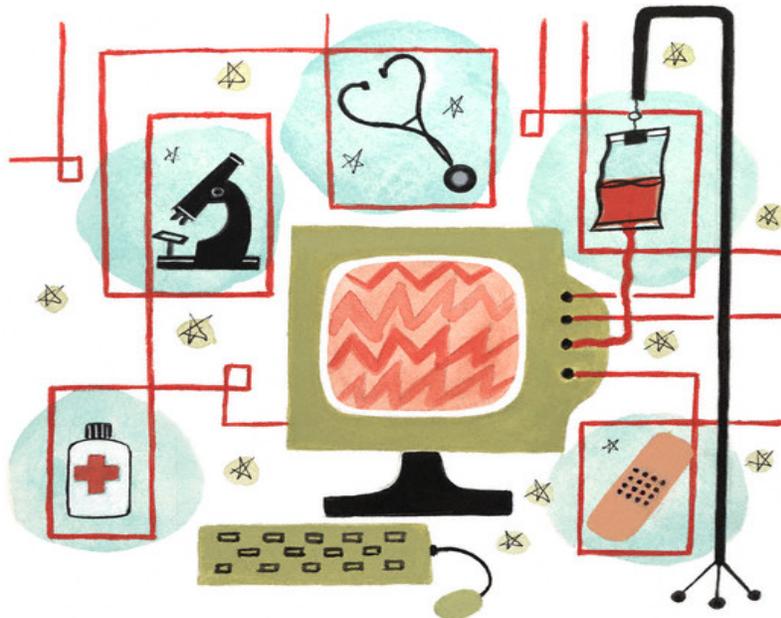


# Clinician Adoption of Healthcare Information Technology

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## Abstract:

The benefits of Healthcare Information Technology (HIT) and specifically, Computerized Physician./Provider Order Entry (CPOE) programs have been widely recognized by clinicians of all disciplines. Despite the well-documented benefits, neither CPOE nor HIT have been either successfully or fully implemented in the vast majority of institutions.

Physicians and other clinicians are frequently (and unfairly) held partially responsible for the slowed progression of HIT because of their skepticism towards it. Often the perception is that they are simply reluctant to change or lack interest in integrating technology. Resistance to change can result in a negative response to it. More often than not, the manner in which the change is managed has a significant role in the adoption or rejection of these technologies. This article will address some of the key factors in physician/clinician rejection of HIT. As well, strategies that have proven to be successful in gaining physician/clinician acceptance will be explored.

## **Introduction**

Healthcare Information Technology (HIT) integration is important to keep healthcare institutions viable and competent in the 21st century. The Institute of Medicine (2001) identified a role for information technology (IT) in all six care improvement goals identified by the Institute for the 21st century: safety, effectiveness, patient-centered care, timely delivery, efficiency, and equity in healthcare access. Implementing HIT, specifically an Electronic Health Record (EHR) and the technologies that support it cannot be viewed as only a project. The adoption of HIS and EHRs demands permanent change in the working environment and requires on-going attention and adaptation by clinicians.

Clinician adoption of HIT is an integral part of the success of information technology in a healthcare institution. According to Canada Health Infoway (2006) , “End users – physicians, nurses, pharmacists and other health care practitioners – are the people who must make the solutions work in their everyday activities in hospitals, clinics and communities. They are the people who must adopt and properly use these modern health information systems and communication technologies”. This article explores some of the potential barriers to HIT adoption by clinicians as well as potential approaches to mitigate the rejection of HIT.

Technologies can refer to a multitude of technologies in the healthcare setting. In this article, the focus is on IT that is specific to the Electronic Health

Record (EHR). To clarify, the clinicians referred to in this document are nurses, physicians and allied health professionals unless otherwise noted.

Even though the benefits of CPOE and HIT adoption by clinicians have been widely recognized, these technologies have not been successfully implemented in the vast majority of institutions. Physicians and other clinicians are frequently held responsible for the rejection of HIT. There is often a focus on their unwillingness to change or their lack of interest in technology. Technology is always changing in the healthcare arena and many physicians, nurses and allied health professionals actually do embrace it. Barry Chaiken, MD (2001) wrote, "If current technology is compared with present day offerings, a trend can be identified that shows increasing functionality and benefits, which correlates very closely with actual use". Advances in healthcare technology have resulted in systems that meet the needs of clinicians, hence they are using it more and more in the workplace. The issue of HIT adoption or rejection, in many cases, is far more complex than a willingness or unwillingness to change from a paper-based system to an electronic one.

In this article, six key factors in the adoption of HIT by clinicians or specifically physicians are identified:

- The Administrative Executives' Role
- Clinicians and Specifically Physicians involvement in the process
- Demonstrated benefits to clinicians
- Demonstrated ease-of-use and alignment with work-flow
- Availability of Technical support

➤ Educational support

### **Administrative Executive Role**

Most healthcare information systems are selected by Administrative Executives and then introduced to clinicians and other stakeholders. The clinicians are not involved in the decision-making or in planning the HIS implementation. A focus group survey initiated by Harris Interactive (2002) re-enforced the need to involve physicians and other clinicians from the beginning of the process.

Participants in the Harris Interactive survey (2002) stated, "In our organization, we recognize that anything lacking physician support will eventually fail. If the design, selection and implementation of clinical systems are left only to finance-oriented individuals, it will fail clinically. Physicians, non-physician providers, nurses, respiratory therapists and more all need to be involved in the review, development, internal marketing and implementation."

Even when some aspects of HIT have been implemented, specific aspects of the initiative may not be adopted fully. There are often several reasons for a gap in the process but clinician rejection is often the biggest factor. Some clinicians reject viewing the Clinical Record on the computer and may insist on having specific parts printed because it is perceived as more convenient. In this case, administration must find ways to promote the EHR as the legal Health Record and elicit cooperation to discourage printing of any part of the record that is available in the EHR.

Participants in the survey done by Harris Interactive (2002), sponsored by McKesson, noted that in addition to physician resistance, hospital administrators

and information technology vendor behaviours play a strong role in the success or failure of clinical information technology projects. Senior Administrators must be the project sponsors, both in name and in practice. They need to find ways to plan and manage successful change and encourage full clinician participation. The way they choose to manage the change can either encourage or discourage clinician adoption of HIT.

The entire organization must have a clear vision for adopting HIT. It is important that the IT Strategic plan be well documented, adopted and articulated in order to fit into the organizational Strategic plan and be accepted by clinician leaders and clinicians. How the HIT plan fits into the overall IT and institutional plan for the organization should be made clear as well. Regarding the EHR and CPOE, the organization's objectives and goals for automating provider ordering should be laid out. Safety issues are the prime reason for this planning, but successful implementation is dependent on clinician acceptance of the EHR and CPOE in their everyday work life. It is imperative that institutional leaders are fully committed to the success of an HIT implementation. The Accenture Report for the Vanderbilt Center for Better Health (n.d.) added, "Leaders must emphasize that the clinical implementation project represents a strategic imperative for the organization and that there is no turning back."

Open and unfettered communication between administration and clinical leaders is essential for successful HIT integration. In some organizations there has been a rift in the relationship between administration and clinical leaders. This has

resulted in a lack of trust, which contributes to communication breakdown. HIT implementation is a critical system change throughout the organization, which depends on clear communication channels between all members. A collaborative relationship between clinicians and Administration, based on trust and respect has to be in place prior to HIT implementation. Clinicians need to feel that they will have the support needed for the transition into the e-Health world.

### **Clinician Involvement in the Process**

Clinical leaders, including physicians should be involved in preliminary and decisive discussions about HIT and in the selection of the system that they will be expected to work with. Administrative leaders should be committed to considering the systems that clinical leaders choose or at least be open to discussions about them. They need to be clear about why a particular type of system, an integrated system for example, is desired and work with clinical leaders in choosing a system that meets the needs of all concerned.

Sites that have had success with CPOE implementation and clinician adoption of other IT initiatives have involved the clinicians in the initial process of choosing the system. Brad Clegg MD and Joe Ketcherside MD (personal communication December 2006), two physicians who head CPOE projects and other physician IT initiatives at two different U.S. hospitals, were interviewed. Both said that having physicians as part of the team to select the software system for the hospital has had a positive effect on their willingness to not only adopt the technology but also take

active roles in the various implementation projects. Physicians and other clinicians are more willing to work with a system that they have helped select.

All is not lost if physicians and other clinicians were not involved in choosing the system. When a system has been purchased without clinicians input they can still be involved in planning implementation initiatives once the system is in place. EHR implementation rarely, if ever, proceeds without Nursing and Allied Health involvement but in some instances it does proceed without Physician involvement. All too often, Physicians are informed about the initiative but rarely involved in the actual implementation except in the case of CPOE.

Encouraging the participation of physician and other clinical "champions" is another key factor in the success of HIT. The individuals chosen should not only be technically savvy but also leaders who have the respect of their peers. They must be influential and able to champion the cause in order to gain buy-in from their peers.

Many sites offer some sort of monetary acknowledgment to reward the efforts of Physician champions. This may not necessarily be a direct substitution of their income. Compensation for physicians can be offered as an honorarium for the time spent testing the system or for working on system planning committees. Other involved clinicians should be paid for their time or receive release time to participate in planning and implementing HIT projects.

Clinical champions may also be involved in the design of systems used in a facility by their peers. For instance, they may be required to validate clinical

information presented in a system or give their opinions on hardware decisions.

Both physician and clinical champions are key players in the process of any successful HIT implementation.

Headed by physician and other clinical champions, the formation of a Clinical User Group and a Physician Advisory Committee are also key strategies since they provide forums for ongoing communication between clinicians and IT leaders during and after HIT implementation. It is vital to have an ongoing commitment to gathering feedback and working to incorporate clinician suggestions in order to maintain clinician support of HIT. These committees provide a vital medium for this communication to take place.

### **Demonstrated Benefits**

Physicians and other clinicians tend to adopt IT if it clearly demonstrates benefits to their ability to provide quality healthcare, but they have to be able to visualize the benefits. Mr. Bill Pascal, Chief Technology Officer of the Canadian Medical Association (2005) stated that physicians "...will use technology if it meets their needs". By involving physicians in the ongoing process, IT leaders can gain better knowledge of what clinicians value in a system and ultimately what they need the system to provide. They must be convinced that HIT is worth the effort and time to incorporate it into their routine work flow. Clinicians would more readily accept new systems if they were convinced that newer technology will save them time or at least make their work easier.

In the Ontario Medical Association's guidelines on EHRs, emphasis is placed on clinical documentation in medical offices including demographic collection and reporting. Incorporating these guidelines into the design of HIT and CPOE can convince physicians to participate by demonstrating how a system can handle medical governing body initiatives. OntarioMD can also be a source of information for requirements and specifications that should be a part of a system. Karen Keith (personal communication December, 2006), a Healthtech Inc consultant, whose previous experience involved working with an HIT vendor states, "From my experience as a vendor (Cerner), certainly the OntarioMD spec provided a good idea of what the expectations were with respect to work flow, reporting, documentation, data mining, billing, etc." One must be wary though: in Ontario, not all physicians agree about the credibility of OntarioMD.

It should also be noted that some IT initiatives such as CPOE or on-line medication administration records should not be marketed as time-savers. Carol Dueck (personal communication December, 2006), a consultant with Healthtech Inc has extensive Clinical IT experience and has been involved in numerous HIT implementations. Carol noted, "Users need to know that the system will expose short cuts and bad habits that have developed in order to cope with increasing workload". The system will force proper protocol and process for some clinical tasks such as writing orders and checking patient and medication identification: this will take more time or at least be time-neutral. On the upside, a system may save time and increase safety by offering decision support. Patient allergies, drug and food

interactions, correct dosages and required lab data reminders can eliminate the time spent on phone calls back and forth between nurses, physicians and pharmacists when medications are ordered or there are care concerns.

In 2002, the Ohio State University Health System implemented CPOE. They achieved an 80 percent success rate of physicians entering orders using the system. The system in place was customized to meet the physicians' needs. Their needs were assessed through the use surveys, interviews and the conduction of a workflow analysis done by a committee. The Ohio State study team, Ahamd, Teater, Bentley, Kuehn, Kumar, Thomas, Hhagop and Mekhjian (2002), found that the committee recommended a vendor system that realized the importance of having physicians take an active and meaningful role in system design.

This study also recognized key criteria for the success of their implementation. They believe that the availability of specialty-specific order sets, the engagement of physician leadership, and a large-scale system implementation were key strategic factors that enabled physician-users to accept a physician order entry system despite significant changes in work flow.

Some system functions tend to be very popular with physicians. It would be helpful to highlight some of these in the beginning of the selection process.

According to Dr. Van Curen (n.d.) of Goshen Health System in Indiana, "The E-signature and Favourite Order Set features are great ones to start with because they're easy to use and provide real time savings to physicians, which wins them

over. Other system features that prove to be more popular with physicians include remote access and decision support”.

Clinicians also need to be convinced about the quality issues that HIT implementation can support. Realistic, relevant data should be used to provide examples of how IT can improve quality in the health workplace. Clinicians tend to respond more favourably to evidence garnered by global research. It is certainly helpful to highlight the examples of how IT has improved quality in different institutions. Site-specific evidence can have a greater effect in eliciting acceptance. If clinicians are aware of the quality issues where they work, they may be open to suggestions of how IT can help to affect those issues.

The Ohio State project stream (2002) revealed several key factors and methods that influenced the success of CPOE at their institution. The factors included, “...executive support and physician empowerment, an effective implementation team, a consistent user-friendly interface, ongoing user support, breadth of order sets, and elimination of dual ordering processes”.

It is imperative that the “myths” or perceptions that contribute to the negativity that surrounds HIT adoption by clinicians, be addressed. Conducting focus group discussions help to highlight clinician concerns and provide opportunity to address them individually. Customized strategies can then be selected to address the concerns, which often alleviates most clinician reservations.

### **Ease of Use/Alignment with work flow**

Systems must be designed to reflect the actual work flow of the clinicians who will use them. All too often, systems are too generic which results in clinicians having to alter their work flow to fit the technology. This approach to system integration usually results in high clinician resistance and outright rejection of the imposing system.

Doctors, nurses, and other clinicians are notoriously short on time so the selected system should be intuitive and easily accessed with a simple and logical approach to data entry and access. The fewer steps needed to achieve the desired outcome within the system, the more likely it will be accepted.

Health care technology should not disrupt the day-to-day clinician work flow. Physicians and other clinicians are both busy and very mobile during the course of their workday. Ease of use of and portability are key factors in ensuring IT adoption. The Harris Interactive study (2002) reports that, "The system must be more powerful and more convenient (value) than what has been available in the past. Information comes from multiple areas of the hospital: admitting, x-ray, lab, transcription, etc. It must all be culled into as few virtual places as possible." As well, new hardware technology must be regularly explored to ensure that clinicians have the best available tools to use the systems.

Another factor that makes the systems easier to use is the availability of devices. Physicians and all other clinical disciplines must be consulted when

selecting the number and placement of devices for viewing and working with patient information electronically. Healthtech Inc consultant, Liz Nemeth (personal communication, December 2006) relates her previous experiences, "One of the major reasons for resistance in one organization was the lack of available computers on the inpatient units to view data". Failure to include the needs of all clinicians in placing hardware throughout the institution can result in non-use of computer systems.

### **Technological Support**

Having around the clock user support is important for clinicians to prevent any delays in care that is dependent on the technology. Physicians generally have different needs in terms of support. Technical support dedicated solely to physicians during the initial post implementation phase, has been cited as an important factor in maintaining the confidence of physicians when implementing HIT and in gaining their acceptance of it. Physicians/clinicians must be ensured of ongoing technical support after the initial implementation of HIT.

Healthcare organizations must update their systems periodically in order to keep pace with new technological changes and to be able to tap into the benefits of ongoing updates. This can be a cause for concern with clinicians since they are expected to keep up and learn to apply the revisions to their practice every time there is a change. It is important to communicate and assure clinicians that most software updates are usually subtle and meant to enhance the system. They must

also be assured that educational and technical support will be provided as needed for any updates.

### **Education Plans**

Training for clinicians must be clinically relevant. The training for each discipline and for clinicians in different specialty areas must reflect their particular area of practice. Training should be planned with different learning curves in mind in relation to comfort and prior technical abilities. Successful training of physicians and other clinicians is a primary factor in their adoption of HIT and their continuous support of it.

Physicians have different learning needs as do other clinicians. Physicians cite useful and thoughtfully planned training as being a critical success factor when implementing new clinical information systems. A Harris Interactive Survey reporter stated, "I think clinicians will resist any system that has a steep learning curve." Training must be planned so that potential steepness in the learning curve can be flattened, and the clinicians' learning needs are met.

Healthtech Inc consultant, Carol Dueck (personal communication, December, 2006) who along with her experience in HIT implementation, also has experience in Corporate Education, stated that manuals and computer-based training used for Nursing and Allied Health training were found to be ineffective for physician training. Lack of adequate training contributes to a lack of support for a system. Both Nemeth (2006) and Dueck (2006) agreed that the rigid time schedules set up for educational sessions for all clinicians, do not work for physicians.

The Harris Interactive Survey states, "Physicians are already burdened by "the system" (insurance companies, government, administration, etc.) to "see-more-do-more" and thus the step of learning ANYTHING new is burdensome. In the end, it will be a significant benefit, but the initial learning is viewed with hesitance".

Training for clinicians, other than physicians can be offered at static times but it must be planned well in advance to fit into their schedules. For physicians, successful training should be one-on-one and offered on a rotational basis.

Ultimately, training for all clinicians must fit into their schedule. Facility and environmental factors should also be taken into account when educating clinicians.

### **Physician/Clinician Engagement Success Measures**

- Executive Leadership (CIO, Physician Leaders, Clinical Leadership etc. need to work together to move the HIT initiatives forward.
- Physicians/clinicians must be aware of activities that concern them, be given opportunities to be involved where they have concerns, and be kept updated about the progress of HIT projects in their institutions
- Physicians/clinicians must have opportunities to contribute to the initiatives without experiencing excessive demands on their time
- Physicians/clinicians must have significant involvement in the institutions IT initiatives
- Physician/clinicians' concerns should be documented, addressed, resolved and communicated

- Ideally, physician/clinicians will view the system as beneficial to their practice.
- Physician/clinicians should find the system simple to navigate and see the system as compatible with their work flow.
- Physician/clinicians must be satisfied with the available technical support.
- Physician/clinicians must be thoroughly satisfied that the education to orientate them to the system is sufficient.

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