You and your EMR: the research perspective

Part 4. Optimizing EMRs in primary health care practice and research

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Dr Park and her team are pleased with their electronic medical record (EMR) selection and have finished their EMR implementation. They have also given some thought to entering and retrieving information from their EMR, and to answering research questions using their EMR data. Having moved past these initial stages of EMR adoption, Dr Park and her team now begin thinking about how to optimize their use of the EMR, both for their practice and their future participation in primary health care studies led by their regional practice-based research network.

The first 3 papers in this series have focused on selecting and implementing an EMR,[1] how the structure of EMR information matters,[2] and how to answer practice-level questions using EMR data.[3] This paper provides a context within which these 3 previous topics might be understood. We take the natural next step in the series by focusing on 5 essential conditions that are necessary for optimal EMR use in both research and patient care. It is important to focus on optimal EMR use, because the mere presence of an EMR might not be enough to allow its potential benefits in patient care and research to be realized.[4] Therefore, this paper outlines 5 conditions that are required for optimal EMR use.

Maximize the potential of EMRs

Electronic medical records need to be fully used in practice to achieve possible advantages in patient care and research. A 2009 survey of primary care physicians in Canada found low levels of "multifunctional" EMR use, with 65% of respondents having or using few EMR functions.[5] Levels of use are important because recent research suggests that "frequently used multifunctional" EMRs assist primary health care practitioners in achieving higher-quality care.[6] For research purposes, frequently used multifunctional EMRs might contain richer data and enable more sophisticated analyses than suboptimally used EMRs.

Harness the power of EMR information

Many of the potential benefits of EMR use come from being able to collect and use large volumes of data relatively quickly at the practice population level. This is necessary for both patient care and research. To maximize potential benefit, EMRs need to be further developed to better handle complex searches of practice populations (eg, to identify patients who require preventive care), and to support both practice-level research and clinical decision making at the point of care. The full power of an EMR cannot be realized if this technology is designed and used simply as an electronic version of a paper record.

Advocate for primary health care EMRs as a central hub for electronic information

As a first step, this involves working toward developing EMRs and companion systems that have the capacity to receive external information (eg, laboratory reports) from organizations electronically, and also to send information electronically to external providers and organizations, thereby potentially enhancing coordination of care. Currently, our largely paper-based health care system impedes optimal use for patient care and research. Information that enters the practice in hard copy form and is scanned in is generally difficult to use when conducting searches and analyses.

Interact effectively with the computer during patient care

This includes approaches such as attending to the patient and the computer at separate points during the visit (not both at the same time),[7,8] adjusting for "interpersonal distancing" created by the computer-patient-practitioner interaction through organization of the examination space and verbal communication strategies,[9] and reflecting on the way the patient interacts with the practitioner and the computer.[10] It is important to be aware of the potential for the EMR to drive the recording of information in the encounter at the expense of missing information the patient might be presenting.[8] Less effective patterns of interaction with the computer during a patient visit might adversely affect the amount and type of information shared by the patient, the amount of information recorded, and ultimately the quantity and quality of EMR data available for both patient care and research.

Understand the context within which EMR data are created

At the practice level, it is important that members of the team are familiar with the recording habits of the group to aid in interpreting the information present in the patient charts. When EMR data are used for secondary

purposes such as research, it is imperative that primary health care practitioners link with policy makers, managers, and researchers to help them understand both the nature of EMR data and the context within which primary data collection and use occurs. This needs to be done with the recognition that the focus of the clinician is on excellent information for patient care, rather than for other purposes. However, "routinely collected primary care data" can be used successfully for research.[11] As a final note, it is critical that data quality be assessed when data are used for purposes that go beyond individual patient care.

By attending to the considerations discussed in our 3 previous papers, as well as the 5 essential conditions described in this last paper of our Hypothesis series, Dr Park and her team are confident in their ability to achieve the final stage of their EMR adoption—optimizing EMR use for patient care and research.

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Competing interests

Dr Cejic is the Chair of the Physician Advisory Board of Nightingale Informatix for 2011-2012 (the vendors of the electronic medical record that **Dr Cejic** uses). None of the other authors has any competing interests to declare.

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References

1. Ryan BL, Cejic S, Shadd JD, Terry A, Chevendra V, Thind A. You and your EMR: the research perspective. Part 1. Selecting and implementing an EMR. *Can Fam Physician* 2011;57:1090-1. Available from: **www.cfp.ca/content/57/9/1090.full**. Accessed 2012 Apr 20. Erratum in: *Can Fam Physician* 2011;57:1126.
2. Ryan BL, Shadd JD, Terry A, Cejic S, Chevendra V, Thind A. You and your EMR: the research perspective. Part 2. How structure matters. *Can Fam Physician* 2011;57:1473-4. Available from: **www.cfp.ca/content/57/12/1473.full**. Accessed 2012 Apr 20.
3. Shadd JD, Cejic S, Terry A, Ryan BL, Stewart M, Thind A. You and your EMR: the research perspective. Part 3. Answering practice-level questions. *Can Fam Physician* 2012;58:344-5. Available from: **www.cfp.ca/content/58/3/344.full**. Accessed 2012 Apr 20.
4. Linder JA, Ma J, Bates DW, Middleton B, Stafford RS. Electronic health record use and the quality of ambulatory care in the United States. *Arch Intern Med* 2007;167(13):1400-5.
5. Schoen C, Osborn R, Doty MM, Squires D, Peugh J, Applebaum S. A survey of primary care physicians in eleven countries, 2009: perspectives on care, costs, and experiences. *Health Aff* (Millwood) 2009;28(6):w1171-83. Epub 2009 Nov 2.
6. Friedberg MW, Coltin KL, Safran DG, Dresser M, Zaslavsky AM, Schneider EC. Associations between structural capabilities of primary care practices and performance on selected quality measures. *Ann Intern Med* 2009;151(7):456-63.
7. Shachak A, Reis S. The impact of electronic medical records on patient-doctor communication during consultation: a narrative literature review. *J Eval Clin Pract* 2009;15(4):641-9. Epub 2009 Jun 10.
8. Booth N, Robinson P, Kohannejad J. Identification of high-quality consultation practice in primary care: the effects of computer use on doctor-patient rapport. *Inform Prim Care* 2004;12(2):75-83.
9. Margalit RS, Roter D, Dunevant MA, Larson S, Reis S. Electronic medical record use and physician-patient communication: an observational study of Israeli primary care encounters. *Patient Educ Couns* 2006;61(1):134-41.
10. Pearce C, Arnold M, Phillips C, Trumble S, Dwan K. The patient and the computer in the primary care consultation. *J Am Med Inform Assoc* 2011;18(2):138-42. Epub 2011 Jan 24.
11. de Lusignan S, Hague N, van Vlymen J, Kumarapeli P. Routinely-collected general practice data are complex, but with systematic processing can be used for quality improvement and research. *Inform Prim Care* 2006;14(1):59-66.

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