

Extending large-scale electronic health records to Canadian family physicians

Perspectives from a clinical trainer

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Electronic health records (EHRs) are becoming increasingly popular and their potential value is recognized internationally.¹ In a recent survey of 788 family physicians across all Canadian provinces, 97.5% of the respondents reported using computers in their practices, and 67.5% reported using EHRs.² Nonetheless, countries attempting to implement large-scale EHR programs have reported a number of barriers to their implementation and misperceptions about their use.³ For example, one study found that the software program's developers and its users often diverged in their opinions about how well a system or upgrade would meet user needs.⁴ More specifically, a survey of family doctors in Quebec found that the number of system functions used by individuals varied, as did their understanding of the functions available to them.⁵ A systematic review by McGinn et al⁶ identified design or technical concerns, privacy and security concerns, and cost issues as the most frequent barriers to EHR implementation. The lead author's (Dr Gary Viner's) experience confirms the challenges these barriers pose at both the personal and the institutional levels.

Implementation

After an extensive 2-year planning and training period funded by the Ontario Ministry of Health, the Atlas Alliance—5 hospital partners in eastern Ontario, including The Ottawa Hospital's family medicine (FM) program—launched an EHR system on June 1, 2019. The first electronic medical record system had been implemented in The Ottawa Hospital's FM program in 2007 while Dr Viner was serving as the program's medical director; the system came with a host of deficiencies and design issues but nonetheless had been operating continuously until a new vendor, Telus Communications, deemed it obsolete in 2018. At that point, change was thrust upon us.

In February 2018, relatively early during planning for the EHR implementation process, Dr Viner was recruited as a “change sponsor”; later he also agreed to be a “clinical trainer.” The supposition was that following an early introduction to e-learning training modules and personalized face-to-face training, Dr Viner would be able in turn to train his family physician colleagues. Ideally, clinical trainers should be active in their particular domain. Although Dr Viner is now retired from both inpatient medical care and low-risk obstetric care, he

learned to train his fellow family physicians working in the inpatient, obstetric, and ambulatory contexts.

Setting

Our office includes 15 staff FM physicians, several nurses and allied health professionals, 25 to 30 first- and second-year residents (8 to 10 in a teaching unit at any given time), and a scattering of allied health students—in short, it is a large and busy clinic. A sister clinic includes 5 more staff members; between the 2 clinics, we serve almost 16000 patients. All offices are equipped with computers and many also have local printers; however, as the EHR prescriptions only print on networked printers, we soon discovered that we were incapable of printing prescriptions in the examination room during a patient's visit.

Using clinical trainers to implement EHRs

The planned training (organized jointly by information technology services at The Ottawa Hospital and the vendor) was beset by issues from the outset. It rapidly became clear that the complex considerations involved in quickly training 15000 to 17000 users, including 1500 physicians, had not been addressed.

Early on, the decision was made to ask physicians to train their colleagues. As one of these change sponsors and clinical trainers, Dr Viner was consulted about the curricula for both ambulatory and low-risk intrapartum maternity care. This consultation was essentially a token process, as he could not understand the implications of those decisions without knowing the system.

Although all physicians received similar training, the clinical trainers received the video learning elements supplied by the vendor 2 to 3 months earlier than the other trainees. Short videos (2 to 10 minutes each, totaling 3 hours altogether) were distributed through an e-learning system that tracked usage. Numerous delivery problems became apparent: there was no viewing order supplied, the videos were mainly passive demonstrations with limited interactivity, fonts were small, there was little opportunity to explore the system, and there was little appreciation of real-world work flow. For FM, the inpatient and ambulatory components were integrated. The obstetric elements, although occasionally redundant, were provided separately, even though family physicians have well-differentiated clinical roles.

After completing the online modules, clinical trainers met with skilled training coaches from the vendor.

Dr Viner attended a 4-hour interactive session, at the end of which the trainer offered her contact information for ongoing questions or further meetings. Dr Viner was also given several training lesson plans and exercise booklets comprising about 200 pages. The different lesson plans each had 1 or 2 sentences describing a patient situation, but the patient was not at the centre of the activity: rather, the system was the focus. He was also provided access to a daily reinitialized vendor system (a “sandbox” or “playground”) with which to learn skills and attempt to integrate the step-by-step plan for training.

Dr Viner experienced sensory and cognitive overload, despite his general confidence with learning and exploring new computer systems. He was overwhelmed with the need to learn this complex system without actual patient encounter “practice” and then to teach it to his colleagues.

He spent many hours reviewing the paper documents but preferred a digital format that he could edit and condense. He was frustrated by inconsistencies between the lesson plans and playground screen. These inconsistencies motivated him to send several follow-up e-mails and arrange 3 more individual meetings with the trainer. It was difficult for him to imagine how to cover all the necessary material in a 3-hour teaching session. The lesson plans failed to fully capture the work flow of a real patient encounter with contemporaneous charting. It seemed that the complexity and variation of family physician work flow and needs were not considered or understood.

Planning deficiencies

The curriculum decisions for the training modules were made in the fall of 2018. Although the work flow planning occurred somewhat concurrently and engaged overlapping individuals, it was done essentially independently. There are innumerable processes to consider; only a limited number were managed and completed either before or just after implementation. Some common processes, such as dealing with an unscheduled patient (eg, a mother requests that her accompanying child be seen) or referring to a provider outside our institution, were not encompassed. As a result, several important processes were excluded from the curricular content. The process of designing the clinical build for our installment of the EHR had limited physician involvement and was led instead by “tech-savvy” administrators who have a potentially skewed and incomplete notion of the clinical process.

The family physicians in our clinic, particularly because it is a teaching centre, are dealing with ambulatory primary care for the full range of patients and problems. As the EHR system has a context-specific interface, physicians need computer and work flow training for each of their relevant environments, but the clinical trainer courses on offer were nonspecific to FM user needs. There were supposed to be 4 FM clinical trainers; however, communication and staffing issues meant only

3 were trained. Dr Viner was responsible for the FM maternity, ambulatory, and hospital inpatient care training. His 2 other colleagues, who are hospitalists and thus have no connection to the ambulatory or maternity environment, were to teach ambulatory and inpatient content, but the online course availability schedule only offered “family medicine” or “family medicine obstetrics” training, so the providers who attended these courses were from a combination of mostly family physicians who provided solely ambulatory care, hospital care, and maternity care with or without ambulatory care.

Barriers and limitations

The biggest barrier to learning this EHR system is the initial view of the interface or the landing screen. There is substantial complexity and a potential for visual overload. Any curriculum needs to start with an overview of and orientation to the screen layout and clear, consistent terminology regarding the regions and purposes of the basic screen.

Many of the advanced features of this EHR system are “cleverly” titled with an identical prefix but as a result these features all sounded too similar for the novice user and might have confused trainees.

Presumably because this software originates in the United States, it employs several work flow terms that are unfamiliar in the Canadian context. The predefined roles and permissions accorded to the different staff categories in the EHR do not readily translate in a public health care context.

The work flows in our version of the EHR for FM could lead to an uncomfortable adaptive response, as it might become necessary to change our process of care to use the many positive features of the software. For example, the EHR’s rooming process includes a role for the medical office assistant to clarify the reason for the visit. This prompts the physician to continue a process based on that predefined stated reason and leads to expected efficiencies, as there is essentially a predefined end point and clinical flow for the encounter. Our current reality is that such a role does not exist and that the flow of an encounter is defined through a patient-centred process, which is more fluid and organic.

Many of the challenges Dr Viner faced both as a clinical trainer and as a user of this system have previously been identified in the literature. However, given what we know about the importance of stakeholder engagement as a critical success factor for EHR implementation,⁷ from Dr Viner’s perspective, the failure to achieve this engagement with the FM stakeholders in our clinic is perhaps the software’s most disappointing failure.

Conclusion

This EHR software is reputed to be excellent in hospital settings. However, its transfer to the primary care setting in Canada requires a different planning process and an

adaptive work flow. The training process needs substantial review and requires the input of family physicians well trained in the EHR environment and aware of the many facets of Canadian FM practice in the ambulatory setting. A recent systematic literature review⁸ identified similar adoption issues as discussed herein (user interface, feature functionality) as well as the idea of social “fit” factors in a primary care setting. Furthermore, research on optimizing EHR use among primary care teams has demonstrated the importance of both involving all stakeholders in the optimization process and ensuring that users have the skills to take advantage of the full functionality of the system.⁹

Along these lines, possible improvements in future Canadian implementations might include the following:

- ensuring that there is a trained and knowledgeable Canadian family physician who can appreciate the organizational and systemic context and guide the creation of the local version;
- updating the online training modules with a brief clinical vignette and a demonstration of an experienced user’s interaction with the EHR;
- organizing the training process to align with the clinical roles of the physicians, ensuring that there is appropriate training time for each role;
- providing simulated patient interactions and practising with such a context (perhaps with some “intelligent” online help modules) to enhance and simplify the training experience; and
- showing the personalization feature after some exposure to clinical use of the system and not before implementation.

Many physicians have adapted to changes bigger and “bumpier” than this, but it behooves us to make the process as smooth as possible for future implementations. 🍁

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Competing interests

In 1991, **Dr Viner** co-authored ENCODE-FM (a coding scheme for diagnosis and reasons for encounter in primary care), which is owned by INSITE Family Medicine Inc, of which he remains a co-owner. The other authors have no conflicts of interest.

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