Electronic Medical Records: A Path Forward

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Summary • Health systems are moving to implement comprehensive electronic medical record (EMR) systems, or significant pieces of them, in the belief that EMR can be integrated into clinical practice and lead to improved patient outcomes and enhanced safety. There are substantial roadblocks to implementing EMR, including significant cost, the competency needed to implement, the political environment, organization infrastructure and culture, and how organization leaders understand return on investment. Complicating factors include the drive to implement EMR to meet meaningful use standards to qualify for a federal incentive program and recently publicized studies that question the value equation of the EMR as it relates to patient care improvements.

We offer our experiences on the successful implementation of the EMR across the large health systems we lead. We offer practical advice and tips on how to achieve successful implementation, evidence that successful implementations improve patient care and safety, and a glimpse of how EMR is a significant foundation in a future of collaborative models that provide continuum-based care.

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Introduction

If ever there were a time that innovative solutions are needed, we are in that time. One of the most visible examples of such innovation, and one that few people truly understand, is the profound impact of a successful implementation of an electronic medical record (EMR).

We will describe the steps of successful EMR implementations at the organizations we lead. We also will share some early returns that we believe are a glimpse into a future in which our two organizations will thrive because of the quality of our care and the efficiency by which it is delivered, no matter how difficult the environment or politics.

What’s at Stake?
The past two years have been full of media coverage about the state of our healthcare system and healthcare reform. Healthcare has clearly evolved into one of the top emotional and domestic political stories of our time. Journalists must be exhausted working to reveal some new, unexplored angle or fact to help us appreciate or better understand the current state. What more can possibly be said?

Through all of this complexity, the cutthroat politics, and the enormous amount of our nation’s resources expended, it comes down to this: No matter where people are in the political spectrum, we all must face the fact that our current health system cannot be sustained. It costs far too much, and these costs are growing—and, in too many cases, the system delivers too little. Whether people agree or not with healthcare reform, it is an attempt to address this unbalanced equation.

If our current health system cannot be sustained, what about the sustainability of hospitals and health systems that choose to make few or no changes to how they provide patient care in this evolving and volatile environment? Can these institutions remain viable? We believe such institutions—which may number hundreds or more—are at great risk. Further complicating this situation is the inconvenient truth that, with or without healthcare reform, there is no turning back the clock for us in the healthcare industry.

Is there a pathway, then, that can lead our institutions and industry to sustainability or, possibly, a new era of thriving—while delivering high quality care and improved patient outcomes?

The efforts to implement EMRs at the organizations we lead, Sentara Healthcare, headquartered in Norfolk, Virginia, and Banner Health, headquartered in Phoenix, Arizona, have been ongoing since 2003. (See exhibits 1 and 2 for an overview of these institutions.) It is important to note that our organizations’ commitment to fund and deploy EMR systems far predated the development of the “meaningful use” financial incentives of the American Recovery and Reinvestment Act. Our motive for successful EMR implementation was the same in 2003 as it is now: to improve the quality of patient care and the processes that support that care.

We have chosen to use the phrase successful EMR implementation and not just EMR implementation for a good reason: The implementation of EMR systems is a sizable capital investment over a long period. More important, an EMR system only works if intensive education and training of physicians and other clinical
staff are provided and change these professionals’ ingrained clinical practice habits. Without a doubt, an EMR is only as good as clinicians’ ability to incorporate it into patient care. When EMRs fail to deliver anticipated benefits—a common problem—it is most likely because clinicians do not integrate the EMR into patient care.

In the cases of our respective organizations, which have invested hundreds of millions of dollars into our electronic environments, failure to implement these innovative solutions to improve patient care has not been an option. The patient care and financial stakes are far too high.

**Check Your Infrastructure**
A successful EMR implementation depends on an organization’s infrastructure.

**Mission**
Whether a health system is in the early planning stages to implement an EMR or struggling with an implementation already underway, the best foundation to support these deployment efforts can be found within an organization’s mission. A mission defines why an organization exists; it is incredibly helpful to call on as the primary reason for the implementation of something that creates significant disruption.

Innovation requires that leaders push highly educated people into new processes that change their habits. This disruption can result in resistance—sometimes aggressive resistance—to innovative solutions such as EMR and can derail implementation efforts. When an organization frames EMR implementation as an important part of fulfilling its mission, the ability to tolerate disruption can improve because people rally around that mission.

Our organizations’ missions are strong examples:

- Banner Health—We exist to make a difference in people’s lives through excellent patient care
- Sentara Healthcare—We improve health every day

**Exhibit 1** Sentara Healthcare: An Overview

- 24,000 members of the team
- $5.0B total assets
- $3.9B total operating revenues
- 432,600-member health plan
- 123-year not-for-profit mission
- 10 hospitals; 2,349 beds; 3,700 physicians on staff
- 10 long-term care/assisted living centers
- Extended stay hospital
- 3 medical groups (600+ providers)
- Sentara College of Health Sciences
- $5.0B total assets
- 24,000 members of the team
Our missions are simple and clear and are generously used in any communications about EMR implementation or other potentially disruptive innovations.

**Vision**
A vision statement is meant to capture present and future organizational priorities and can serve as another effective rallying point, especially if it incorporates language that sets innovative solutions such as EMR into an organizational priority. As with our respective mission statements, we also integrate organizational vision into communications around implementations:

- Banner Health vision—We will be recognized for clinical excellence and innovation, preferred for a highly coordinated patient experience and distinguished by the quality of our people
- Sentara Healthcare vision—Be the healthcare choice of the communities we serve

**Operating or Holding?**
It is pivotal to understand whether an organization functions as a holding or operating company. Typically, a holding company model operates as a federation that allows the respective parts of the organization to make independent decisions about implementation. A hospital or a clinical group perceives that it has the ability to opt out. However, in an operating model, which is generally driven from a central point, all parts of the organization are obligated to participate in an implementation such as

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**Exhibit 2** Banner Health: An Overview

- 23 acute care hospitals
- Medical group with 800+ providers
- Behavioral hospital
- Home care services

- Outpatient surgery
- $5 billion revenue
- 36,000 employees
- 76% of revenue from Arizona

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EMR. There simply is no opting out. All physicians, employed and independent, and all other clinical providers must understand how to integrate the EMR as an essential part of the patient care skill set.

While it is true that both kinds of organizations can achieve successful implementations of the EMR, it is far more difficult to successfully implement an EMR in a holding company model that allows opting out. Ultimately, it is not possible to successfully implement an EMR when some hospitals or physician clinics in the system opt out. An EMR functions best for patients and their physicians when it is a single database within a health system that acts as a single unit and can therefore serve as a tool to improve patient care across the entire organization.

Another factor that significantly raises the probability of success is having an IT department that has superior technical skills and can collaborate with all areas of a health system concurrently. The IT department becomes even more effective in an EMR implementation when the department mirrors a single-system approach. This ensures that vendors and platforms are selected to serve the entire system, and implementations are done in a similar manner in facilities throughout the system.

**Three Maxims for Successful Implementation**

**Plan the Work, Work the Plan**

A successful implementation depends on great planning and great execution.

If you are beginning to conclude that there is no magic formula that will lead to a successful EMR implementation, you are correct. It is about a number of basic, known actions that must be done well, done consistently, and done over an extended period. It is equal parts leadership, vision, commitment, execution, learning, and perseverance. It is hard work.

Health system executives and boards of directors sometimes overlook the fact that implementation is an organizational competency and a competitive advantage. Look at it this way: If EMR implementation can be done by any system with relative ease, then why have fewer than 10 percent of hospitals in this nation fully implemented EMRs throughout their facilities—not just on selected units?

When you begin to think about how EMRs can improve patient care and begin to make decisions about designing and building a system that will work for your needs, consider the expertise within your organization. Remember that IT proficiency is critical to the design, implementation, and support of an EMR, but clinicians and end users are equally vital to its successful implementation. The insight the clinical staff provides makes the final system stronger and begins to establish which individuals will be most prepared to train and lead the transition from paper to electronic records. In other words, consider hiring from within, allowing clinical staff to consult in the design/build phase and then ensure smooth implementation down the road.

Successful EMR implementation is a highly complex process that demands competency from the hundreds or thousands of people involved. The process is supported by a thorough and comprehensive plan that ideally begins in a facility where the probability for success is high.
The highest probability for success is in a facility that is being built. The EMR is then incorporated into the construction of that facility, resulting in physicians and other healthcare professionals who want to learn or practice the skills necessary to care for patients in an electronic environment. If an existing facility is chosen for an initial implementation in a multifacility organization, the wisest choice is the facility determined through research to have the highest tolerance for disruption and the greatest desire to integrate the EMR.

Once a successful implementation has occurred, it is essential to transfer the knowledge from that implementation—including mistakes that were made—into the next implementation. Knowledge transfer can be enhanced by putting people from a successful implementation on the team for the next facility’s implementation. This seemingly simple formula—starting with a pilot facility and then moving on to facilities one by one throughout the system, applying standard implementation methodologies and lessons learned—is a competency that must be in place to ensure the significant benefits that EMRs promise.

Finally, a plan is only as good as its timetable. It is far better to take the time necessary to educate and train clinicians on how to effectively use EMRs—thereby creating a rich stock source of advocates—than to rush the process and potentially create conflict with clinicians. In healthcare we know that in most cases it takes time to change how patient care is delivered. This is especially true with the successful implementation of EMRs.

**Prepare for Change**

When profound change is involved, disruption should be anticipated.

Change can be wonderful—unless, of course, it involves you. All of us struggle with change, so it should be no surprise that there will be resistance—occasionally heavy resistance—when highly educated clinicians have no option other than to change how they provide patient care so that EMR is profoundly integrated into their clinical practices. After all, it is this integration that is the heart of EMR, not the technology. The integration of EMR into clinical practice is where patient care is transformed to a higher level.

At the beginning of any EMR implementation, it is wise to have already created physician champions who can speak passionately to their medical colleagues about a future that offers a higher level of quality care through the integration of the EMR into clinical practice. It is particularly effective if these advocates are perceived as leaders of the medical staff.

Equally important to engaging strong champions, leaders must consider change management and process redesign in the earliest stages of EMR design and implementation. This is a good time to evaluate the processes in place and identify how workflow will change and, even more important, what needs to change. Thinking through how the process will be different, rather than automating what has always been done, is in the best interest of the organization and a key part of a successful EMR implementation.

As implementations proceed, transparency must be the organizational currency. It is important to keep in mind that as
one implementation is deploying, leaders in the facilities yet to experience implementations are watching closely. The best transparency is to ensure that all details of an implementation—the good, the bad, and the ugly—are shared with those awaiting their turn. In addition to regular reports in meetings and on web pages and SharePoint sites, it is particularly effective to involve clinicians from upcoming implementations because they will emerge as the go-to, on-the-ground experts who are sought out for the “real” story. These individuals become an organization’s most persuasive champions, advocating for the patient care benefits that EMRs can bring.

Leadership Matters

Comprehensive EMR implementation is only possible through strong, clear leadership.

Well before an EMR implementation begins, the leader of the organization must state the case for EMR and clearly outline her expectations. The single most important message must be delivered by the leader and then cascaded throughout the organization repeatedly and through many communication channels. The directive is this: There will be no opting out. This is not an easy message to deliver, and it is even more difficult to enforce. While the word enforce may seem somewhat drastic, make no mistake—the message must be enforced through action, if necessary.

Given the profound changes that will occur in clinical practices as the EMR is integrated into patient care, some clinicians will challenge the “no opting out” message. These challenges may be passive-aggressive, or they may even erupt into unanticipated and heated debates at a meeting with the medical executive committee or a hospital executive. Such challenges to the message can even come from medical groups or physicians deemed “indispensable” partners of the hospital.

At times such as these, reality sets in. Once the message “no opting out” has been delivered, hospital executive leaders must be prepared to take the ultimate step with respect to physicians who may choose not to integrate the EMR into their practices. They will need to let them go. Remember that an EMR cannot possibly work in a hospital or even a system if some physicians choose to use it and others do not. In this scenario, systemic EMR-related improvements to care cannot be achieved.

As uncomfortable as it may be to lose valuable and good physicians who choose not to embrace the EMR, our recommendation to leaders is to be prepared to take this step. Without this level of commitment, the organization’s significant investment into the EMR will be for naught. What may be perceived as a short-term gain from accommodating these clinicians will soon enough become a long-term strategic and significant loss for the organization and, most important, for that organization’s patients.

Once a health system leader has clearly outlined the non-negotiables, other organization leaders can effectively fill specific roles to ensure successful EMR implementation. Hospital CEOs, for instance, own the physician relationships within their facilities. It is crucial for the CEO to step up engagement of these relationships well prior to and during an implementation. With strong medical staff relationships, the CEO can effectively recognize physicians likely to
emerge as EMR champions, hear concerns or doubts from other physicians and bring them along through their persuasive abilities, and reinforce the “no opting out” message from the system leader to the small number of physicians who may challenge that message.

Leadership needs to set the vision and the standard of care that is unwavering. Recognizing that there will be challenges is important, but above all else, leaders need to rally everyone around the common commitment to improve care. In our experience with EMR implementation, much of the resistance is simply a fear of the unknown and can effectively be overcome with peer coaching and encouragement. Engage champions to help in this effort.

The CEO also owns the delivery and reinforcement of the “no opting out” message to hospital staff. As much of a change that the EMR brings to physicians, this change equally affects hospital staff. These staff members, particularly nurses, have tremendous power as EMR advocates to physicians and other staff in spontaneous hallway and break room discussions. These crucial conversations are especially well supported by the transparent approach discussed earlier. Rumors are denied traction before they can be planted in the grapevine, and incorrect information is quickly corrected.

Again, it is the leader’s role to eliminate as much mystery as possible with open and plentiful communication. Leaders can help illustrate the new reality for employees and physicians and continually reinforce the messages of quality care and adherence to the highest clinical standards.

Another credible voice and able advocate for EMR use among physicians is the hospital chief medical officer (CMO). The CMO is both a medical and technical content expert who is readily available to discuss issues that are best handled physician-to-physician and who can assist physicians in the actual EMR system learning process. Physicians come to rely on the CMO as their trusted inside source.

Remember, there is no magic formula for successful implementation of EMR. All health systems have a mission, a vision, strong leaders, talented employees, physicians committed to the highest levels of quality care, and a solid grounding in the utilization of technology. The magic is in bringing these known elements together in order to focus them on a complicated task that will create disruption in the short term. However, in the long term what will emerge from this disruption is a level of patient care that has the power to clearly differentiate an organization from its competitor as the one who delivers a higher quality of clinical care.

Stories from the Front Lines

We turn now to some compelling outcomes from the successful implementation of EMR in our organizations that we believe help differentiate our services and care.

Never Underestimate a Good Support System

Real time and role-based support is critical to a successful launch.

Perhaps the best advice when talking about successful EMR implementation is to adopt the philosophy “Hurry up to go
Successful EMR implementation will be unlike any previous IT-related transition. A comprehensive electronic record system touches every level of the organization and has limitless potential for improving healthcare delivery. With this newfound access to data, organizations can quickly become overwhelmed with information.

Successful organizations enter into the process with some expected outcomes that undoubtedly were built into the business case for EMR investment. In order to ensure that the clinical teams are able not only to use the EMR system but to maximize efficiency, it is good planning to leave an optimization team in place following implementation. These teams consist of technical support, process improvement, and dedicated support for physicians. The purpose of the optimization team is to stabilize the system, help ensure the expected benefits to the organization, help identify additional benefits, and support the organization’s operational leadership through the transition.

For Sentara, the 2010 return on investment exceeded $48 million, significantly more than the business case expected benefits of $35.5 million. Not only did cost benefits exceed expectations, clinical improvements were dramatic. More than 100,000 potential medication errors were avoided, readmission rates decreased across all facilities after implementation, average medication administration times were cut from 132 minutes to 38 minutes, and physician order entry reached 87 percent.

Since its first implementation with the opening of Banner Estrella Medical Center in 2005, Banner now has 3,518,635 unique persons in the EMR database. During February of this year, the point at which

Delivering Care in an Electronic World
Success can be measured in quality and efficiency.

slow.” The first facility implementation serves as the best education in what works and, just as important, what needs to be improved. With all eyes of the organization closely following the first major step of the implementation process, leadership must have the utmost confidence that every scenario has been considered and plans exist to adequately handle what comes next. Repeatedly testing these possibilities helps the team feel prepared, and in most cases the back-up plans will never need to be used.

Facility prep begins months in advance of a predetermined go-live date. We talked earlier about the need to rethink process flow before the actual implementation of an EMR. Facilities should identify the processes critical for smooth operating well in advance of implementation and should use internal or outside consultants to get fresh perspectives, question convention, and present a new normal.

An organization should use the same clinical experts who helped to design and test the EMR system as trainers. Ultimately, these employees are the best leaders for physicians and staff through the transition. The organization should develop a staff training model that is specific to job roles and responsibilities and provide onsite support before, during, and for a specified period of time after implementation. Similar to how disaster preparations are handled, we implemented an incident command center that was staffed around the clock for the time surrounding implementation. This tactic is useful for gauging in real time the level of support needed.

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an EMR system had been implemented into nearly all Banner facilities, 8,563,580 charts were opened and, more important, 221,328 adverse drug-related alerts were fired off to help clinicians provide safer care to their patients.

**Managing Meaningful Use: How Do We Get There from Here?**

The motivation for implementing EMRs in our organizations had to do with improving care for patients and understanding the potential to change healthcare for the better. While investments were significant, we firmly believe that quality care ultimately costs less, and our results are surpassing even our most optimistic expectations.

The federal government understands the potential and has incentivized providers to get on board. However, an organization’s true motivation should not focus on dollars alone. Meaningful use standards have been outlined and are one way to measure the effectiveness of EMR implementation. The standards ensure that all providers are using similar definitions and vocabularies to define success, but those of us who are operating on an EMR system understand that the potential effect is limitless.

For Sentara, perhaps one of the greatest illustrations came as a response to the H1N1 outbreak. By analyzing EMR data, we were able to identify where patients were being seen across the system. We designed order sets and pushed those protocols to all physicians in the inpatient and outpatient settings throughout the region. We were further able to use reports from the EMR system to monitor and anticipate patient volume and then allocate resources and supplies based on that real-time data.

In mid-2010, Banner Health launched an effort to use the enabling technology of EMR to address a particularly vexing challenge that nearly every hospital in the nation faces—the development of sepsis, a serious blood infection that often results in organ damage and death. While sepsis does not attract the public attention as other disorders such as cancer, heart

**Exhibit 3** Sentara eCare® Cost and Benefits by Year

An image of a graph showing the cost and benefits of Sentara eCare® by year, from 2006 to 2015. The graph shows the expected benefits, achieved benefits, and expenses, with a focus on net impact changes. The data points indicate a trend of increasing benefits and decreasing expenses over time.
Welcome to the Starting Line: “So This Is Why We Do It”

You have successfully implemented an EMR and you can prove meaningful use through improved clinical metrics. Congratulations. Now the real work begins.

Simply improving patient care is no longer enough. The healthcare landscape is changing dramatically, and providers need to be ready to interact with patients in a vastly different way. Successful EMR implementation provides the necessary platform to more effectively launch new strategic initiatives, test care concepts, and track results in any setting of care, whether inpatient, home based, or at other sites of care.

The ability to mine and manage data will ensure accountability and help transform care. It is time to provide the necessary leadership and vision to tackle some of healthcare’s greatest challenges. We are moving toward a system that rewards improved outcomes and healthier communities. Patients will be engaged as never before and, in time, financial incentives will foster collaboration and efficiency.

Successful EMR implementation gives you a place at the starting line, but healthcare organizations need to think even further ahead to the health outcomes that will be expected down the road. Once you can outline that future for physicians and staff, then the implementation challenges will quickly fade. With the course laid out before us and the necessary tools within reach, the successful strategy becomes figuring out the smartest way to run the race.

disease, or Alzheimer’s disease do, it is our nation’s number-ten killer. Patients with severe sepsis have a very high mortality rate, depending on the severity of the infection. Sepsis is highly complex and very costly to treat. By alerting physicians and other caregivers early in the process that a patient may be developing or is in the early stages of sepsis through an EMR alert, Banner Health has experienced a mortality decrease in its intensive care units from a rate of about 30 to 35 percent, which is fairly typical, to 17 percent since creating the sepsis alert in July of 2010.

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