

EDITORIALS

Implementation of an electronic health record

Involves numerous challenges, but examples show it can be done successfully

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Implementing an electronic health record along with computerised provider order entry and clinical decision support is hard. Integrating these advanced technologies into a complex and rapidly changing healthcare delivery environment is a major task, but the associated cultural, process, and change management obstacles make the task even harder. Furthermore, the challenges and costs often accrue long before any real value of the effort is seen.

The current controversy regarding the NHS effort to implement a system-wide electronic health record is a good case study of how difficult these initiatives can be.¹ When health systems encounter the associated and inevitable difficulties, the natural inclination is to question whether the aggravation and effort is worthwhile. This is clearly at the core of the debate in the United Kingdom regarding the NHS effort. At such times, leaders who are seriously interested in improving the safety, quality, efficacy, and cost of care need to do what all good leaders do—pause, carefully assess the situation, and learn from the experience of their efforts as well as that of others. They should then use this knowledge to determine how to achieve the ultimate goals of the initiative—better and more efficient care for patients.

The implementation of an electronic health record that produces value for patients and purchasers is a continuous learning opportunity. This is shown by Sheikh and colleagues in a linked longitudinal qualitative evaluation (doi:10.1136/bmj.d6054), which assesses the implementation and adoption of the NHS Care Records Service in 12 English “early adopter” hospitals.² Overall, the authors concluded that implementation of the NHS service was time consuming and challenging, with limited distinct benefits for clinicians and no clear advantages for patients. Although the study highlights the difficulties of these endeavours, it should not dissuade clinicians or policy makers from striving for the ultimate goal—to provide healthcare value defined by higher quality, increased safety, and greater access to good care at a reasonable cost.

This goal is not possible without using a combination of advanced information technology and knowledge management to capture, code, and disseminate health information in the form of electronic health records. Such records have enormous potential to improve the flow of information across healthcare settings and systems. Furthermore, computerised provider order

entry coupled with advanced clinical decision support can improve the safety, quality, and cost of care.³ The implementation of electronic health records is not about digitising the paper chart, but about laying the foundation for achieving better outcomes through better access to information and better decisions.

What are the key practical lessons for those who are trying to implement such systems? A summary report by the National Alliance for Health Information Technology provides some useful categories of crucial success factors.⁴

The goal is to improve care, not information technology. IT is a powerful enabler, nothing more. Crucial success factors are: careful definition of project goals in terms of better care for patients, development of metrics to measure progress in achieving these goals, creation of change management and comprehensive communication plans, and the refinement of organisational policies and procedures to reflect the changes produced by the implementation.

Manage culture and change. It is crucial to understand the culture of an organisation. New systems inevitably introduce major changes to traditional care processes and work flows, which often produces substantial resistance from staff. A comprehensive change management plan is crucial to overcoming cultural resistance and should provide the education and motivation people need for change to happen.⁵

Engage clinicians. The views of those involved in the implementation must be built into the implementation early and often. Clinical groups led by respected clinical champions must be educated, informed, inspired, and engaged. They should be involved in creating the project goals and standard success metrics, participate in the development and execution of the communication plan, validate clinical process and workflow changes, and help to inform and influence their clinical peers as to why the initiative is important to patient care.

Improve processes and workflow. Implementations are an opportunity to examine current processes and workflow practices, eliminate unnecessary workarounds, and improve the delivery of care. Without proper analysis, inefficient practices can become simply entrenched rather than improved. If existing process and workflow are adequate, maintain them.

Test on the end user. End user testing should be done before implementation and feedback should be incorporated.

Train and educate. Careful attention to methods of training and how it is offered will pay dividends in terms of acceptance by the end user and achievement of organisational goals. Too much training overwhelms users with information and can become annoying, but too little will mean goals are not achieved. Just in time training (training shortly before implementation) often works best for busy clinicians. Such training can include practice systems, online courses, and “at the elbow” ad hoc support from other knowledgeable users.

Communicate. Communicate frequently about progress, challenges, and mistakes.⁴ It is also equally important to listen and respond to constructive feedback.

Incorporating advanced information technology into the complex care delivery environment so that it improves care processes and work flows while also not harming patients or alienating clinicians is difficult. Years of experience show that electronic health records and clinical decision support can be implemented to improve individual and population health,⁶⁻⁹ but it is not easy. The literature is full of examples of lessons learnt, mistakes made, and outright failures.¹⁰⁻¹² It is therefore important to view the implementation as a learning opportunity, and not simply as either a success or a failure.

Competing interests: The author has completed the ICMJE uniform disclosure form at www.icmje.org/coi_disclosure.pdf (available on request from the corresponding author) and declares: no support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous three years; no other relationships or activities that could appear to have influenced the submitted work.

Provenance and peer review: Commissioned; not externally peer reviewed.

- 1 Cross M. Government announces end of NHS IT programme—for second time. *BMJ* 2011;343:d6175.
- 2 Sheikh A, Cornford T, Barber N, Avery A, Takian A, Lichtner V, et al. Implementation and adoption of nationwide electronic health records in secondary care in England: final qualitative results from prospective national evaluation in “early adopter” hospitals. *BMJ* 2011;343:d6054.
- 3 Massachusetts Technology Collaborative. Saving lives, saving money: the imperative for CPOE in Massachusetts, 2008. www.nehi.net/publications/8/saving_lives_saving_money_the_imperative_for_computerized_physician_order_entry_in_massachusetts_hospitals.
- 4 Rules of Engagement. Summary report by the National Alliance for Health Information Technology. 2006. https://dl.dropbox.com/u/17591589/NAHIT.pdfhttps://dl.dropbox.com/u/17591589/BMJ_References/NAHIT_review_on_CPOE_approach_and_Lessons_Learned%5B1%5D.pdf.
- 5 Kotter JP. *Leading change*. Harvard Business School Press, 1996.
- 6 Hug BL, Witkowski D, Sox C, Keohane C, Seger D, Yoon C, et al. Adverse drug event rates in six community hospitals and the potential impact of computerized physician order entry for prevention. *J Gen Intern Med* 2010;25:31-8.
- 7 Schnipper JL, Liang C, Hamann C, Karson A, Palchuk M, Sherlock M, et al. Development of a tool within the electronic medical record to facilitate medication reconciliation after hospital discharge. *J Am Med Assoc* 2011;18:309-13.
- 8 Schnipper JL, Hamann C, Ndumele C, Liang C, Carty M, Karson A, et al. Effect of an electronic medication reconciliation application and process redesign on potential adverse drug events. *Arch Intern Med* 2009;169:771-80.
- 9 Fiumara K, Moniz T, Churchill W, Bane A, Luppi C, Bates D, et al. Case study on the use of health care technology to improve medication safety. In: Porche RA, ed. *Medication use: a system approach to reducing errors*. 2nd ed. Joint Commission Resources. 2007:103-14.
- 10 Chin HL. The Reality of EMR implementation: lessons from the field. *Permanente J* 2004;8:43-7.
- 11 Keshhavjee K, Bosomworth J, Copen J, Lai J, Kucukyazici B, Lilani R, et al. Best practices in EMR implementation: a systematic review. Proceedings of the 11th International Symposium on Health Information Management Research. 2006. https://dl.dropbox.com/u/17591589/Keshavjee.pdfhttps://dl.dropbox.com/u/17591589/BMJ_References/Best_Practices_in_an_EMR_Implementation_-_A_systematic_review.pdf.
- 12 Ovreteit J, Scott T, Rundall T, Shortell S, Brommels M. Implementation of electronic medical records in hospitals: two case studies. *Health Policy* 2007;84:181-90.

Cite this as: *BMJ* 2011;343:d5887

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