Return on Investment for EMR: A Retrospective Analysis of Five Medical Practices

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Executive Summary

Physicians considering electronic medical records (EMR) technology are looking for systems that offer financial as well as clinical benefits. Building the financial case for EMR has typically been limited to prospective analyses in the absence of historical data from current users. This study shows the historical financial results achieved by five medical practices, demonstrating an average 73% return on investment by the end of the first calendar year after implementing their EMR system.[1]

Introduction

Investing in an electronic medical records system can be a daunting decision. Physicians and administrators need to analyze the impact of the investment on the financial and operational health of the practice as well as its clinical impact for patients. Implementing an EMR system has wide-ranging effects on relationships inside and outside the practice, and introduces a host of changes that can seem threatening to the social structure of the organization. With so much at stake, physicians and administrators need to manage the risks with as much relevant information as they can find. At the same time, the motives for considering an EMR system are growing to include national concerns for patient safety and the never-ending quest for operational efficiency.

Some of the most compelling arguments for implementing an EMR can be found in clinical and operational benefits. With EMR, physicians gain better ways to:

- monitor their patients' vital health measurements over time
- educate patients with a variety of resources, including their own health record
- protect against adverse drug interactions
- identify patients that can benefit from specific preventative interventions
- complete documentation by the time each encounter is concluded
- reduce the medical and overhead costs of the "lost-chart syndrome"
- streamline patient communications
- streamline internal communications

Recent reports from the Institute of Medicine highlight the need for health care organizations to pay greater attention to patient safety. In *Crossing the Quality Chasm*, the Institute laid out ten simple rules for the 21st Century Health Care System. The recommendations included the following principles which EMR systems can help physicians and healthcare organizations accomplish:

- Care should be based on continuous healing relationships
- Care should be customized according to patients' needs and values
- Knowledge should be shared and information should flow freely
- Decision-making should be evidence-based
- Safety should be integrated into patient care systems
- Patients' needs should be anticipated
- Clinicians should cooperate in patient care

While clinical benefits like these can be enormously valuable, they are nearly impossible to measure in economic terms. Physicians and managers may desire the clinical benefits of an EMR system, but they still want assurance that their investment at least *won't hurt them* economically, and at best may pay for itself. Marketing efforts by EMR vendors have attempted to stimulate interest in their products and services by generating *prospective* analyses of the financial return on investment in an EMR system. Financial planners have also focused on analytical models that attempt to *project* the revenue increases and cost reductions that an EMR system might produce, but the most convincing data is likely to come from *retrospective* analyses.

This study is among the first to examine the return on investment of a sample of practices that are current users of an EMR. A[4] Health Systems engaged Kenneth M. Hekman, MBA, President of The Hekman Group, a medical management consulting firm, to measure the financial return on investment for a sample of its clients.

Methodology

Five client practices using HealthMatics EMR from A[4] Health Systems volunteered to participate in this study, each of which implemented their EMR system between 2000 and 2002. They include two family practice groups, two obstetrics/gynecology groups, and one dermatology practice. The clients submitted financial and operational data to The Hekman Group for the calendar year prior to implementation and for the calendar year after implementation. The data was formatted and analyzed consistently by the consulting firm, so the results would be normalized for all participants in the study.

The methods for measuring the return on investment in the financial literature are wide-ranging. Returns typically include a combined measurement of increased revenues and decreased costs, divided by the initial capital investment, with the result reported as a percent of the investment. But the methods for measuring revenue increases and cost savings can be broad or narrow, significantly impacting the results of the return on investment. The Hekman Group focused on conservative choices in selecting the following definitions:

$$\text{ROI} = \frac{\text{Capacity-adjusted change in receipts} - \text{Change in EMR-related overhead}}{\text{Capital investment}}$$

Where:

- ROI is the Return on Investment.
- Capacity-adjusted change in receipts is the change in net receipts per full-time-equivalent (FTE) provider, times the number of providers at the end of the study period. Providers include physicians and physician-extenders.
- Change in EMR-related overhead is the change in transcription and supplies costs, since those two items are most clearly impacted by an EMR.

Results

Each practice experienced unique transitions as they implemented their EMR systems, including provider turnover, expanded facilities and changes in practice management systems. Despite the variety of organizational developments, the results demonstrated a noteworthy consistency. **The data shows an average return on investment of 73% after the first calendar year of implementing their EMR system.** Results for three of the study participants were in a narrow range of 50% to 71%, while the other two practices experienced unusual circumstances that resulted in returns of 9% and 240%.

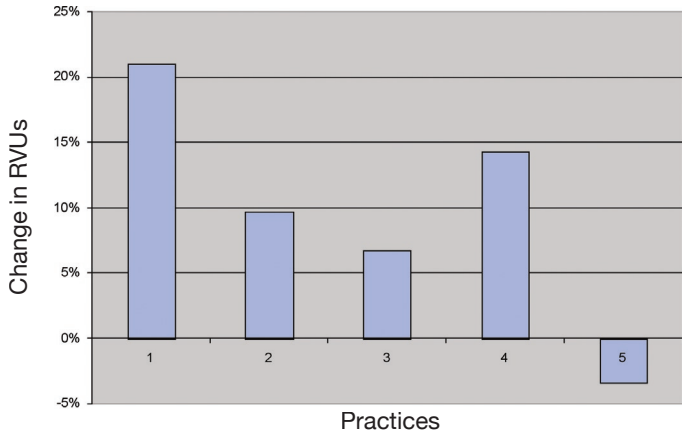
Change Factors

The economic impact of EMR was about equally attributable to revenue gains as to cost savings, with the most notable changes in the following areas:

- **Coding** – Despite declining patient encounters, all but one of the practices realized benefits in their coding patterns. The relative value units per encounter increased an average of 10%. Chart A shows the percent change in relative value units per encounter for each practice in the study.
- **Transcription** – Most practices eliminated or significantly reduced their transcription costs, with average savings of more than $8,000 per provider per year.
- **Supplies** – The cost of medical records and other clerical supplies dropped an average of $3,000 per provider per year.

We also noted that only one of the practices saw an increase in the average volume of patient encounters per provider. The other practices experienced decreases due to changes in providers, declining local economic conditions, and other factors unrelated to EMR implementation.

Chart A
Percent Change in Relative Value Units (RVUs) per Encounter



Individual Circumstances

The variance in results between the participating practices demonstrates the realities of medical management.

- Ira Bedenbaugh, Administrator for Family Health Care in Clinton, South Carolina implemented EMR during a season of major changes at his practice. "EMR helped me keep costs down," he indicated, despite increases in total overhead costs with two office locations, rising insurance costs and rapid depreciation of recently-acquired assets. Staffing ratios remained about the same overall, but the administrator increased his nursing department while decreasing reception and medical records staff costs. His ROI was the lowest among study participants at only 9% overall, but neither Mr. Bedenbaugh nor his physicians were disappointed. The clinical and operational benefits were foremost in their minds. "They're just happy to be done at the end of the day," the administrator indicated of his physicians. They're also happy to see their documentation support more accurate coding.
- OB/GYN of West Michigan in Muskegon, Michigan, managed to gain a 65% return on their investment, despite losing a highly productive physician and hiring two new physicians just out of residency. The manager, Leslie Wrolstad, used the transition time to restructure her staff, cutting six full-time-equivalent staff positions in transcription and nursing. "If physician loads would have stayed constant, we would have been more profitable," she noted.

- Dr. Jack Dekkinga made significant strides in business development with the implementation of his EMR system. His costs for transcription and supplies went down as it did for the other participants in the study, but his receipts grew by 32% on an 18% increase in patient encounters. With the smallest practice in the study, he achieved the highest ROI at 240%, in effect paying for his EMR system with increased revenues and decreased costs in about five months.

- Beth Zandstra, Administrator for Lakewood Family Medicine in Holland, Michigan is also pleased with the results of their EMR system. The 10-physician group is gaining a 50% return on their investment, saving about $100,000 per year in transcription costs alone. "There's no way my physicians would go back to paper medical records," she indicated, citing their gratitude with the clinical benefits of their EMR. Now they can also rest assured they made a good financial investment as well.
- Nash OB-GYN Associates in Rocky Mount, North Carolina gained 71% by reducing transcription and supplies costs, while coming in about even on revenues per provider. The results were better than Administrator Kim Sparks expected since the implementation period included major provider changes and a conversion to an A^4 practice management system at the same time.

Conclusion

The clinical and operational benefits of EMR systems have been compelling, but they have often been overshadowed by the unknown financial risks. This study demonstrates that the initial financial barrier need not prevent medical practices from gaining both clinical and economic benefits of an EMR system.

Market acceptance of Electronic Medical Records technology is still emerging, although the software capabilities have grown amazingly robust in recent years. Additional studies of the retrospective impact of EMR will be valuable to extend the benefits of the technology and to monitor further changes in the industry. As technical developments enhance the benefits and reduce the costs, the utility and return on investment may improve. In the long-term, EMR systems may also impact physicians' capacity to provide care for more patients, providing one additional competitive advantage over those who remain committed to paper records.

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1. All participants in this study used HealthMatics EMR from A^4 Health Systems. www.a4healthsystems.com