2013 HIMSS ANALYTICS REPORT: Streamlining Workflows and Access to Patient Data in Canadian Hospitals

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Executive Summary

As hospitals and the broader healthcare industry in Canada transitions from paper-based to computerized operations, the electronic health record (EHR) continues to be the focal point of these efforts. For Canadian healthcare organizations to achieve their goals of delivering higher quality care at lower costs, they must facilitate increased EHR adoption by their doctors, nurses and other clinicians. As is always the case when technology supplants traditional workflows, using EHRs means that clinicians need to change certain aspects of how they do their jobs. In particular, it changes how they access patient information, and how that information is used in clinical workflows. These changes can create resistance among the clinical staff that impedes EHR adoption. There are, however, technologies such as single sign-on (SSO) that can minimize or eliminate barriers to EHR adoption. This paper looks at ‘real-world’ examples of how leading Canadian hospitals are approaching the challenge of driving EHR adoption to streamline their clinical workflows and ease care providers’ access to patient information.

Background and Purpose

Like much of the rest of the world, the adoption and utilization of information technology (IT) in the Canadian healthcare system is in a state of flux. Indeed, as far back as 2004, Canadian hospital executives cited IT and electronic medical records (EMRs) as their top priorities for a one-time capital investment to improve quality of care1.

Adoption of EMRs in Canada has been slow but steady over the past four years. At the end of 2009, one-third of the 660 Canadian hospitals tracked by HIMSS Analytics were identified as Stage 0 facilities on the HIMSS Analytics EMR Adoption Model (EMRAM)SM, suggesting that these organizations still had not yet implemented a full complement of laboratory, radiology and pharmacy systems2. By the first quarter of 2013, only 21 percent of Canadian hospitals had this designation. Furthermore, four Canadian hospitals have been awarded a Stage 6 designation, meaning that they have established clear goals for improving safety, minimizing errors, and prioritizing IT implementations3.

There may be a multiplicity of reasons to explain the difference between the Canadian and U.S. hospital EMR adoption experience. But the simple fact remains that any data housed electronically is less valuable if clinicians face challenges in accessing the data. In order to maximize access to this data, organizations must address workflow, including ensuring that IT is not adding to the time that clinicians need to access patient information4.

1 Canadian Hospitals and the Health Care System: Views of Hospital Executives; Findings from the Commonwealth Fund International Health Policy Survey.
2 HIMSS Analytics EMRAM ModelSM http://www.himssanalytics.org/emram/index.aspx
3 HIMSS Analytics EMRAM ModelSM http://www.himssanalytics.org/emram/index.aspx
Single sign-on (SSO) is one solution that can facilitate streamline access to mission critical data clinicians need to access. SSO can be defined as a specialized form of software authentication that enables a user to authenticate once and gain access to the resources of multiple software systems\(^5\).

Use of this solution has grown at Canadian hospitals over the past five years. In 2008, 10 percent of Canadian hospitals reported using SSO technology. Currently, 18 percent of Canadian hospitals reported using SSO\(^6\). This percent could double in the future, as another 13 percent have either signed a contract to use this solution or are presently installing SSO and five percent plan to purchase this solution in the near future.

This white paper addresses workflow issues at Canadian hospitals, including the ways in which clinicians are currently accessing data, barriers and challenges to current workflow, future plans to change the way in which clinicians access data and the benefits of streamlined data access.

**Study Population and Approach**

In order to obtain this information, HIMSS Analytics conducted one-on-one interviews with 12 information technology (IT) executives across Canada. Interviews were completed in nine of Canada’s provinces and territories. Participant titles included Chief Information Officer, Vice President of Information Technology, Chief Technology Officer, Executive Director, Chief Medical information Officer, Director of Information Management and Director of Solutions Delivery. Conversations lasted between 30 and 45 minutes.

The participants in this study represent a variety of types of healthcare organizations, including a single hospital system with 130 beds, and several multi-hospital regional systems ranging from 100 beds to more than 2,000 beds. A number of the participants had provincial-level responsibility.

In general, most of the participants reported using a single software solution for as much of their EHR as possible. For some of the participants, this means rolling out a single solution across an entire province or region. For others, that means standardizing as much of a single hospital’s EHR environment on a single vendor. One participant indicated that a best-of-breed solution was used at all of the hospitals in his organization.

EHR vendors in place include Cerner, Meditech, and Allscripts; one organization plans to move to Epic in the future. Despite a desire for as much vendor consistency as possible, there are areas in which participants have decided to move forward with another solution. The most notable of these is the picture archive and communications (PACS) environment. A number of participants noted that their PACS solution is from a vendor that is not their organization’s core IT system. In some instances,
participants also noted that they have other niche applications, such as OR, oncology or radiology solutions.

The interviews were conducted by a HIMSS Analytics executive using a discussion guide collaboratively developed by executives from HIMSS Analytics and Imprivata. While this small sample size is not meant to be representative of the market as a whole, the sample population provides an excellent point for generating continued discussion around this topic.

Current Workflow

The interviews began by asking participants to explain the process by which clinicians currently accessed data to facilitate informed patient care at the point of care. The majority of participants indicated that they have streamlined the number of vendors implemented at either their organization or across their region/province. Several participants indicated that they are presently trying to streamline data access through back-end integration, employing a single vendor wherever possible. The participants also noted that any other systems used share sufficient information so that the main information system has the vast majority of information in it. Other participants claimed they are using Citrix to create a presentation layer through which clinicians can access multiple systems. However, in this environment, unique log-ins to each system must still be used.

By limiting the numbers of vendors, these participants noted that they were trying to eliminate some of the workflow challenges that come from the management of multiple systems. In fact, one participant noted, that their organization has not only standardized on a single vendor, but also standardized on a single installation that is rolled out to all of the hospitals in their environment.

Type of Device

A clear message from these conversations is that clinicians use a wide variety of devices to access patient information at the point of care. This includes use of shared workstations, computers/workstations on wheels (WOWs), tablets, smart phones and more. In fact, one participant suggested that his organization’s strategy was to give clinicians more than one option to securely access information to minimize barriers to data access.

To some extent, the type of device used to access the data varies by location type. For instance, many organizations leverage computers/workstations on wheels on patient floors. However, in the Emergency Department (ED), one participant noted that laptops are in use because computers/workstations on wheels were inefficient. Another was rolling out laptops in his hospital for a similar reason; computers/workstations on wheels were difficult to navigate in their old buildings.
Data Access

With regard to actual access to data, a number of participants reported that their organizations have created links within their core clinical environment to access information housed in other environments. In some cases, these links facilitate direct access to data in another system without requiring another log-in, while in other cases, it is necessary for clinicians to log-in to the new environment. For instance, one participant indicated that their organization had a PACS system that was not developed by their core HIS vendor. While their organization had been able to integrate the reports from the PACS system into their HIS vendor, participants still had to log in through a web-browser to view the digital images.

The necessity to log-in once again was particularly noted for data that was housed outside of the healthcare system. For instance, one participant said that clinicians who have logged into their primary MEDITECH environment are able to launch a browser, requiring them to log-in again to access the system that houses more broad based provincial data, including information documented by physicians in ambulatory facilities.

The Age Old Debate, Access vs. Security

In the Canadian healthcare industry, there is an increasing push to digitize as much of the patient’s medical record as possible. This push is accompanied by concerns from organizations that are focused on data security. The concern is that digitizing ever increasing amounts of patient information will put that data at increased risk.

When asked to respond to the “access vs. security” issue, participants provided a mixed response. At one end of the spectrum, security was not considered a barrier to digitizing records. One participant stated, “I frankly don’t see it as even a question about whether or not we move towards further electronic data”. Instead this individual said that healthcare organizations simply need to be vigilant about securing data and putting a process in place to evaluate that the security processes are working. Audits, for instance, were widely cited as a strategy of ensuring that data was continually secure.

At the other end of the spectrum, participants expressed concerns that tools needed to secure data would inhibit access to electronic information. Voicing the concerns of these individuals, one participant found the need to balance security and computerized access to patient data extremely frustrating. This individual noted that the restrictions in place surrounding the electronic data were highly restrictive compared to a paper-based environment.

Participants also realized that a one-size-fits-all solution was not always going to best fit their organizations’ needs. They would need to use different security solutions to manage different types of devices. One participant noted that their organization has set different levels of security on shared workstations and kiosks, but has implemented a higher degree of security on mobile devices. From their perspective, the trade-off for having enhanced flexibility to using a mobile device is a longer log-in process.
Challenges to Data Access

The conversion of paper records to electronic records has impacted the workflow of clinicians who need to easily be able to access information in order to provide safe, quality care to patients. The participants in this research study identified several key barriers and challenges to being able to access patient data electronically. These challenges include:

- Paper records
- Lack of integration
- Ease of access
- Lack of available workstations
- Privacy & security

Paper Records

Not all of the medical records in Canada have been digitized at this time; many organizations are still relying on a combination of electronic records and paper records. This creates a significant challenge, particularly in an environment in which the data that is stored in a paper chart has to be pulled specifically for review. Other participants identified a cultural barrier, suggesting that physicians who are accustomed to accessing data on paper are reluctant to move to an electronic solution.

Lack of Integration

While lack of integration has been documented for some core systems, such as PACS images or other niche solutions, a key area where lack of integration is a challenge is when clinicians are trying to access information from across diverse care settings. For a number of participants, lack of integration means that clinicians have to launch the provincial system through the organization’s key clinical solution, often an EHR system. Thus, the data is accessible, but requires a separate log-in. For one participant, this challenge was more daunting because there was no provincial health system and the majority of the physician notes from ambulatory encounters are paper-based.

Ease of Access

Many participants noted that “speed” was a key concern; clinicians simply were not able to get to the data they needed as quickly as they wanted to. This tended to manifest itself in a number of different ways. Most participants indicated that having to log in to multiple systems of concern and one participant noted that this was their organization’s biggest challenge. One of the key areas for multiple log-ins identified by participants was the need to log in to both the Windows environment and the vendor application. In addition to the time it takes to key in multiple log-ins, one participant noted that his clinicians are challenged because they have to remember a host of different passwords, which need to be changed frequently to meet security requirements.
One participant raised an interesting point with regard to log-ins. Their organization had implemented a virtual environment to try to enhance workflow. However, the clinicians at this organization had been so well trained to log-out that they frequently logged out of both the vendor application AND Windows. This prevented them from using the virtual workstation, which requires that clinicians stay logged into Windows.

*Lack of Available Workstations*

The lack of available workstations manifested itself in two primary ways in this research. First, participants noted that clinicians had challenges with being able to ensure that their workstations were available when they needed them. This is particularly of issue when clinicians have to utilize shared workstations. In fact, one participant has indicated that availability of workstations is the biggest challenge regarding shared workstations and he is trying to mitigate this problem by extending his organization’s Bring Your Own Device (BYOD) program. Others noted that placement of shared workstations was an issue, if these workstations were not located in good proximity to the patient. Issues also arose around the ability to maintain and keep devices current and running up to standards, so that clinicians can access the data that they need quickly and securely.

*Privacy & Security*

Yet another concern for the ability to access information in a streamlined way is the ability to ensure that the data is readily accessible, but still secure. Specific challenges identified in this area included the presence of generic log-ins that were used by multiple clinicians, forgetting to log out of a system after use and leaving the data exposed and managing multiple credentials when logging in. In many organizations, security requirements also mandate that sessions time out after a certain amount of time. This can be extremely frustrating for clinicians who are directly engaging with a patient for an amount of time that is longer than the prescribed time-out timeframe.

*Solutions to Data Access Challenges*

The ability to streamline data access has the ability to reduce some of the data access challenges identified above. Participants discussed two key solutions that are presently being used in their organizations to facilitate this type of access.

*Single Sign-On*

Single sign-on has emerged as a solution that can simplify access necessary systems by streamlining the authentication and authorization process7. While SSO is not used universally in Canada, use of this technology has grown 80 percent in the past five years8.

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8 HIMSS Analytics [www.himssanalytics.org](http://www.himssanalytics.org)
About half of survey participants reported that SSO technology is presently being used or piloted in their organizations at this time. Several participants, for instance, are piloting this technology in their emergency departments (EDs) because these are high traffic areas in which clinicians need to quickly access data from multiple systems in order to make decisions. One participant noted that their organization is rolling out SSO department by department; strategically focusing on one of the hospitals in their province that has a best-of-breed environment which requires clinicians to use multiple passwords. This individual reports that this strategy has been well received by physicians and this positive reception will be the genesis for rolling the technology out to other hospitals in their environment.

A number of participants noted that this is a type of technology that they would be investigating in the future. Several participants indicated that they are going to make future decisions based on the pilot programs that are presently underway. Pilot programs afford organizations the ability to find an SSO solution that would meet all of their needs and address the “wide variety of systems that we are managing”. As such, organizations are evaluating where they can get the biggest return on their investment. Others will look to purchase this technology in the future. For instance, one participant indicated that the purchase of SSO technology was on their organization’s project plan and they were hoping that the technology would be implemented in the next 18 months.

Finally, several participants indicated that SSO was only one component of truly streamlining data access. One participant noted that SSO was just part of the solution that their organization was going to roll out in the future. She noted that SSO combined with authentication management could effectively “collapse” the number of passwords required enabling clinicians to access all their key resources including their Windows desktops, EMR solution, and other clinical and administrative applications. Their organization was also hoping to use proximity cards, RFID and other solutions to facilitate this access. Another participant noted that biometrics could also streamline data access. One participant, for instance, indicated that the solution at his organization would include three components – a smart card, a single sign on process and a roaming profile.

**Virtual Desktop**

Virtual desktop solutions offer clinicians the ability to log in and out of a session on any desktop that has been established as a virtual desktop. This means that a clinician can see a patient in one room, log-in to the system, log out and then move to another room and re-log-in to the same place he was on the previous computer. With respect to facilitating easier access to data, one participant noted that this solution was “just as good as SSO”.

While few participants have fully implemented virtual desktop technology, a number of participants are rolling this technology out either in pilot programs or in a department by department format. A number of participants, for instance, are rolling this technology out in the ED, where clinicians need to move from bedside to bedside to treat patients. In fact, one participant noted that clinicians at his
organization have reported saving upwards of 30 minutes a day and that his organization cannot keep up with the demand for this solution.

The value of a virtual desktop solution was also recognized by those who have not yet piloted or implemented this solution at their organization. One participant noted that virtual desktop offers secure access to data, while another identified improved patient care because clinicians would have streamlined access to the data they need to provide patient care. Lastly, one participant noted that this solution could generate cost savings at their organization.

Finally, one participant offered a lesson learned, indicating that their organization previously evaluated the solution, but did not find the technology to be robust enough. Instead, this organization invested in developing their own solution. This individual admitted regretting the choice, because while it was cheaper to implement, it took much longer than expected. In hindsight, this participant noted that if given the choice again, he would implement a virtual desktop solution.

**Benefits of Improved Access**

As organizations implement solutions to help clinicians facilitate access to the data clinicians need to facilitate patient care at the point of care, numerous benefits have already been documented. These participants have documented benefits in a number of categories.

*Faster Access*

A number of participants indicated that their streamlined processes yielded improved speed and access to clinical systems. One participant specifically noted that his organization’s implementation of an SSO solution significantly reduced the number of locked workstations that clinicians could not access. This translates into time savings for clinicians; when they can spend less time dealing with technology, they can spend more time focusing on their patients and care delivery.

*Clinician Experience*

Many participants indicated that improved access to data resulted in an improved experience for the clinicians. For instance, several participants noted that streamlined access to data would yield more time for clinicians to spend on patient care. Another participant noted that better access to data would also foster improved inter-professional relationships and collaboration, yielding in improved patient care. Another participant noted that while saving clinicians time, their focus was on improving the clinician experience. This individual noted that by trying to simplify the number of log-ins required, they were trying to remove the “psychological” barriers that come with having to remember and use a number of different passwords.
Improved Patient Care

Several participants noted that streamlined access to patient information improves patient care. As one participant noted, “when the clinician has all of the information relating to their patient, the patient can only benefit”. One participant noted specifically that their organization has created efficiencies with regard to medication administration because electronic medication orders are legible; reducing the amount of time it takes for nurses to validate medication orders that were unclear. Another participant noted that streamlined access to data had reduced the need for duplicate test results.

A participant noted that streamlined access to information also enhances the patient experience. This individual cited the example in which patients in the ED at his organization were able to see images directly at the bedside, enabling the clinician to actively engage in a conversation with the patient about their care.

Mobile Solutions

Mobile technology has been identified as having the potential to create a huge paradigm shift on the way in which clinicians provide healthcare. Despite the fact that one participant characterized mobility as a “matter of when we will provide it, not if”, most participants reported that they were currently piloting the use of mobile technology and expected to roll these solutions out more fully in the future. Despite this level of use, participants indicated that mobile devices are perceived as not only valuable to the provision of healthcare, but favorably received by clinicians. While a number of issues were raised around mobile technology, two items were raised that specifically address clinician workflow; these are BYOD and ability to access data with a mobile device.

Bring Your Own Device (BYOD)

Participants noted taking different approaches to the way in which they were planning to roll out mobile devices. While one or two participants noted they were going to provide clinicians with mobile devices, quite a few more reported that their organization would pursue a BYOD strategy. A hybrid model, in which they would both supply devices and support personal devices that clinicians wanted to use for business purposes, was also identified as an option.

Financial challenges were identified as a significant driver to implementing a mobile device strategy. Several participants noted that while their preference would to be to provision enough devices for all clinicians, this simply was not financially feasible. One participant is presently running a BYOD pilot to see if that is an effective solution, while another is facilitating use of this type of device use to clinicians. The ability to control the devices was identified as a key driver among respondents reporting that they would supply devices to clinicians. One participant elaborated that their organization chose to supply

devices because they could track the devices and remotely wipe the contents of devices that were lost or stolen.

**Ability to Access Data with a Mobile Device**

A key benefit to mobile devices is the ability for clinicians to have broader access to clinical information. In addition to addressing technological issues such as network reliability and their capability to roll out networks in older buildings, participants also addressed the ways in which clinicians accessed data using mobile devices.

In some instances, participants noted that clinicians had difficulty viewing information on mobile devices in a meaningful way, limiting the efficacy of the data. One participant solved this issue by creating a virtual desktop environment, which seems to have been favorably received by clinicians. Another participant noted that clinicians use a web-based product that enables them to access data on their smart phones while rounding on patients. Other participants reported that devices at their organizations were simply for viewing data, but did not yet offer the ability to be more interactive with data.

**Decision Making Process**

Many participants indicated that decisions at their organization were made by committees that are often comprised of team leaders from throughout the organization. Participants noted that CFOs, physician executives, nursing executives, IT executives and others sat on these committees. In most instances, clinicians were highly involved, both as executives that chaired committees and made decisions regarding solutions, to clinicians evaluating and testing solutions that are in the process of being evaluated by the organizations.

Executive participation is demonstrated in a number of ways, including reviewing and evaluating IT purchases, as well as defining organizational priorities. One participant noted that the VP of Medical Affairs and Chief Nursing Officer were part of a group of executives that formed a steering committee to discuss IT solutions.

Front line clinicians are also widely engaged in the decision making process. One participant also noted that at their organization, which engages clinicians in trialing new products, just created a new framework for capturing feedback from the clinicians. Another noted that clinicians were actively involved in providing advice and feedback on various IT initiatives, ranging from the implementation of the organization’s computerized provider order entry (CPOE) technology to the selection of the tablets to be purchased for clinician use.
Conclusion

Clinicians need to be able to quickly and efficiently access patient data at the point of care. The transition from paper-based records to data housed electronically requires a shift in workflow processes for clinicians who are used to flipping through a paper chart. In order to maximize access to this data, organizations must address workflow, ensuring that IT is not adding to the time that clinicians need to access patient information, enabling them to maximize time spent on patient care.

The participants in this research reported that they currently use a variety of tools to help clinicians facilitate access to patient data. Several have embedded links to other vendor systems inside their primary vendor’s solution, while others rely on a Citrix environment. Still others are using either virtual desktops or SSO solutions to facilitate access. While these solutions have begun to streamline data access for some respondents, other participants claim their efforts are hampered by multiple log-ins and speed of access.

Participants reported that they are considering solutions such as SSO, proximity cards, biometrics and other solutions to continue streamline data access. In some cases, participants noted they would look for combined SSO and authentication solutions with proximity cards to create the most streamlined solution. Using both of these solutions would enable a clinician to simultaneously log-in to both Windows and a single portal from which all of their additional applications could be launched without the use of additional log-ins. These solutions also have the potential to solve key log-in challenges that organizations face such as the use of generic log-ins to circumvent the need to remember multiple passwords or forgetting to log out of a system.

In order to ensure that clinicians have access to the data they need in a way that meets both the clinicians and the organizations’ needs, participants reported that they are diversifying the ways in which clinicians can access data. Many organizations support data access through multiple types of devices, including computers/workstations on wheels, shared workstations and tablet computers. Use of mobile devices is also becoming more widespread. A number of participants reported that their organizations are not only piloting the devices to determine the most effective strategy as it relates to the ways in which to present the data, but also so that they could determine how to best support the devices.

Regardless of the solution that organizations are choosing to implement to streamline data access, they need to do their due diligence before implementing a solution. It is important to determine the organizational goals, as well as the specific clinical workflows that need to be streamlined. Clinicians need to be engaged in the process to ensure that the organization understands the challenges and barriers they face with regard to accessing information.
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