

AMDIS Case Conference

Implementing Electronic Health Records in a Small Subspecialty Practice

¹M. Terpenning; ²A. Berlin; ³J. Graham

¹Santa Monica Hematology-Oncology Consultants, Santa Monica, CA, USA; ²Independent Consultant, San Francisco, CA, USA;

³NorthBay Health System, Fairfield, CA, USA

Keywords

Change management; electronic health records; hematology-oncology; small practice

Summary

Electronic health record adoption has failed to achieve critical mass in small private practices in no small part due to lack of leadership; the challenge of cultural change; and the difficulty of adapting to new automated workflows. We present one small practice that successfully navigated these obstacles, and examine its accomplishments through the lens of organizational psychology.

Correspondence to:

Justin Graham, MD MS
NorthBay Health System
75 Larry Lane
Oakland, CA 94611
USA
E-mail: jgraham@gmail.com

Appl Clin Inf 2011; 2: 158–164

doi:10.4338/ACI-2010-11-CR-0066

received: November 17, 2010

accepted: March 31, 2011

published: May 18, 2011

Citation: Terpenning M, Berlin A, Graham J. AMDIS case conference – implementing EHR in a small subspecialty practice. *Appl Clin Inf* 2011; 2: 158–164
<http://dx.doi.org/10.4338/ACI-2010-11-CR-0066>

Introduction

In this feature, a case report illustrating a common applied clinical informatics dilemma is presented by a clinician and discussed by expert informaticians who have addressed similar difficulties elsewhere.

Case Report

Santa Monica Hematology-Oncology Consultants (SMHOC) is an urban four-physician hematology-oncology practice founded in 1988, which implemented an electronic health record system (EHR) in 2007. The practice, staffed with 4 oncology nurses, 4 medical assistants (MAs), an administrator, and 7 ancillary staff, sees over 120 patients daily, including over 20 patients a day receiving cancer treatments in its private office setting.

SMHOC has a longstanding commitment to the use of information technology (IT) as a valuable tool to improve the quality of patient care, support the business office, and give the practice a competitive edge. As early as the 1990s we began outfitting physicians, nurses and MAs with Palm Pilots loaded with medical software and established remote access to local hospital record clinical information systems. We developed a public website in 2004 permitting secure patient requests for services and communications. The practice also had developed standardized paper documentation tools that were easily audited and reproducible as a preparatory step for electronic health records (EHRs).

In 2006, we felt prepared to move to an EHR after performing a practice readiness analysis that involved a thorough review of our

- Extant medical records processes
- Physical plant
- Staff and physician computer expertise and commitment
- Financial health
- Technology infrastructure
- Overall practice strengths and weaknesses

We subsequently formed an EHR committee, with physician leaders and cross-department membership, which was charged with establishing the objectives for EHR selection. After an internally managed needs assessment and review of the marketplace, SMHOC retained a consulting firm to assist with final selection and manage vendor contract negotiation.

After vendor selection, we went into a pre-implementation planning phase that was critical to our success. In particular, we made decisions, months in advance of implementation, regarding

- Selecting paper chart sections to scan into the chart, and the timing of scanning
- Preloading of problem list and medication and allergy profiles
- Phasing of implementation, saving chemotherapy administration for last
- Temporarily increasing MA staffing to assist in preloading data and maintaining patient flow

The physician and administrator teams worked side-by-side on the front lines with staff at all levels in all departments to train and to revise workflows that were ineffective. Establishment of confident use of the EHR by the front staff and MA was felt to be central to maintaining office stability prior to automating physician workflow. Minor technology problems and product related issues were transcended by teamwork, the legacy culture, strong physician leadership and IT support.

Our implementation was staged to allow us to build incrementally upon small successes. The first phase involved the entire staff learning basic communication tools (e.g. phone notes) in the electronic chart that replaced paper (or verbal) workflows. Next, MAs began to document their lab and injection visits. We had recognized the potential for nursing error in drug administration due to change in workflow, and kept oncology nursing using paper charts until other clinicians had smoothly completed the transition. However, we failed to anticipate the difficulty our physicians would have in transitioning to electronic charts, despite two months of dedicated work on documentation templates and forms.

Oncology and hematology are data-driven specialties: physicians review and integrate data from multiple sources including serial radiology images and serial laboratory results. Physicians have de-

veloped mental heuristics that allow them to rapidly review all of this data and develop judgments that are documented formally in the medical record. After implementation, external records that previously could be spread out on a desk could now only be viewed as serial windows on a single screen. Despite our extensive preparation, we had not taken into account our visual dependence in data review and the need to transition our workflow. Rapid decisions became difficult and productivity dropped. The learning curve was at times slow, very individualized, and not age dependent.

With a touch of pragmatic sadness, we began to print out reports that had been scanned to have them in front of us as we created our notes in the EHR. We had retreated back to paper! Realizing that we needed to create more efficient work habits, we implemented split screen monitors to be able to simultaneously review charts while dictating or typing. Physicians soon gained the ability to track fine details between screens without printing out paper documents. As a group, we shared ideas freely on finding shortcuts and pathways to restore our ability to make prompt decisions and regain our productivity.

One essential aspect of clinical decision-making in oncology involves complex order writing for the use of toxic drugs. Policies and procedures guiding order preparation, format, and monitoring of toxicities are an integral part of an oncology practice, with goals of 100% accuracy in prescription and administration. Anticipating the potential for errors as physicians were getting up to speed on the EHR, we kept chemotherapy orders on paper as we set up a formal order-error monitoring system. The nursing staff reviewed all clinical orders and tracked errors with immediate notification of the involved physician. We waited to regain the speed and accuracy of our prior decision-making by tapping into our tacit knowledge of oncology developed over many years through our newly learned neural pathways for data assimilation. Then we leveraged our extensive experiences as physicians to modify our own work patterns, keeping within the functionality of the EHR, for review and confirmation of orders, admixture, and documentation to maintain practice quality standards.

Despite extensive preparation and a culture that welcomed the strategic use of health IT, the unexpected consequence of relearning the skills of data gathering in the electronic paradigm caught us by surprise. Fortunately, we were able to rely on the practice's deeply held values of safe practice principles, perseverance and organizational vision to preserve the integrity of our patient care.

Discussion

By all accounts, SMHOC's EHR implementation is an early adoption success story. Well-resourced in technology savvy and managerial competence, the practice invested in "strategic IT planning," staffed a multi-disciplinary EHR committee, and articulated a sound methodology for vendor selection.

The data on EHR implementations – in both ambulatory and acute settings – tell a very different story. Technology adoption success rates are estimated at 30–60% [1, 2], and when successful, it is the norm for IT projects to exceed time and budgetary expectations [2, 3]. An immature but growing literature on EHR implementation success factors – physician champions, stakeholder and end-user buy-in, resources dedicated to workflow redesign [2, 4] – correlates with key features of this case study's success. SMHOC's EHR committee was multi-disciplinary, RFI development was preceded by thorough review of IT infrastructure and functional requirements, and, most importantly, after go-live, "minor technology problems and product related issues were transcended by teamwork, the legacy culture, strong physician leadership and IT support."

Intangible yet not inconsequential, the culture of a medical practice and the quality of its teamwork are central to the fate of the organizational crisis that is an EHR implementation. Research in failed implementations highlights problems with "peopleware" as a key cause [2]. How is it that in some environments, unanticipated outcomes and "glitches" are "transcended" while elsewhere they make for dead ends?

The field of organizational psychology is beginning to delineate predictors of implementation success. In an article entitled "A theory of organizational readiness for change," organizational psychologist Bryan Weiner posits that an organization's readiness for change is embedded in a context of its prior history of change efforts, its structure and culture; and is more proximally determined by the inter-related factors of individual commitment to change and "change efficacy." This latter di-

mension he defines as “a function of organizational members' cognitive appraisal of three determinants of implementation capability: task demands, resource availability, and situational factors” [5].

At SMHOC, a history of staff development through technology exposure – such as Palm Pilots for nurses – fostered a culture inclined to embrace both change and IT, long before the EHR implementation began. A practice tradition of physician leadership regularly spending time “on the front lines” problem-solving with front desk, billing, and other support staff set the collaborative tone for the cross-departmental EHR committee and provided important organizational context for the committee's inclusive decision-making by consensus. Generous resource allocation to iterative workflow re-engineering before and after go-live reduced task demands and enhanced resource availability for the physicians: when changes in workflow forced them to master novel data processing habits, the “slow, very individualized, and not age dependent” relearning was facilitated by a temporary and creative paper-based work-around. The practice's ability to tolerate a range of learning styles and paces among physicians exemplifies Weiner's concept of change efficacy. Rather than coerce compliance, the organization made an accurate assessment of the unanticipated workflow stumbling block and was quick to address it – prioritizing accommodation over project completion.

Of course, the “sadness” that accompanied this disappointing setback to paper-based workflow highlights an often-overlooked dimension of EHR implementations: they are emotional. They are emotional because they involve people and they involve change. The cornerstone of successful EHR implementation, behavior change, as the preceding case study demonstrates, is not the same thing as workflow redesign. Even when users are motivated, as was the case for SMHOC's physicians, behavior change may come at a frustratingly slow pace and unearth upsetting emotions along the way. As the clinic leader describes, despite an enviable combination of leadership and preparation, SMHOC was “caught...by surprise.”

Organizational leaders often confuse emotional responses to change initiatives with resistance to be overcome [6]. Resistance, while challenging, is in fact a sign of engagement, and effective leadership requires working with – as opposed to against – the emotions behind it. The techniques for responding to emotional cues listed in ► Table 1 are drawn from the field of change management. Equal parts art and science, change management is “a structured approach to transitioning individuals, teams, and organizations from a current state to a desired future state. It is an organizational process aimed at empowering employees to accept and embrace changes in their current business environment [7].” David Garets, the editor of a recent HIMSS publication, *Change Management Strategies for an Effective EMR Implementation*, locates change management at the core EHR implementations: “[EHR] deployments are not about technology. They are about equipping organizations to reach critical business objectives by providing people with the technical capabilities that make new things possible and by engaging people in changing their behavior to effectively use the new capabilities to generate results” [8]. A recent survey of CIOs in health systems with advanced use of EHRs highlighted change management as “critical to [implementation] success as information technology (IT) planning and execution” [9].

William Bridges, author of *Managing Transitions: Making the Most of Change*, defines the period that typically follows the first steps of organizational change as a “neutral zone” which he describes as “a disorienting sort of ‘nowhere.’” [10]. As the SMHOC example demonstrates, strategic IT planning in health care organizations should anticipate the disorientation, frustration, despair, and shame that high-achieving health care workers experience as they fall from master clinician to novice EHR user. Open communication channels should be leveraged, whether via formalized meetings or informal presence of leadership on end-user front lines. This is not only to drive optimization of the EHR, but also to provide a forum for attuning to and supporting workers through their emotional neutral zones. Transparency regarding errors, including well-articulated error contingency plans, such as SMHOC's order checking protocol for chemotherapy orders, reassures workers whose fears of making mistakes might limit their ability to adapt to new workflows. Modified productivity expectations, increased staffing, and advanced planning for staff turnover help preserve morale.

As organizational psychologist David Armstrong writes, “Every organization is an emotional place. It is an emotional place because it is a human intervention, serving human purposes and depending on human beings to function. And human beings are emotional animals; subject to anger, fear, surprise, disgust, happiness or joy, ease, and unease.” The SMHOC case study is a story of technology deployment in a culture with a well-established commitment to staff development and staff

empowerment. “Staged...to build incrementally upon small successes,” focusing first on support staff’s experience of “confident use” of the EHR, and then on physicians, the pace of the SMHOC implementation both anticipated and accommodated the emotional highs and lows of its workers’ “neutral zones.” Technical know-how, an attuned finger on the pulse of the front line experience, and project leadership poised to respond to emotional cues at all levels of the organization led together to tolerable and sustainable change.

Acknowledgments

The authors thank Christoph Lehmann for his support and advice.

Conflict of Interest

Dr. Terpenning’s clinic is a reference site for GE Healthcare and Intrinsic (the electronic health record implemented in this case report), and she consults for Intrinsic. She has also received honoraria from MGMA. The remaining authors report no conflicts of interest.

Human Subjects

No human subjects were involved in this study.

Table 1 Change management in EHR implementations: taking the emotional pulse

Technique	Example
Monitor non-verbal communication	While discussing anticipated milestones for an upcoming EHR implementation, a project leader notices the exchange of a derisive glance between two colleagues. She responds by inviting meeting participants to voice concerns and criticisms regarding the project and timeline.
Be curious	When one of the staff at the meeting rejects the milestones as "unrealistic," the project leader resists the temptation to reassure/defend; instead, she probes his concerns until she can accurately reflect them back to him.
Invite problem solving	Having clarified his concerns, the project leader invites others to juggle organizational tensions: "What are your suggestions for how we can address the conflicting priorities of our current backlog with the need to go-live, in order to remain in compliance, by June 1?"
Be prepared to change	When one of the meeting participants suggests bringing on temporary staff to eliminate the backlog before EHR deployment, the project leader, aware that this will nonetheless shift resources away from go-live efforts, makes a commitment to incorporate this process into the project timeline.
Provide alternate communication channels	After the meeting, the project leader seeks feedback from staff members who did not contribute to the group discussion. She values their input, but knows they hesitate to speak out in front of large groups.

References

1. Morton ME, Wiedenbeck S. A framework for predicting EHR adoption attitudes: A physician survey. *Perspect Health Inf Manag* 2009; 6: 1–19.
2. Lorenzi NM, Smith JB, Conner SR et al. The success factor profile for clinical computer innovation. *Stud Health Technol Inform* 2004; 107: 1077–1080.
3. Gans D, Kralewski J, Hammons T, Dowd B. Medical groups' adoption of electronic health records and information systems. *Health Aff* 2005; 24: 1323–1333.
4. Miller RH, Sim I, Newman J. *Electronic medical records: lessons from small physician practice*. Oakland (CA): California HealthCare Foundation (US); 2003 Oct.
5. Weiner B. A theory of organizational readiness for change. *Implementation Science* 2009; 4: 67–76.
6. Ford JD, Ford LW. Decoding resistance to change. *Harvard Business Review*. 2009; 87: 99–104.
7. en.wikipedia.org.org [Internet]. San Francisco: Wikimedia Foundation, Inc. [updated 2010 November 6; cited 2010 Nov 11]. Available from http://en.wikipedia.org/wiki/Change_management.
8. McCarthy C, Eastman D. *Change management strategies for effective EMR implementation*. Garets D, editor. Chicago(IL): Healthcare Information Management and Systems Society; 2010.
9. Knickrehm M, Ficery K. (Accenture, Chicago, IL). *Secrets of success on EMR journey to meaningful use: leading hospital CIOs reveal key lessons learned*. Available from http://www.accenture.com/SiteCollectionDocuments/PDF/Secrets_to_Success_on_the_Journey_to_Meaningful_Use.pdf.
10. http://www.managementconsultingnews.com/interviews/bridges_interview.php [Internet]. Oregon: MindShare Consulting LLC; c2010 [cited 2010 Nov 11]. Available from: http://www.managementconsultingnews.com/interviews/bridges_interview.php.
11. Huffington C, Armstrong D, Halton W, Hoyle L, Pooley J, editors. *Working below the surface*. London: Karnac; 2004.