores

Ontario's hospital EMRAM scores for Q1 2011 offer important insight into the current extent of electronic clinical solutions implementation in the province's 124 acute care hospitals. For Q1 2011, Ontario's EMRAM scores are shown in Tables 1 and 2 (HIMSS Analytics 2011).

In the wake of the recent update by eHealth Ontario of their strategy for implementing three regional HIAL hubs, it becomes possible to begin clustering HIMSS Analytics EMRAM hospital scores according to the regional HIAL hub to which the province's hospitals will be assigned. Such regionally segmented acute care hospital EMRAM scores are important data points that will be useful in assessing some of the potential and challenges faced by each region in connecting a specific set of hospitals.

For the purpose of providing a preview of the regional segmentation of Ontario's current EMRAM scores in alignment with eHealth Ontario's announced HIAL strategy, it is fruitful to undertake a case study review of the EMRAM scores for a single already well-defined acute hospital grouping, among

TABLE 1.  
Q1 2011 Ontario hospital EMRAM scores

Mean	Minimum	Maximum	Median
2.3291	0.0000	6.0550	2.3430

N = 124 ©2011 HIMSS Analytics

TABLE 2.  
Ontario hospitals and EMRAM stages distribution

Percentage of Ontario acute care hospitals scoring at each of the EMRAM stages	
Stage 7:	0.0000%
Stage 6:	0.0016%
Stage 5:	0.0080%
Stage 4:	0.0725%
Stage 3:	0.4190%
Stage 2:	0.2903%
Stage 1 or below:	0.2086%

several possibilities, in each proposed regional HIAL. For the ConnectingGTA project, whose territory has been defined, the case study actually includes all acute hospitals in LHINs 5, 6, 7, 8 and 9. However, in the case of each of the other two proposed regional HIAL hubs, whose boundaries have yet to be formally announced, only one example of a hospital grouping has been highlighted from among multiple hospital grouping possibilities mentioned by Greg Reed in his presentation at The Canadian Club. For the proposed southwest-area HIAL, hospitals belonging to the SPIRE, or the Southwest Physician Interface Office to Regional EMR, project are reviewed. For the proposed northern- and eastern-area HIAL, hospitals belonging to the North East and North LHINs are reviewed.

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First Case Study: Proposed South West HIAL and the SPIRE Project

In the South West LHIN, work is under way to implement SPIRE (South West LHIN 2011). SPIRE will provide access by the area's community physicians, via their office EMR solutions,

to EPRs at 15 of the area's hospitals. Located in London, the South West LHIN serves approximately 946,000 residents, or 7.2% of Ontario's population.

As of Q1 2011, all hospitals participating in SPIRE registered EMRAM scores of 2.000 or better, with an average score of 2.7933. This translates to all area hospitals having implemented electronic solutions feeding laboratory, pharmacy and radiology patient information into a clinical data repository (CDR) that provides physician access for retrieving and reviewing results at hospitals. The CDR contains some capacity for a controlled medical vocabulary, and a clinical decision-support/rules engine provides rudimentary conflict checking.

Led by London Health Sciences Centre and St. Joseph's Health Care, eight South West LHIN hospitals participating in the SPIRE project scored EMRAMs above 3.0000. This means that nursing/clinical documentation (e.g., vital signs, flow sheets) has been implemented and integrated with the CDR for at least one hospital service. The first level of clinical decision support is implemented to conduct error checking with order entry (i.e., drug/drug, drug/food, drug/lab conflict checking that is normally carried out in the pharmacy). In addition to the fact that the SPIRE hospitals are operating comparable levels of clinical solutions, 11 hospitals have implemented the same Cerner Millennium clinical platform (two others operate the MEDITECH Magic solution), which localizes the significant challenges of establishing common standards and nomenclature.

## **The lessons learned** from the ConnectingGTA project ... will be leveraged to develop scalable and cost-effective additional HIAL hubs in Northern/Eastern and Southwestern Ontario.

Having developed some capacity for sharing patient clinical information between hospitals, the South West LHIN is poised to implement the next stage of data sharing that advances an integrated EHR for local patients. Namely, by means of the SPIRE project, the South West LHIN is moving to provide physicians with office EMRs to access patient reports already being electronically shared within, and to some extent between, hospitals. The degree and kind of implementation of electronic patient data sharing that has been achieved or is under way at hospitals in Southwestern Ontario makes the LHIN's hospitals a realistic model of the prerequisite conditions for connectivity required for effectively contributing to and benefitting from participation in a regional HIAL hub, such as the one that eHealth Ontario has announced it will collaborate on developing and implementing in Southwestern Ontario, following on experience with ConnectingGTA.

## **Second Case Study: ConnectingGTA and LHINs 5, 6, 7, 8 and 9**

On May 11, 2011, eHealth Ontario announced that work has been under way for some time on the first stages of implementing ConnectingGTA, the first of the three HIAL hubs that will create interoperable EHRs covering the entire Ontario population in three regional segments. (ConnectingGTA 2010). The lessons learned from the ConnectingGTA project, the first phase of which is to be completed in 2013, will be leveraged to develop scalable and cost-effective additional HIAL hubs in Northern/Eastern and Southwestern Ontario.

ConnectingGTA is a largely natural patient referral catchment in the Greater Toronto Area that will cover approximately 6.3 million residents and involve approximately 700 health service providers, including 27 acute care facilities. The ConnectingGTA regional hub boundaries match the service areas of five of the province's 14 healthcare administrative LHINs: Central West (#5), Mississauga Halton (#6), Toronto Central (#7), Central East (#8) and Central (#9).

As of Q1 2011, 26 ConnectingGTA acute care hospitals registered an average EMRAM score of 3.2682. EMRAM scores for the Greater Toronto Area include hospitals at the following stages: Stage 6 (2), Stage 5 (1), Stage 4 (9), Stage 3 (7), Stage 2 (5), Stage 1 (1) and Stage 0 (1). Toronto's EMRAM scores are led by St. Michael's Hospital with 6.0550 and North York General Hospital with 6.0320. This means that these two hospitals, after completing electronic clinical requirements for Stages 1 to 3, have implemented some higher-order electronic clinical requirements for enhancing EHRs to realize improved patient clinical and safety outcomes. In particular, St. Michael's Hospital and North York General Hospital have implemented a closed-loop medication environment operating on an electronic medication administration record system (eMAR), including bar coding at the unit dose level and, for the patient, a full clinical decision-support system issuing drug alerts and verification of the Five Rights of Medication Safety: that is, Right Patient, Right Drug, Right Dose, Right Route, Right Time. Just as importantly, physicians in at least one in-patient unit are entering orders and patient notes on a fully operational computerized practitioner order entry (CPOE) solution that produces discrete data in structured templates.

Given the size and complexity of the sprawling Toronto metropolitan population and the multiplicity of the area's 700 health service providers, getting the ConnectingGTA HIAL fully and effectively operational, so as to produce robust and meaningful EHRs that are fully interoperable at all sites, will be an enormous and challenging task. Compounding the obvious logistics of this inaugural regional HIAL undertaking is the fact that the 27 Toronto acute care facilities operate 11 different electronic clinical solutions. There is limited consolation in the fact that 13 hospitals operate on MEDITECH platforms, either



Magic (10) or Client Server (3), given the challenge of securing common standards among facilities with different instances of the same clinical vendor solution.

Even though the SPIRE project in Southwestern Ontario might seem more likely to yield faster and more effective connectivity, it was decided that ConnectingGTA's challenges must be addressed early and head-on, given, among many critical factors, the area's high concentration of the province's most advanced academic medical institutions providing the most advanced clinical treatments available anywhere in Canada. Unless eHealth Ontario can show that nearly 50% of the province's population concentrated in a small and highly urban geographic area of Southern Ontario are benefitting from electronic clinical connectivity providing robust iEHRs, it will be hard to demonstrate that the investment of time, effort and funding will ever produce (employing contemporary e-Health speak) any "meaningful use" for the province as a whole.

### **Third Case Study: Proposed Northern/Eastern HIAL and the North West and North East LHINs**

eHealth Ontario has also proposed developing a regional HIAL hub in Northern and Eastern Ontario that would connect service providers to facilitate and enhance patient data sharing in several LHINs, including the North West and North East LHINs. Over the last decade, the hospitals in the two northern LHINs have achieved a significant degree of clinical solution integration and EHR interoperability. At the same time, there is substantial disparity between levels of clinical solution implementations in the northern hospitals that is rooted in distinctive and permanent regional population and geography factors. Thus, the conditions for and utility of connecting northern and eastern hospitals in a third proposed regional HIAL hub will most likely require a strategy and tactics differing from the approach adopted for developing and implementing an HIAL in Southwestern Ontario.

In the North East LHIN, since 1999, a growing consortium of healthcare corporations, including hospitals, have collaborated on creating an integrated patient record allowing for seamless delivery of healthcare through Northeastern Ontario. Currently, the Northeastern Ontario Network (NEON) has 19 hospital partners in the North East LHIN who share patient data that is hosted under a single data centre (NEON 2010).

As of Q1 2011, 15 of 16 hospitals in the North East LHIN reporting data for the Ontario Hospital Association – HIMSS Analytics Technologies and Applications Study registered an average EMRAM score of 1.7665. Seven hospitals, led by Sudbury Regional Hospital, scored above 3.0000. Two hospitals had scores of 2.0000 or better, while six facilities scored below 1.0000. This means that seven acute facilities scoring above 3.0000 have implemented electronic solutions not only

for the three ancillary services, but also for nursing documentation, thus feeding substantial foundational patient data to a CDR that populates a fairly robust in-patient EPR. By contrast, at seven facilities in the North East LHIN with scores below 1.0000, either the laboratory, pharmacy or radiology information systems are still not automated. The absence of patient data from one or more of the ancillary services at these largely remote facilities limits the benefits of an iEHR for the area's patients who live at significant distances from major referral centres. Also, while the acute care facilities of the North East LHIN have the advantage of sharing the same MEDITECH Client Server clinical solution, hosted on a single server at Sudbury, once again, as in the case of ConnectingGTA, tapping the potential of a common clinical platform involves the challenge of dealing with multiple instances of the same vendor solution.

**... tapping the** potential of a common clinical platform involves the challenge of dealing with multiple instances of the same vendor solution.

The North West LHIN, located in Thunder Bay, serves approximately 231,000 residents, or approximately 1.8% of Ontario's population, with 13 acute care hospitals. The North West LHIN's Physician Office Integration (POI) Program, started in 2007, facilitates patient data transfer of approximately 21,000 patient reports per month from 13 area hospitals to 25 physician clinics for approximately 150,000 area patients (North West LHIN 2011).

As of Q1 2011, 12 out of 13 hospitals in the North West LHIN reporting data for the Ontario Hospital Association – HIMSS Analytics Technologies and Applications – Study registered an average EMRAM score of 2.1422. Four hospitals, led by Thunder Bay Regional Health Sciences Centre and St. Joseph's Care Group – Thunder Bay had scores of 3.0000 or better. Six hospitals scored 2.0000 or better; one hospital scored above 1.0000; and two facilities scored below 1.0000. This means that the four acute hospitals scoring above 3.0000 have implemented electronic solutions not only for the three ancillary services, but also for nursing documentation, thus feeding substantial foundational patient data to a CDR that populates a fairly robust in-patient EHR. The clustering of ten out of 13 facilities with EMRAM scores between 2.0310 and 3.0800 establishes a more level implementation field in the North West LHIN than in the North East LHIN. But, as with the North East LHIN, all acute hospitals in the North West LHIN share the same MEDITECH solution, though the facilities are split evenly between Magic and Client Server versions, a situation that carries challenges of establishing common standards.

## Conclusion

A more comprehensive review of HIMSS Analytics EMRAM data for all Ontario acute care facilities, including hospital groupings not covered in this preliminary review that were mentioned by Greg Reed – which acute hospitals constitute an indispensable components of Ontario's local and regional continuum of care and iEHR – awaits more information about the configuration of the proposed regional HIAL hubs, specifically about the acute care facilities to be included in the two proposed HIAL hubs, other than the well-defined ConnectingGTA. Also, critical issues affecting implementation of any iEHR – including standards, governance, change management, etc. – need to be reviewed in the context of Ontario's distinctive challenges in these regards. Criteria appropriate to Ontario healthcare delivery need to be developed for assessing a “meaningful use” of electronic clinical connectivity that advances eHealth Ontario's strategic goal of implementing a robust pan-provincial EHR that can be accessed anywhere within a regional HIAL hub and eventually anywhere in Ontario. If eHealth Ontario's updated strategy of regional HIAL hubs can be successfully implemented, then, over time, access by all health service providers to electronically enabled robust patient EHRs should advance better clinical and safety outcomes for every Ontario resident.

## Endnotes

1. In 2009 eHealth Ontario announced a strategy that focuses on Diabetes Management, Diagnostic Imaging/Picture Archiving and Communications System (DI/PACS) and Wait Times.
2. It is important to note that in American terms, EMR refers equally to an in-patient hospital or outpatient ambulatory environment. In Canadian terms, EMR refers most often to the ambulatory environment of physician offices, health centres or outpatient clinics; while electronic patient record (EPR) refers – as for provincial RHA, DHAs or Health Regions – to the in-patient hospital environment.
3. For a full description of the eight stages of the EMRAM score for hospitals, see HIMSS Analytics' EMR Adoption Model: <[http://www.himssanalytics.org/hc\\_providers/emr\\_adoption.asp](http://www.himssanalytics.org/hc_providers/emr_adoption.asp)>.

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