Rapid Implementation of an Electronic Health Record in an Academic Setting

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ABSTRACT

One of the sources of resistance to the implementation of electronic health records is that it often takes years to roll out a fully functional system. The George Washington University Medical Faculty Associates (MFA) has set a new standard for rapid EHR implementation by bringing 99 physicians and 130 residents and interns live in less than 30 days in a complex academic setting. MFA leveraged a rapid implementation process based on study of previous successful implementations. The rollout plan incorporated aggressive hands-on education, in-person and virtual training modules for self-review, and a leadership triad of physicians, administrators, and information technology experts.

KEYWORDS

■ Electronic Health Record (EHR) ■ Electronic Medical Record (EMR)
■ Implementation ■ Physician utilization ■ Medical Faculty Associates

Rolling out a full-purpose electronic medical record (EMR) can take years at many organizations. George Washington University Medical Faculty Associates in Washington did it in less than 30 days. One of the capitol's largest multi-specialty physician practices, MFA relied on a unique combination of best-practices planning, just-in-time training, and aggressive support to bring 99 faculty physicians, plus 130 residents and interns and more than 200 support staff, live on the group's new EHR in just 28 days. This article offers a closer look at the MFA implementation and examines lessons learned that could potentially speed the pace of EHR rollouts in other ambulatory settings.

Paper Does Not Cut It

Like many large academic physician practices, MFA has earned a reputation as an early adopter of breakthrough clinical technologies that have transformed patient care in recent decades. Its 275 physicians in 41 medical specialties serve more than 425,000 patients each year, including many national leaders. Formerly an unincorporated part of George Washington University's School of Medicine, not-for-profit MFA separated from the university in 2000 but continues as a world-class physician training ground, currently with 400 residents overseen by MFA's physician faculty.

Despite its cutting-edge reputation, MFA has relied, like the vast majority of the nation's physician practices, on inefficient paper methods for storing patients' charts, prescribing medications, tracking laboratory test results, billing insurers, and conducting a host of everyday activities.

Reinforced by decades of habit, MFA's paper-based recordkeeping methods were labor-intensive and time-consuming. For example, physicians in the Division of General Internal Medicine had their phone messages

hand-delivered to any of three different mailboxes on separate floors of the practice's 325,000-square-foot facility. Similarly, because of the inefficiencies inherent in a paper process, it often took five to seven days to refill routine prescriptions. And getting lab results could take even longer.

Decentralized paper processes also were hurting MFA's bottom line, requiring excessive spending on human resources and by failing to capture significant revenues. As a result, MFA decided to adopt a more efficient electronic solution to enhance patient and physician satisfaction, improve recordkeeping, lower costs, accurately capture revenues, and ultimately raise the quality of care it provided by streamlining and speeding the delivery of clinical information to physicians.

MFA is not alone in making this decision—a growing number of physician practices have embraced electronic medical records in recent years. About 13 percent of hospitals and 14 percent to 28 percent of physician practices now use some form of EHR.[1] National Coordinator for Health Information Technology, David Brailer, MD, PhD, whose senior staff viewed MFA's new EHR in a November 2004 visit, has repeatedly said he believes widespread adoption of EHRs is inevitable. Several recent studies have demonstrated the technology's ability to cut expenses, boost revenues and prevent medical errors.[2,3,4,5]

Not Just Another Treadmill

After MFA decided to purchase an EMR, it evaluated six of the leading solutions on the market, basing its decision on the technology's ability to meet the practice's needs. In particular, MFA wanted an EHR product that, first, integrated seamlessly with its existing core practice management system, IDX Flowcast. Second, the solution had to support a "phased implementation," enabling MFA to roll out one module of functionality at a time rather than taking the so-called "big bang" approach of going live with the entire EHR at once (a strategy that the practice felt would strain its resources to the breaking point).

Using these criteria, MFA chose the TouchWorks EHR from Allscripts Healthcare Solutions of Chicago, which integrates seamlessly with IDX and supports a phased rollout of a highly integrated package of services, including clinical messaging, results reporting, decision support, task management, clinical documentation, order entry, and administrative processes such as scheduling, billing, claims, authorizations, and referrals.

Deploying the full EHR was anything but simple. In fact, few technology projects are as dauntingly complex as an EHR, and its implementation at MFA required the wholehearted participation of a dedicated team of professionals who were guided by a clear project governance structure. MFA leveraged a "leadership triad" consisting of the senior leadership from the administrative, physician and information technology areas of the practice. This project steering committee consisted of the chief executive officer, who was the project's executive sponsor; the director of the division of general internal medicine, the project manager and physician sponsor; the chief information officer; and the director of clinical operations.

The steering committee adopted a project governance structure that stressed the importance of defined roles, stakeholder involvement, clear escalation paths and, swift issue resolution to continue forward momentum.

The project steering committee ultimately was responsible for attaining the overall project goals, objectives, success criteria, and financial viability, as well as removing project obstacles throughout the organization, including within the governance structure). The steering committee was responsible for approving all design decisions, go/no-go decisions, the project plan, and the scope document.

The project manager was responsible for coordinating all resources in the delivery of the project, working within teams to remove obstacles when possible and escalating decisions up the governance structure when obstacles were significant.

The steering committee evaluated change requests involving scope, technical or functional matters, and pushed these requests to the board of directors if resolution could not be achieved within the team.

Work groups included individuals who provided suggestions on the design, development and delivery of the implementation. A steering committee member typically led each workgroup.

Stakeholders were identified within this structure for all key decision points, including defining the project's scope, the project plan and workflow design decisions. These stakeholders were responsible for validating recommendations made by the steering committee and providing recommendations when that group was not able to.

In addition to defining the roles of the teams, MFA defined "escalation paths" for project deliverables. An escalation path maps out the process for elevating an implementation decision or obstacle to a higher level in the project team structure when consensus cannot be achieved at a lower level. Generally, the escalation path at MFA was from the work groups and other teams to the project manager. If necessary, the project manager brought significant issues to the steering committee.

After the project's foundation was laid, the project team decided to limit the initial implementation to the 99 physicians in the Department of Medicine, which they considered the "meat and potatoes" of the medical faculty practice. The move was designed to take full advantage of the academic organization's existing departmental structure while limiting the administrative burden of managing the implementation. Because the Department of Medicine was

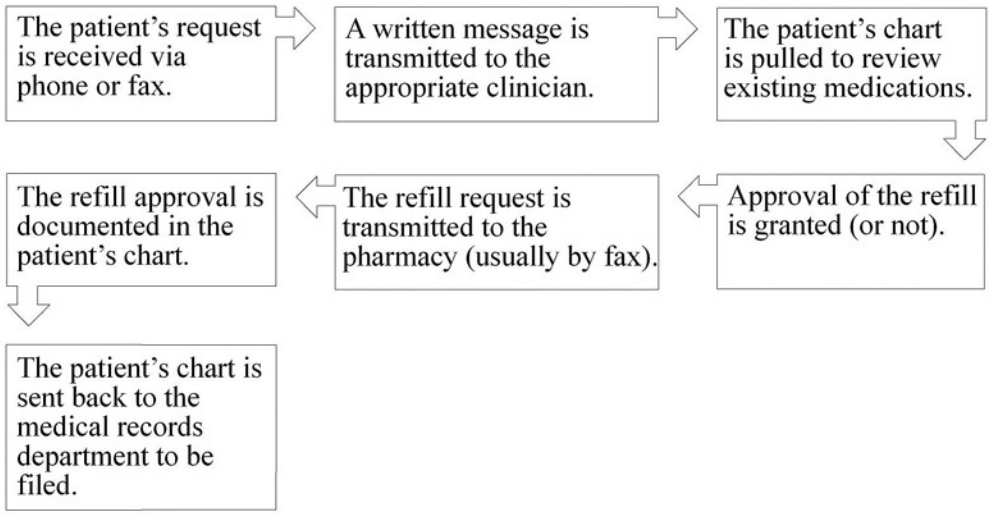

Figure 1. Medication Renewal

by far the largest of MFA's 14 departments, the steering committee reasoned that focusing on it first would enable a large percentage of the practice's physicians to adopt the EHR. Also, it would limit the administrative burden by requiring coordination with only one departmental chair instead of 14.

If the EHR implementation went over well within the Department of Medicine, the committee knew that word of its success would lay the groundwork for its later implementation in the subspecialties. Meanwhile, MFA's 130 residents and interns would all go live on the EHR along with the Department of Medicine's physicians, who each supervised at least one physician-in-training.

After deciding who should receive the EHR, the team's next important step, which they began prior to the rollout to physicians, involved mapping and analyzing the old paper-based work processes—everything from handling a refill request to tracking down laboratory reports—and then converting these "workflows" into improved electronic procedures that could be facilitated by the EHR.

The workflow is the EHR's essential blueprint, without which very little can be accomplished. A good project design based on sound workflow is what keeps an EHR from becoming a very expensive and time-consuming treadmill machine—an "impulse purchase" that sits unused in the closet because of insufficient foresight and commitment. Designing the myriad workflows that are facilitated by the EHR is a critical step necessary to guiding the implementation and avoiding wasted time during the rollout. This process is generally known within the healthcare IT industry as "workflow management by use of IT."[8]

According to the general principles of workflow management, before the project team could decide whether a paper workflow was appropriate for conversion into an electronic workflow, they first had to understand, document and measure the process. Fortunately, when the EHR project team began looking for established workflows to analyze and redesign as electronic workflows, it found numerous paper protocols in the Department of Medicine's call center that could benefit from standardization.

Designing Workflows for Easy Wins

Like many large practices, MFA long ago established a call center to address the high volume of patient calls coming to the Department of Medicine. Today, the call center receives more than 2,100 patient calls a day for the department's 100 physicians; it employs 20 full-time customer service representatives, including some with clinical experience.

Long before MFA began pursuing an EHR, the practice streamlined the call center by establishing teams of service reps and providers. A nursing team was established to take advice calls, a triage team was formed to prioritize care, and several similar teams skilled in handling specific types of calls were created. Their jobs were complicated by a lack of uniform policies; for example, nurse practitioners who decided whether to grant a patient's request for a "bridge" prescription refill did so based on their knowledge of each individual physician's policies. This led to a very time-consuming process that was not standardized. To cope with this, the call center teams had established a set of protocols—workflows—for the most common incoming calls.

The project team sat down with the call center staff and literally mapped out on a whiteboard every task and every role involved in the most common patient phone calls. Then, they analyzed the process map for efficiency and looked for ways to improve on it electronically. Medication

renewal requests, for instance, may include the steps outlined in Figure 1.

Before converting the medication renewal process into an electronic workflow, the project team examined each step to determine which ones could be automated by the EHR, which would still require human interaction, how much information should be documented in the chart, and whether the entire process could be improved. They did this for every call center task, believing that once the physicians, hospitalists and nurses got excited about using a new EHR function, the pathway for transforming the software functionality into actual human tasks within MFA already would have been established, and the provider's enthusiasm would not be dampened.

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The team labeled this electronic pathway process the "starfish method," a catchy phrase whose purpose was to assure physicians that they stood at the hub of an electronic nerve center. So when they pushed a button to write an electronic prescription, for instance, they could feel confident that someone out on one of the starfish's limbs knew how to receive that request and act upon it.

The workflow design process is complex and time-consuming in any healthcare organization, but the difficulties are multiplied in an academic setting. MFA's attending (faculty) physicians are responsible for overseeing the training of residents and interns, including seeing patients. As part of this training, the results of all test orders are routed to the attending physician for review, including those that the resident may have written. In the old paper-based system, the attending physician would sign the bottom of a resident's lab order slip and sign off on the result before sending it to the resident with written instructions. Converting this workflow into the EHR meant designing a second layer of complexity that involved special protocols for tests ordered by residents, as opposed to physicians, and for routing the results of those tests.

While the project team was developing electronic workflows and configuring them into the EHR, they also tackled the question of physical access to the new system. They realized that getting rid of the paper chart and automating every possible paper process means making access to the EHR as easy as picking up a pen and paper. After considering wireless PDAs and tablet PCs, the team settled on putting a new desktop computer in every exam room—there are 50 in the Division of General Internal Medicine alone—as well as in area pods and staff lounges.

The strategy was, in part, symbolic—few things communicate an organization's commitment to a technology project better than brand new computers with flat-panel displays. The project team believed that MFA's physicians, long accustomed to cost-cutting measures, would see the computers going in and realize this was a system they would be expected to use. That would hopefully undercut one of the most common hurdles to an EHR implementation: physician resistance to abandoning their old paper-based work patterns.

Early Implementation Strategies

Beginning in January and March 2004, the team decided to test the different elements of the newly developed EHR one at a time within select departments that fell under the umbrella of the Department of Medicine. They deployed the structured note module, for instance, in the cardio/thoracic department because the surgeons there already were accustomed to producing highly structured operative reports, increasing the likelihood that the changeover would be less traumatic and might even turn the surgeons into enthusiastic supporters who would champion adoption of the EHR. The test runs had the added benefit of uncovering workflow challenges and other design issues that needed rethinking before the system's broader rollout.

When these deployments were well-received, the project team decided to implement the entire EHR in one small department that would serve as a testbed for wider implementation. For this test, they chose the urgent care center, where patients with an existing physician relationship can receive immediate care even if their physician is unavailable. The team set a reasonable deadline for implementing the EHR in the center, but the emphasis was less on speed than on working the kinks out of the process. For instance, the project team was expanded to include clinicians from within urgent care, and these sub-teams re-evaluated the EHR's workflows in light of their more intimate departmental experience.

By May, the project team decided the foundation was in place for a much broader rollout of the EHR. Inspired by President Bush's mention of healthcare information systems in his February State of the Union speech, the team decided to push ahead with a highly aggressive, accelerated 30-day rollout to all 99 physicians in the Department of Medicine. In addition to the Division of General Internal Medicine (the largest division in the department), the full EHR would be deployed in all the medical specialties within the department, including Cardiology, Endocrinology, GI, Infectious Diseases, Podiatry, Pulmonary, Rheumatology, and Renal.

It was an ambitious undertaking. Every physician, regardless of their attitudes toward technology and no matter how busy they were, would have to be trained and prepared to

use an unfamiliar, highly technical system that would entirely change the way they did their jobs—all in four weeks' time.

Just-In-Time Training[6]

To accomplish this Herculean mission, MFA developed a phased training strategy that would focus on one or two EHR modules or components per week. The first week, they trained the physicians on Tasking and Results, two modules that let the doctors immediately appreciate how the EHR could make their lives easier. The physicians were especially impressed with Results, which let them view the lab reports from patients they had recently seen; that was a vast improvement over the reporting of the past, which reached them as a paper note days or weeks later). In the following weeks, the physicians were trained on the charge capture, electronic prescribing, clinical notes and orders modules.

Physicians were expected to commit to the entire schedule of four two-hour classroom training sessions and were scheduled into the sessions under a highly regimented formula. However, it soon became apparent that the physicians were not going to stick to their scheduled training hours. They would drop by the training center when they had a break in their schedules or at mealtime. They would stop by with five minutes to spare and ask for guidance on just one task. Almost any arrangement seemed to be preferable to the one the team had organized.

The project team realized that the training schedule they had so carefully mapped out in advance would have to be adjusted to accommodate physicians' schedules. They quickly developed a just-in-time or real-time training method that hinged on staffing a training "war room" with outsourced professional trainers and project team members from 7 a.m. to 7 p.m. Providing breakfast and lunch for the physicians proved to be an effective strategy.

In addition to flexible scheduling, the training team learned to be flexible with the content of its classroom sessions. Some physicians would come in the first week not knowing what a browser was, and the trainers would immediately downscale the session and focus on the fundamentals of signing in and using a mouse.

Another key success of the just-in-time training program was the strategy of bringing physicians up live on the EHR immediately after their classroom training. This was accomplished using one-on-one training with a member of the IS department, conducted in the physicians' own department, often at a desktop computer in an empty exam room. Some physicians requested the follow-up training immediately after group training was completed; others needed several days to clear some time in their schedules. But in all cases, the follow-up training and go-live took place within five days of the group training, so the information was still fresh in the physician's mind.

This strategy called for a large commitment of resources on the part of the IS staff, especially in maintaining a challenging "version control," with up-to-date information on which physician or support person was trained on which module or who had signature authority for charges. But the commitment was worth it because it ensured that physicians were going live on the EHR as quickly as possible, reducing the chances of non-utilization and wasted effort.

Hurdling Physician Resistance

As with every rollout of a major technology initiative, MFA experienced several serious obstacles to the EHR rollout. Chief among them was physician resistance. It is just not easy to convince seasoned healthcare professionals to dramatically change the way they are accustomed to doing their jobs.

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The MFA project team ran into this hurdle early on when they discovered many physicians were refusing to use the new system to generate referral letters. The letters between referring and consulting doctors are part of the "warm handshake" that builds professional relationships between physicians. At first, the EHR's default referral letter proved to be impersonal; it looked like a computer-generated letter because it was. The MFA project team solved this problem by leveraging the flexibility of the EHR to document their referral note in the EHR using a combination of dictation, voice recognition, existing forms, and templates, and then fine-tuned the output to make it more personalized.

However, most physician resistance proved to be less specific but was easier to overcome. In this effort, the team's best tool was the psychological phenomena known as the Eureka Effect,[7] the natural inclination to respond to novelty with interest. To induce the Eureka Effect, the team found it was critical to impress physicians right away with the EHR's capabilities. So, for instance, in the one-on-one follow-up training sessions, they would show a physician all the labs they had ordered in the past month and tell them that, from now on, the reports would automatically show up via a live feed; the labs would be part of the physician's daily task list, accessible at any time from any workstation.

Another important lesson concerning user resistance was that it mattered who leads the implementation. In getting physicians to go along with the project, it helped that the project manager was also director of the Division of

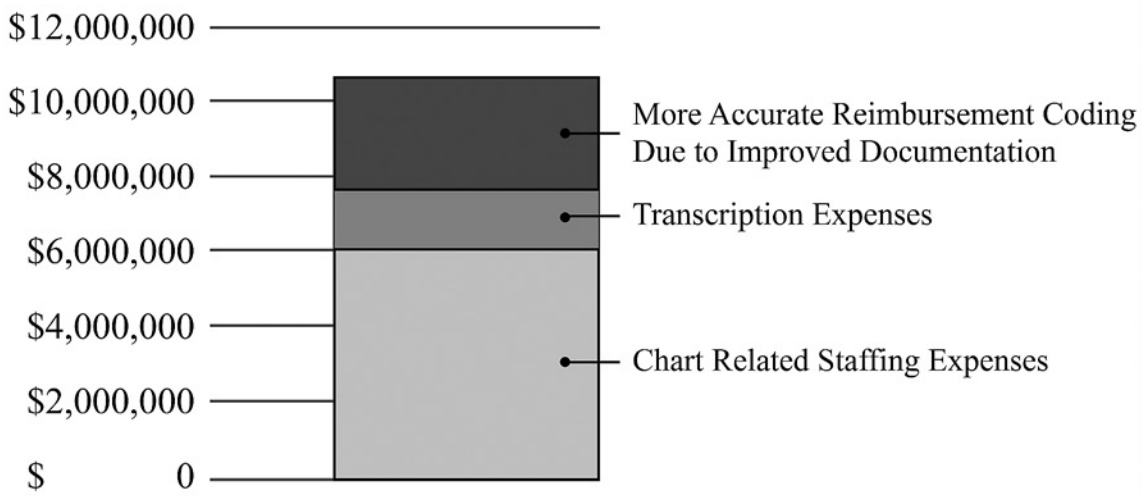

Figure 2. Five Year Impact of EHR.

General Internal Medicine, which had 35 of the 100 physicians in the project. His leadership and direction urged the division's physicians to work a little harder to understand and adopt the technology. And because MFA's CEO was openly and strongly committed to the project, this encouraged not only physicians and residents but the entire 200-member support staff of MFA to quickly learn and adopt the EHR.

Other Lessons and Pitfalls

In addition to the many lessons mentioned already, MFA's accelerated rollout of its EHR turned up several anecdotal lessons:

- Do not call the EHR a panacea. While it is important to communicate how the EHR will bring substantial improvements to the practice, avoid the overuse of hyperbole such as, "It will make your life easier," or it will help users do things "faster" and "better." Users should be cautiously optimistic about the new system so they understand that there will be a substantial learning curve but also real benefits.
- Be sensitive to the "uncovering" of embarrassing issues that the project may reveal. The project team needs to recognize the embarrassment factor and encourage clinicians to cooperate in fixing the problem.
- Resist entrenched loyalties and support structures. In the past, physicians may have relied on a favorite support person to handle their administrative tasks, but that approach runs counter to the centralized support network of an EHR system. MFA countered this highly decentralized and inefficient practice by designating teams of support personnel to handle particular tasks, such as pre-authorizing medications. After physicians were confident that someone on the other end of the EHR was taking care of their task, they felt comfortable letting go of that responsibility.

Results Matter

MFA's physicians, nurses, and support staff now have grown accustomed to a highly efficient, centralized, and automated business process. Instead of using paper notes to remind them of chores, physicians get real-time reminders and task lists electronically. Instead of checking three mailboxes on three different floors for patient messages that may be outdated, they receive real-time e-messages from the call center. Lab results, which once took days or weeks to arrive and were sometimes initially delivered to the wrong provider, now go directly to the ordering physician via a live feed from the laboratories. And prescriptions, which routinely took patients one week to fill, are now guaranteed within 24 hours.

By many measures, the EHR has streamlined and improved the everyday processes that support and uphold MFA's delivery of quality care. The EHR also has improved the practice's bottom line, as outlined in Figure 2.

A high-level, very conservative return-on-investment analysis conducted by MFA in October 2004, or four months after rollout, revealed a 35 percent reduction in daily paper chart pulls following the implementation (from an average of 1,640 charts pulled per day to 1,066, for an estimated annual reduction of 144,083 pulls). Based on an average cost of $5.66 in chart-room staff time for each chart pull, MFA estimated a first-year savings of $81,551. When RN time devoted to chart responsibilities was factored in, the first-year savings on decreased chart pulls ballooned to $335,900. Based on the experience of other academic medical centers, MFA estimated paper chart pulls would decline by 70 percent in the second year of the implementation and disappear entirely by the end of the third year. As a result, MFA estimates it will save more than $6.3 million over five years in chart-related staffing expenses alone.

Revenues also have been strongly affected by the new system, thanks largely to more accurate reimbursement coding generated by the EHR's built-in documentation templates. MFA estimated that its physicians were under-coding 9 percent of patient visits prior to using the EHR, resulting in a reimbursement loss of $695,877 per year. Based on a 30 percent first-year reduction in such "down-coding," MFA estimates that the EHR will completely eliminate improper coding by the end of the third year of the implementation. As a result, the practice estimates it will generate nearly $3.5 million in revenue over the first five years of the EHR's use.

Further reductions in transcription expenses ($1.3 million over five years) and the costs of developing new patient charts ($1.23 million) bring the total estimated positive financial impact of the EHR to more than $11.7 million over five years. That figure, which is in line with other recent studies documenting significant economic benefits from implementing an EHR,[9] does not take into consideration the substantial added impact of rolling out the system to MFA's remaining physicians.

While the challenges of winning physician adoption of an EHR are often cited as a barrier to adoption, the experience of MFA proves that medical groups can rapidly implement an EHR on a large scale in a complex environment. Considering the magnitude of the ROI, not to mention anecdotal improvements in physician and patient satisfaction, the MFA rapid-rollout experience suggests that the fear of a long, drawn-out deployment may no longer be a valid reason for putting off implementation of an EHR. The practice's example further indicates that the best practices and the technology for improving the delivery of clinical care are available today, and that the time for adopting them is now.

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