

Implementation Of Electronic Medical Records: How Healthcare Providers Are Managing The Challenges Of Going Digital

Rochelle Brooks, Ph.D., Viterbo University, USA

Courtney Grotz, Viterbo University, USA

ABSTRACT

Electronic medical records (EMRs) are the newest form of documenting a patient's medical record. An EMR is a system that contains a patient's personal medical history, test results, dictations, and other medical and financial information. EMRs will improve healthcare by enhancing patient care, preventative health, and provider convenience and is an extreme improvement to an already highly technological healthcare corporation. The implementation 'wave' is not happening just because it is an improvement to healthcare, but it is also moving forward because it is required by the U.S. government. President Obama recently employed a stimulus package that will assist healthcare establishments with startup of electronic medical records. Along with the great improvements and advantages come inconveniences, challenges, and high costs. For large hospitals, EMR deployments can cost the organization millions of dollars; hospitals can spend from \$25,000 to \$60,000 per physician to deploy a system. EMR deployment is a public policy challenge with the federal government possibly spending more than \$20 billion in stimulus funds to reimburse providers for EMR implementations. EMR system implementations are like any business process reengineering project because they cause many challenges. Employees are not always accepting of change and managing change effectively is critical to successful implementation of any new technology. Additionally, new electronic technologies increase privacy issues while at the same time healthcare facilities are becoming stricter with confidentiality. Electronic medical record implementation is complex, but the benefits of organization and improved healthcare outweigh the minor setbacks. In this study, data was gathered from two healthcare facilities through interviews of the leaders of the EMR implementation process at each facility. Trade journals and EMR vendor information was also explored. The goal was to explore the phenomenon of the EMR implementation in this short term research project.

INTRODUCTION

A hospital is a place of organization and cleanliness. It is a place that is technologically advanced for saving lives. It is an institution in which sick or injured persons are given medical or surgical treatment. What you probably do not think about is the amount of information about the patients that is needed to make this possible. One person can have countless visits and a great amount of information documenting those visits. Many people expect to have their information recorded on paper by the provider or nurse. Although this form of recording is easy and well known, it is not the most beneficial. Hurricane Katrina provided us with a powerful lesson.

After Hurricane Katrina devastated the Gulf Coast in 2005, most of the one million people displaced by the storm no longer had any medical records. This made it difficult, and in some cases impossible, for physicians working in disaster medical centers and community hospitals to treat them (Mann, 2005). Physicians do not want to repeat the challenges of that disaster complicated by the lack of medical records for those needing emergency medical care. There has been progress since 2005, yet there are challenges that continue.

The healthcare field has prolonged adopting modern information technology even as they incorporate advanced technology to treat patients (Levey, 2009). Electronic Medical Records (EMRs) are the newest form of documenting a patient's information. If the implementation of Electronic Medical Records is done correctly, they will improve the quality of healthcare while lowering costs. But, this has not been easy. Deploying any large system is complicated and costly and this is also true in the healthcare industry. There are ethical challenges in moving forward.

The EMR adoption rate for healthcare facilities has been low as of the time of the signing of the American Recovery and Reinvestment Act (ARRA) of 2009. There are several reasons for the low adoption rate which are consistent with implementations of systems in other fields outside of the healthcare arena. The systems are typically costly. There is a productivity issue as it takes time for staff of all levels of the organization to learn the systems. Data security and access control issues related to privacy must be addressed (this is critical in healthcare due to federal privacy regulations). Lastly, there is the challenge of integrating the current technology solution with other existing systems.

This study is undertaken as a joint cross-disciplinary project between a professor who teaches Management Information Systems in a School of Business and a nursing student who has a minor in management and an interest in successful usage of information technology in healthcare. The project originated as an undergraduate student research project and moved in a co-authoring project between an Information Systems professor and a nursing student.

This research project provided an opportunity to seek a greater understanding of the implementation of the electronic medical record (EMR) and how healthcare providers are managing the challenges of moving to a digital information environment. This was accomplished by exploring the implementation of EMR systems at two major health care facilities. Additionally, content was utilized from major trade journals published in the last three months. Vendor documentation was also utilized.

Two key questions have been identified as key to this research study. In this case study, the primary questions are both "how" questions:

- a) How does a medical facility successfully implement an EMR system?
- b) How does the passing of the Obama stimulus plan affect the implementation of the EMR in a healthcare facility?

This case study is designed to bring out the details from the viewpoint of the participants by using multiple sources of evidence while investigating the implementation of EMR at two major healthcare facilities and reviewing reports provided in trade journals.

LITERATURE REVIEW

The literature shows that as businesses progress over time they must change to accommodate the implementation of new and better technology. Healthcare providers are one type of business needing to take advantage of emerging technologies. According to McCaughey (2009), the healthcare industry is the largest employer in the United States with almost 17 percent of the nation's gross domestic product. Healthcare is an industry in which all of us have significance dependence.

Having a modern healthcare establishment is critical for our technologically advanced country. Yet, healthcare records are extremely behind in technology compared to various organizations in the U.S. (Levey, 2009). Electronic Medical Records (EMRs) are the modern technology to document a patient's information. Not only does an EMR contain a patient's medical history, it also contains tests, results, doctors' notes, insurance information, and much more. The exact contents of an EMR are not dictated by the law; different EMRs contain different information.

Although the idea of an EMR is not new, it is becoming extremely well known and the push is evident to have EMRs implemented in all hospitals across the United States. The implementation of EMRs has been an extremely slow process. It is an expensive system and many organizations do not have the financial means to implement such a system (Levey, 2009). Because an EMR is such an important tool, the government has taken action to help implement EMR systems in hospitals across the nation.

It is time that the healthcare industry records are updated to the level of technology equivalent to other industries. The idea of a connected EMR system has been envisioned for a few decades, but completion of a workable system is just now being introduced. President Bush's administration was the first to establish a plan for use of EMRs. Dr David Brailer, former National Coordinator for Health Information Technology who worked with President Bush's administration from 2004 to 2006, stated that it is not as simple as dropping a computer on every doctor's desk. There are many difficult technical problems to overcome (Paddock, 2009). Although the idea of having a structured system where all hospitals and organizations can communicate with necessary information is a genius idea, it is an extremely complicated design. While President Bush was in office his goal was to have all hospitals rid of paper medical records and to have only electronic medical records by the year 2014. Freking (2009) says he remains confident that Bush's goal of widespread use of electronic medical records by 2014 will still be met, yet many analysts are doubtful. Installing an EMR might sound simple because of the great benefits, but there are a few inconveniences and the process is not without stress.

Change is one of the greatest fears of people. Change takes patience and an open mind. Implementation is not the only thing that takes time; training is also a significant time commitment. President Bush's idea of implementing EMRs to improve healthcare is not the only benefit of EMR deployment; EMR implementation and upkeep also creates jobs. This idea is appealing to President Obama since it is part of his stimulus package. The jobs created include health care workers turned Health Information Technology (HIT) workers or IT workers trained to be knowledgeable in the healthcare field. These job adjustments affect implementation time for training and may also lead to more mistakes than acceptable if training is not done properly (Freking, 2009).

The largest setback to implementing EMRs is the challenge of funding. President Obama and his administration have agreed to fulfill Bush's vision of full implementation of EMRs. According to Brown (2009), President Obama has promised to spend \$50 billion over five years on Healthcare Information Technology and fulfilled more than one-third of the pledge with \$17.2 billion in the economic stimulus package to help healthcare organizations with adopting electronic record systems. According to McCaughey (2009), the stimulus bill will affect every area of healthcare, from medical and nursing education to the way in which patients are treated to the amount that hospitals get paid. The bill allocates more funding for this bureaucracy than for the Army, Navy, Marines, and Air Force combined. It is an extravagant amount that will be spent on healthcare at one time.

Japsen (2009) states that under the stimulus package which was approved by Congress and signed by President Obama in February 2009, each physician will receive more than \$40,000 from the Centers for Medicare and Medicaid Services over a five year period beginning in 2011 for the implementation of EMR systems. The expectations for EMR are high. President Obama told Congress that this recovery plan will invest in electronic health records and new technology that will reduce errors, bring down costs, ensure privacy, and save lives.

We have some contrasts in use of information technology among different industries. Mann (2005) observes that from nearly anywhere in the world, we can withdraw money from our bank accounts, pay bills, apply for mortgages, book airline tickets, and even order groceries online. Yet, it could not be common for healthcare facilities to share an X-ray digitally, from one hospital to another, even if they are located on the same street. The point is that there are many professions that use or have been using a computer system to keep their business organized and efficient for years. Paper records are not common in today's digitized world. Yet, many healthcare professionals are still using paper records. That provides a big contrast in information technology usage. The statistics tell the story: only nine percent of hospitals and about 25 percent of doctor offices have gone to EMRs in the United States. There is agreement that EMRs are the trend but not everyone agrees it will save money and improve patient care (Low, 2009).

Most EMRs that are used today are not full EMRs that include programs to assist in medical decisions. These are just standard records. Computerized records are extremely valuable. They will keep the hospital staff organized with information at their fingertips which in turn can save lives and prevent simple mistakes. The healthcare field has the most impressive medical technologies in the world and can cure some of the most remarkable cases. Why would this exceptional field be so behind in information technology?

The healthcare field is changing every day and it is time to revolutionize the way records are kept and used to make better decisions. Electronic Medical Records improve the way records are kept and reviewed and can make an extreme difference in the treatment of a patient, but it can also make the patient more vulnerable. The greatest ethical challenge involving EMRs is patient privacy. Basically, any type of medical, insurance, and payment information is kept within this record. Patient's medical records are extremely confidential and they need to be carefully monitored.

Although it is illegal to take or give out any unnecessary information, people continue to take advantage of people's records. Electronic Medical Records are usually accessible through a system called an intranet. An intranet is similar to the Internet, but is only available to people who work at the healthcare facility. However, companies such as insurance or financial corporations have access to certain parts of these records. The idea of an EMR includes the ability to communicate one's information to any healthcare provider or company to view someone's personal information.

Implementation is also a long process because of privacy policies. The Health Insurance Portability and Accountability Act (HIPAA) was enacted by Congress in 1996. As a component of the act, the HIPAA Privacy Rule regulates the use and disclosure of certain information held by "covered entities" (generally, health care clearinghouses, employer sponsored health plans, health insurers, and medical service providers that engage in certain transactions.) The HIPAA privacy regulations are loaded with nuances; healthcare providers need to deal properly with them or risk large fines or even jail time (Terry, 2009).

According to Goldman (2009), HIPAA was not intended for the digital age. This view is very contradictory because HIPAA is a law written about healthcare technology. The real meaning however is that HIPAA and its' guidelines are not ready for the caliber of information that is held and shared in an Electronic Medical Record. The HIPAA Privacy Rule is seen as a landmark in privacy protection, but it is commonly acknowledged that the regulation is insufficient to cover the new and swiftly developing e-health environment presented as a result of the EMR system.

In a study that will not be popular among privacy advocates, researchers from two academic institutions warned that increased efforts to protect the privacy of health data will hamper the adoption of electronic medical records systems. The study, conducted by researchers at MIT and the University of Virginia, found that EMR adoption is often slowest in states with strong regulations for safeguarding the privacy of medical records (Vijayan, 2009).

On average, the number of hospitals deploying EMR systems was up to 30 percent lower in states where health care providers are forced to comply with strong privacy laws than it was in states with less stringent privacy requirements. This can be attributed to the concern that privacy rules often made it more difficult and more expensive for hospitals to exchange and transfer patient information. In these cases, the value of an EMR system is reduced, the study found. Regardless of EMR's effectiveness in reducing medical errors and improving baseline indicators of patient health, hospitals remain deterred from adopting EMRs by strong health care privacy laws (Vijayan, 2009).

According to Miller and Tucker (2009), the research suggests that there is a trade-off between achieving rapid implementation of EMR technology and strong health care privacy laws. In general, while medical privacy is positive for consumers of healthcare, medical privacy does not always allow for quick implementation of EMR systems. The study confirms that privacy laws are getting in the way of hospitals trying to exchange information with one another. Healthcare policy-makers will need to choose how much EMR implementation they want and at what cost to privacy of the patient.

While keeping the challenges of privacy rules in mind, healthcare providers need to make a decision regarding what organization they will partner with in the implementation of the EMR. Having EMR systems that are interconnected and integrated is vital. There are many different vendors of EMR systems. Each company has a different system envisioned. Hospitals use the system that best fits their needs, but is also conscious of the fact that all systems must be connected somehow in the near future. According to SIEMENS Healthcare, it would be hard to design a system that thinks like a physician. SIEMENS is a technological healthcare company that originated with robotics and other healthcare technologies. They are now one of the leading EMR manufacturing companies in the U.S. (Goldman, 2009).

According to Brown (2009), computerized systems are seen as the foundation of a national health information network that proponents say will improve care, advance medical knowledge and save the country tens of billions of dollars annually. But with the startup costs per physician in the tens of thousands of dollars, many smaller practices have been slow to move from the paper on the clipboard to the computer keyboard.

Smaller practices are suffering because unlike larger practices they do not have easily accessible financial resources. It may seem as though smaller practices will close down due to the financial challenge. Many small practices are defined by small town clinics or specialty clinics that may only have a handful of doctors. Many of these small town clinics do not have the funding available in larger practices.

Japsen (2009) found that small practices that do not get funds and support to equip their offices with the latest technology have little hope for President Obama and Congress to effectively implement healthcare reform. In the EMR movement, small practices are the underdog. Without them, however, people's health would be hindered. According to Lohr (2009), 75 percent of the nation's physicians work in offices of 10 or fewer doctors. There are many people who do not live close to large towns and truly depend on small practices. Japsen (2009) feels that small practices need assistance to operate similar to larger practices.

Small practice or large health care conglomerate, strict privacy laws or more flexible privacy guidelines, the power of the Electronic Medical Record system requires the effort to reap the benefits. Healthcare facilities with EMR systems still need to analyze this new goldmine of digital information to improve patient care. Healthcare providers can only gain full value if the data is studied to spot trends and develop improved best practices. This is not a new concept in today's business environment.

METHODOLOGY

This study provides an opportunity to seek a greater understanding of the implementation of the electronic medical record (EMR) and how healthcare providers are managing the challenges of going digital. This will be accomplished by exploring the implementation of EMR systems at two major health care facilities. Additionally, content will be utilized from major trade journals with information published in the last three months. Vendor documentation will also be utilized if possible.

Two key questions have been identified as key to this research study. In this case study, the primary questions are both "how" questions:

- a) How does a medical facility successfully implement an EMR system?
- b) How does the passing of the Obama stimulus plan affect the implementation of the EMR in a healthcare facility?

The case study research methodology provides the foundation for a study into the implementation of the electronic medical record for this research project. In determining the most appropriate research methodology strategy for this study, it was necessary to clearly understand the purpose of the research problem. This inquiry displayed the characteristics of both exploratory and descriptive research. The type of analysis required for this study led to the usage of a qualitative methodology.

The goal of understanding a phenomenon such as the implementation of the electronic medical record from the point of view of health care facility privacy officers would be lost if there was an attempt to quantify the data obtained in interviewing of key healthcare personnel. This study is dependent on the power of qualitative data to provide strength to the opportunity to learn more about the role of the American Recovery and Reinvestment Act (ARRA) in the adoption of Electronic Medical Records.

In February of 2009, U.S. President Obama signed into law the ARRA. Known as the economic stimulus plan, one section of the ARRA focuses on electronic health records. Since the passing of the ARRA stimulus plan is very recent, time has not allowed for much to be published regarding the impact that the stimulus has on the EMR implementation phenomenon.

A qualitative case study methodology will be utilized to execute this research project in order to gain a deeper understanding of EMR implementation and the stimulus plan. As a qualitative method, case study research excels at providing an understanding of a complex issue or entity and can extend experience or add strength to knowledge discovered through previous research. This case study is designed to bring out the details from the viewpoint of the participants by using multiple sources of evidence while investigating the implementation of EMR at two major healthcare facilities and reviewing reports provided in trade journals.

The two facilities selected for this descriptive case study were selected to provide some diversity. One facility selected is part of a very large healthcare system. The other facility is an independent facility also known as a leader in the healthcare field. Depth will be added to this descriptive case study by searching for themes present in the EMR implementation activities investigated.

The two healthcare facilities were contacted to obtain recommendations for individuals to assist in this study. Both facilities responded with providing the name of the person who manages the medical record function of the facility; the individuals recommended were also both designated as the Privacy Officer for their respective facility. Questions were prepared in advance and grouped into several topic areas. The list of questions was sent to both interview participants by e-mail in advance of the interview meeting.

Interviews were transcribed and data was analyzed and summarized. The research study will provide data to write description of the implementation of the EMR. The findings of this study are documented in a report that details the analysis of the knowledge gained regarding EMR implementation and lessons learned from the process. With interview data combined with very recent reports from major trade journals, multiple sources of evidence regarding the lessons learned in implementing an EMR system will be achieved. This will serve in providing a stronger study in the attempt to learn more about the challenges faced by healthcare organizations when moving forward with electronic medical record systems.

FINDINGS

"This is a train that's coming, you need to get on." This is a piece of advice from the Chief Information Officer of Midland Memorial Hospital. Midland Memorial Hospital in Midland, Texas, took a year to roll out their system which was based on an open source EMR (electronic medical record) based on the U.S. Department of Veterans Affairs' VistA e-health record, which has been used in VA facilities for about 20 years. Since Midland Memorial fully deployed its EMR in 2007 and made process and organizational changes related to the systems' use, it has seen a significant improvement in quality of care, including a 27 percent decline in deaths among heart attack patients and an 88% decrease in central line bloodstream infections (McGee, 2009). With these statistics, it becomes evident why the deployment of the Electronic Medical Record (EMR) is a topic that has earned cover story status with InformationWeek.

This research study provided an opportunity to seek a greater understanding of the implementation of the electronic medical record. Two key questions have been identified as key to this research study. In this case study, the primary questions are both "how" questions: (a) How does a medical facility successfully implement an EMR system? and (b) How does the passing of the Obama stimulus plan affect the implementation of the EMR in a healthcare facility?

This excitement about EMR systems was echoed by the participants in this research study. Administrators of two major healthcare facilities concur: Electronic Medical Records are a good investment. You will not be able to give good healthcare without them. There are many reasons it would be impossible to give quality care without these systems. EMRs provide efficiency, accuracy, and a professionally organized way of holding patients' information.

The EMR is only the beginning in the advancement in healthcare information technology. According to an ongoing series assessing the future of the Internet, McGee, Conry-Murray, and Foley (2009) report that three hospitals will soon let 30,000 patients read their doctor's notes regarding the state of their health during an exam. This will be done electronically and the concept of this sharing of information makes some physicians uneasy because they are concerned with how patients will react to reading blunt observations like "morbidly obese" in their records.

The new developments in healthcare continue and could be seen as a bit shocking. For example, one healthcare provider is testing the use of avatars to prod patients who do not follow physician orders. This is done by combining Internet-connected, at-home diagnostics with an automated rules engine which lets the avatar know whether to inform the patient to put down the salt shaker or even ask the patient if he/she took the prescribed medication (McGee, et. al, 2009). An avatar is a graphical image that represents a person, in this case, on the Internet. The concept and technology of the EMR makes this possible.

Electronic medical records can provide a patient with online access to lab results, medication history, information on allergies, and some of the physician diagnoses. They generally do not provide the explicit notes the healthcare provider writes about an office visit such as observations about a patient's symptoms, behavior, and appearance. This program could be very helpful for patients who get nervous during doctor visits and don't remember everything stated by the physician. For patients who are in denial about their health problems, putting information in writing that can be accessed online can be a very necessary shock (McGee, et. al, 2009).

InformationWeek, a trade journal with a focus on the business value of technology, took the EMR implementation challenge and made it the cover story of their August 17, 2009, issue (McGee, 2009). The investigation into finding ways to make E-Health succeed, resulted in a report on nine lessons learned which were presented not only for sharing with the healthcare industry but with everyone who is interested because all individuals are stakeholders in seeing that healthcare technology and the leaders who manage the change succeed. The nine lessons are summarized as strong findings in the investigation of this research study (McGee, 2009) and validated with confirming details from participants of this research study.

Lesson 1: Be ready for Sticker Shock.

EMR implementations cost millions of dollars for large hospitals. One northern Kentucky provider with 1,000 physicians and six hospitals is spending \$40 million on an EMR deployment. Healthcare providers can spend from \$25,000 to \$60,000 per physician for EMR systems. The costs are not limited to hardware and software. One needs to plan for consulting, training, add-on software, and other related expenses. Also, glitches can disrupt processes such as billing which can cause some painful cash-flow challenges. One healthcare executive director in North Carolina states that healthcare providers should add 50 percent onto EMR system cost for lost productivity, training, and unexpected problems. Sticker shock is common.

Interviews done in this research study confirmed that organizations also need to consider the cost of decreased productivity as well as the loss of revenue due to a reduced provider/patient schedule during the "go-live" time period. This is the time when the new system becomes functional within the organization. The decision to reduce the workload during an implementation is good advice for any organization during the stressful time of deployment.

Lesson 2: Get Doctors and Nurses on Board.

Healthcare organizations need buy-in by those in the front lines of healthcare and this should be obtained early in the process. Partnerships between Information Technology staff and providers are very critical to success.

Input from participants in this study validated that providers were included in the planning process from the beginning--working closely with IT staff. Without the necessary step of getting doctors and nurses on board, patients could witness the friction caused by the technology which would detract from the provider/patient relationship.

Lesson 3: Get Expert Help.

Experience shows that physicians who deploy EMRs often underestimate the business transformation involved, which highlights why it is a mistake to move forward with implementation of such a business process changing system without the assistance of an expert. The combination of expert change leadership with an insider who understands the needs of the providers and the intricacies of the organization is a strong recommendation.

Consultants were utilized in the organizations participating in this study. This also led to the usage of "superusers." One organization interviewed for this study set up a command center with superusers ready 24 hours a day for two weeks after the system went "live." The initial help desk would take in all of the phone calls and forward them to the appropriate specialty area. They currently have an IT help desk with "superusers" who are based in nursing areas.

Lesson 4: Bend EMR to your Needs.

No two businesses operate exactly the same. This is evident in the business of healthcare as well. There are many differences between policies and procedures between two healthcare providers taking part in this study. The simple fact is that there is not one EMR system that fits all practices. For some providers, an integrated system that combines the EMR with the practice management system is important.

One participant in this study provided this comment in regards to successful use based on making EMR fit the needs of the organization: "We haven't seen or had any concerns, but you do see it in literature. It depends on implementation; you must really have your foundational pieces together to have satisfaction." This advice should be critical to all organizations moving forward with EMR implementations.

Lesson 5: Start Small.

It is tempting to aggressively implement EMR systems to obtain those appealing federal stimulus funds, but EMR veterans would recommend not rushing and starting small. In some cases duplicate efforts in systems are challenging but necessary.

When Midland Memorial Hospital in Midland, Texas, took a year to roll out their system healthcare providers were on dual systems which meant that data was entered electronically but then the information was also printed to file with the patients' records in a physical file. This extra effort was seen as being challenging but necessary. Going slow in the process is a preventative measure in avoidance of errors. Based on lessons learned, problems can be caught early if the rollout is gradual rather than rushed.

According to one of the key participants in this study, the model of the EMR development has seven levels. This is more of a hospital designation than a clinic designation. The seven levels of EMR Adoption Model include cumulative capabilities which explain what information and/or divisions of the hospital are installed. Stage zero includes that "all three ancillaries are not installed" (HIMMS, 2009, p.1). Hospital ancillaries are described as separate members of the hospital. The three ancillaries described by HIMMS (2009) are "Lab, Radiology, and Pharmacy. Once these stages are installed it is known as Stage one" (p.1). According to HIMMS (2009), "Stage seven is when the medical record is fully electronic; HCO is able to contribute to CCD as a byproduct of EMR; Data

warehousing is in use. In quarter one of 2009 only 0.3% of U.S. hospitals have achieved this stage” (p.1). The benefits of Electronic Medical Records are hard to define. As one participant stated, “until we reach level 7 or levels we have not even defined, you do not realize all of the benefits.”

She goes on to add the observation that you would not find that level of complexity in other industries. A great deal of time and expense has gone into forming a useable Electronic Medical Records system. Participants in this study are reaching for high levels in successful implementation.

Lesson 6: Training is Essential and Even Doctors Need IT Training.

Physicians want to spend their time focusing on the healthcare of their patients; they do not want to spend their time learning new computer systems. This is a challenge. From lessons learned from EMR implementations it is evident that if physicians do not set aside sufficient time to learn the new EMR systems, the system will not be mastered. Schedules must be cleared to make room for training. This is not a popular concept with physicians. When the Institute for Family Health rolled out its Epic EMR, it had consultants train several staff members, and they trained their peers. This is known as a train the trainer approach which is used heavily in many information technology systems. Epic was the system implemented by one of the participating organizations in this study.

One basic challenge many organizations experience is that physicians over the age of 50 years old often do not know how to type. Older doctors have often relied on dictation. While speech recognition products can digitize data, they do not structure it the way EMRs need to have it structured. For the physicians who do not type and need to hunt and peck, a productivity decrease will be the result in their medical practice.

Training is a fundamental component in successful implementation of Electronic Medical Records. Required training was specified by facilities participating in this study. Employees, including doctors, were scheduled into a baseline learning class. Training was scheduled and provided by the hospital, but practicing with Electronic Medical Record simulators was completed by employees on an unscheduled basis. This was vital to successful implementation.

Training will be important to reach the highest levels of utilization of the EMR system. A strong feeling shared by a participant in the study was based on meeting goals of the top levels of utilization: Level 7 cannot be met without sufficient training. The healthcare organization needs to adapt to organizational learning to be able to optimize the system.

A large concern at the start of implementation is patient comfort and awareness. Electronic Medical Records are aimed at improving patient’s records, but there is also an expressed concern for the patient-provider relationships. One participate stated, “It is really about how the physician learns to interact with the computer and the patient.” Patient-provider relationships should be improved with improved technology. It appears that a combination of technology/computer skills with the soft skills necessary for strong provider/patient relationships will be essential.

Lesson 7: Expect a Productivity Hit.

As in all information technology implementations, productivity drops after an EMR implementation and then it increases. Yet, experience shows that this rebound varies widely by different organizations. As a guide, Stephen Bennett, CEO of Concordant, an IT services firm working with several EMR rollouts, offers these observations:

- a) Productivity will fall as much as 50 percent in the first two to three weeks after the live date.
- b) The next three to six weeks it will ramp up to about 75 percent of what it was prior to the implementation.
- c) Following this it will go back to normal as long as there are no setbacks.

For some organizations, it can take at least a year to return to full productivity. Organizations need to keep in mind that the EMR benefit comes from better documentation, improved accuracy, and safer patient care. The cost

for these gains can be lost productivity. According to one of the participants in this study regarding the greater care gains, "it is a challenge to measure that. Electronic anything is about work flow and how you use it as a clinical support tool. EMRs have improved accessibility--that is clearly defined."

Lesson 8: Think About the Future.

One needs to try to predict the future which is not easy. The system that organizations select now is not what they will need in the future. Because medical advances are always changing the type of information (data) that is important, data collected and analyzed today can affect the future requirements for data collection. The U.S. government is currently finalizing its definition of what comprises the "meaningful use" of EMR systems. This is extremely important because compliance with this newly formed definition will determine whether a healthcare provider will be eligible for federal stimulus funds. Providers must ensure that their EMRs will be able to capture whatever data is deemed important in the definition. In addition to this, providers need to ensure that their systems can meet insurers' and other healthcare payers' pay for performance requirements.

It is very obvious that healthcare facilities will be eager to abide by the definition of meaningful use because this will be the mechanism for the government to decide if the hospital will qualify for the stimulus reward. Participants in this study are positive in their approach and are determined in their goal to meet the requirements of the definition. It appears clear that the organization will support these efforts.

According to documentation within a white paper published by Dell Affiliate Physician EMR Solution and Ziff Davis Enterprise (2009), to appreciate the "meaningful user" term, it helps to understand the government's reason for funding EMR. The EMR incentives fall under the broader Health Information Technology for Economic and Clinical Act (HITECH) provisions of ARRA (American Recovery and Reinvestment Act). Under HITECH, the ultimate vision is to "enable significant and measurable improvements in population health through a transformed healthcare delivery system." The key goals include the following:

- a) Improve quality, safety, and efficiency
- b) Engage patients and their families
- c) Improve care coordination
- d) Improve population and public health
- e) Ensure privacy and security protections.

These goals can only be realized through the effective use of information to support better decision making. To accomplish this, HHS (Health and Human Services), through its Office of the National Coordinator for Health Information Technology (ONC), is creating guidelines as to what constitutes meaningful use. This will be critical to the successful future outlook of the EMR system.

Lesson 9: Manage Expectations

Honest and straightforward information is necessary. The healthcare organization must ensure that their staff understands why they are implementing the EMR in the time frame selected. Also, it is critical that all participants understand that the goals will not be achieved immediately. All must know the destination--it is not the "go live" day. It is the ongoing use of the application and the change in the business process in the healthcare organization.

The users of the system must know that the transition to an EMR system will not be easy--no major transition in IT is easy in any organization. It is critical to keep in mind in any IT transition that vital business issues are at stake--the bottom line is that the future of the organization is at stake. In healthcare, organizations cannot let this train go by without hopping aboard.

Installing an EMR system is expensive in itself. Upkeep of an EMR is also extremely important and costs money as well. Implementation of EMRs creates jobs, improves healthcare, and provides a positive effect on the overall wellness of our society. While all of this technology seems complex, the participants of this study agree that

information technology in healthcare lags behind the information technology utilized in other industries. It is probably because change is extremely hard and the great amount of information that medical records contain is astounding. Implementation costs are the largest concern at the current time. The focus however, is trying to turn towards the cost savings.

Lesson 10: Is Anything Missing? Don't Forget About Privacy.

Surprisingly, none of the nine lessons provided in the cover story of InformationWeek (McGee, 2009) had an explicit focus on privacy. The findings of this study show that privacy of patient data cannot be ignored in the successful implementation process. Patient's medical records are extremely confidential and they need to be carefully monitored. As one participant in this study (also the privacy officer for the organization) stated, "It is a lot of powerful information and we need to make sure it is not used incorrectly."

There are mechanisms within the technology to track the viewing of patient data. As one privacy officer from a major hospital said "A clinician portal is a system that shows records of who looked at a patient's information." This is extremely important to the healthcare organization because it tracks exactly what information is viewed and by whom. This system provides an alert or red flag when an employee is looking at the records of a relative or someone who is connected to them in some way. This normally shows a breach of private records. A system such as this prevents serious violations of privacy.

There is significant concern for internal infractions of patient privacy. As one participant in the study shared, strict internal security actions are most valuable because "it is much more likely that breaches happen because of people doing the wrong thing inside of your walls."

The potential to have a patient's information so freely available--because of the digital record--is a very large ethical challenge. While improving healthcare with information technology is a positive move for the healthcare industry, some people do not understand the results of trying to implement too fast. A powerful question presented by a key participant in this study brings us to the core value of respect for the human person: "We are throwing all of these things toward wanting to make healthcare better, but does anyone understand the ramifications of privacy?" One of the major reasons that EMR implementation is so challenging is because of privacy issues.

CONCLUSION

To summarize all the lessons learned and the concerns of the stakeholders in the implementation of Electronic Medical Records Systems, it would come down to the eight word statement made by one of the key participants in this study: EMRs need to be implemented with common sense. Although this may sound simplistic and even blunt, this is a major conclusion of this investigation of the phenomenon of the implementation of the Electronic Medical Record System while jumping through the hoops to earn government stimulus funding. Going digital does not mean that we neglect basic common sense. This is simple yet wise advice for a very complex system that contains the private and confidential information of all people who seek healthcare by caring and ethical providers within the United States.

Taking time to put in place a method and making sure that it is accurate and ethical is beneficial to all who are involved. Using common sense to implement an EMR system will conclude in success for the stakeholders of electronic medical records.

REFERENCES

1. Brown, M. H. (2009, March 23). Computerized records giving doctors new tool. But some fear loss of privacy with U.S. Health Information Network. Retrieved June 8, 2009, from www.chicagotribune.com/news/health
2. Dell (2009). Electronic medical records 101. Retrieved September 15, 2009, from <http://www.webbuyersguide.com/resource/resourceDetails.aspx?src=rss&kc=rss&id=15003>

3. Freking, K. (2009, January 14). Stimulus includes help for doctors. Retrieved June 8, 2009, from www.foxnews.com
4. Goldman, D. (2009, January 12). Obama's big idea: Digital health records. Retrieved June 8, 2009, from <http://cnnmoney.com>
5. HIMMS Analytics. (2009). EMR adoption model. Retrieved July 20, 2009, from www.himmsanalytics.org
6. Japsen, B. (2009, June 4). Advocate exec: Doctors in smaller practices need infrastructural, administrative help and access to latest technology data. Retrieved June 8, 2009, from www.chicagotribune.com/business
7. Levey, N. N. (2009, March 17). Shot in the arm for digital health. *Chicago Tribune*. Retrieved June 8, 2009, from <http://www.chicagotribune.com/news/nationworld/chi-health-techmar17,0,7364529>
8. Lohr, S. (2009, February 10). Electronic Health Records: How to Spend the Money Wisely. *New York Times*. Retrieved June 1, 2009, from <http://bits.blogs.nytimes.com/2009/02/10/electronic-health-records-how-to-spend-the-money-wisely/>
9. Low, R. (2009, May 11). Clinics slow to adopt paperless medical records. Retrieved June 8, 2009, from <http://www.fox4kc.com/news/wdaf-clinics-paperless-records,0,7058639.story>
10. Mann, D. (2005, September 23). Katrina shows need for electronic health records. *FoxNews.com*. Retrieved June 8, 2009, from <http://www.foxnews.com/story/0,2933,170146,00.html>
11. McCaughey, B. (2009, February 9). Ruin your health with the Obama stimulus plan. *Bloomberg.com*. Retrieved June 8, 2009 from <http://www.bloomberg.com/apps/news?pid=20601039&sid=aLzfDxgbwhzs>
12. McGee, M. K. (2009, August 17). Nine ways to make e-health success. *InformationWeek*, 1238, 27-32.
13. McGee, M.K., Conry-Murray, A., & Foley, J. (2009, October 5). The customer web. *InformationWeek*, 1242, 8-16.
14. Miller, A. R. & Tucker, C. (2009, July). Privacy protection and technology diffusion: The case of electronic medical records. *Management Science*, 55(7), 1077-1093. DOI: 10.1287/mnsc.1090.1014
15. Paddock, C. (2009, January 12). U.S. will have digital health records in 5 years says Obama. *Medical News Today*. Retrieved June 8, 2009, from <http://www.medicalnewstoday.com/articles/135131.php>
16. Terry, K. (2009, March). Patient Privacy - The new threats. *Physicians Practice*, 19(3). Retrieved November 1, 2009, from <http://www.physicianspractice.com/index/fuseaction/articles.details/articleID/1299.htm>.
17. Vijayan, J. (2009, April 14). Privacy rules hamper adoption of electronic medical records, study says. *ComputerWorld*. Retrieved November 1, 2009, from http://www.computerworld.com/s/article/9131578/Privacy_rules_hamper_adoption_of_electronic_medical_records_study_says