

Managing Practice Disruption from EHR Implementation in Primary Care Settings: One
Regional Extension Center Experience

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Abstract

EHR implementation carries major financial and organizational risks as documented in studies done in large healthcare organizations. Regional Extension Centers, funded by the Office of the National Coordinator for Health IT under the ARRA-HITECH of 2009 have amassed a wealth of experience on EHR implementation in small primary care practices. The Washington Idaho Regional Extension Center (WIREC) has identified important patterns in implementation errors that result in financial loss, practice disruption and patient safety issues. These errors pertain to leadership, workflow, provider engagement, training, data interfaces and the user interface. For each category we describe the errors in detail and recommend specific strategies that primary care practices of all sizes can use to minimize the risk of practice disruption and the associated costs.

Introduction

Studies of EHR implementation have documented the difficulty of the process (1)(2)(3), yet most of the research on EHR implementation challenges comes from large organizations (4)(5)(6). The Regional Extension Centers (REC) for Health Information Technology program, included in the 2009 ARRA-HITECH Act, has taught us about EHR implementation in smaller practices (7)(8). The experience of one such REC program, the Washington & Idaho Regional Extension Center (WIREC) is documented here.

EHR implementation requires orchestrated information technology and business-process “system builds” in which end users understand their workflows, each technology component works properly with its corresponding workflow, and every end-user knows how to use relevant software components. However, the traditional model of EHR implementation focuses on the technology with inadequate appreciation for the amount of training required for the complexity of the user interface and change management issues affecting how care teams work together. Implementation timelines are invariably technology-driven, focusing on the culminating event in which all EHR components are turned on, used simultaneously, and expected to function, which it typically they do not. Clinics that experience more successful implementations do so by understanding how technology fits the users’ needs in advance, setting expectations, planning for change management, preparing workflow changes and avoiding common errors (9).

The Setting:

WIREC is a program of Qualis Health, a nonprofit healthcare consulting organization based in Seattle, Washington. WIREC delivers health IT consulting services to over 3,000 primary care providers in the Northwest in more than 630 practice locations, with an average of 4 providers per practice. By the end of its second year WIREC had assisted 70 percent of enrolled providers in fully implementing an ONC-ACTB certified EHR. WIREC has gained insight into the factors determining success or failure of EHR adoption in small practices as demonstrated in the following vignettes.

In Clinic A the physician owner made the EHR selection without input from employees including other providers leading to disengagement first by providers and then by other employees following their example. Decisions about placement of terminals and printers were made without input from front line staff that would be using the equipment. Several medical records clerks were assigned to scanning paper charts in preparation for implementation without considering the value of various data elements. The vendor gave the clinic a list of tasks including creating charting templates, order sets and preference lists, however no one was responsible for assuring each task was understood and completed. Meetings to review workflow lacked focus and participants ended up talking about something else. To control costs a small number of clinic personnel were trained with the assignment to train remaining clinic staff over several months before go-live. Planning efforts focused on the providers' computer use, and front desk workflows weren't addressed until days before go-live. Go-live was scheduled when the clinic owner was planning to be away. Providers were frustrated with the process, complaining loudly in the hallways. Both staff and providers felt demoralized by the end of implementation.

In Clinic B a senior physician supported the EHR. He led planning meetings, sending out weekly communications to all staff setting expectations for how the practice would change. Two younger providers enthusiastically endorsed the EHR. One became familiar with the software to find all the “cool” things it could do while the other encouraged more skeptical colleagues. While still using paper charts the clinic mapped and standardized key workflows to plan how the processes would work with the EHR. The EHR committee led by these physicians met weekly to build templates, order sets and preference lists. After planning for the clinic’s top 100 diagnoses they developed plans for setting up new tools post go-live. The clinic hired two employees to enter key information, including medications and past medical history into the EHR before go-live. Training was required. Both staff and providers were pulled out of clinic for training. The go-live date was pushed back once to assure the lab interface was operational. When the clinic implemented the EHR they went live one team at a time. On-site trainers focused their support on the team going live and teams that had just completed implementation. The process went smoothly, and drop in productivity at any given time was comparable to having one or two providers on vacation.

These vignettes reveal patterns of preparation for EHR implementation that can lead to avoidable errors (Clinics A) or successful adoption (Clinic B). Each error carries costs that reduce the likelihood of success, seriously jeopardizing a medical practice’s financial viability and negatively impacting patient care. The implementation errors causing practice disruption were organized into six categories (shown in Table 1), along with suggested strategies for successful EHR implementation.

Type of Error	Detailed description
Leadership	<ul style="list-style-type: none"> ▪ Lack of unconditional leadership support with the skills, knowledge and engagement to manage the project. ▪ Poor decision-making structure, or the wrong people in leadership to drive the health IT project. ▪ Lack of good bi-directional communication between leadership and staff with an understanding of the principles of change management.
Workflow	<ul style="list-style-type: none"> ▪ Failure to understand the overwhelming importance of workflow in determining productivity, and inadequate workflow mapping prior to go-live. ▪ Failure to set up an “easiest way” to see patients and document visits prior to go-live. ▪ Failure to assign specific roles for data gathering and data entry. ▪ Failure to do a full walk-through to identify gaps and determine where devices should be located to support workflows.
Providers	<ul style="list-style-type: none"> ▪ Absence of a strong clinical champion. ▪ Failure to have full provider support and buy-in for the project with full provider participation in the selection process. ▪ Failure of physicians to understand their role, leading to counterproductive physician behavior.
Training	<ul style="list-style-type: none"> ▪ Underestimation of the amount of training required. ▪ Failure to time the training so users can absorb it. ▪ Failure to assure that providers complete training. ▪ Failure to have a full dress rehearsal before go-live. ▪ Failure to provide sufficient real-time support during go-live when the risks are greatest, the learning potential is highest and when staff need training the most.
Data Interface	<ul style="list-style-type: none"> ▪ Failure to build, test and implement all essential interfaces for lab and imaging prior to go-live. ▪ Failure to migrate the right information from legacy systems and paper records.
User Interface	<ul style="list-style-type: none"> ▪ Failure to properly configure and test all essential EHR features. ▪ Failure to create and test tools including charting templates and preference lists needed to see patients, place orders, and document visits. ▪ Failure to organize charting tools so they can be easily found. ▪ Failure to limit customization prior to go-live. ▪ Failure to plan for prioritizing fixes and customization after go-live.

Table 1. The most common errors in primary care EHR implementation contributing to practice disruption.

Leadership Issues:

Common Errors:

Most leadership problems stem from inadequate leadership support. The failure to manage the EHR implementation project is often caused by lack of skills, knowledge and understanding of change management principles. Frequently smaller practices have decision-making processes lacking structure including formal communications with staff.

Recommendations:

1. Leadership's responsibility is to establish specific organizational aims and develop and oversee a strategy executed at the highest governance level. This requires articulating a business case for clinical quality as well as resource allocation, removal of barriers and full engagement of providers and patients (10)(11).
2. Develop a shared understanding of the need to use information technology to measure and manage clinical quality.
3. Ensure a framework for communications about health IT priorities within the clinic, both for top-down and bottom-up communication.
4. Help the clinic understand that they are embarking on continuous practice transformation that involves technology, not a technology project that involves healthcare (12).

Workflow Issues:

Common Errors:

Clinical personnel, including providers, often lack insight into the clinic's workflows and roles others play in care delivery. This blind spot results in inadequate planning for the most important determinant of successful implementation. Most organizations must backtrack after go-live to fix (i.e. standardize) workflows in an effort to recover from the resulting productivity drop. Without identifying standardized best practices to do the work, every user is left to struggle alone with a complex and confusing user interface without agreement on how information should be gathered, who should enter it and where it is entered. There is commonly a lack of understanding of how the information is processed and organized or where in the workflow the information will be used and by whom. Performing a pre go-live "walk-through" to visualize how information flow integrates with workflow allows the team to optimize processes in advance. It also avoids improper hardware placement including workstations, printers and scanners that is costly to repair after go-live.

Recommendations:

1. Clinics should map and standardize workflows before EHR selection, using what they learn to determine which EHR tools best support their workflows. If that step has been missed workflows should be mapped before implementation. Relying on vendor-suggested standard workflows rarely works because the set-up of each practice is different and clinic personnel need a clear understanding of how the technology supports their own workflows. Workflows should be mapped and redesigned by the

front line staff doing the work. Workflow mapping should include both current processes and envisioned future processes. On-site walk-through exercises should be conducted to assure that hardware is placed and technology is configured to deliver the right information to the right person at the right time.

2. In general, data entry by providers should be confined to actual clinical decisions such as ordering tests and treatments or entering diagnoses. Whenever possible support staff should enter other data. Many provider data entry tasks can be “set up” by support staff using written protocols in which the provider pushes the button to place the order.

Provider Issues:

Common Errors:

Many EHR implementation projects fail from underestimating the importance of one or more strong clinician champions to serve as opinion leaders for providers in the clinic. The clinician champion must guide colleagues in understanding their roles in the implementation and enlist their involvement in such complex tasks as EHR selection, workflow redesign, template development and quality improvement (13). Without a champion, dysfunctional physician behavior can easily undermine the project with negative messaging to staff and even result in “hijacking” the project through endless demands for poorly thought out changes that delay implementation and prolong the stabilization period.

Recommendations:

1. Identify one or two clinical champions and define their roles.

2. Work with the clinical champion(s) to engage providers early in the selection and adoption process.
3. Focus on efforts to reduce waste and improve clinical outcomes using the early adopters to lead the effort. Enlist more reticent providers to review plans and point out what could go wrong.
4. Leadership must include the clinical champion(s) in tactical decisions and difficult judgment calls including how much optimization can reasonably be completed before go-live and what to delay until after system stabilization.

Training Issues:

Common Errors:

Vendors frequently limit training to didactic sessions organized by technology feature and taking place weeks before go-live. Providers often assume they can learn anything on the spot and may skip aspects of training altogether. This assumption, combined with a natural tendency for practices to minimize costs, leads to going live with inadequate preparation.

Recommendations

1. Spend money to appropriately train staff. Consider a “train the trainer” approach, where the vendor trains internal “super users” who in turn, train other staff.
2. Training should be reality-based. Providers learn by entering problem lists, medications and preventive information on their own patients into the production EHR. In a test environment providers can use live patient simulations to document visits and place orders.

3. Consider going live with clinical support staff before providers or hiring additional “training staff” so adequate support is available for providers during go live. Providers are juggling the most complex medical thought processes, multiple distractions and time constraints while learning the most complex and broadest scope of the EHR environment.
4. Practice each major workflow repeatedly just before and during go-live. Workflows to rehearse include rooming patients, ordering common tests or procedures and end-of-visit scenarios.

Data Interface Issues:

Common Errors:

EHRs must make it easier for care teams to find information. Failure to complete and adequately test data interfaces before go-live results in “work-arounds” that contribute to post implementation costs by wasting valuable staff and provider time handling or looking for information needed at the point-of-care. Errors in data migration from legacy systems or paper charts contribute to post implementation costs by:

1. Failing to capture data likely to be required for clinical decisions including old electrocardiograms and immunization data.
2. Storing important information in ways that make it difficult to find like scanning immunization records.
3. Wasting resources entering old information into the EHR that is unlikely to be used in the future such as old progress notes.

Recommendations:

1. Do not go live without a fully functional lab interface.
2. Do not scan paper charts in their entirety.
3. Develop a data migration methodology based on specific information the EHR will need, e.g. for prevention guidelines and chronic diseases quality metrics, rather than trying to preload as much information from the old system as possible, much of which will be of limited value. Having providers enter key data from paper records into the EHR is an effective form of training before go-live (14). After go-live make the paper chart available for patient visits on a limited basis, and design a workflow for care teams to enter the key information into the EHR.
4. Encourage providers to write 1-2 sentence summaries of chronic conditions as a short abstract in the problem list instead of scanning old progress notes.

User Interface Issues:

Common Errors:

EHR user interfaces are notoriously complex with features essential to a visit crowded into small overlapping spaces on the screen. Failure to properly configure and test each feature before go-live means having to fix it later. Failure to set up an “easiest way” to conduct a visit with basic charting templates results in an “everyone for themselves” approach that spells disaster. Failure to build preference lists for diagnoses, medications and tests leaves providers scrolling through pages of choices, which is time consuming, frustrating and error prone. Preparing information management tools before go-live to create a

manageable starting point must be balanced against the risk of “over customization” that can contribute to failure through delay and distraction.

Recommendations

1. Set up office visit templates for common visit types.
2. Make preference lists with 5 to 10 choices for diagnoses, medications, and orders for as many situations as possible before go live.
3. Make sure flow sheets for vital signs and common blood tests are working.
4. For information management features that cannot be completed before go-live, create a plan for prioritizing fixes and customization.

Discussion

All healthcare organizations encounter major challenges with EHR implementation. At its worst, the result is wasted resources, frustrated alienated providers, loss of confidence by patients and families, and patient safety issues. The experience of the RECs has uncovered important patterns contributing to practice disruption. Requirements for successful implementation include strong and committed leadership to articulate a vision for change and engage providers to communicate enthusiasm to staff; optimization of critical workflows and the use of information management tools to support them; heavy investment in training and onsite support during and immediately after go-live; working interfaces to lab and radiology; a clear plan to migrate patient data into the EHR; and an assurance that each feature is configured properly prior to go-live. .

RECs provide value by identifying existing gaps in preparedness required for EHR implementation and helping providers and staff understand the broader context of healthcare transformation that relies heavily on health IT to engage patients, coordinate care, reduce health disparities, and improve population health (15)(16). Providers and office staff can be strong partners for successful implementation if they view the technology as a tool to make it easier for them to get through their day with less wasted effort and take better care of their patients. Carefully executed EHR implementation and meaningful EHR use, for all the challenges, are necessary for them to do that.

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