

Saskatchewan’s Strategy for Moving e-Health Forward: Prepared to Implement Patient First Review Recommendations

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Introduction

In October 2009, the Saskatchewan Ministry of Health (MOH) released the findings and recommendations of the Saskatchewan Patient First Review, *For Patients’ Sake*. It provides a comprehensive description and analysis of the strengths and weaknesses of the health system in Saskatchewan, the birthplace of Canada’s Medicare system for healthcare delivery and funding. The Review, which consisted of patient experience and administrative components, concluded with the Commissioner’s 16 Recommendations, which were organized under nine major topics (Table 1). In the history of Canadian healthcare reviews, it is considered to be unique “in its focus on the care and caring experience” (Government of Saskatchewan 2009b: ii).

Although less than one of the Review’s 78 pages was devoted to outlining the need for information technology (IT) transformation in healthcare administration, the IT imperatives were prominent for their forcefulness and urgency. The province’s leading healthcare stakeholders were mandated to “invest in and accelerate development of provincial IT capabilities within a provincial framework” (Government of Saskatchewan 2009f: 30). Specifically, the province’s e-Health Council was mandated to develop an e-Health implementation plan by early 2010, less than six months after the Patient

Table 1. Patient First Review – major recommendations

1	For a patient- and family-centred health system
2	For equitable care
3	For coordinated care
4	For convenient, timely care
5	For communicative, informative care
6	For comprehensive care
7	For respectful care
8	For functional e-Health care
9	Improving system performance and leadership

First Review was issued. Other mandates involve funding for the provincial electronic health record (EHR) and Health Region (HR) implementation requirements, as well as determining the preferred service delivery structure for IT at the HR

level. Working on the assumption of the continued existence of the province's current organizational structure of 13 HRs in tandem with the provincial Health Information Systems Centre (HISC), the Review pressed the claim that implementing the Commissioner's Recommendations for patient-centric healthcare in short order depends heavily on enhancing the province's capabilities for electronic healthcare delivery to improve patient safety and clinical outcomes.

The primary mandate of HISC, which operates under the Saskatchewan MOH, has always been to direct implementation of the province's e-Health initiatives.¹ In light of the Patient First Review, HISC is expected to "assume more of a strategist-integrator-steward role for the [province's] health system" (Government of Saskatchewan 2009a: 2). Looking back at the history of HISC initiatives, it seems that the provincial e-Health organization has been preparing for this moment for a decade.

For Saskatchewan, as for other provinces, territories and Canada Health Infoway, the endgame of e-Health is to develop an iEHR.

The extensive portfolio of HISC initiatives currently under way reflects the province's commitment to an ambitious strategy of e-Health efforts geared to "getting the right information, to the right individual, at the right time, in the right place!" (Government of Saskatchewan 2007). The most important initiatives include an interoperable EHR (iEHR)/Laboratory Results Repository, Pharmaceutical Information Program (PIP), Provider Registry System, Diagnostic Imaging Project, Radiology Information System (RIS)/Picture Archiving and Communications System (PACS/Archive), Shared Client Index or Client Registry, Telehealth, Panorama Public Health system and an Electronic Medical Record (EMR) Program for physicians.² The province's foundational e-Health strategy, which HISC is responsible for achieving through the specific initiatives mentioned above, is built on development, implementation and integration of three IT pillars:

- A province-wide integrated EHR
- Regional capabilities for a paperless clinical environment across the full continuum of care, including acute, primary, community and public healthcare
- A physician office EMR environment

For Saskatchewan, as for other provinces, territories and Canada Health Infoway, the endgame of e-Health is to develop an iEHR. The function of Saskatchewan's EHR is to "give

authorized healthcare providers rapid access to patients' pertinent, up-to-date health information to support clinical decision-making and case management. A shared patient-centric health record will provide a longitudinal view of an individual's key health history and care" (Government of Saskatchewan 2007).

If Saskatchewan's EHR strategy is to be viable and useful, then the province must first implement the means enabling the collection, entry and transmission of patient care data to populate the EHR for every Saskatchewan resident. For this reason, HISC has prioritized implementing the second IT pillar of electronic clinical capabilities in collaboration with the province's 13 HRs, and the third IT pillar of the physician office EMR environment in collaboration with the Saskatchewan Medical Association (SMA).

HISC Strategy for Regional Clinical IT Enhancements

Sometimes being behind the national e-Health implementation curve can produce long-term advantages for success. In more populous and well-funded provinces, the demand for early adoption of electronic clinical applications led HRs in the same province to implement different vendor solutions, with the consequent difficulties of achieving province-wide integration of disparate electronic clinical environments. In contrast, little advanced clinical IT implementation has occurred throughout Saskatchewan's HRs. In developing its EHR, the province is able to avoid the major challenges involved in attempting integration of diverse clinical vendor environments with extensive interfaces or replacing multiple vendor applications with a costly single province-wide solution.

Since 2001, Saskatchewan has had an agreement with the 13 HRs that the province would fund and, in most cases, host remotely a single province-wide vendor solution for all ancillary and clinical application suites across the continuum of care. These application suites are essential to feeding a robust EHR that will drive improved patient safety and care outcomes.³

Table 2. HISC-hosted provincial applications – integrated clinical system

- EMR/EPR Acute Care Environment: Eclipsys' Sunrise Clinical Manager
- Pharmacy Management System: Interactive Business Systems' WinPharm
- Client Patient Index/Registration: Momentum Healthcare's Wincis
- Laboratory Information System: Soft Computer Corp.
- Shared Client Index/Electronic Master Person Index: Initiate Identity Hub
- PACS: Philips Healthcare's Stentor, Inc./isite
- Radiology Information System: Cerner's Quadris
- Home Care Administration System: Procura's InterRAI MDS-HC

Currently, the province has adopted standardized vendor solutions for an Integrated Clinical System encompassing acute care, clinical, ambulatory and home-health environments (see Table 2). At most sites, especially outside Regina and Saskatoon, most new installations of standardized vendor solutions are the first instances of an electronic application going live and operational. In general, only the Regina and Saskatoon HRs will have to replace some previously installed vendor solutions in order to adopt the provincial standard solutions. Although the implementation schedule is stretched out over a decade, with many implementation dates as yet undefined due to limited fiscal and personnel resources, the strategy is in place and the long-term commitment is secure.

Saskatchewan has adopted a province-wide strategy of maximizing equal access for all residents to high-quality healthcare by focusing investments in acute care clinical systems at its largest and more complex care facilities.

The complete suite of the Integrated Clinical System will be implemented in only nine HRs. These are home to the largest 18 general or full-service hospitals out of the province's 60 acute care facilities. Even in these HRs and at these hospitals, components will be implemented selectively. Saskatchewan has adopted a province-wide strategy of maximizing equal access for all residents to high-quality healthcare by focusing investments in acute care clinical systems at its largest and more complex care facilities. At the same time, there will be broad implementation of systems across the province to support delivery of community-based services such as home care, primary healthcare and public health.

The clinical vendor solution for Saskatchewan's Integrated Clinical System is being provided by Eclipsys and its Sunrise Clinical Manager (SCM) product. Saskatchewan first acquired a license to the core functionality of SCM in 2001, followed over the last three years by license agreements for content modules in the following clinical areas: Emergency Department Manager, Order Communication, Clinical Documentation (Physician and Nursing), Exit Care and Clinician Portal.

Currently, implementations of SCM's core functionality have been completed or are under way at eight facilities in four HRs: Five Hills Health Region (Moose Jaw Union Hospital), Regina Qu'Appelle Health Region (Regina General and then Pasqua Hospitals), Saskatoon Health Region (Saskatoon City Hospital, St. Paul's Hospital and Royal University Hospital) and Sunrise Health Region (St. Peter's Hospital and Yorkton Regional Health Centre). Eclipsys core installations are

contracted but not yet installed for an additional ten facilities in five HRs (Cypress, Kelsey Trail, Prairie North, Prince Albert Parkland and Sun Country).

Saskatchewan's strategy and timeline for going live and operating with the full suite of clinical applications in the Integrated Clinical System is best reflected in the efforts of the Regina Qu'Appelle Health Region and Saskatoon Health Region. These are the province's two leading HRs and encompass the two largest cities; they are working toward securing a completely paperless environment at their major acute care facilities.

Saskatchewan e-Health Case Study – Regina Qu'Appelle Health Region

At first glance, Regina Qu'Appelle Health Region (RQHR) might seem to be behind the curve on e-Health readiness. The province's capital HR has not yet met the minimal requirements for an electronic clinical environment in which all major ancillary systems are installed for Pharmacy, Laboratory and Radiology. However, the current slate of live and operational clinical systems in RQHR does not reflect the breadth of e-Health initiatives and timelines under way for acute care services. Regina has a host of "installations in process" at the two urban acute care facilities, Regina General Hospital (RGH) and Pasqua Hospital. These include the Radiology information system, a clinical decision-support system (CDSS), computerized practitioner order entry (CPOE), nursing documentation and possibly physician documentation. Plans to also implement some or all of these applications at the Health Region's two main rural acute care facilities (Moosomin and All Nations Healing Hospital – Fort Qu'Appelle) are scheduled to begin in late 2010.⁴

An important key to understanding RQHR's approach to working towards an electronic clinical environment is its agreement with the provincial decision to implement modules of SCM, the Eclipsys clinical solution for a comprehensive acute care eHealth environment. For in-patient care, the province and HRs have adopted a single-vendor solution, acquired the license for most modules of the Eclipsys product, developed a strategy for implementing a full suite of clinical applications at the province's full-service facilities and scheduled sequenced implementations of specific modules as finances, personnel and time permit. For the RQHR, RGH has been designated as the hospital scheduled in the near future for implementation of CPOE coupled with nursing documentation, along with enhanced CDSS capabilities related to evidence-based medicine protocols.

Installation of RQHR's first Radiology information system is under way with implementation of the Philips Healthcare Ximis Inc./Xiris product at RGH, as well as the region's eight other acute care facilities. By their target date of September 2010 for reaching EMRAM Stage 1, RQHR hopes to have secured funding to quickly bring CDSS live and operational

at RGH for rudimentary conflict checking. With the Clinical Data Repository (CDR) of Eclipsys's Sunrise Clinical Manager being fed data from the three ancillary systems, and with RQHR physicians able to retrieve and view results on Eclipsys' Clinical Viewer, RQHR would reach Stage 2 during fiscal year 2010–2011.

Unusual in a typical e-Health implementation sequence is RQHR's next step to enhance its eHealth clinical capabilities at the 418-bed RGH. Saskatchewan's capital HR will bypass implementation of order entry (OE) for Stage 3, choosing instead to bring Nursing Documentation (Stage 3) live and operational in tandem with CPOE (Stage 4) – including documentation and use of CDSS to conduct error checking – possibly to be followed soon thereafter by Physician Documentation.

Instead of applying the “big bang” approach to simultaneously implementing Nursing Documentation and CPOE across all service units in a facility, RQHR has opted to implement them one service unit at a time. Initial implementation of the appropriate applications and technology will occur in the maternity service unit at RGH; the implementation is being coordinated with a bricks-and-mortar renovation under way at the facility's Rawlco Centre for Mother Baby Care, scheduled for completion in fall 2011. Along with CPOE and Nursing Documentation, monitoring devices are being connected electronically to clinical systems in the unit.

While RQHR is currently not looking beyond the clinical requirements associated with a fully functioning CPOE environment, the region is considering all applications and technologies germane to a fully electronic environment for the Mother Baby Care unit. This could include implementation of an electronic medication administration record (Stage 5). As well, existing wireless connectivity in the urban acute care facilities, which allows practitioners to order and document at point of care, raises the possibility of implementing use of hand-held devices, including C-Motion Tablets that were originally purchased for use in the Emergency Department.

A major consideration favouring RQHR's piecemeal approach to clinical implementation by service unit, in addition to restricted finances, is the change management challenge RQHR faces in assisting physicians to use CPOE for all facets of patient encounters. Having decided not to mandate use of CPOE for its physicians (as Winnipeg Regional Health Authority is doing in Manitoba at St. Boniface Hospital), RQHR hopes that the long-standing collaborative work habits of the Mother Baby Care unit's 20 physicians will facilitate an easy and speedy transition to substituting CPOE for paper notes and transactions at point of care. Odds favour the success of RQHR's strategy, given that the region's two Senior Medical Officers support the Clinical Information System (CIS) Plan and the CPOE project at the Rawlco Centre. Currently, no HR in Saskatchewan has implemented CPOE.

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Saskatchewan e-Health Case Study – Saskatoon Health Region

Saskatoon Health Region (SHR) is also poised for significant e-Health implementation advances over the next two years. As with RQHR, the current state of live and operational clinical systems at SHR's acute care facilities does not reflect the full story of the region's strategic planning for, and near-term scheduled implementation of, the Eclipsys SCM.

Currently, SHR has the three ancillary applications installed at all acute care sites.⁵ The solution for the Laboratory information system is provided by SCC Soft Computer's SoftLab application. The Pharmacy management system is GE Healthcare's Centricity product. Finally, the Radiology information system is Cerner's Quadris solution. The provincially-hosted single repository PACS – Philips Healthcare's Stentor, Inc./iSite product – delivers nine of ten PACS modules, excluding Orthopedics. SHR's EHR environment, which will be primarily Eclipsys based, is a project that stands before the province's largest HR. A legacy order management system for Laboratory and Diagnostic Imaging, though not for Pharmacy, is currently in operation only at Royal University Hospital. Beyond this, SHR has not yet gone live with a CDR, CDSS, CPOE or a vendor solution for OE, Nursing Documentation, Physician Documentation or eMAR.

However, major components of SHR's EHR environment are due to become operational starting in June 2010, when the first phase of the SCM implementation will be completed for the Emergency Departments (EDs) at three SHR urban sites (St. Paul's Hospital of Saskatoon, Saskatoon City Hospital and Royal University Hospital). The initial clinical implementation of Eclipsys in the ED is in line with a similar ED undertaking by RQHR and the provincial mandate to improve patient flow through the province's over-worked EDs. Eclipsys functionality being installed includes the foundational clinical database and data repository; interfaces to existing systems for Admissions, Discharges and Transfers; Laboratory, Diagnostic Imaging and Transcription; and context mapping to the provincially hosted PACS and PIP applications. In addition to the ability to view results online, specific Eclipsys technology is being implemented to support the ED, electronic triage note and a patient status/tracking board.

SHR's journey to implementation of CPOE has recently begun under the leadership of the region's chief medical information officer. SHR is currently exploring options for the purchase of packaged order sets to be implemented across all acute care sites inside and outside Saskatoon. Unlike the challenge faced by other jurisdictions, the delay in introducing CPOE is not due to physician reluctance. A key group of physician leaders understand and embrace the concept that electronic order entry at the point of care improves patient safety and quality of care.

As for CDSS, the Eclipsys CPOE product comes with the ability to fire alerts and with embedded links to references and protocols. SHR leadership, in concert with the region's physicians, has not determined what direction to take with regard to evidence-based content behind CPOE/CDSS. Given the various vendor solutions, SHR intends to evaluate the costs and benefits of purchasing an off-the-shelf CDSS product or building it from scratch. Likewise, the timeline for implementation of Nursing Documentation will be determined in conjunction with a collaborative decision on CPOE, as it is needed to support implementation of physician order entry.

More important to SHR's e-Health progress than the schedule of near-term implementations is the strategic work of the region's e-Health Strategy Council. Charting the future direction of SHR's EHR initiatives, which will be determined by the Council, will require striking a balance between aligning with the province's mandated strategy for meeting the Commissioner's Patient First Review Recommendations and also meeting region-specific strategic goals for improving patient safety and quality of care.

HIMSS Analytics' EMRAM Scores for Hospitals and Ambulatory Settings

The state of Canada's progress at implementing a comprehensive e-Health strategy for acute care facilities in ten provinces and three territories is documented in the HIMSS Analytics Canada EMR Adoption ModelSM 2009 Q4 scores, which are based on the 2009 Canada Information and Communications Technology (ICT) Study for acute care hospitals.

Since 2007, HIMSS Analytics has conducted an annual survey of ICT systems at acute care hospitals in Canada. In late 2009, an annual survey of ICT systems at Canadian ambula-

tory health centres and outpatient clinics was initiated. The annual surveys target detailed information about an acute care or ambulatory facility's EMR environment. In United States terms, EMR refers equally to an in-patient hospital or outpatient ambulatory environment. In Canadian terms, EMR refers most often, as in Saskatchewan, to the ambulatory environment of physician offices, health centres or outpatient clinics; whereas electronic patient record (EPR) refers, as in Saskatchewan, to the in-patient hospital environment.

The outcomes of the Annual ICT Survey are measured by the HIMSS Analytics' EMR Adoption ModelSM (EMRAM) score for acute care hospitals and the future Ambulatory EMR Adoption ModelSM score. Currently, HIMSS Analytics publishes quarterly EMRAM scores for Canadian hospitals, based on the most recent data collection for the acute care environment across the ten provinces and three territories. An Ambulatory EMRAM score will be based on the Canadian data collection for physician offices, health centres and outpatient clinics that has recently been inaugurated.

The acute care EMRAM Score measures levels of acute care EMR/EPR capabilities ranging from limited ancillary department systems to a fully electronic environment on a continuum of eight stages from zero to seven (Table 3). Stage 7 allows clinical information to be readily shared via electronic transactions or exchange of electronic records within a health information exchange, including other healthcare organizations, government entities and patients in Canada or the US.⁶

Table 3. Canada EMR Adoption ModelSM

Stage	Cumulative capabilities	2009 Q4
Stage 7	Complete EMR; CCD transactions to share data; data warehousing; data continuity with ED, Ambulatory, OP	0.0%
Stage 6	Physician documentation (structured templates), full CDSS (variance and compliance), full R-PACS	0.2%
Stage 5	Closed loop medication administration	0.0%
Stage 4	CPOE, Clinical Decision Support (clinical protocols)	1.1%
Stage 3	Nursing/clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology	28.8%
Stage 2	CDR, Controlled Medical Vocabulary, CDS, may have document imaging; HIE capable	22.7%
Stage 1	Ancillaries – Lab, Rad, Pharmacy – all installed	11.7%
Stage 0	All three ancillaries not installed	35.6%

Data from HIMSS AnalyticsTM Database © 2010.

N=660

The Ambulatory EMRAM Score will measure levels of an EMR environment at physician offices, health centres or out-patient clinics ranging from an entirely paper environment to a fully electronic environment on a continuum of six stages from zero to five.⁷ The major indicator of Stage 5 is participation by a physician office in an interconnected regional community of physicians, hospitals, lab companies, the pharmaceutical industry, imaging companies and patients, allowing easy sharing and exchange of information and collaboration for improved patient care and development of evidence-based medicine protocols (Table 4).

Table 4. Ambulatory EMRAM Score – Stage 5 indicators

- Proactive and automated outreach to patients for preventive care and chronic disease management
- Proactive searching for patients with particular conditions and medications as new clinical evidence (including recalls) develops
- Interconnected regional community of physicians and healthcare organizations to easily share and exchange information, and collaborate, for improved patient care
- Ability to mine data for clinical research

The methodology and algorithms of the hospital EMRAM Score are currently used to automatically score more than 5,000 hospitals in the US database and more than 650 Canadian acute care facilities participating in the 2009 Canada ICT Study. Of the 76 benchmarking reports that HIMSS Analytics makes available to participating regional healthcare organizations and their hospitals, 33 compare their EMRAM scores to factors such as IS Department Operating Budget, Nurse FTEs, IS Department FTEs and other hospitals' EMRAM scores.

Measuring Saskatchewan Acute Care Clinical Capabilities: the HIMSS Analytics EMRAM Methodology

EMRAM results from HIMSS Analytics' ICT 2009 Complete Study of Saskatchewan's 13 HRs and their 60 acute care facilities reflect only the current live and operational state of the province's existing e-Health clinical capability. The province's EMRAM scores do not measure the extent to which installations of advanced clinical systems for the acute care environment are already in process, or contracted but not yet installed in various HRs, with projected dates for going live and operational in the next 12 to 24 months. Nor do the province's EMRAM scores reflect the extent to which Saskatchewan is substantially prepared to implement a master plan for a tiered geographical approach to clinical e-Health readiness, as soon as fiscal and personnel resources permit.

Canadian regional organizations and their hospitals, which complete the annual HIMSS Analytics' ICT Study, have easy web-based access to combined 76 benchmarking reports, including 47 at the hospital level and 29 at the regional level. Each of these reports allows them to compare their organization against ten de-identified peers selected on the basis of 33 hospital or 13 regional factors including bed size, adjusted patient days, facility type, total operating expense, system installed, location, etc. Benchmarking comparisons include information system department operating statistics such as full-time equivalents, operating budget and salary expense, in addition to EMRAM score comparisons.

For Saskatchewan's largest 18 general or full-service hospitals, the province's acute care environment EMRAM scores for 2009 Q4 ranged, on a scale of 0 to 7, between 2.0920 and 2.0750 on the high end for Sunrise HR's Yorkton Hospital and St. Peter's Hospital, respectively; and 0.0720 to 0.0050 on the low end for eight of 18 general hospitals.⁸ For 2009 Q4, the mean EMRAM score for Saskatchewan's 18 general hospitals was 0.7521, compared with a pan-Canada mean EMRAM score for all hospitals of 1.5609.⁹

Many of Saskatchewan's hospitals, including eight of 18 general hospitals, have yet to reach Stage 1 because one or another of the three ancillary applications for Laboratory, Pharmacy and Diagnostic Imaging (Radiology) is not yet live and operational. Still, for five of the hospitals a RIS is currently being installed or has been contracted but not yet installed. As noted above, by June 2010 RQHR will have a RIS live and operational at Regina General Hospital and Pasqua Hospital, two of Saskatchewan's largest general hospitals. Likewise, Kelsey Trails HR has a RIS contracted but not yet installed at Melfort Hospital and Nipawin Hospital, and Five Hills HR has a RIS contracted but not yet installed at Moose Jaw Union Hospital; these are three of the province's general acute care facilities.

The Saskatchewan regions with comparable high scores for all acute care facilities are Sunrise HR and SHR. In Sunrise HR, Yorkton Regional Health Centre, St. Peter's Hospital and St. Anthony's Hospital have moved into Stage 2, with EMRAM scores above 2.0000. In each case, all three ancillaries are live and operational, as well as the Eclipsys CDR, document imaging and some clinical documentation. Currently, scores for all four hospitals in SHR are between Stage 1 and 2, with all three ancillaries live and operational and other implementations. With the implementation by June 2010 of the core components of Eclipsys' Sunrise Clinical Manager at all four facilities, including the clinical data repository, SHR will move into Stage 2.

It is important to note that the EMRAM scores for Saskatchewan's hospitals should be read in light of the province's

distinctive strategy for implementing a full continuum of care *For Patients' Sake*. In order to provide Saskatchewan's slightly more than one million residents, who are fairly well distributed over an extensive geography, with the highest patient safety and care benefits of a comprehensive electronic clinical environment, the province will most likely focus on outfitting the handful of tertiary care hospitals in the southern sector around Regina and the central sector around Saskatoon to develop an advanced electronic clinical environment (Stage 7) that can best serve the needs of all residents in all three southern, central and northern sectors.

From the perspective of the Patient First Review recommendations mentioned above, the investment of resources, including academic medicine personnel, in primary healthcare services is as important for advancing the province's healthcare strategy as the development of advanced clinical capability for inpatient tertiary care. Among the Commissioner's Recommendations, for example, were suggestions for creating urban urgent care centres to alleviate the inappropriate usage of emergency rooms; outpatient or self-help programs for promoting good health and preventing illness and injury; and a chronic disease management strategy that connects patients with multidisciplinary healthcare teams.

In order to successfully implement these Patient First Review Recommendations for the non-acute care, outpatient environment, Saskatchewan needs to educate and retain sufficient physicians. It needs to assist physicians in acquiring the electronic clinical resources of a physician office EMR system that will enable them to provide patient care in accordance with the standards of evidence-based medicine. Finally, it needs to develop sound methodologies of measuring best practices for the physician office environment.

Physician Retention – Necessary for Implementing the Patient First Review

More than other provinces, Saskatchewan has long been challenged to recruit and retain sufficient physicians, as well as nurses, without whom it is impossible to provide timely patient access to health services, especially primary care. According to the MOH, the province ranks ninth out of 13 provinces and territories in the number of physicians as a percentage of population. Also, Saskatchewan is home to fewer family physicians and far fewer specialists than the national average, and retains fewer of its medical graduates. In common with other provinces, physician shortage is most acute in the rural areas, especially in northern Saskatchewan, home to the bulk of the province's First Nations and Métis populations (Government of Saskatchewan 2009c).

In spring 2009, the MOH announced a multi-faceted and prioritized strategy of physician recruitment, committed \$3.5 million to the effort and initiated a process of immediate

implementation. Four primary avenues for increasing physician numbers have been targeted.

- Persuade expatriate physicians trained in the province to return and practice
- Retain current students and residents at the University of Saskatchewan's (U. of S.) College of Medicine
- Enhance medical training, and improve programs addressing professional and personal lifestyle issues, to attract more physicians to urban and rural settings outside Saskatoon
- Establish a Saskatchewan-tailored program to attract foreign-trained physicians (Government of Saskatchewan 2009c)

Immediate measures taken to realize these objectives include adding 24 additional seats at the U. of S. College of Medicine and 24 new residency positions for 2009–2010 in order to meet the previously established goal of 100 undergraduate seats and 120 residency positions by 2011. As well, a pan-Saskatchewan team of healthcare representatives led by a member of the province's health workers recruitment agency have recruited in Ireland, where approximately 450 Canadian students study medicine.¹⁰

To address the long-term challenge in a permanent way, a physician recruitment agency is being established in spring 2010. Nine major parties with a stake in resolving the province's physician shortage will form the new provincial agency's board (Government of Saskatchewan 2009d). The agency will be responsible for meeting the province's major physician retention targets by 2013. The targets are:

- Reduce the annual turnover of physicians to less than 10%
- Increase the number of U. of S. medical students and residents training outside Saskatoon by 25%
- Increase the percentage of U. of S. medical graduates establishing practices in the province by 10%
- Increase the percentage of Canadian-trained physicians working in the province by 10%

More advanced than the physician recruitment process is the partnership of the Saskatchewan Union of Nurses and the Government of Saskatchewan (SUN/Government Partnership). The first of its kind in Canada, it was established in 2008 to increase nursing numbers and excellence of care. By October 2009, the province had already achieved 70%, or 560, of the target number of 800 new registered nurses and registered psychiatric nurses; the target was established in late 2007. As well, nursing vacancies had declined from 518 in October 2008 to 403 as of June 30, 2009, salaries were now competitive with those of other provinces, and hiring targets had been established for every HR. The MOH has already issued substantial reimbursements to the HRs for progress made in meeting their

nursing hire targets. Among the major outstanding challenges are continuing vacancies in some understaffed critical nursing units and the constant turnover of nurses due to retirement, the combination of which burdens newly hired and novice nurses (Government of Saskatchewan 2009e).

Physicians and EMRs – Important for Achieving Patient First Review

In concert with much of the rest of Canada, Saskatchewan has prioritized physician adoption of the physician office environment EMR as a *sine qua non* for securing advanced healthcare that improves patient safety and quality outcomes. As elsewhere in Canada, educating and persuading physicians to use an EMR in their patient clinical workflow is the major challenge. Currently, many physicians limit use of IT in their patient practice to a practice management system for patient billing and scheduling. In US healthcare, with its pervasive medical malpractice environment, the legal protections and patient safety benefits of using an EMR to document all patient encounters is a significant pressure and incentive for physician EMR adoption. Without the pressures of a litigious environment, persuading Canadian physicians to employ an EMR in their clinical workflow is often more effective when implementation proceeds incrementally.

Saskatchewan offers physicians on going change management support and financial incentives to adopt an EMR for documenting all patient encounters – both pre-assessment and outcomes – electronically rather than by paper. Saskatchewan's strategy is to enhance the value of EMR for physicians by integrating their EMR with the province's EHR services such as the delivery of lab results, chronic disease management and ePrescribing through a staged approach. This integration will occur once enough EMR sites are up and running, and the vendors of these systems are able to implement the necessary standards-based interfaces in accordance with annual integration priorities established by the province in conjunction with physicians.

The Saskatchewan EMR Program, which went live in September 2009, is a partnership between the Saskatchewan Medical Association (SMA) and HISC.¹¹ The SMA organized and conducts the EMR Program for approximately 1,300 of the province's nearly 1,700 fee-for-service physicians,¹² while HISC oversees the program for nearly 300 salaried primary healthcare (PHC) physicians and other health professionals operating in multi disciplinary PHC teams. The SMA opted to offer participating physicians the choice of hosting their EMR system locally in their office (client server) or having it hosted centrally via broadband by the application service provider (ASP). For the province's PHC teams, their EMR will be centrally hosted, given the tighter integration required with other health region programs. SMA reasoned that, because

most Saskatchewan practitioners have historically practised in isolated environments, either alone or in pairs, most physicians are accustomed to relying on the resources in their office, both paper and electronic, rather than on Internet technology and communications with remote service providers. As a precaution against the risks of using client server for the EMR, the SMA recommends that physicians back up all patient data nightly and store backups off-site.

In September 2009, the SMA concluded the physician office EMR vendor selection process with the announcement that three of four vendor offering slots had successfully completed initial (functional) conformance testing. From among the 14 original vendor applications and seven finalists, SMA selected four EMR solutions: Optimed Software, Med Access, Practice Solutions® EMR and Nightingale Informatix. These Canadian vendors, familiar with Canadian physician clinical work flow issues, had previously been selected as well for physician office EMR projects in other provinces, including British Columbia, Ontario, Alberta and Nova Scotia. Approximately 250 physicians, mainly members of large clinics, were early adopters of the EMR prior to the announcement last fall of the vendor choices. Although nearly all had selected the Optimed solution (and 80% opted for client server access), the SMA expects each of the four vendor solutions will eventually be selected by physicians in substantial numbers.

By contrast with the SMA process, HISC selected a single vendor solution, Med Access, for the approximately 300 PHC physicians who practise at PHC sites, which are administered by the HRs. Since November 2009, the Med Access solution has been implemented at four PHC sites (see Table 5), three of which employ academic family medicine physicians. The next implementations of Med Access EMR at a PHC site will take place this year in Prairie North Health Region, where more than 55% of the region's residents rely on a PHC provider.

Since the implementation schedule of the EMR Program for all PHC physicians is regulated by HISC in collaboration with the health regions, rather than voluntarily opted for by the SMA's fee-for-service physicians, measurable outcomes on the return on investment (ROI) will be more readily available.

Conclusion: Measuring the ROI for Patient First Review Objectives

There are important advantages to Canada's provincial approach to healthcare delivery. Given the wide diversity of population size, urban concentration and rural sprawl among the provinces and territories, one size for healthcare delivery does not fit all provincial needs. At first glance, Manitoba and Saskatchewan, neighbours with apparently similar population and geographic profiles, would seem suited to adopt the same approach to healthcare delivery. But the fact that Manitoba has one huge urban centre with 60% of its population, while Saskatchewan

Table 5. PHC physician office EMR implementations

- A remote PHC facility of Heartland Regional Health Authority in lower western Saskatchewan with one physician and two nurse practitioners employing Med Access
- West Winds Primary Health Centre, an urban interdisciplinary academic medical clinic with a total 200 allied professionals from the University of Saskatchewan's College of Medicine; 42 physicians and residents are employing Med Access;
- La Ronge Health Centre, an academic family centre in the northeastern Mamawetan Churchill River Health Region with nine physicians on Med Access
- The Regina Academic Family Medicine Unit, an urban, multidisciplinary and cooperative academic family medicine site located in Regina Qu'Appelle Health Region with 11 physicians on Med Access

has two medium-sized urban centres with less than combined 40% of the provincial population, has led to a more centralized approach to healthcare delivery for Manitoba and a more decentralized approach for Saskatchewan. Promoting the physician office EMR environment is important to both provincial healthcare strategies, but with differing orientations. Manitoba eHealth prioritized achieving early adoption of CPOE at its leading urban hospital, even before its physician office EMR project got off the ground. Saskatchewan has prioritized securing adoption of a physician office EMR environment for its academic family medicine clinics, even before targeting hospital-based CPOE implementations.

In this light, it will be especially important for Saskatchewan, early on, to develop methodologies for scoring physician progress at maximizing the potential of the EMR environment for improving patient outcomes and safety. More than the HIMSS Analytics EMRAM for acute care hospitals, Saskatchewan will find the HIMSS Analytics Ambulatory EMRAM, which measures and evaluates levels of an EMR environment at physician offices, health centres or outpatient clinics, to be useful for moving the province's *For Patients' Sake* strategy forward.

As noted above, the six stages of the Ambulatory EMRAM range from an entirely paper environment to a fully electronic environment on a continuum from zero to five. The indicators confirming that a physician office EMR is fully functioning at Stage 5 include the following:

- Proactive and automated outreach to patients for preventive care and chronic disease management
- Proactive searching for patients with particular conditions and medications as new clinical evidence (including recalls) develops
- Interconnected regional community of physicians and

- healthcare organizations to easily share and exchange information, and collaborate, for improved patient care
- Ability to mine data for clinical research

Clearly, all four indicators of Stage 5 of the ambulatory model address the Commissioner's Patient First Review Recommendations. Nonetheless, in Saskatchewan, where physicians tend to work independently in a solo or a two to three physician environment, and at geographically great distances from other physicians, the most important patient benefit of educating physicians to embrace the EMR environment for their clinical workflow is their capacity to participate in an electronically enabled collaborative healthcare environment. EMR-enabled physicians have the opportunity to contribute to an interconnected regional community of physicians, hospitals, lab companies, pharmaceutical industry, imaging companies and patients, allowing easy sharing and exchange of information and collaboration for improved patient care and development of evidence-based medicine protocols.

In this light, Saskatchewan's focus on early implementation of the Med Access EMR system at all the province's academic family medicine PHC sites promises the possibility of early measurement of an EMR system's utility in enabling all healthcare stakeholders to meet the Recommendations laid out in the Patient First Review Commissioner's Report. In particular, early measurement of EMR implementation at all PHC sites should provide useful lessons and best practices for more effective utilization of EMRs by all 2,000 Saskatchewan physicians to assist them in meeting the most important of the Commissioner's Recommendations. In the spirit of the name of the Report, *For Patients' Sake*, the first recommendation exhorts "... the health system (to) make patient- and family-centred care the foundation and principal aim of the Saskatchewan health system, through a broad policy framework to be adopted system-wide" (Government of Saskatchewan 2009b: 8). **EH**

Endnotes

1. HISC is also responsible for delivering non-e-Health IT services to governmental healthcare organizations.
2. For more information on each of these projects, go to <<http://www.health.gov.sk.ca/her-strategy>>.
3. Information and data on HISC IT strategy is based on the HIMSS Analytics 2009 ICT Study and follow-up communication.
4. Information and data on Regina Qu'Appelle Health Region's clinical software applications is based on the HIMSS Analytics 2009 ICT Study and follow-up communication.
5. Information and data on Saskatoon Health Region's clinical software applications is based on the HIMSS Analytics 2009 ICT Study and follow-up communication.
6. 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>.

7. For a full description of the six stages of the future Ambulatory EMRAM score, see HIMSS Analytics' EMR Adoption Model, <http://www.himssanalytics.org/hc_providers/emr_adoption.asp>.
8. Saskatchewan EMRAM scores are published with permission of HISC.
9. For a full account of results for the Canada EMR Adoption Model, 2009 Q4, go to <http://www.himssanalytics.org/hc_providers/emr_adoption.asp>.
10. For more information, go to <www.HealthCareersinSask.ca>.
11. Information and data on the Saskatchewan EMR Program is based on communications with the Saskatchewan Medical Association and HISC.
12. Some specialists, such as anesthesiologists and radiologists, were not eligible for the EMR offering.

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