

Health Reform Observer - Observatoire des Réformes de Santé

VOLUME 4

| ISSUE 2 |

ARTICLE 1

A Portrait of Electronic Medical Record Use in Primary Care Across Canada

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1 June 2016

A Commentary

Commentaries are reflection pieces prompted by a HRA or CHRA, and either provide background information or respond in some way to conclusions reached in a HRA or CHRA.

RECOMMENDED CITATION: Rubinowicz A, Vedel I, Sanche S, Lortie M, Law S, Hughes J, Laporte L. 2016. A Portrait of Electronic Medical Record Use in Primary Care Across Canada. *Health Reform Observer - Observatoire des Réformes de Santé* 4 (2): Article 1. DOI: [dx.doi.org/10.13162/hro-ors.v4i2.2463](https://doi.org/10.13162/hro-ors.v4i2.2463)

1 COMMENTARY

Many countries have established national initiatives to implement information technologies to improve patient safety and the quality and efficiency of health care services, and Canada has been a part of this global trend (Schoen *et al.* 2012). Many Canadian provinces have implemented health information technologies, such as electronic medical records (EMRs) in primary care in Alberta, population drug information in British Columbia and regional inter-operable health networks in Sault Ste. Marie, Ontario (Rozenblum *et al.* 2011). The use of electronic health records (EHRs) in clinical settings in Canada is considered to be pivotal to an integrated health care delivery system and assumed to be central to achieving true patient-centred care (The College of Family Physicians of Canada 2011). EHRs, which have the potential to bring together patient health information from multiple health care settings, such as hospitals, community-based primary care clinics, and community pharmacies, have reportedly contributed to improved efficiency, safety and quality of care (Delpierre *et al.* 2004; Joos *et al.* 2006). Whether EHR or EMR can save costs remains uncertain however (Hillestad *et al.* 2005; Wang *et al.* 2003). Even though they could benefit, a relatively large number of physicians and clinics in Canada are still hesitant to adopt EMR or EHR within their practices. Indeed, according to a 2012 international survey, 44% of Canadian primary care practices overall do not use EMR (Schoen *et al.* 2012); the adoption rate varies widely by jurisdiction.

This commentary presents the first findings from a study, commissioned by Canada Health Infoway (Infoway), to describe how clinics and physicians in Canada who have adopted EMR use it and what impact they perceive it has on their practice. As described in two health reform analyses (HRAs) published in this journal (Daniels 2014; Zelmer and Hagens 2014), Infoway is an independent, not-for-profit corporation established in 2001 to accelerate the development of electronic health records and related technologies on a pan-Canadian basis. Ultimately, Infoway's goal is to support the implementation of EMR, which implies supporting physicians in their decision-making related to the adoption of EMR.

Our research team—with the support of Infoway, EMR vendors, and EMR program offices in several provinces—identified primary care practices, as potential participants for this study, based on the following criteria: (1) a primary care clinic with or without walk-in service, a community pediatrics clinic, a community ob/gyn clinic, or a nurse-practitioner led practice/clinic; (2) not exclusively a walk-in clinic; (3) not a medical specialist clinic; (4) must have implemented an EMR within a 3- to 8-year window, which allowed for adequate clinician adoption time (Vedel *et al.* 2012). We contacted 132 randomly selected primary-care clinics in Canada that were using EHR for recruitment to the study. Sixty-two clinics declined to be screened when contacted, most citing time constraints. Of the 70 clinics that agreed to be screened, 18 were found to be ineligible, usually because they fell outside of the 3- to 8-year implementation window. Hence, 52 clinics were successfully recruited to this study. This sample size enabled us to adequately conduct statistical analysis. Tables

1 and 2 show the main characteristics of the clinics recruited for this study regardless of their participation status. This study was granted IRB exemption from the St Mary's Hospital (McGill University) Institutional Review Board. The study design consisted of a telephone survey conducted post EMR implementation requesting descriptive information about the characteristics of the sites and the characteristics of the EMR based on the tool used by the Commonwealth Fund (2012). Additional questions on perceptions of the EMR were adapted from a previously validated questionnaire (Likourezos *et al.* 2004) on perceived impact. These questions allowed the measurement of the perceived impact of EMR implementation with respect to current use, impact of work and impact on patient care. The medical director of the site was asked to complete the questionnaire. To describe the sites and the types of EMR used at all times during the study period and the perceived EMR impact on work, patient care and EMR general use at the different study sites, a descriptive analysis was conducted.

Table 1: Characteristics of the Clinics I

		TOTAL # OF CLINICS
Number of clinics with multi-practice sites	23	49
Number of sites as part of a new primary care model supported by public funding (e.g., Family Health Teams)	29	48

Table 2: Characteristics of the Clinics II

	MEAN	MIN	MAX	TOTAL # OF CLINICS
Number of family clinicians practicing at the clinic	5.69	1	17	49
Total clinician FTEs	4.715	1	13	49
Number of registered patients the clinics serve	7557	500	23000	52
Number of active patients the clinics serve (registered and unregistered patients)	9282.5	500	36112	46
Number of nurse practitioners practicing at the clinic	0.525	0	5	49
Months between now and implementation kick-off date	256.2	15	135.8	51
Months from the go-live date that managed the change from paper to EMR-based operations	7.11	0	69	46

EMR implemented in the various study sites included a broad range of modules. Table 3 summarizes the frequency of answers to questions related to the use of various modules.

Nearly 87% of the surveyed clinicians (who all work in clinics which have implemented an EMR for 3 to 8 years) stated that they routinely used the electronic prescription module (selection of medication from EMR and printing script); however only 23.9% of the clinicians were able to routinely transfer prescriptions electronically to a pharmacy, and 71.7% stated they were not able to do so. Close to 78% (77.8%) of clinicians stated that they used electronic prompts about a potential problem with drug dose or drug interaction, as part of their daily routine. More than half of the clinicians routinely shared information electronically with other health professionals regarding patient clinical summaries (68.9%) and laboratory and diagnostic tests (69.6%). As for referring patients to specialists electronically, physicians were almost split as data showed that almost 47.8% said they did not use the EMR for that, while 43.5% said they use it routinely and 8.7% used it occasionally. The majority (78.3%) of the clinicians surveyed stated they receive laboratory results electronically—integrated into the EMR (not scanned) on a daily basis. This was not the case for electronically ordering laboratory tests, as 43.5% did so as part of their daily routine but 41.3% did not use it. The rest of the clinicians (15.2%) electronically ordered laboratory tests occasionally.

Our data show that overall a vast majority of the medical directors who responded to the survey agreed or strongly agreed that the EMR adoption facilitated daily activities at the different sites but at different levels (see Table 4). For example, after EMR implementation, 93% of family physicians reported they were able to complete the billing process more efficiently and effectively than before and they were better able to bill for each respective patient encounter and associated incentive program. With the use of the EMR, 91% of family physicians found themselves better able to monitor their patients' progress. At the same time they found it easier to access data from and enter data into the EMR, as well as read text on the computer screen. More importantly, 93% of the medical directors agreed that the EMR improved the quality of medical care received by the patients (52% strongly agreed and 41% agreed).

More than half of respondents indicated that after EMR implementation there was an improvement in continuity of care and patient access to services, which they felt decreased the need for emergency department visits. Respondents also noticed reductions in patient waiting times, in the risk of making errors, in the number of laboratory tests and in the costs of patients' care. However, our data also showed that there was not strong agreement about everything. Respondents were divided when questioned about overhead costs saved after EMR implementation and whether clinicians were able to finish their work much faster than before.

We conclude that the potential value and application of EMRs in primary care is substantial but implementation can be slow and not very smooth, like any learning process. Our study demonstrates that many professionals have already started to accept and implement EMR and are using it within their clinical practice. Many of the health care professionals in this study were satisfied with their EMR; more than half of the medical directors reported that the EMR supported a variety of daily activities at their sites. Canada is still only

at the beginning of the EMR era, relative to other countries, and more work needs to be done to expand its use. Health care professionals need to be educated about the emerging evidence regarding the potential benefits of EMR-enabled clinical practices. The more EMR is adopted, the more it can be refined and improved. As part of an integrated and interdisciplinary health care system, it can support improvements in healthcare delivery for health gains at the level of individual care and population health.

Table 3: EMR Use by Primary Care Physicians

ITEM	FORMAT LABEL	SAMPLE SIZE	FREQUENCY OF ANSWERS BY CATEGORY		
			0	1	2
Electronic referring to specialists	0 (Routinely) - 2 (No)	46	20	4	22
Electronic prompts about a potential problem with drug dose or drug interaction	0 (Routinely) - 2 (No)	45	35	7	3
Electronic receipt of laboratory results integrated into the EMR (not scanned)	0 (Routinely) - 2 (No)	46	36	5	5
Electronic ordering of laboratory tests	0 (Routinely) - 2 (No)	46	20	7	19
Able to electronically transfer prescriptions to a pharmacy	0 (Routinely) - 2 (No)	46	11	2	33
Electronic exchange outside practice: laboratory and diagnostic tests	0 (No) - 1 (Yes)	46	32	14	-
Electronic exchange outside practice: patient clinical summaries	0 (No) - 1 (Yes)	45	31	14	-
Electronic prescribing of medication (selection of Rx from EMR and printing script)	0 (Routinely) - 2 (No)	46	40	1	5

Table 4: Perceived Impact after EMR Implementation

ITEM	FORMAT LABEL	SAMPLE SIZE	FREQUENCY OF ANSWERS BY CATEGORY				
			0	1	2	3	4
With EMR, admin staff at our site are able to finish their work much faster than before	0 (s. disagree) - 4 (s. agree)	44	1	1	6	16	20
With EMR, family physicians are able to complete the billing process more efficiently and effectively	0 (s. disagree) - 4 (s. agree)	44	2	-	1	15	26
With EMR, I am better able to monitor patient progress	0 (s. disagree) - 4 (s. agree)	44	-	1	3	11	29
With EMR, clinicians at our site are able to finish their work much faster than before	0 (s. disagree) - 4 (s. agree)	44	1	12	12	10	9
Easy to access data from EMR	0 (s. disagree) - 4 (s. agree)	45	1	2	-	11	31
Easy to enter data into EMR	0 (s. disagree) - 4 (s. agree)	45	1	1	1	12	30
Easy to read text on the computer screen	0 (s. disagree) - 4 (s. agree)	45	-	2	-	10	33
EMR decreases the number of laboratory tests	0 (s. disagree) - 4 (s. agree)	44	-	7	10	23	4
EMR will make patient care less expensive	0 (s. disagree) - 4 (s. agree)	44	3	4	14	17	6
With EMR, family physicians are better able to bill for each respective patient encounter and associated incentive programs	0 (s. disagree) - 4 (s. agree)	44	2	-	3	15	24
EMR eliminates a lot of paperwork for the administrative staff	0 (s. disagree) - 4 (s. agree)	44	3	2	9	14	16
EMR eliminates a lot of paperwork for our clinicians	0 (s. disagree) - 4 (s. agree)	44	4	6	5	15	14

ITEM	FORMAT LABEL	SAMPLE SIZE	FREQUENCY OF ANSWERS BY CATEGORY				
			0	1	2	3	4
With EMR, overhead costs are saved	0 (s. disagree) - 4 (s. agree)	44	5	4	12	13	10
It is confusing to follow the sequence of screens	0 (s. disagree) - 4 (s. agree)	45	12	20	4	6	3
EMR improves the quality of medical care received by the patients	0 (s. disagree) - 4 (s. agree)	44	-	1	2	18	23
EMR use improves continuity of care and patient access which will decrease patient need to visit the Emergency Department	0 (s. disagree) - 4 (s. agree)	44	-	5	12	18	9
EMR decreases patient waiting time	0 (s. disagree) - 4 (s. agree)	44	1	6	13	20	4
EMR reduces the risk of making errors	0 (s. disagree) - 4 (s. agree)	44	1	2	5	19	17
Patient information is more confidential with EMR than with paper records	0 (s. disagree) - 4 (s. agree)	44	-	3	7	19	15

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