By Michael A. Krall, MD

Achieving Clinician Use and Acceptance of the Electronic Medical Record

Introduction

This article addresses the important role clinician acceptance plays in successful implementation of an Electronic Medical Record (EMR) system. It discusses various barriers and challenges as well as strategies for overcoming them.

The Kaiser Permanente Medical Care Program has embarked on a national information technology strategy. The Program intends to invest considerable resources in the next few years to develop and implement a Clinical Information System across the country. The expected benefits to members, clinicians, and to the health plan are substantial. These benefits include improved quality of care, improved information management, increased efficiency of practice, decreased practice variability, and improved cost structure. Installing an EMR system in a large organization is a great undertaking with a variety of hurdles to overcome.[1] Perhaps chief among the barriers is achieving user acceptance and successful use. Unless achieved, the system may otherwise be very acceptable while the project remains a failure.[2] How does one ensure user acceptance?

"Like other individuals, clinicians want to feel invested in projects that require them to change and exert substantial effort."

The Northwest Division is now the second largest of seven divisions of the Kaiser Permanente Program. Through its constituent members (Kaiser Permanente Northwest, Group Health Cooperative, and Group Health Northwest) it serves over one million members in three local markets in Oregon, Washington, and Idaho. In 1994, Kaiser Permanente Northwest, serving Northwest Oregon and Southwest Washington, began implementation of a comprehensive EMR system, EpicCare (Epic Systems, Madison, Wisconsin).[3,4] Today, our system is in daily use by more than 800 physician and allied health clinicians, more than 1300 other clinical staff users, directly serving 418,000 plan members in our local market. To our knowledge, we have the largest installation of a comprehensive outpatient medical record system in the country. The members of our project team are often asked, "How did you do it? Did you meet any resistance along the way? What can you share with others who are about to embark on a similar journey?"

This article will address the issue of clinician "buy-in." It will discuss the types of resistance we met. It will draw upon our experience and the literature.

"We're in this together?"

Like other individuals, clinicians want to feel invested in projects that require them to change and exert substantial effort. They need to feel benefit for their effort. If direct personal rewards seem small while requirements seem great, they need at least to believe that there is a truly compelling reason to make the change. In organizations such as ours, this must start with unequivocal and visible support from upper management and leadership.[5,6] This will be absolutely necessary at both the overall Program and local levels. These individuals must provide the context, the vision, and the strategic rationale, and they must communicate it in terms that are meaningful to the people who will be making the change. Aligning the values of the various constituencies in an organization is crucial for successful introduction of major change.

"The institution must communicate clearly the strategic importance of Physician Order Entry and work with physicians and other care providers to develop an approach that they see as helping them as individuals. If this communication is not put in place early, distrust and fear will build into powerful barriers to implementation."[5] It is definitely worth spending the effort prospectively to develop a detailed and comprehensive communication plan. This involves identifying the various stakeholders and determining for each the preferred content, means and frequency of communications. Clinicians must have numerous and varied opportunities for input. Individuals will prefer different methods and may not become aware of some opportunities. Options will include surveys, focus groups, department meetings, interest groups, and written and electronic communications. Further, the communication must be bi-directional. Regular feedback, progress reports, and updates on project status to clinicians are essential. Clinicians who choose not to make use of the opportunities to provide input must still be aware that such opportunities exist. Otherwise, "resisters" will be quick to point out that "No one asked my opinion."

Making this a reality is difficult. Despite considerable effort, we were unable to meet all the goals set out in our communication document. Clinicians were often too busy to attend the "user" sessions; predictably, users most in need of the sessions were often least able to attend them. Newsletters and user tips were also more sporadic than intended or optimal and were not of consistent quality. This should be someone's clear and important accountability.

"It's not MY system"

Clinician "buy-in" will require that their involvement is substantial and real. The project team must have strong clinician representation from the outset and throughout the project, including the planning, implementation, and post-implementation phases.[5,6]

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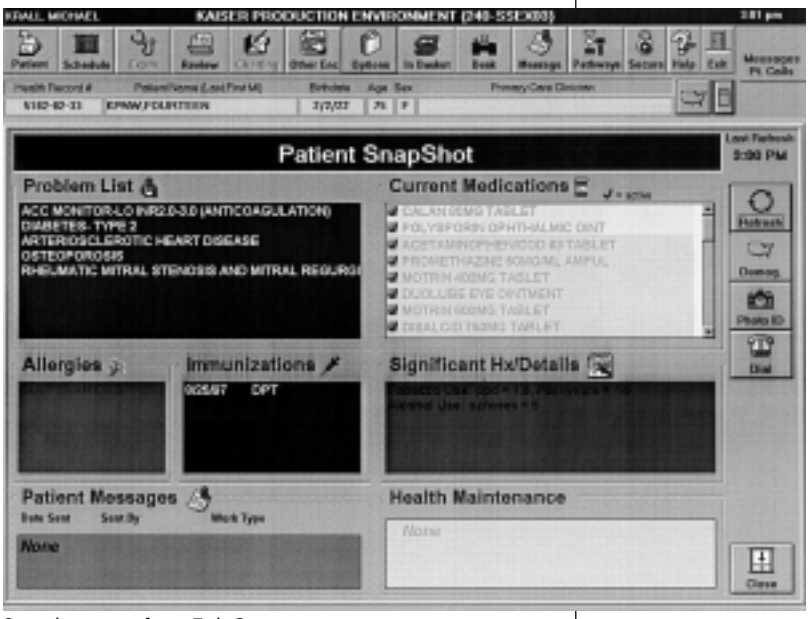
Clinicians need to believe that the decisions they make matter. This group should include "regular" practitioners and formal and informal leaders and opinion makers. It should include computer neophytes as well as more computer- or technology-oriented clinicians. Individuals who resist this technology are quick to criticize an implementation or planning team that has largely non-practicing or reputed "computer nerd" clinicians. Representing a variety of specialties, level of practitioner, and geographic settings will also prove important in most instances. Each department and facility will perceive that they have unique needs. Unless they have ample opportunity for input, they may become disgruntled. Even the best efforts in this regard will fall short at times. Although our ten-member project team included an internist, a family physician, and an obstetrician/gynecologist, all of whom were in clinical practice at least 50% of the time, we heard from primary care clinicians that they did not feel represented. The team also included a clinical pathologist. Later, we added an oncologist.

Implementers must understand the needs and expectations of their customers. They also should have a good understanding of their state of readiness for this innovation, and for change generally. Counte reported in 1987 that individuals who report the greatest difficulty adapting to medical information systems have a more negative orientation toward change in general.[7] In our surveys of users before and after implementing EpicCare in two medical offices, we found the factor most highly correlated with a negative opinion of the computer system was disagreement with the statement "At work I like new challenges."[3] Gender, age, and attitudes toward or experience with computers did not correlate.

The user community should have a clear understanding of what the system can and cannot do. Customers who are accepting of the technology may have unrealistic or inflated expectations about what it will accomplish, especially in early phases. They may not appreciate that it is a tool which requires substantial configuration with local business rules and with data before realizing much of its promise. They must achieve a sense of "ownership" of these decisions and of this work. This process can be quite difficult and time consuming and must begin early. In achieving the local understandings and agreements, users begin to feel it is their system, provided their involvement in the process is substantial and real. Users should understand that the product is dynamic and that it is undergoing constant improvement. Communications regarding changes under development should be frequent. Users should see results as rapidly as possible so they feel they are being heard and supported.



Sample screen from EpicCare

We achieved clinician "buy-in" in several ways. First, our physician board of directors created the role of Assistant Regional Medical Director for Clinical Information Systems to partner with Kaiser Foundation Health Plan. A national search led to the hiring of an individual with sound credentials and experience. This process underlined the importance that the medical group placed on the project and on physician leadership in its direction. It created a focal point for physician input and communication. Second, physicians were represented on the project team from the outset. These physicians represented both primary and specialty care and they were in active clinical practice. The project team regularly solicited input from "ordinary" physicians and from physician leadership. This was done through both formal and informal contacts, including updates to the Northwest Permanente Board.

In the Northwest, clinicians were gradually introduced to electronic systems. Overall, this helped to achieve acceptance. Most clinicians used applications such as office automation or e-mail, a results-reporting system, an appointment system, and Internet access prior to our introduction of EpicCare. This culture helped prepare, acclimate, and "hook" clinicians on the power and benefits of clinical computing. But whereas these applications are easy to use and have high benefit for clinicians, the additional demands placed on clinicians by the comprehensive EMR system do not always seem to yield corresponding benefit.

By the time the clinician actually begins training, attitudes and expectations should be at least "open" if

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not enthusiastic. Training allows opportunity to reinforce the rationale and organizational imperative for the EMR system and to hear and address the concerns of users. To be effective, this requires that representatives of the project team and clinicians are active in training. For effective use and acceptance of an EMR system, training cannot be overemphasized. Special attention must be paid to the unique requirements and learning styles of adult learners, and there must be ample opportunity for practice and for achievement of mastery. We found advanced training after 6 to 12 weeks of use very helpful. We tailor training to individuals based on their identified needs, with the primary aim being increased efficiency.

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"What's in it for ME?"

The best preparation aside, when users actually start to work with the EMR in a real setting, acceptance hinges on usability of the software. What do clinicians want most? Speed and performance. At the very least, they insist, "Don't slow me down!" The system must be fast and easy to use, and the user interface must behave consistently.[5] Users will generally expect sub-second performance for most operations and will become increasingly impatient if response time exceeds 2 to 3 seconds. This window may be extended when benefit or time saved is perceived to be greater than provided using previous methods. When clinicians perceive the time is completely nonproductive, even short waits will be intolerable. Reduced performance with new versions or features will be especially poorly accepted.

The system must also make sense in the context of the clinician's practice and workflow. Users must perceive that the system supports instead of interferes with the performance of their jobs as they define them.[8] "Users are supportive of systems which support their work patterns, their professional status, and professional values such as impact on patient care, professional autonomy, relationship between physician and patient, and the art and science of medicine."[9]

The issue of authority and autonomy will affect acceptance. Important questions arise: "Will the new system enable administrators to monitor or control physician practice behavior and decrease departmental independence or professional decision making? Is there a shift in the balance of power between clinical personnel and managers, between departments, and between the institution and attending physicians?"[10] Such changes should occur only when carefully considered and intended, when clearly justified, or when unavoidable. Even then, they must be honestly acknowledged and thoughtfully communicated.

For every system, implementers should ask, "Whom does it benefit, and who incurs its cost?" If the benefit accrues to someone other than the individual doing the work or experiencing the inconvenience, the result will likely be dissatisfaction. With clinicians it is preferable whenever possible to use the "carrot," not the "stick" approach to motivation. We try to add value for clinicians so that they prefer using the system. Our constant refrains are "make the system so easy they want to use it" and "make it easy to do the right thing." Unfortunately, we are not always successful. Experience has shown how important these principles are to user acceptance.

That there are costs and barriers associated with using an EMR system must be clearly acknowledged to users and potential users (Table 1). Learning and training time, and lost productivity during learning or training may be particularly difficult in small departments or in settings where it will be difficult to "back fill." Systems that depend on clinicians entering clinic notes and orders inevitably impart some significant cost to them. Expecting this aspect of the system to be time neutral or better is very optimistic. While some notes and orders may be done more

Table 1. Costs and barriers for clinicians associated with using an electronic medical record

Costs	Barriers
• Learning and training time • Lost productivity during learning • Time for order entry and electronic charting • Time and changed workflow required by alerts and reminders	• Energy required to overcome the inertia of the status-quo • Perception that entry is clerical work • Perception that current system is adequate • Lack of agreement on benefits • Dislike or disagreement with guidance offered by the system • Perceived lack of flexibility of system in interpretation and enforcement of rules

quickly, especially those which use panels or templates, others may be slower. Our experience is that a more realistic goal is to achieve sufficient time savings in some tasks such that the total impact on a clinicians' day is favorable. New tasks associated with the EMR system and alerts and reminders to do more for each patient, carry time costs. Clinicians sometimes disagree with or feel constrained by the advice, and this may be a barrier.

There are additional potential barriers to clinician acceptance. There is an "energy" cost to overcome the inertia of the status quo. Clinicians may have "work-arounds" or local solutions that allow them to function, even though these solutions create inefficiencies elsewhere in the system. Multiple isolated records or filing systems may be an example of this. Changing from these systems to the EMR system requires a degree of effort and disruption. The perception that the current system is adequate and the new system is inflexible and of uncertain benefit also can be hurdles.

Fortunately, the potential "rewards" or benefits of such systems are also substantial (Table 2). Communicating the potential rewards genuinely is important. "Over marketing" them then failing to realize the benefits can yield dissatisfaction and mistrust. Clinicians clearly understand the importance of legible charts and ready access to prior notes and other data. The paper record is often unavailable or unreadable or the information may be misfiled or awaiting filing. When appropriate and not overly intrusive, alerts, reminders, and decision support may improve both the quality and efficiency of clinicians.

Table 2. Benefits to clinicians associated with using an electronic medical record

- Legible charts
- Ready access to prior notes and other data
- Remote and simultaneous access to the medical record
- Ability to easily sort and trend past data
- Reduced need for reentering data
- Alerts, reminders, decision support with improved quality and efficiency

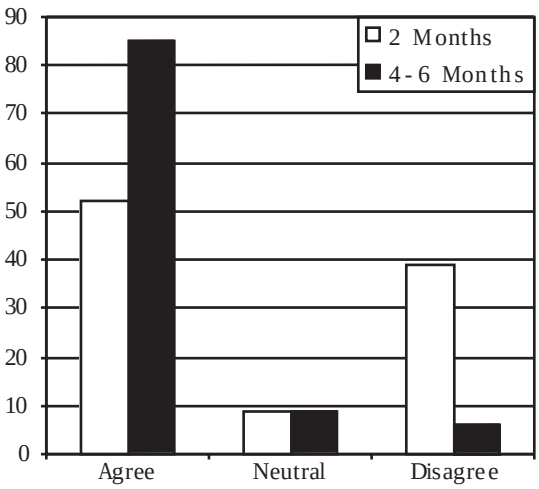

Fig 1. "EpicCare is worth the time and effort to use it." Results of user survey 2 and 4-6 months after "go-live" in the Kaiser Permanente Northwest pilot implementation.[2] At 2 months, 52% agreed, and 39% disagreed (n=33). At 4-6 months, 85% agreed, and 6% disagreed (n=34).

Horak described the relation between user productivity and time which results after introduction of an information system.[11] He developed a model based on experiences implementing 5 integrated hospital information systems. After switching to the information system there is a predictable decrement in productivity as the new technology and workflows are adopted and learned. Later, productivity gradually returns. Our experience suggests a similar impact on user satisfaction during this period.[3] In our pilot study, satisfaction had dramatically improved 4 to 6 months after implementation (Figure 1). Anticipating this effect allows better planning and more successful management of expectations. Strategies can minimize the depth and breadth of the decline. The efforts of trainers, support personnel, and implementation teams are crucial. System modifications made in response to user requests may also contribute substantially.

"What have you done for me LATELY?"

Credibility and support from the user community must be earned every day during and following implementation. First, the system must perform reliably. In addition, there must be opportunity for ongoing user input. Users want to be heard, understood, taken seriously, acknowledged, empathized with, and responded to quickly. Like other users, clinicians tend to have short memories about the good, long memories about the bad, a seemingly infinite capacity for wanting changes to the software, and a lack of patience for what it takes to change it and maintain it.

Well beyond the initial rollout, ongoing user input is necessary. Formats may differ somewhat from the early phases, but opportunities must be constant. These include phone, e-mail, onsite support personnel, and personal contact with members of the implementation team. User meetings are extremely helpful. They may take place at lunch time

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("brown bag" or "hosted") or before or after work hours. These provide an opportunity for new feature announcements and introductions. More important, users will learn from each other, and this can be especially effective. Informal discussions (at department or work group meetings), and more formal presentations address different needs. User surveys and evaluations as well as visits from the vendor can also be useful ways to gather feedback.

"Where were you when I NEEDED you?"

Continuous and immediately available user support is absolutely necessary. When clinicians are in the midst of seeing patients, they are frequently running behind, over-scheduled, and under a variety of pressures. Even momentary unavailability of the system or delayed ability to perform some task is unacceptable. If they need an answer about a hardware problem or how to perform a task such as generating an uncommon order or coding an unusual diagnosis, they want help immediately. Five minutes later is frequently too long because before then they need to be on to the next task. Providing this kind of support may be difficult and expensive. We hired and trained a group of professionals known as "site specialists." During rollout, we assigned one to each clinic. After rollout, there is about one site specialist for every two clinics, but they are available by beeper at all times. The site specialist is a trained, onsite troubleshooter with a clinical and/or Information Systems background. These individuals not only provide timely user support but coordinate trouble reports, user tips, and updates.

"The site specialist is a trained, onsite troubleshooter with a clinical and/or Information Systems background."

"Oh, brother. One MORE new thing."

It is a cliché as well as a truism that change is a constant today. Our division and local market, like others, are undergoing major restructuring. This includes closing a hospital and entering into new alliances, more than doubling the hospitals we cover. In addition, there is major reorganization of primary care services, major member access improvement initiatives, major changes in physician compensation, major geographic expansion, and more. In such an environment, implementing an EMR system is even more challenging as people may be unable to absorb new content and behaviors, even if these promise benefit. Furthermore, along with the EMR system come new tasks. Although many of these are not requirements of the EMR itself, the perception may be that they are. Various constituencies in the organization see the advent of the EMR as a means to introduce or enforce policies designed to accomplish a variety of goals. New tasks for our clinicians include diagnostic coding, evaluation and management coding, clinician order entry and prescribing, and more prevention reminders. With all the initiatives combined, clinicians find they are expected to do more in less time.

Introduction of computer systems in health care organizations result in changes on several levels. These include changes for individuals and their jobs, departments as a whole, and for performance of the department's work. It also may affect the structure and functioning of the entire organization, as well as the quality of both service and medical care which patients receive.[12] Techniques for overcoming resistance to change include gathering benchmark data (establishing the imperative for change), and analyzing benefits (providing the justification). These techniques include assessing the general organizational climate (understanding and acknowledging the context for the change), and finding physician champions (overcoming inertia and resistance). They will also involve developing general ownership ("buy-in"), and establishing realistic expectations (engaging peer leadership and support). Timely training (adequate and thorough preparation), extensive support (readily available help), and system stability (an absolute requirement) will also be important. Successful implementers will also find ways to protect physician egos (keeping them "on board"), and to plan end-stage fun (rewards).[6]

Achieving user acceptance and mastery of new technologies is far from a new problem. Doctor Henry Plummer experienced it in 1907, when he introduced the system of central medical records at the Mayo Clinic. "It was not easy for all the doctors to make the change. To some of them the new way seemed more cumbersome than the old, just a lot of unnecessary red tape. It seemed much simpler to jot down a few notes in a ledger lying open on the desk than to fill in all the blanks on a form sheet, much easier to pull out one's own volume and look up what old record was there than to call for an envelope and wait till it was brought from the file. At first some [doctors] just forgot about the record blanks and used their ledgers when they were very busy, but in time they all saw the worth of the new system, and it became a routine followed without question and with tremendous benefit."[13] Those who introduce EMR systems in the late 1990s can hope for as much success. ❖

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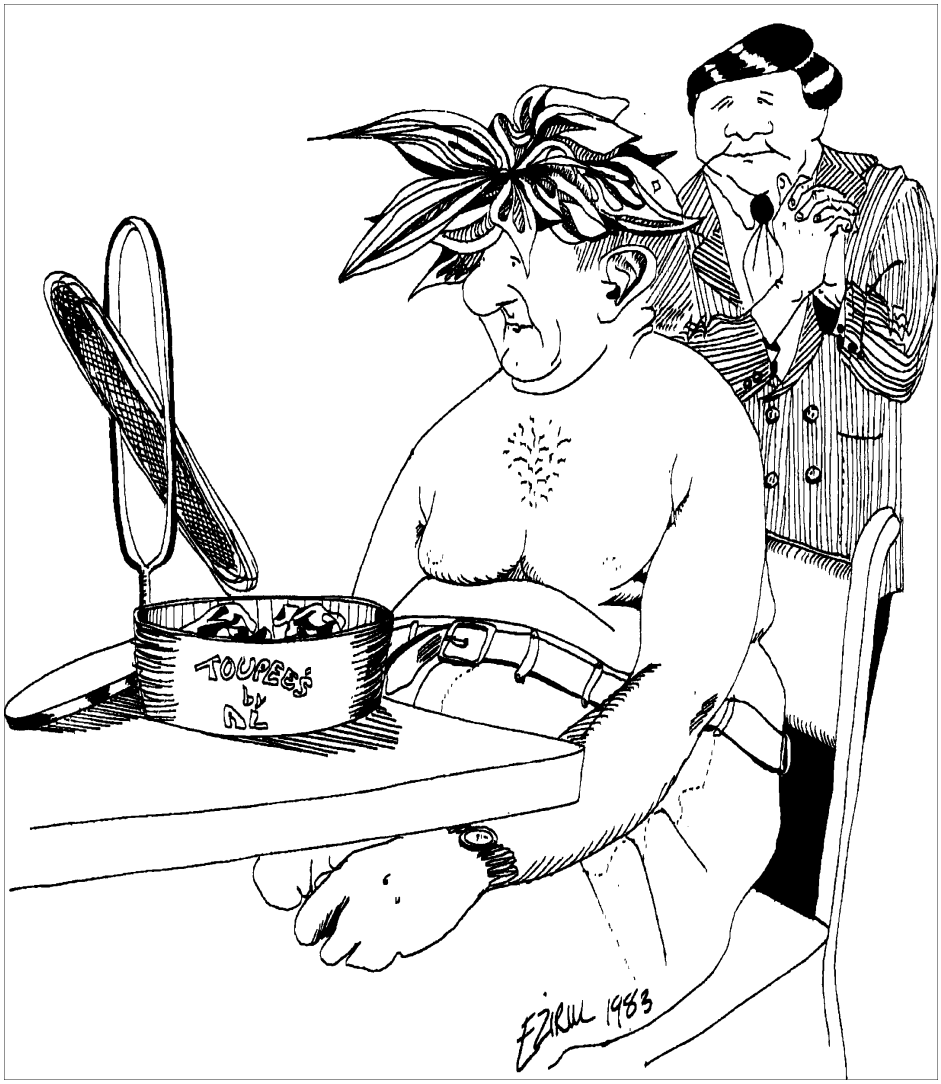

"Toupees by Al" by Evany Zirul, DO, MFA. Another piece of her work can be seen on page 14.