# You and your EMR: the research perspective

## Part 1. Selecting and implementing an EMR

**Bridget L. Ryan** MSc PhD **Sonny Cejic** MSc MD CCFP **Joshua D. Shadd** MD CCFP **Amanda Terry** MA PhD
**Vijaya Chevendra** MSc **Amardeep Thind** MD PhD

*Dr Park and her partners have a group family practice in a medium-sized Canadian town. They are intrigued by the potential advantages of an electronic medical record (EMR) for patient care. Dr Park is also interested in using an EMR to answer practice-based questions (eg, chart audits, quality improvement initiatives) and perhaps participate in their regional practice-based research network.*

The pace of EMR adoption among family physicians in Canada is accelerating and the potential of EMR research is tantalizing for physicians, researchers, and policy makers. This 4-part series, written by a team of clinicians and researchers who have expertise in EMR implementation and research, addresses considerations for EMR adoption when the goal is not only individual patient care but also research. The articles will discuss selecting and implementing an EMR, inputting data, answering questions using the EMR, and optimizing the potential of EMRs.

Choosing and implementing an EMR is a challenging process and a long-term commitment. It is critical that the EMR facilitate patient care; most guides to EMR selection adopt a patient care perspective.[1-4] However, family physicians might also be interested in the research potential of EMRs. This series will discuss considerations for family physicians who, like Dr Park, wish to realize this potential.

The good news is that much of what makes an EMR appropriate for patient care also makes it ideal for research. Considered in its broadest sense, research is the ability to answer questions; it can involve monitoring individual patients' health over time, conducting chart audits and quality improvement initiatives, meeting government reporting requirements, and conducting projects of a larger scale. All of these situations necessitate access to and analysis of high-quality, reliable, and valid information.

### Selecting an EMR

To choose an EMR program that will facilitate research, begin with a few prototype questions that are relevant to you (eg, "What proportion of my patients with chronic kidney disease is at target for blood pressure control?"). Coming back to these questions throughout the process will help you determine how well the EMR will meet your research needs.

To realize its research potential and encourage adoption to its fullest capacity, the EMR must be a good fit with your practice team. It must be intuitive and user-friendly. Electronic medical records vary greatly with respect to necessary hardware systems, user interface (data entry), user-friendliness, technical support, cost, and the ability to produce reports. We recommend at this stage that you 1) have extensive interactions with vendors and understand what is included before making the purchase, 2) test-drive the EMR program and talk to practices that are using that particular EMR system, 3) ask vendors to demonstrate how the EMR can answer your prototype questions, and 4) negotiate with the vendor, remembering that you have greatest leverage *before* the purchase is made.

There are 3 specific research considerations in choosing the EMR. The first is an essential design issue concerning the amount of structured and unstructured data that can be entered into the EMR. It can be tempting to want primarily free-format text. This narrative format emulates a paper chart, which is essential to family practice. However, free text can make it extremely difficult to answer complex questions.[5] Ideally, an EMR should provide many options, such as structured fields (eg, dates in a specified format of day, month, and year), pick lists (eg, drop-down box for choosing an appropriate diagnosis), and templates (eg, vaccination flowchart).

The second research consideration is the ability to answer questions or conduct queries.[6] In some systems, complex queries must be conducted by the vendor (often with a cost). Having someone else run queries might seem ideal, but once the EMR is familiar, answering your own questions will be more flexible and expedient. Many EMRs allow users to generate only basic reports (eg, a list of patients with diabetes). If the intention is to conduct analyses rather than generate reports (eg, to determine the proportion of your patients with diabetes and hypertension), data must be output in a format that enables them to be imported into software for analysis. Also, consider the effect of queries on office processes; EMR performance might decrease. Thus, running queries during slower times, such as over lunchtime, might be effective.

The third research consideration is to plan for the type, timing, and cost of training that specifically addresses your research needs. Training focused solely on day-to-day input will not be sufficient to enable subsequent information retrieval.

## Implementing an EMR

Once an EMR has been chosen, your attention will turn to implementation. Successful implementation revolves around both processes and people. Each of your staff and colleagues must understand and agree to changes in processes. Consistency in inputting information is critical to retrieving good, usable information from the EMR. Research questions can only be answered with data that are available. Only elements of the historical paper record that are manually keyed into EMR fields will be available for research; scanned documents are not useful for research. We recommend that you return to your prototype questions at this stage to identify pivotal information that you want to capture from the outset, remembering that implementation is a process that occurs over time. It is wise to start slowly with good data and add more complexity as comfort levels increase. At the beginning, the focus will be on appropriate and efficient patient care. Office productivity will probably decrease initially, as staff will be consumed with inputting the information into the EMR rather than considering how to retrieve it. This leads to 2 further recommendations. First, ensure that people have access to refresher training on consistent and accurate data entry. Second, identify a leader who will champion the research perspective throughout implementation. A good champion will be someone who is passionate about conducting clinical research and who has a good understanding of the capabilities and limitations of the EMR software.

In order to conduct research using EMRs, the selection process must entail confirmation that the EMR is capable of answering questions. Thoughtful implementation will ensure that the information needed to conduct research is both accessible and of high quality. Most important, careful consideration of those who will use the EMR during selection and implementation will ensure that the EMR is a good fit for both patient care and research purposes.

**Dr Ryan** is a postdoctoral fellow in the Centre for Studies in Family Medicine in the Department of Family Medicine at the Schulich School of Medicine and Dentistry at the University of Western Ontario (UWO) in London, Ont. **Dr Cejic** is a family physician in an academic practice in London and Associate Clinical Professor in the Department of Family Medicine at the Schulich School of Medicine and Dentistry at the UWO. **Dr Shadd** is Assistant Professor, **Dr Terry** is Assistant Professor, **Ms Vijaya** is IT Consultant, and **Dr Thind** is Associate Professor, all at the Centre for Studies in Family Medicine in the Department of Family Medicine at the Schulich School of Medicine and Dentistry at the UWO.

**Competing interests**

**Dr Cejic** is Chair of the Nightingale Advisory Board at Nightingale Informatix (the vendor of the electronic medical record that **Dr Cejic** uses). None of the other authors has any competing interests to declare.

**Correspondence**

**Dr Bridget L. Ryan**, Centre for Studies in Family Medicine, Schulich School of Medicine and Dentistry, Department of Family Medicine, University of Western Ontario, Suite 245, 100 Collip Circle, London, ON N6G 4X8; telephone 519 661-2111, extension 20115; fax 519 858-5029; e-mail **bryan@uwo.ca**

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