

EHR AND COST: IS “MEANINGFUL USE” MEANINGFULLY REDUCING HEALTH
CARE COSTS?

by

Katie R. Pridgen

A Senior Honors Project Presented to the

Honors College

East Carolina University

In Partial Fulfillment of the

Requirements for

Graduation with Honors

by

Katie R. Pridgen

Greenville, NC

May 2015

Approved by:

Dr. Paul D. Bell, PhD, RHIA, CTR

Department of Health Services and Information Management, College of Allied Health Sciences

Abstract

The United States of America is one of the top spenders on health care per capita in the world; in 2013, we spent twice as much as France, a country known for having quality health care for its citizens (OECD, 2013). As a result, the federal government has mandated the use of EHRs in order to curb health care costs and improve health care for the citizens of the United States by increasing efficiency and interoperability of different health care delivery systems. The Medicare and Medicaid EHR Incentive Programs provide financial incentives for the “meaningful use” of certified EHR technology. However, there is growing doubt whether this monetary incentive is sufficient to offset the substantial costs associated with implementing and maintaining EHR systems (Fleming, Culler, McCorkle, Becker, & Ballard, 2011). Additionally, during this same time period, the landscape of health care facilities has changed; solo practices and small group practices have been acquired by larger health care systems who are more able to purchase expensive EHR technology. This study aims to consider the benefits and drawbacks of implementing and meaningfully using the EHR as well as discuss the specific financial and nonfinancial costs of EHR implementation. This study further aims to contribute to existing research as well as to suggest further topics of related research.

I. Introduction

Health care has been a highly controversial topic since the beginnings of organized insurance coverage at the start of the twentieth century. From credentialing physicians to insurance to privacy laws to pharmaceuticals, almost every nut and bolt in the health care industry has been debated. Perhaps the most infuriating topic of all is the engine of the industry: cost. In 2013, the Organisation for Economic Co-Operation and Development reported that the United States is one of the top spenders on health care per capita in the world, surpassing even France – known for quality health care for its citizens. Additionally, one of the top reasons US citizens file for bankruptcy is because of medical bills (Mangan, 2013). Furthermore, The Institute of Medicine’s (IOM) “To Err is Human: Building a Safer Health System” has brought to light the frequency and extraordinary cost of medical errors. Health care in the United States has reached a breaking point. Quality is being compromised and costs are high. The government has stepped in to essentially rebuild health care delivery from the ground up. The IOM’s follow up to “To Err Is Human,” “Crossing the Quality Chasm: A New Health System for the 21st Century,” breaks down the problems of the US health care system and lists the overarching goals of health care as well as offers performance expectations. Meaningful Use, the product of these reports as well as the HITECH Act within ARRA, is the Center for Medicare and Medicaid Services’ (CMS) program to promote quality health care while controlling its costs. The main ingredient in Meaningful Use is the adoption of a certified electronic health record (EHR) by health care organizations. Although the goal of the proposed use of EHR systems is to promote quality, patient safety, and efficiency, many in congress as well as leaders in health care and medicine believe the adoption and implementation of EHR systems comes with various costs that may prevent health care organizations from realizing these expected benefits. An

examination of the cost of health care will be examined by a review of the literature concerning health insurance history, and Meaningful Use. This literature review and study aims to consider the benefits and drawbacks of implementing and meaningfully using the EHR as well as discuss the specific financial and nonfinancial costs of EHR implementation. This study further aims to contribute to existing research as well as suggest further topics of related research.

II. Methods

Throughout this review and study, I will use the definition of EHR suggested by the Healthcare Information and Management Systems Society (HIMSS): “longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting.” A review of relevant literature was conducted by using specific search terms to find sources related to this topic in academic databases such as PubMed, CINAHL, and Medline. Search terms included “electronic medical record (EMR),” “health care quality,” “sickness coverage,” “accident insurance,” “EHR implementation,” “costs of EHR,” and “meaningful use objectives.”

III. Literature Review

This literature review will begin by highlighting the events and particular factors that lead the United States health care system to become one of the most expensive in the world. Understanding the previous methods of health care delivery as well as cultural and political factors is important to the way in which we understand how our health care system is financed today. Furthermore, the history of health care delivery can inform current and future reform efforts to improve the cost efficiency of the US health care system. Reviewing the beginnings of

insurance, development of technology, social insurance programs such as Medicare and Medicaid, and quality of health care will outline the factors that drive up the cost of health care.

Health insurance is a contract in which the insured pays the insurer a small premium in exchange for a larger benefit when certain health services are used. (Murray, 2007). For risk-averse Americans, a price can be put on the ability to “avoid, minimize, or shift the risk of suffering a loss” (Hall, 1994). In 1798, the US Marine Hospital Service was established for merchant marines after President John Adams signed it into law. In the mid 1800s, the first known accident insurances were issued in the US, and group accident and health insurance began in 1891 (Murray, 2007). At the start of the twentieth century, employers of railroad workers, miners, and other industries started providing doctors that were compensated out of workers’ paychecks. Sickness coverage became more common during this time as well. Sickness coverage was insurance that resulted in a disbursement of a cash payment upon the determination of a worker’s illness and inability to work by a physician or sickness fund committee. The fund provided income for the worker and his family that would have otherwise been lost. Medical expenses were not covered, but there were not many proven medical therapies at the time (Murray, 2007). Accident insurance progressed into what we now know as workmen’s compensation. Starting in 1911, forty-one states adopted a form of workmen’s compensation over a span of nine years (Murray, 2007). At this same time, medicines and surgical techniques were considerably improving.

After the apparent success of workmen’s compensation, a group of Progressives and state insurance activists, called the American Association for Labor Legislation (AALL), started to draw up social insurance programs funded by a combination of the worker, the employer, and the state. The programs the group drew up included medical, surgical, and nursing care for the

worker and his family, and a choice in physicians among other benefits. The AALL thought these programs would begin as smoothly as workmen's compensation, but the concept was derailed because of states' apprehension to becoming involved in funding health care (Murray, 2007). This was because of two opposing political positions regarding state supported health insurance; a struggle ensued between conservatives who saw funding for such insurance as state sponsored socialism and progressives who argued for expanding the pool such that the risks and costs associated with providing health insurance could be more equitably shared across the population.

Two decades from the start of group insurance, over one hundred organizations in the US made health insurance their primary business (Murray, 2007). In 1929, a group of teachers at Baylor University formed a prepaid hospital arrangement at Baylor University Hospital in Dallas, Texas. The arrangement became known as Blue Cross (Follmann, 1963, 107). In the 1930s, Blue Cross was the first organization to successfully market a hospital insurance policy (Hall, 1994, 14). One decade after Blue Cross broke ground on the health insurance we know today, the foundation for employer-sponsored insurance was laid.

The boom in employer-sponsored health coverage began after World War II when wages were frozen and jobs were not lucrative. After the Department of Labor determined that fringe benefits, like sick leave and health insurance, were not considered wages, employers were able to retain employees at the frozen wage rate by offering better fringe benefits. Employers were also able to remain competitive among other businesses seeking workers based on these benefits. Since fringe benefits were also excluded from personal income taxes, insurance was purchased by employers using their employees' before-tax income. From the 1950s through the 1960s, employer-sponsored insurance was widespread (Murray, 2007).

The very nature of the benefit of third-party insurance is also its great weakness. Moral hazard is the way a person's behavior changes when they are issued insurance against losses. In health care, when people become insured, they are more likely to see a doctor or use other medical services (Thoma, 2013). Critics of state funded insurance referenced its moral hazard by citing the increased number of days missed by workers in Germany covered by sickness insurance (Murray, 2007). To alleviate the impact of moral hazard and adverse selection, the tendency for insurance companies to charge higher premiums or exclude those who are at a higher risk for submitting a claim (Law, 2014), sickness funds enforced a waiting period for claimants and required a certification by the claimant's physician (Murray, 2007). Later, third party insurances and employers controlled moral hazard by requiring the insured to pay deductibles and copayments, as well as capping reimbursement amounts and the number of days of benefits before out-of-pocket costs were required for continued care. Employer-sponsored insurance also curbed the problem of adverse selection (Hall, 1994, 13).

Though moral hazard and adverse selection were improved, there were still portions of the market that were left out. The impoverished and the elderly and disabled were unable to obtain insurance coverage; the poor could not afford insurance, the elderly did not have jobs, and the disabled found insurance very expensive because of their preexisting conditions. These two groups lead to the government enacting Medicare and Medicaid, social insurance programs for the elderly and the poor and disabled, respectively (Hall, 1994, 14-15). In 1965, the Social Security Act passed Medicare and Medicaid as Title XVIII and XIX. According to the Centers for Medicare and Medicaid Services (CMS), as of July 2012, there were 50.5 million people enrolled in Medicare Part A or Part B. According to Medicaid.gov, there are 4.6 million people enrolled in Medicaid, almost all of which are also enrolled in Medicare. As more and more

people enroll in Medicare and Medicaid, more people use the services. As a result, increased utilization is one reason for medical cost increases.

The development in technology has also contributed to the rise in medical costs. As medical technology becomes more complex, personnel are needed to operate it. The expectation and competition among facilities of possessing certain diagnostic equipment such as a CT scanner or an MRI machine coupled with increased use of such equipment contributes to increased costs. Specialization of medicine has also increased medical costs. Medical technology is also growing obsolete at a faster rate than before and is replaced by newer more sophisticated and more expensive versions (Hoffman, 2009). As with the rest of the economy, inflation and the rising cost of living also contribute to increased medical costs.

Poor quality of patient care is another significant cost driver in our health care system. Examining quality in health care is essential to cutting health care costs; errors cost money, and identifying ways in which to improve quality means fewer errors and greater opportunity to cut costs. In 1999, the Institute of Medicine (IOM) released “To Err is Human: Building a Safer Health System,” a report revealing some disturbing trends in our health care system. The report estimated that, after two studies were conducted, between 44,000 and 98,000 people die every year as a result of preventable medical errors. In the report, the IOM investigated the costs associated with preventable medical errors. Including the cost of additional medical care due to the error, lost income, and disability, preventable medical errors cost between \$17 billion and \$29 billion in hospitals across the country. In 2001, the IOM released “Crossing the Quality Chasm: A New Health System for the 21st Century,” a follow up report detailing objectives for policymakers and those involved in the health care industry. The report offered a framework for a reformed health care system and methods for change management, the tools and processes used

to maintain control of a change effort (Kotter, 2011). Additionally, the report was one of the first big pushes to improve health care quality in addition to reducing costs.

As a part of its report, the IOM highly recommended the use of information technology (IT) to improve health care. They identified five areas that IT could be used to improve health care delivery: clinicians and patients could easily gain medical knowledge through use of the Internet; computer-aided decision support systems could assist physicians in providing evidence based care; collecting and sharing clinical information could contribute to improved medical studies as well as improved quality of care during a patient's transition or coordination of care; errors could easily be reduced by prompting the physician to complete certain tasks based on patient information as well as prevent drug interactions by examining the patient's medication list; and boost patient and provider communication by allowing messages to be sent between the parties in order to treat minor illnesses or continually monitor a chronic condition (IOM, 2001, p. 31-32).

Overall, "Crossing the Quality Chasm" made the first big push for converting paper records to electronic records. The IOM outlined the need for electronic records as follows:

The meticulous collection of personal health information throughout a patient's life can be one of the most important inputs to the provision of proper care. Yet for most individuals, that health information is dispersed in a collection of paper records that are poorly organized and often illegible, and frequently cannot be retrieved in a timely fashion, making it nearly impossible to manage many forms of chronic illness that require frequent monitoring and ongoing patient support. (IOM, 2001, p. 15)

The report continued by pointing out the lack of infrastructure at the time to support the software that would provide a means to improve quality and efficiency of health care. It further stated that

technology should play a central role in the reconstruction of our health care system; automation of clinical, financial, and administrative tasks were proposed to play a big role in improving quality and efficiency as well as boost patient confidence in their providers and prevent errors. Further, it recognized the need for commitment by government officials as well as health care leaders and clinicians to make this change (IOM, 2001, p. 16). This commitment, the IOM estimates, should lead to the elimination of most handwritten documentation by the year 2010 (IOM, 2001, p. 17). Due to the initial lack of widespread adoption of the EHR, this particular estimation did not prove itself to be correct. However, legislation to come would spur EHR adoption rates.

The IOM successfully set the stage for federal legislation pertaining to use of IT to reduce costs of health care while improving health care quality. After the release of the IOM quality report, the government was indeed motivated to enact change. In 2009, President Barack Obama signed the American Recovery and Reinvestment Act (ARRA) into law. The Health Information Technology for Economic and Clinical Health (HITECH) Act, a specific provision within ARRA, mandated implementation of an EHR system in health care organizations across the nation and set aside \$27 billion in incentives for physicians and hospitals that successfully met criteria that demonstrated “meaningful use” of the EHR (Fleming, Culler, McCorkle, Becker, & Ballard, 2011; Adler-Milstein et al, 2013). The incentives are meant to encourage physicians to adopt a certified EHR and to cushion the initial costs of EHR adoption. Incentives are available for those physicians and hospitals that sign up as eligible professionals (EPs) and eligible hospitals (EHs). EPs and EHs must also meet certain quality and objective measurements before they receive the financial incentive. These measurements are collectively called “meaningful use” objectives and were created by the secretary of the Department of Health and

Human Services (Blumenthal & Tavenner, 2010). From 2011-2013, EPs were required to choose six out of forty-four clinical quality measures (CQMs) to report for the incentive program. Starting in 2014, EPs are required to choose nine out of sixty-four CQMs to report. These CQMs must cover three of the six National Quality Strategy (NQS) domains. The six domains are patient and family engagement, patient safety, care coordination, population/public health, efficient use of healthcare resources, and clinical process/effectiveness (Centers for Medicare and Medicaid Services, 2014).

The Meaningful Use (MU) objectives aim to promote more than just adoption. Specifically, MU objectives are meant to encourage the meaningful use of certified EHRs in order to promote quality, patient safety, and efficiency. Additionally, objectives aim to encourage the engagement of patients and their families in their health, improve coordination of care, and maintain the confidentiality of each patient's health information (Medicare and Medicaid Programs, 2010). HITECH also provides technical support for training, implementation, and utilization of EHR systems through the establishment of regional extension centers (RECs) (HIMSS, 2014b). In order to demonstrate meaningful use, EPs and EHs must submit electronic data to the Centers for Medicare and Medicaid Services (CMS) demonstrating they are meeting the thresholds of the selected objectives by using their EHR system. The objectives have been separated into two groups: core objectives and menu objectives. The core objectives are basic functions of a physician practice or hospital; physicians should use the EHR to input patient information and demographics, update medication lists, record vital signs, and current problems list. Other core objectives encourage EHR users to get the fully intended benefits out of the system. For example, physicians should implement computerized physician order entry (CPOE) and prescribe medications through the system, known as e-prescribing.

CPOE is superior to a manual prescribing system because the software is able to check the order against the patient's vitals, weight, and current medication list. CPOE software aims to improve quality by preventing drug errors and adverse drug events. The IOM reported in "To Err is Human" that a study conducted on prescription related errors revealed a rate of 3.99 errors per 1,000 medication orders (p. 33); if approximately 300,000 medication orders were written over the course of one year at a hospital, 1,197 of those orders would contain an error. The menu objectives are tasks that allow the physician more choice in how the physician will implement their EHR. Tasks in the menu objectives include checking drug formularies, incorporating lab results into EHRs, reminding patients of care for a specific condition, and providing a means of information transmission upon a patient's transition of care. These objectives aim to meet the proposed goals of the IOM: improved safety, quality, and efficiency (Blumenthal & Tavenner, 2010).

After several years of attestation and submission of data for MU, many are interested in the actual cost implications of this program. Cost factors can be separated into two groups: financial factors and non-financial factors. A study by Fleming, Culler, McCorkle, Becker, and Ballard (2011) aimed to calculate the cost of implementing EHR systems in primary care practices, and they listed financial costs as funds spent on hardware, software licensing, hosting, and technical support. Factors considered non-financial were time estimates on interface development, redesigning workflows, and installation of technology as well as the time consultants spent advising the implementation team. Additionally, time spent training end users, using simulations, and any other time devoted to implementing the EHR were considered non-financial costs. The extent of non-financial costs of EHR implementation will be elaborated upon

following the data and analysis. The next section includes a specific report on the monetary costs of EHR implementation.

IV. The Costs of Implementing and Using the EHR

A study by the American Hospital Association was conducted regarding the experiences of hospitals that implemented a certified EHR system and using electronic clinical quality measures (eCQM) in conjunction with participation in the incentive program (2010). Overall, EHRs have improved efficiency and reduced error rates because of the ease of access to a patient's clinical information such as lab results and medication lists. Additionally, CPOE and clinical decision support systems have significantly reduced drug errors, such as adverse drug events and prescription errors. However, this study found that physicians were frustrated with the emphasis on documentation and attention to the EHR. Physicians have to spend time inputting data into a reporting system and deviating from normal work flows in order to meet thresholds and continue receiving incentives when they would rather attend to patients. Additionally, a lot of extra work had to be done in order to make the eCQM tools perform as they should. Organizations had to add or modify their EHR system to allow the user to pick from a drop down box or click a check box because of problems inherent to reporting via free text narrative. Free writing documentation is not conducive to reporting because of the lack of categorization of data elements potentially contained in the free text. Narratives can be analyzed, but organizations using these eCQM tools have observed difficulties with accurate data output due to missing data fields and data qualifiers (Eisenberg et al., 2013).

Fleming, Culler, McCorkle, Becker, and Ballard estimate that the cost per physician of implementing an electronic health record system including maintenance costs through the first

year is \$46,659. Financial costs tallied up to \$110,790 per practice, while non-financial costs tallied up to \$87,095 per practice. The authors of the study mention that reduction in cost is more likely for larger practices rather than a practice with a few physicians. These results line up with other studies done on pilot communities in Massachusetts and New York City (Mostashari, Tripathi, & Kendall, 2009). Other studies on cost savings note deficits in the first year of implementation, but costs are recovered quickly. Many of the practices reporting for the study mentioned problems at the start of implementation, but no practice reported that the financial costs outweighed the benefits. The study reported the high ratio of benefits to costs is mostly a result of cost savings from eliminating employees needed for maintaining paper charts, chart-related activities, and transcription. In addition, increased revenue from coding contributes to the benefits. The researchers note there was a study in which three of the six community centers studied never recovered the initial investment in the EHR system (Desmartis, Gagnon, & Gallego, 2010). This study was conducted before the CMS EHR Incentive Program and Meaningful Use standards were in place, so practices may not have used their EHR to the same standards as EPs and EAs were at the inception of MU.

V. Discussion

The following discussion investigates specific challenges presented by the EHR that can result in added health care expenses in the areas of patient safety and care quality, employee morale, and efficiency. The implementation of the EHR has brought forth significant positives such as increased legibility, quicker record retrieval, and timely eprescribing, but not without notable negative stumbling blocks. This discussion explains the need for caution when touting

EHR implementation as the definitive solution to the existing concerns in our health care system and elaborates on the particular stumbling blocks.

Most of the objectives in the Meaningful Use program are not hard to meet; the tasks of the eligible providers (EPs) and eligible hospitals (EHs) are tasks they should have been performing anyway, but they are now being required to document them in a standardized fashion. Quality of care has certainly improved; the anecdotal chicken scratch of a primary care physician is in the past, and one can be sure the pharmacy will not mistake their prescription because of illegible handwriting. Patients are able to be more involved in their care because of patient portals, direct messaging with physicians, and telemedicine. Documentation is plentiful and makes for a more complete patient record. However, I do not believe we have harnessed the cost savings portion of the EHR program. During the beginnings of talks between the government and health care leaders and physicians, physicians understood the government to be subsidizing their purchase of an EHR. However, the government clarified that they would be offering an initial incentive after the first attestation period and then diminishing incentives as the physician or organization continually demonstrated meaningful use. This, understandably, put many physicians off because of the lump sum and additional maintenance costs of an EHR. The lack of information proving the effectiveness of an EHR also did not help physicians get on board with the program (Terry, 2009).

IOM proposed in their report, "Crossing the Quality Chasm," that a shift from symptomatic care to preventative care should take place in order to decrease costs. Yearly mammograms, colonoscopies after forty years of age, and pelvic exams understandably are less costly than the treatment of advanced staged cancer. The Affordable Care Act mandated that insurance provide preventative care at no cost to the patient. Additionally, EHRs are built with

the capability to remind patients via the patient portal to schedule preventative care appointments based upon their age and health history. The concept of preventative care is largely flawless, but it requires the patient be educated about his or her own particular health status and be aware of the opportunity for these preventative procedures.

In her article, “The Affordable Care Act and Electronic Health Care Records: Can Technology Help Reduce the Cost of Health Care?”, Fontenot is skeptical of the IOM and federal government’s heavy reliance on the EHR to transform our current health care delivery system to bring about cost savings, efficiency improvement, and quality of care improvement. She speaks specifically to patient perceptions of health and the difficulty of proposing the shift from symptomatic care to preventive care to unique patients with differing knowledge about their health. Fontenot writes, “that vision falls short because it presumes that, if the patient is well-informed, his or her motivations will be logical” (p. 69). Not every patient is going to comply with his or her medications, agree with a particular treatment option, or even believe they can be healthy. Health literacy is an important constituent to EHR implementation and cost reduction because EHR implementation alone will not realize significant health care cost savings. On the other hand, restructuring health care delivery such that it emphasizes preventive population health over conventional health care delivery and encouraging patient education should not only help decrease costs, but should also promote application of the EHR for the delivery of efficient high quality health care.

Furthermore, Fontenot surmises that for cost reduction to occur, patients should be cost-conscious as well. Moral hazard, again, is observed in the shielding of patients from the actual cost of their health care. Patients hardly see the full cost of their health care because of a third-party payer only requiring a low copay. Fontenot explains that the likelihood of a patient

choosing a less expensive treatment because they care about the impact on the health care system is slim. A study in *Health Affairs* by Sommers, Goold, McGlynn, Pearson, and Danis discusses the responses and attitudes of patients when asked to consider costs of medical procedures. The study reports “there were four times as many negative comments as there were positive ones on the theme of willingness to discuss costs” (Sommers et al, 2013). Patients do not consider cost when consulting with physicians about their medical treatment because when our health is on the line, we want the best available treatment no matter the cost.

Fontenot continues to point out that physicians can now order tests and procedures more easily than before because of the automatic nature of checking a box or selecting an option from a dropdown menu. Now that a physician can click codes and auto fill explanations, more procedures can be ordered, and in turn drive up health care costs. Overall, Fontenot is not in complete opposition to EHR implementation in order to decrease cost; she only wants to make legislatures and health care leaders aware that an EHR will not be a quick-fix solution.

The ability to copy and paste information from one patient’s record to the other can cause errors. In “Fixing a Broken EHR,” Butler presented a case of a patient and her daughter being seen in a health care facility while the nurse was speaking to her as if she was someone else. When the daughter of the patient asked to see the screen the nurse was reading from, the incorrect information was not there, as if the nurse had to quickly delete portions of information frequently. Because of the frequency of copy and paste errors, transcriptionists have seen an increase in demand of their skill. Medical transcriptionists and editors are being hired to scour records for copy and paste mistakes as well as to advise practitioners on the best ways to document. An organization may also need to contract with a scribe company. A patient may not feel as though they are a priority and lose trust for their physician because the patient only sees

the physician typing on a computer instead of listening to them. Scribes are able to dictate what a provider is saying and doing for each individual patient so the provider can truly listen to the patient without having to sit in front of a computer and interrupt the flow of the discussion to type. While the use of scribes allows physicians to see more patients (Butler, 2015), there are concerns associated with adding this job title. It represents an added cost to the organization. Additionally, questions may be raised regarding the quality of documentation since it is not generated directly from the provider. Despite the expectation for immediate benefits to flow from implementing EHR systems, many health care enterprises are disappointed because of maintenance and work flow changes that must be implemented in order to realize smooth implementation and utilization of these electronic systems (Fontenot, 2014).

A cost that was not specifically explained in any studies I reviewed was the cost of change management. Change management may mask itself in the form of time that supervisors, directors, and physician champions (respected physicians who act as the liaison between a group of physicians and an EHR implementation team) (National Learning Consortium, 2012) take out of their day to train and assist end users, but we should not underestimate the cost it imposes on an organization. Regional Extension Centers (RECs) are funded by HITECH and serve to guide organizations or physicians through EHR implementation. The Office of the National Coordinator for Health Information Technology (ONC) released an evaluation in January 2014 detailing the impact of RECs. One of the biggest challenges this evaluation found was the resistance to REC use because of the requirement to pay for their services. The more providers in a practice and the further away the practice was from full EHR implementation, the more RECs charged. Another challenge was providers' hesitation to adopt an EHR because of the technological aspect and the deviation from their normal workflows (Farrar et al, 2014). The

evaluation did not specify whether providers believed RECs were worth the investment, so future evaluations should be structured to include such data.

With large changes such as implementing an EHR system, morale among clinicians, mid-level practitioners, and nursing staff must be monitored. We must consider the cost to the organization of reworking a workflow or auditing patient records because health care staff do not understand the change or refuse to change and are not documenting in accordance with objectives. One big impact on employee and physician morale noted in the REC evaluation were the distasteful business practices of some EHR vendors. RECs could not assist their clients to their full capacity because of inaccurate advertising, poor training, and poor customer support. The evaluation noted it had to start over with some clients on a different EHR because of poor relations with the vendor (Farrar et al, 2014). Overall, the RECs were able to cushion the blow to physicians and employees from the shift from paper to EHR, but not without setbacks that had impacts on clinician and mid-level practitioner morale. The change management strategy and a cohesive team willing to change during the EHR implementation process will be the driving force behind improved health care quality, improved health outcomes, and lower costs.

As previously mentioned, EHR implementation has many benefits that have greatly improved quality, safety, and efficiency. Implementation results in financial incentives; legibility of documentation is improved; documentation is standardized and reports detailing trends among patients can be generated from it; CPOE and clinical decision support systems cross check orders with patient data to reduce errors; and patient health information is able to be transmitted upon a transition of care to facilitate appropriate continuity of care. However, the upfront costs of the EHR software, continual maintenance costs, time reallocated to implementation activities, the increased ease of entering orders, change management strategies, and lower employee morale

because of modified workflows should be noted as significant challenges that accompany EHR implementation and may derail the goal of financial efficiency and cost reduction.

VI. Conclusion

Initially, physicians were willing to implement EHR systems because of the associated financial incentive. In the early stages of Meaningful Use, physicians are still focused on securing incentive payments and not entirely on quality reporting. After incentive payments taper off, the quality reporting will still be required. Quality reporting requirements will continue and potentially become more demanding (Lohnes, 2014). If CQM requirements have been increased after three years, requirements could potentially be modified again in order to capture greater CQM data. Overall, I believe Meaningful Use and the implementation of EHRs has improved the quality of patient care and the safety of patients, but I think there is more to be desired in terms of cost savings. I believe cost increase will slow, and cost savings may eventually be realized as health care organizations become accustomed to documenting through an EHR and perfect their own EHR system, but administrative costs and non-financial costs such as employee morale and potential decreased patient trust should be monitored. Modification of CQM reporting requirements will necessitate adjustment of workflows leading to continual improvement of an organization's change management strategy. The cost of change management and all its components should be the subject of future studies; as MU standards change, hospitals and physician's offices should be studied to see if workflow changes result in cost savings and quality improvement. We should see studies disseminated by the government in the near future detailing patient care and quality improvements as a result of the EHR, but future research should also consider the overall financial impact of implementing an EHR. The EHR Incentive

program has encouraged providers and hospitals to adopt EHR systems in the name of increased quality, safety, and efficiency, but in order to realize real cost savings, these same providers and hospitals should learn how to apply change management principles for the optimal application of EHR technology.

References

- Butler, M. (2015). Fixing a broken ehr. *Journal of AHIMA*, 86(3), 18-23. Retrieved from <http://search.proquest.com/docview/1656658923?accountid=10639>
- Centers for Medicare and Medicaid Services. (2012). *Medicare enrollment - all beneficiaries: As of July 2012*. Retrieved March 4, 2015, from <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/MedicareEnrpts/Downloads/12All.pdf>
- Centers for Medicare and Medicaid Services. (2014). *2014 clinical quality measures*. Retrieved March 25, 2015, from http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/2014_ClinicalQualityMeasures.html
- Desmartis, M., Gagnon, M., & Gallego, A. I. (2010). Assessing the cost of electronic health records: A review of cost indicators. *Telemedicine and e-Health*, 16, 963+. Retrieved from <http://go.galegroup.com/ps/i.do?id=GALE%7CA245738920&v=2.1&u=gree96177&it=r&p=HRCA&sw=w&asid=1765507ed5ed965fc4bf913b1be87a5f>
- Eisenberg, F., Lasome, C., Advani, A., Martins, R., Craig, P. A., & Sprenger, S. (2013). A study of the impact of meaningful use clinical quality measures. *American Hospital Association*, February 16 2015.
- Farrar, B., et al. (2014). *REC program evaluation interim report: Round 1 case studies*. Retrieved April 11, 2015, from http://www.healthit.gov/sites/default/files/rec_casestudyround1.pdf
- Fleming, N. S., Culler, S. D., McCorkle, R., Becker, E. R., & Ballard, D. J. (2011). The financial and nonfinancial costs of implementing electronic health records in primary care

- practices. *Health Affairs*, 30(3), 481-9. Retrieved from
<http://search.proquest.com/docview/857836970?accountid=10639>
- Follmann, J. F. (1963). *Medical care and health insurance: A study in social progress*.
Homewood, IL: R. D. Irwin.
- Fontenot, S. F. (2014, January; 2014/10). The affordable care act and electronic health care records: Can technology help reduce the cost of health care? 40, 68+. Retrieved from
<http://go.galegroup.com/ps/i.do?id=GALE%7CA356583339&v=2.1&u=gree96177&it=r&p=HRCA&sw=w&asid=4fbd4821be870d5da70141cc87499ce4>
- Healthcare Information and Management Systems Society. (2014). *Electronic health records*.
Retrieved March 3, 2015, from <http://www.himss.org/library/ehr/>
- Healthcare Information and Management Systems Society. (2014). *Getting help - RECs*.
Retrieved March 12, 2015, from
<http://www.himss.org/resourcelibrary/TopicList.aspx?MetaDataID=950>
- Hofmann, B. R. (2009). *Health Care Issues, Costs and Access : Health Care Costs : Causes, Effects and Control*. New York, NY, USA: Nova Science Publishers, Incorporated.
Retrieved from <http://www.ebrary.com>
- Institute of Medicine. (2001). *Crossing the quality chasm: A new health system for the 21st century*. Washington, DC: National Academy Press.
- Kohn, L. T., Corrigan, J. M., & Donaldson, M. S. (Eds.). (2000). *To err is human: Building a safer health system*. Washington, DC: National Academy Press.
- Kotter, J. (2011). *Change management vs. change leadership - what's the difference?* Retrieved April 17, 2015, from <http://www.forbes.com/sites/johnkotter/2011/07/12/change-management-vs-change-leadership-whats-the-difference/>

- Law, J. (Ed.). (2014). *Oxford reference* (5th ed.) Oxford University Press.
- Lohnes, M. (2014). *The house that HITECH built: Looking beyond meaningful use*. Retrieved February 16, 2015, from <http://www.mckesson.com/blog/the-house-that-hitech-built--looking-beyond-meaningful-use/>
- Mangan, D. (2013). *Medical bills are the biggest cause of US bankruptcies: Study*. Retrieved March 8, 2015, from <http://www.cnbc.com/id/100840148>
- Medicare and Medicaid Programs; Electronic Health Record Incentive Program; Final Rule, 75, Fed. Reg. 44314 (proposed July 28, 2010) (to be codified at 42 C.F.R. pts. 412, 413, 422, & 495).
- Mostashari, F., Tripathi, M., & Kendall, M. (2009). A tale of two large community electronic health record extension projects. *Health Affairs (Project Hope)*, 28(2), 345-356. doi:10.1377/hlthaff.28.2.345 [doi]
- Murray, J. E. (2007). *Origins of american health insurance: A history of industrial sickness funds*. New Haven: Yale University Press.
- The Organization for Economic Co-operation and Development. (2013). *Health at a glance 2013*. Retrieved January 30, 2015, from <http://www.oecd.org/health/health-systems/health-at-a-glance.htm>
- Sommers, R., Goold, S. D., McGlynn, E. A., Pearson, S. D., & Danis, M. (2013). Focus groups highlight that many patients object to clinicians' focusing on costs. *Health Affairs*, 32(2), 338-46. Retrieved from <http://search.proquest.com.jproxy.lib.ecu.edu/docview/1318754845?accountid=10639>
- Terry, K. (2009, July 15). The EHR stimulus: A complete primer. *Physicians Practice*

Thoma, M. (2013). *Explainer: What is moral hazard?* Retrieved March 15, 2015, from <http://www.cbsnews.com/news/explainer-moral-hazard/>