EXECUTIVE SUMMARY

At the 2018 Annual Meeting Policy D-225.974, “Impact of the High Capital Cost of Hospital EHRs on the Medical Staff,” was adopted by the House of Delegates (HOD). The policy asks the American Medical Association (AMA) to study the long-term economic impact for physicians and hospitals of EHR system procurement, including but not limited to its impact on downsizing of medical staffs and its effect on physician recruitment and retention. This report provides the requested study of documented economic and financial impacts of procuring electronic health record systems.

Implementing or upgrading an Electronic Health Record (EHR) in a medical practice, while beneficial in many ways, comes with a variety of costs. These costs include financial, productivity, workforce/personnel, and clinician and patient satisfaction. Long-term, these costs can all have effects on a health system’s medical staff/workforce. These impacts, and the long-term economic and financial costs, are not widely studied or discussed.
Subject: Impact of High Capital Costs of Hospital EHRs on the Medical Staff

Presented by: Jack Resneck, Jr., MD, Chair

Referred to: Reference Committee G
(Rodney Trytko, MD, Chair)

INTRODUCTION

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This report provides the requested study of documented economic and financial impacts of procuring electronic health record systems.

BACKGROUND

Electronic health records (EHRs) are an integral part of the vast majority of health care delivery in the United States. In 2017, 99 percent of large, 97 percent of medium, and 93 percent of small rural non-federal hospitals had a certified EHR product in operation. In 2015, the most recent year for which data could be found, 84 percent of non-federal acute care hospitals had at least a basic EHR in operation, and 87 percent of office-based physicians were using an EHR. The benefits of EHR use are well-documented, however, so are the growing concerns with the amount of time and types of tasks required in using an EHR in practice. There is also evidence showing the often-burdensome financial investment that implementing and maintaining an EHR system requires. Although there are several studies quantifying the financial investment, the reported costs of EHR implementation vary greatly across studies, owing most likely to differences in geographic locations, practice size and type, and EHR type. One study estimated EHR implementation in a five-physician practice would cost $233,297, or $46,659 per physician, in the first year. In 2017 some hospitals and health systems reported EHR implementations costing from $25 million up to $10 billion. The differences in practice size and type, EHR type, health information technology (HIT) budgets, specialty, and rural/urban location, make it difficult to accurately quantify costs that are representative across health care practices in the U.S. In addition, the Centers for Medicare & Medicaid Services (CMS) has not updated the practice expense component of the resource-based relative value scale (RBRVS) physician fee schedule in nearly a decade, compounding the lack of valid comparisons and the potential underpayment to physicians for expenses required to maintain a current EHR system. Notwithstanding the challenges in quantifying costs, it is important to consider and understand the long-term impacts of the financial commitment required to implement or upgrade an EHR, including the effects on the physician and clinician workforce.
The financial costs of implementing an EHR system comprise many factors, including software licensing, projected maintenance, fees, and costs for initial and ongoing training and labor. Some hospitals include the salaries of existing HIT staff in their cost estimates. Others may include the costs of hardware such as new computers, tablets or other devices. These costs can add up to millions, and even billions of dollars for the largest purchasers. Additional costs arise when expenses exceed budgets and when organizations invest in upgrading or optimizing their original EHR system. Other costs, sometimes attributable to EHR implementation, can occur in the form of workforce attrition that happens when organizations cut staff to reduce costs or physicians reduce work hours or leave practice due to frustrations with administrative burden created by EHRs.

Despite these challenges, EHRs will continue to be a principal component of health care delivery in the U.S. However, for the technology to be a viable and sustainable solution for practices of all sizes and types, it will be important to know the potential long-term effects the high implementation, optimization, and maintenance costs will have on the ability to sustain existing medical staff and recruit new staff to meet the growing demand of patients’ needs.

AMA POLICY

The AMA has extensive policy supporting the use of EHRs and encouraging stakeholders to implement policies, technology improvements, and utilization standards to minimize the financial burden and maximize efficiency and safety in the use of EHRs.

The AMA is committed to working with Congress and insurance companies to appropriately align incentives as part of the development of a National Health Information Infrastructure, so that the financial burden on physicians is not disproportionate when they implement health care technologies in their offices. The AMA also continues to advocate for and support initiatives that minimize the financial burden to physician practices of adopting and maintaining EHRs (Policy D-478.996, “Information Technology Standards and Costs”). The AMA is working with EHR vendors to promote transparency of actual costs of EHR implementation, maintenance and interface production (Policy D-478.973, “Principles for Hospital Sponsored Electronic Health Records”).

The AMA supports the drive for innovation in the use of EHRs to develop best practices concerning key EHR features that can improve the quality, safety, and efficiency of health care (Policy D-478.976, “Innovation to Improve Usability and Decrease Costs of EHR Systems for Physicians”). In addition, the AMA advocates for legislation or regulation to require all EHR vendors to utilize standard and interoperable software technology components to enable cost efficient use of electronic health records across all health care delivery systems including institutional and community-based settings of care delivery. The AMA works with CMS to incentivize hospitals and health systems to achieve interconnectivity and interoperability of electronic health records systems with independent physician practices to enable the efficient and cost-effective use and sharing of electronic health records across all settings of care delivery (Policy D-478.995, “National Health Information Technology”).

It is AMA policy that the cost of installing, maintaining, and upgrading information technology should be specifically acknowledged and addressed in reimbursement schedules, which if represented appropriately would help offset these costs for many practices (Policy H-478.981, “Health Information Technology Principles”). Furthermore, the AMA advocates for inclusion of payment supplements in the current and proposed payment systems specifically to cover the costs of maintaining (including upgrades of) EHRs and continuously evaluates and monitors the cost to physicians and their practices of maintaining and upgrading EHRs (Policy D-478.975, “Maintenance Payments for Electronic Health Records”).
DISCUSSION

Costs of implementing or upgrading an EHR system

The costs associated with implementing and/or optimizing an EHR system have been shown to vary significantly across practices and organizations. This is based on a variety of factors, including but not limited to, practice type and size, infrastructure needs, staffing resources, and maintenance fees. Due to the variability of factors, precise costs are difficult to confirm across practice settings.

Several studies and reports have endeavored to document and estimate the immediate and ongoing costs of EHR implementation. One study estimated EHR implementation for a solo physician in practice to cost $163,765, inclusive of labor and hardware costs. In the same study, it was estimated EHR implementation in a five-physician practice would cost $233,297, or $46,659 per physician, in the first year. In 2017 some hospitals and health systems reported EHR implementations costing from $25 million up to $10 billion.

In conjunction with evaluating the costs of implementation, several studies have also described the cost-benefit analysis of EHRs in various practice settings. A 2003 study of EHR implementation in a primary care practice estimated the net benefit from using an electronic medical record for a five-year period was $86,400 per provider. Benefits resulted primarily from savings in drug expenditures, improved utilization of radiology tests, better capture of charges, and decreased billing errors. Using a five-way sensitivity analysis that accounted for variables such as proportion of capitated patients, patient panel size, and software and hardware costs, this study showed results ranging from a $2,300 net cost to a $330,900 net benefit to the organization. However, among fee-for-service patients, a large portion of the savings from improved utilization may accrue to the payer instead of the provider organization. This study was completed using data from an internally developed EMR at Partners HealthCare, an integrated network formed by Brigham and Women’s Hospital and Massachusetts General Hospital.

Another study found that implementation of EHRs in solo or small practices incurred initial costs of approximately $44,000 per FTE provider per year, including software, hardware and lost revenue from reduced productivity. Ongoing costs were estimated at $8,500 per FTE provider per year, including software and hardware maintenance or replacement, and support staff. This study also found the average practice paid for its initial and cumulative ongoing EHR costs within two and a half years, and began to see more than $23,000 in net benefits per FTE provider per year. Also of note, participants in this evaluation reported that providers worked longer hours for about four months after implementation, as they became more familiar with the system.

A 2013 projection of return on investment (ROI) five years after an EHR pilot predicted each physician would lose nearly $44,000 and only 27% of practices surveyed would achieve a positive ROI. An additional 14% would experience a net gain if they received the federal meaningful use incentive. This analysis revealed the largest difference between practices with a positive return on investment and those with a negative return would be the extent to which they used their EHRs to increase revenue, primarily by seeing more patients per day or by improved billing that resulted in fewer rejected claims and more accurate coding.

A 2014 ROI analysis found that primary care practices recovered their EHR investments within an average period of 10 months. An observed increase in the number of active patients, the increase in the active-patients-to-clinician-FTE ratio, and the increase in the clinic net revenue are positively
associated with the EHR implementation, likely contributing substantially to the 10-month average break-even point.\textsuperscript{13}

In addition to initial implementation costs, upgrades and optimizations require significant resources, but can help the organization realize cost and time efficiencies. In 2017, 38 percent of health care CIOs indicated “EMR optimization” as their organization’s top item planned for capital investment through 2020.\textsuperscript{14} A 2018 case study at a Colorado hospital employed an optimization strategy that saved them between $300,000 and $500,000 per year, in addition to a 53 percent increase in cash collections since go-live, a 15 percent decrease in days in accounts receivable, assistance from time-saving tools that automatically track changes to payer rules, authorization management services that free up staff to take on high-value work, and reduced operating costs with transparent pricing that includes upgrades and interfaces.\textsuperscript{15}

Furthermore, to encourage organizations to adopt HIT technology and specifically EHR systems, the federal government provided incentives to those providers who met “meaningful use” standards through the Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009. As of October 2018, CMS reported payments of $38.4 billion to almost 550,000 Medicare and Medicaid providers, or approximately $65,000 per provider. The Medicare Access and CHIP Reauthorization Act of 2015 (MACRA) sunset the meaningful use program for physicians participating in Medicare. Physicians and hospitals participating in CMS programs now fall under Promoting Interoperability (PI) program requirements.\textsuperscript{16} The Quality Payment Program, which replaced the Medicare meaningful use program, sunset the HITECH Act meaningful use incentives. However, PI participants in Medicaid are still eligible for incentive payments through 2021. It should be noted, however, that practices that did not implement an EHR system or were not eligible for the meaningful use program did not receive incentive payments.

Staff/workforce reductions resulting from EHR investment

Many healthcare organizations have reported reductions in workforce over recent years. The reasons for staff reductions vary from lowered reimbursements, realignment towards value-based care, optimizing operational efficiency, and EHR-related costs. Organizations citing workforce reductions related to excessive EHR costs have widely reported layoffs in the areas of general operations, administration, revenue cycle and information technology, not in the positions of direct patient care, such as physicians, advanced practice providers and nursing.\textsuperscript{17} In a recent statement from Tenet Healthcare, leadership reported the intent to offshore more than 1,000 jobs, likely in the area of corporate functions. Tenet leadership also expressly stated direct patient care employees, such as physicians and nurses, would not be affected by the change.\textsuperscript{18}

Reports of workforce reduction or job outsourcing specifically due to investments in EHR technology exist, but are few. For example, in 2015 Lahey Health in Massachusetts lost $21 million due to both lost business and expenses related to EHR implementation. The shortfall prompted Lahey to lay off 130 people, which their CEO attributed partly to unplanned training expenses connected to the EHR implementation.\textsuperscript{19} Also in 2015, Southcoast Hospital reduced its workforce by one percent after expenses related to their EHR implementation exceeded what they budgeted.\textsuperscript{20}

At the end of 2015, Brigham and Women’s Hospital reported lower financial gains than they had originally anticipated with their EHR implementation after falling $53 million short of the $121 million expectation. These losses led to the subsequent elimination of 80 open positions and 20 staff members. Hospital president Betsy Nabel, MD, credited this in part to reduced reimbursements from payers, high labor expenses among a largely unionized workforce, and high...
capital costs, including those related to new facilities and their Epic implementation.\textsuperscript{21} The hospital budgeted $47 million for its implementation, but faced $27 million in unexpected costs.\textsuperscript{22} In 2017, even while finances were improving, Brigham and Women’s was still facing a shortfall, forcing them to commit to a $50 million reduction in operating expenses, including offering a buyout to more than 1,000 senior employees, including nursing staff.\textsuperscript{23}

In 2017, MD Anderson Cancer Center cut between 800 and 900 administrative positions after experiencing significant losses after EHR implementation. MD Anderson also reported decreased patient revenues resulting from EHR implementation but did not provide details on how the EHR affected patient revenue.\textsuperscript{24} However, they reported operating margins were net positive at fiscal year-end 2017.\textsuperscript{25} Wake Forest Baptist Medical Center and Moses Cone Memorial Hospital in North Carolina have both experienced downgraded bond ratings and significant operating losses after implementing EHR systems. They have both also cut staff to make up for these losses.\textsuperscript{26}

EHR implementation was undoubtedly a major factor in the financial circumstances that prompted workforce reductions for these organizations. No one factor can be considered the sole catalyst, however, as other significant costs, such as investments in new facilities, acquisition of other practices, losses on investments, changing reimbursement rates, and increased operational costs contributed to the budget holes that forced these hospitals to take cost-saving measures.\textsuperscript{27} It is also important to consider that hospitals and health systems reduce workforce for many reasons, including forces entirely separate from EHR implementation, such as changing patient population, specialty mix, or community needs.

Considerable costs, unbudgeted expenses, unforeseen training needs, and lost productivity due to learning curves and unexpected downtime, are all known risks of implementing any new or upgraded EHR.\textsuperscript{28} Despite these accounts of losses and financial distress, some organizations implement EHRs without issue and the long-term gains outweigh the short term financial losses. It is also of note that the cases described above all involve the same EHR vendor product, therefore generalizing these adverse experiences to all EHRs is not advised.

In addition to staff/workforce reductions driven by budgetary reasons, EHR implementation is transforming the personnel needs and roles for healthcare organizations. A 2016 publication from the North Carolina Medical Journal highlights the need for new jobs to assist before, during, and after EHR implementation, such as technical software support staff, medical scribe specialists, health care quality improvement specialists, and health care data scientists.\textsuperscript{29} The most common areas of staff reduction due to EHR implementation are in the areas of medical records, transcription, and billing by replacing paper-related processes.\textsuperscript{29, 30}

An indirect cost of EHR implementation can be seen in the effects EHRs have on physicians in practice, including increasing administrative burden, reducing face-to-face time with patients, and even prompting reduction in work hours or leaving medicine altogether.\textsuperscript{31} Nearly 40 percent of doctors list EHR design as one of the two things they find least satisfying about their jobs. Fifty-six percent say the requirement has reduced efficiency and 66 percent report EHR use has reduced the amount of time they spend with patients.\textsuperscript{32} In a 2017 survey, nearly one in five physicians indicated they planned to reduce work hours within the following year. Dissatisfaction with the EHR was an independent predictor of a physician’s intent to leave practice or reduce clinical hours.\textsuperscript{31}
Effects of EHR investment on the financial state of hospitals

Implementing an EHR system is a significant undertaking for any practice or health care organization. Adequate implementation can be costly and time consuming, resulting in many organizations assuming a financial loss for a duration of time, a factor to be included in the capital planning and budgetary process. Many eligible providers received incentive payments for the adoption and use of EHRs, and the majority of eligible hospitals have demonstrated meaningful use of certified HIT through participation in the EHR incentive program.

Common drivers and challenges contribute to the financial impact of EHR implementation. During the implementation process, an increase in overall operational expenses occurs due to training of personnel and the need for additional staff, consultants, and upfront product purchases. During this time, the organization simultaneously experiences a reduction in productivity resulting in decreased patient revenue. In addition to these two factors, some organizations discover they underestimated the full costs of EHR implementation. For example, primary budgeting may only account for the cost reported by the vendor, and the organization does not consider the expenses of staff, training, infrastructure costs, and ongoing maintenance, resulting in significant unexpected costs.

Other areas of additional or unexpected costs include compliance with regulatory requirements, credit challenges, and vendor deficiencies. With the introduction of meaningful use requirements and government incentives, additional costs are often incurred to comply with regulatory requirements. Some hospitals have reported credit challenges in having adequate financial reserves to support the initial capital investment required for implementing an EHR platform. Other organizations have cited additional costs due to vendor shortcomings. For example, Mountainview Medical Center in White Sulphur Springs, Montana filed a lawsuit against NextGen for failing to install a compliant system on time.

As technology advances and regulatory requirements for data collection evolve, EHR implementation and optimization projects are becoming more comprehensive. As a result, many organizations have reported initial financial losses. However, recovery of net operating income and a return to prior productivity levels occur within a short period of time. In 2015 and 2016, Partners HealthCare, the site of the 2003 study previously discussed, implemented a new EHR system. Partners HealthCare reported a decline of $74.1 million in operating income for the last quarter of 2015 compared to the same quarter the prior year, due in part to the organization’s EHR implementation. By the second quarter of 2016, leadership reported gains in operating income, despite simultaneously experiencing costs of $18 million in EHR-related upgrades and expenses.

In the first quarter of 2016, Allegheny Health Network reported an operating loss of $17.8 million due to EHR implementation expenses, $8.1 million more than the same period in the prior year. In planning, the health system projected $9.4 million in net losses for the first quarter of the year, yet reported $20.6 million. Leadership stated that in addition to decreased patient volumes, much of the costs were attributed to a one-time investment in the EHR system.

While there is evidence that practices have incurred financial losses during EHR implementation and optimization, an extensive literature search does not identify an instance of any practice or organization closing or changing their physician recruitment and retention practices specifically due to exorbitant HIT/EHR costs. In addition, there is no requirement for medical staffs to report to a state or national database why a medical staff member decides to resign, nor is there a requirement to report the number of medical staff members and their membership status (e.g., active, courtesy, consulting, emeritus making it further difficult to quantify such effects.
There are very few studies available about the long-term economic impacts or effects of EHR implementation. One 2015 study attempted to examine financial and clinical work day productivity outcomes associated with the use of an EHR over nine years. The difference in net clinical revenue per provider per year did not change significantly after EHR implementation. Charge capture, the proportion of higher- and lower-level visit codes for new and established patients, and patient visits per provider remained stable, and a total savings of $188,951 in transcription costs occurred over a 4-year time period post-EHR implementation. Another 2014 study evaluated the long-term financial impact of EHR implementation in ambulatory practice. Practice productivity was tracked over two years post-EHR implementation and demonstrated that the implementation was associated with increased revenue, even after accounting for observed reduction in the number of patient visits. The AMA inquired with leadership at the American Hospital Association to determine if they had additional research, content, or resources on the subject of EHR cost impacts on hospitals and medical staffs, and they indicated they do not currently have any materials or resources available.

CONCLUSION

It is evident from the literature that the costs, break-even point, and ROI all vary dramatically depending on practice type, size, patient panel, specialty, and location. Given these disparate representations, and the limited amount of recent, rigorous long-term study, it is difficult to establish a universal ROI-focused narrative that makes a case that EHRs are either a wise or poor long-term investment for hospitals or health systems, or any practice type. While there is anecdotal evidence of physicians retiring early due to the implementation costs of EHR’s there is little to no data available to assert that investments in EHR technology will lead to subsequent reductions in medical staff. Although EHR investments have contributed to temporary financial losses for some organizations, there are no reports of hospitals or health systems forced to make sweeping reductions in medical staff or completely closing explicitly due to investments in EHR technology. One could speculate that organizations cutting or outsourcing non-direct patient care staff may not be in a financial position to add more physicians to the staff, however there is no data to support this. Although the impacts of staffing cuts inevitably affect care teams and patients, there is little to no evidence that physicians have been included in the groups of workers laid off by organizations that have made cuts.

A common theme throughout the available literature on cost-benefit analysis is that realizing the benefits and achieving a positive ROI depend heavily on the engagement with and optimization of the EHR as a tool for efficiency and process change. Simply installing the system without proper training and feature customization will slow productivity and create new problems. Partial implementation of an EHR, i.e., the continued use of paper for some record keeping, will inhibit the benefits of implementing an EHR and reduce the total return on investment. Organizational policies that promote EHR-enabled changes, such as EHR-supported clinic workflow, along with more thorough research and planning for the implementation process, could facilitate the realization of positive ROI and reduce the potential need for workforce reduction.

RECOMMENDATION

The Board of Trustees recommends that Policy D-225.974, “Impact of the High Capital Cost of Hospital EHRs on the Medical Staff,” be rescinded as having been fulfilled by this report and that the remainder of this report be filed. (Rescind HOD Policy)
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