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DRIVING ROI FROM DATA-DRIVEN EMR CLINICAL OPTIMIZATION

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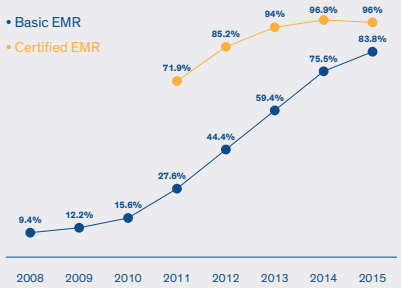
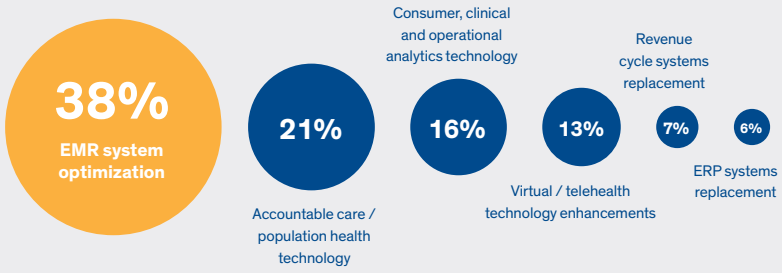
Abstract

Healthcare Delivery Organizations (HDOs) spent more than $20B in the adoption of electronic medical record (EMR) systems from 2008 to 2016. Although the 2009 American Recovery and Reinvestment Act gave health systems a financial incentive to achieve Meaningful Use of EMRs, many HDOs have struggled to capture value. As the capabilities and sophistication of EMRs continue to grow, there is a widening divide between HDOs that harness the capabilities for a competitive advantage and those that are crippled by poor usability, workflows, and adoption.

EMR ADOPTION (BASIC VS. CERTIFIED) 2



CAPITAL INVESTMENT PRIORITIES OVER NEXT 3 YEARS[3]



Background & Introduction

Under the pressure of moving ahead to meet the requirements of the Meaningful Use program, most EMRs have been implemented using a Big Bang approach, and very rapidly. While this approach may have been the most effective to capture incentives, generic, rapid EMR implementation has led to several unintended consequences, which has resulted in widespread user dissatisfaction.

EMRs today serve more as a transactional system of record than a system of engagement. To be used to their full capacity, the different components and modules of the EMR should be evaluated against baseline metrics to harness additional capabilities including clinical decision support, analytics at the point of care, and efficiency of workflow. To realize lasting impact from the EMR, extensive post go-live enhancement and optimization is needed. Leveraging the operational data in the EMR system can support many initiatives to improve workflows, as well as clinical and financial performance. Prioritization of the levers that can be adjusted depends on the HDO's implementation baseline and strategic goals.

> "Once the go-live is complete and you've stabilized, you start looking at your growing optimization list. It's important that you have clear governance and have a partnership with your clinicians and IT so that your clinicians, with support from leadership, are driving the high priority changes that are needed in that optimization effort."
>
> –Sue Schade, Principal, StarBridge Advisors; Interim CIO, Stony Brook Medicine

Another Quick Fix: Is the Source EMR Really to Blame?

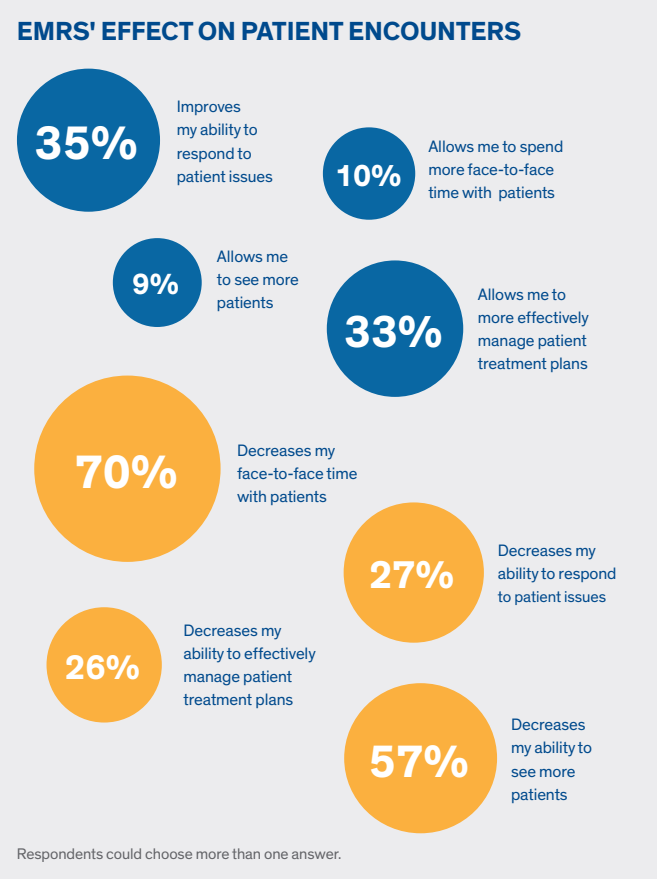
Over 95% of hospitals have implemented EMRs, yet many are planning to invest in improvements or replacements. A Healthcare IT News survey of hospital executives - "2017: The Year Ahead in Health IT" - found that 24% are conducting a major system upgrade, while 21% are replacing their existing EMR at one or more sites. Several HDOs cite deficiencies in usability and interoperability as the key drivers for EMR replacement.

A Black Book report from 2013, revealed:

- 66% of doctors using EMR systems did not do so willingly
- 87% of those unwilling to use the system claimed usability as their primary complaint
- 84% of physician groups chose their EMR to reach meaningful use incentives
- 92% of practices described their EMR as "clunky" and/or difficult to use

EMR products get widely varying reviews. There is strong support and appreciation for EMRs in some HDOs, where the sentiment exists that the EMR is well-designed, saves time, and supports clinical workflows. That said, in other HDOs, providers using the same EMR complain that EMRs add work, decrease face time with patients and create usability issues and slowdowns. The resounding sentiment for these set of providers is that the EMRs are not designed for the way they think and work. Why then the varying response among providers to the same EMR products? Deficient implementations.

Recently, three prominent Boston-area physicians contributed an opinion piece to WBUR, "Death By A Thousand Clicks". They postured that when doctors and nurses turn their backs on patients in order to pay attention to a computer screen, it pulls their focus from the "time and undivided attention" required to provide the right care. Multiple prompts and clicks in an EMR system impact patients and contribute to physician burnout. That said, if providers lack proper training, they may not know of the system's capabilities or have awareness of a more efficient way of accomplishing a task.



> "Usability and number of clicks are clearly something that we hear over and over from clinicians, more so for physicians, but I think it's an issue for our nurses as well. The main point with workflow is: do you adopt your workflow to the product or do you adopt the product to your workflow? I think there's some happy medium there and what you don't want to do is a lot of hard-coded customization, because every time you get a new upgrade from the vendor you'll have to do all the retro fitting; Organizations are trying to do less of that so that they can work within the base product. Vendors are exploring how they can be more user-configurable to adapt to the uniqueness of an organization and their specific workflows.
>
> –Sue Schade, Principal, StarBridge Advisors; Interim CIO, Stony Brook Medicine

The Thin Line between EMR Replacement and Optimization

Most HDOs today face a decision: start over with a new EMR or optimize what you have? A poorly executed implementation, coupled with substandard vendor support makes EMR replacement an attractive and necessary measure. Further, the increase in mergers and acquisitions is driving system consolidation and consequently increasing the number of HDOs seeking EMR replacement to address usability and productivity concerns. A survey by Black Book Rankings found that nearly one-fifth of large practices and clinics intended to undergo an EMR replacement by the end of 2016. In addition, a 2015 Kalaroma report showed that the EMR replacement market will grow at an annual rate of 7-8% over the next five years.

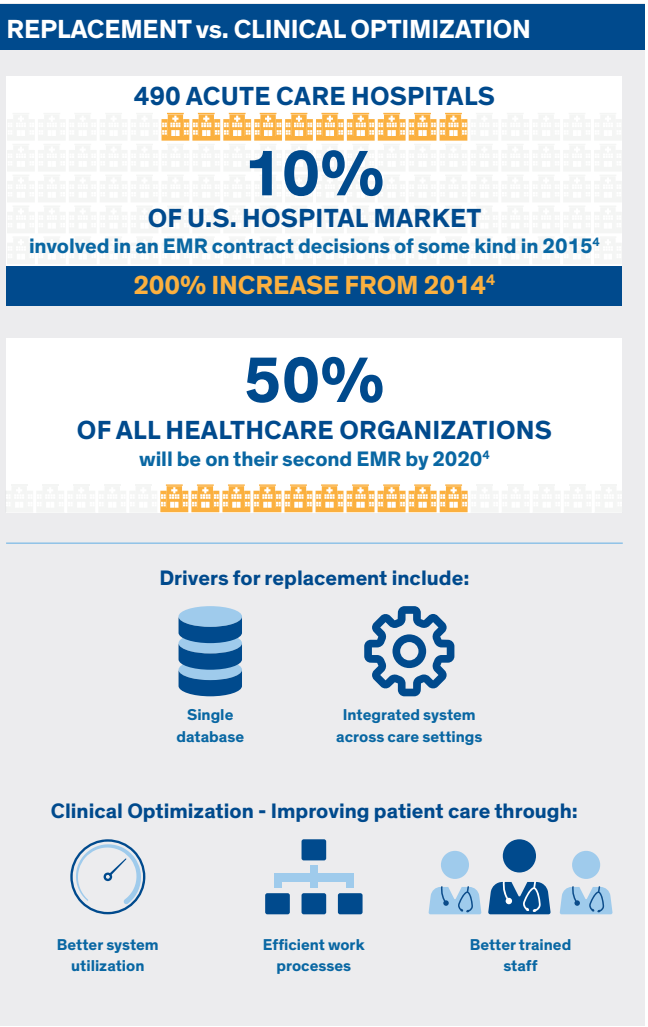
> "We looked at Athenahealth and at MEDITECH because our hospital uses MEDITECH and it would be great to have a common integrated chart. We also evaluated Epic. After that assessment and review, we decided it would be most advantageous to stay on our current existing platform and optimize. We made that decision through sequences of finding out what's important for physicians, evaluating those vendor systems through field trips, and speaking with physicians, not through demonstrations, but actually getting their hands on the systems. Although we saw a lot of cool things with Athena, a cloud based EMR, we just felt like there was nothing significant that would tip us to invest in a full rip-and-replace of our EMR."
>
> – Jim Boyle, VP of IS, St. Joseph Heritage Healthcare

Another Black Book survey of hospital executives and IT employees who have replaced their EMR system in the past three years paints a grim picture. Respondents reported higher than expected costs, layoffs, declining revenues, disenfranchised clinicians and serious misgivings about the benefi ts of switching systems.

Specifically:

- 14% of all hospitals that replaced their original EMR since 2011 were losing inpatient revenue at a pace that wouldn't support the total cost of their replacement EMR
- 87% of hospitals facing financial challenges now regret the decision to change systems
- 63% of executive level respondents admitted they feared losing their jobs as a result of the EMR replacement process
- 66% of system users believe that interoperability and patient data exchange functionality have declined

REPLACEMENT vs. CLINICAL OPTIMIZATION



All said, the various reports and surveys fail to reach a consensus on EMR optimization and replacement. This is unsurprising as some HDOs may not have the financial wherewithal to undertake EMR replacement and instead must focus on extracting value from their current system. Conversely, replacement is sometimes unavoidable due to merger, acquisition and consolidation, rendering optimization not feasible. Regardless, these reports do highlight the different paths available to HDOs to get the most out of their EMR, whether that is replacing with a new system or optimizing the existing system.

The Widening EMR Gap: Valuable Asset vs. Required Repository

Despite the ONC pegging EMR implementation rates representing 95% of hospitals, most are not optimized for users. They were implemented as one-time, factory boilerplate-style system installations. Given that, and downward cost pressures that come with transitioning from fee for service to value-based care, it should be no surprise that EMR optimization is the top priority for healthcare CIOs. According to a recent survey conducted by KPMG, in collaboration with CHIME, 38% of the 112 respondents ranked EMR optimization as their top choice for where they plan the majority of capital investment over the next three years.

EMR implementations were often hastily executed in order to achieve meaningful use requirements. Consequently, this prevented HDOs from recognizing sustainable return on their investment. To compensate for deficient implementations, HDOs reacted by patching together resolution to issues that arose post-go-live. The result is an increasingly frustrated EMR user community and failed remediation admist a myriad of initatives to support the fixed fee to value based care transition.

To address this, HDOs should refine their EMR strategy from a short-term clinical documentation data repository to a long-term asset with substantial functionality surrounding clinical decision support, health maintenance planning and quality reporting. HDOs should approach their IT investment as a platform rather than a system of record and glorified data repository. Capturing information is only the most basic feature of an EMR. HDOs should ensure the EMR is positioned to be flexible and extensible to adopt emerging technologies driving insight to the point of care.

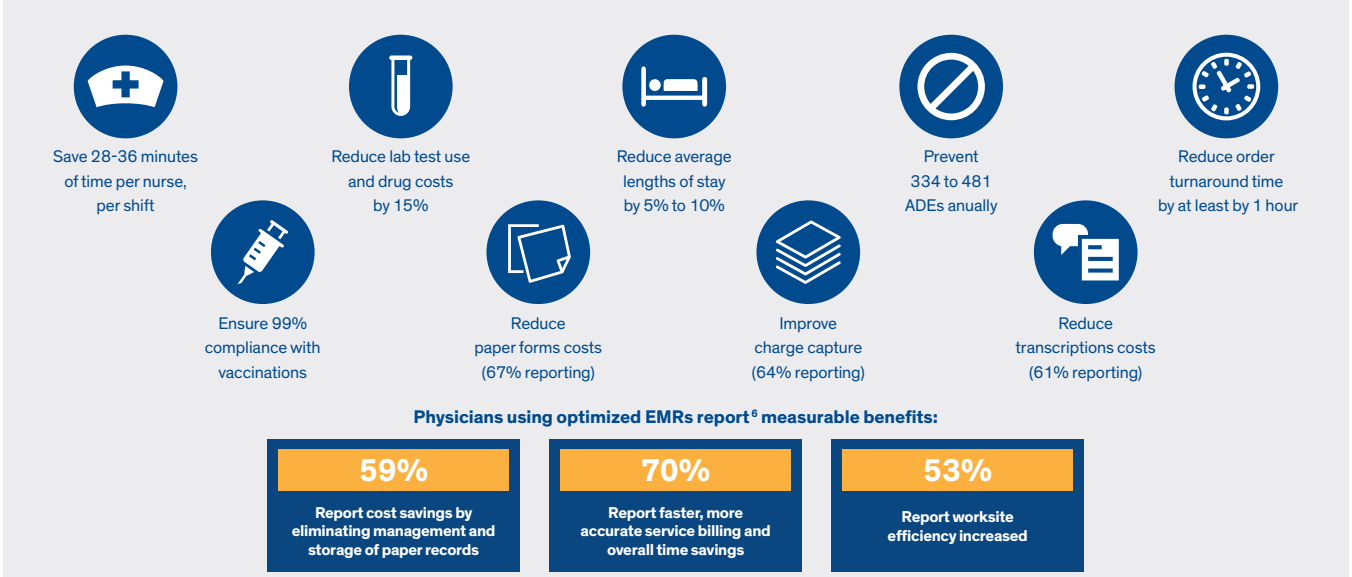
In response, most EMR vendors are taking a platform-as-a-service approach to evolving their applications. In this regard, the EMR or system of record should facilitate interoperability through APIs to outside entities including state registries, health information exchanges, clearing houses, and interface engines. The integration layer itself should be agile as to accommodate and be compatible with updates in interoperability standards and models.

Three emerging areas that are top of mind for CIOs as the EMR transitions from “systems of record” to “systems of engagement” include:

- Platform-as-a-service: move to hosted solutions
- APIs
- Portfolio rationalization

Optimization Benefits

As organizations seek to optimize EMRs, they need to recognize that EMRs deliver value when data can be leveraged to drive strategic decisions, improve patient care, and control costs.



- **Why Optimize?**
  - Meet regulatory requirements
  - Increase the ROI on your technology investment
  - Provide higher quality, cost effective care for your patients
- **What can optimization do?**
  - 71% of surveyed physicians described their EMR vendor to be "meeting or exceeding" their expectations for EMR optimization
  - 82% of administrative staff reported noticeable improvements to the operational or financial capabilities of their practice management and EMR systems
  - Increases patient satisfaction by: giving greater information transparency, easier access to their records, decreased time to care, and more user-friendly payment systems
  - Physician satisfaction levels increase when the EMR and clinical systems are set up to provide more flexible workflows, reduce work time, and offer greater information transparency

"This past fiscal year, one of our strategic focuses was around physician leadership. Within Heritage (Medical Foundation for St. Joe's in CA), we have created new physician leadership positions within our Shared Services divisions. Wherever you have an administrator, you have a dyad physician partner. For me, as I oversee the Information Services Department, I have a physician dyad Internal Medicine physician partner who practices 3 days a week, and 2 days a week she is in the office. She is an invaluable asset to the service we provide. As we have grown in size, we wanted to empower our physicians more. Our slogan is to have the physicians own the EMR experience. As a result, we brought in a physician from each group to form a Physician Informatics and Technology Advisory Group. These physicians serve as both an ambassador for IT and advocate for their medical group."

– Jim Boyle, VP of IS, St. Joseph Heritage Healthcare

Types of Optimization/Optimization Areas

Opportunities for EMR optimization generally fall into three categories:

- Usability & efficiency: Improve end-user satisfaction and make providers more efficient and productive
- Cost Avoidance: Improve workflows to increase utilization and decrease variability
- Increase Revenue: Implement analytics to transition from volume to value

Usability

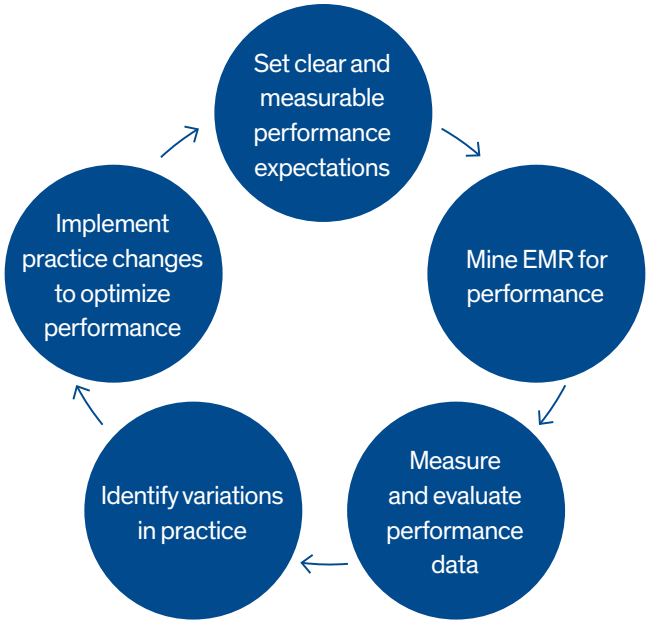
For many EMR end-users, frustrations continue to mount and impede performance. An AMGA Physician Retention Survey found 11.5% provider turnover rate among advanced practice clinicians. Losing and replacing a single provider costs a minimum of $250K, but the actual cost often exceeds $1MM (per New England Journal of Medicine Career Center). A focus on provider retention through enhanced EMR interaction produces non-trivial returns, as increasing retention by just 4 providers equates to $1MM to $4MM in savings in costs associated with provider loss and replacement.

> "Our physicians were at a tipping point. If you look at our physician engagement scores, there is a specific question around their rating of the organization's pursuit of an appropriate EMR strategy. Our physicians rated 30% below the benchmark on that score. The raw comments weren't too much around strategy, but rather the way the system was configured, the level of support that they had, and the ability to make change. We had a burning platform and this led us to write a value proposition to apply for operating capital for our division."
>
> – Jim Boyle, VP of IS, St. Joseph Heritage Healthcare

For HDOs that experienced failed EMR implementations, making corrections and re-engineering is a necessary first measure. Typically, a deficiency in the additional support for the system implementation is to blame, and employing qualified application support staff will help to address and resolve end user dissatisfaction. A good first step is to reduce ticket backlog.

> "A lot of the issues of usability surrounded the visual design. We performed a lot of improvements to make how you get information easier. For instance, we put on one page visually versus one section, one piece of content, another section for labs, jumping in and out of screens, going back and forth. We improved the visual experience and realized efficiencies through consolidating clinical data and presenting in one place."
>
> – Jim Boyle, VP of IS, St. Joseph Heritage Healthcare

Identifying the chokepoint, and borrowing ideas from Lean and Agile, HDOs should then limit their intake to what can be accomplished within one quarter, referred to as a sprint. Accountability should be assigned, and visual controls or Kanban should be leveraged. In doing so, HDOs should be able to reduce ticket backlog by 80% within one sprint.

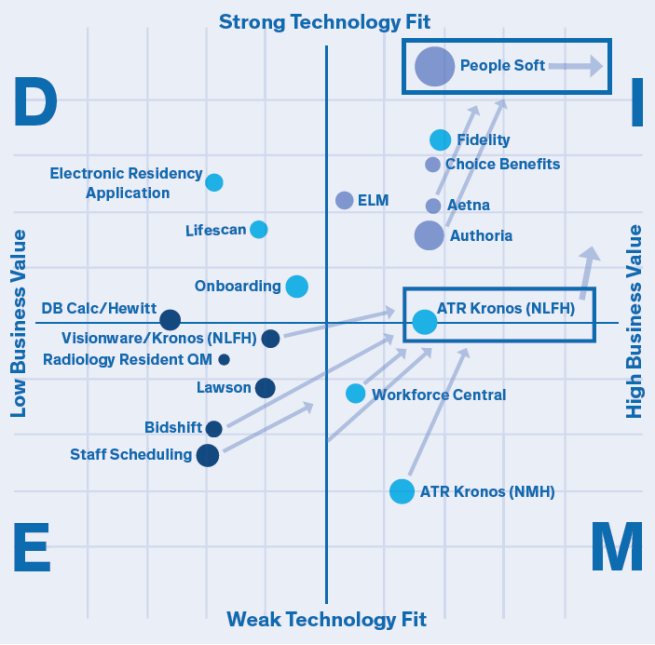


Cost Containment Through Flexible Resourcing

A flexible resourcing model can be used to optimize staffing levels. Such a model can be developed using historical patient census data from the EMR. The EMR data is adjusted to incorporate anticipated future growth and coalesced with payroll data to identify staffing costs by role. The result is optimial staffing by specialty, department and role, blending a mix of full-time, part-time and per-diem staff. This approach can save a health system close to 1% in total labor costs when compared with what traditional staffing and support forecasting approaches.

Application Portfolio Rationalization

At most hospitals, IT operations feature an assortment of disconnected applications. Most large health systems deploy thousands of applications across the enterprise. The total cost of ownership can range from $1MM to hundreds of millions per year, often requiring ~50% of incremental annual IT operating costs on top of licensing costs. Rationalizing such siloed, incompatible systems can produce a significant reduction in TCO over five years.



> "Inventorying your application portfolio can be painful. You have a lot more disparate and duplicate applications than you ever realized, but step one is to get your hands around that current state. Let me just say this, application rationalization is something that often goes hand-in-hand with implementation of a new core EMR because you may be implementing a common system where there's been disparate systems at multiple facilities that common system can replace a lot niche applications. The current state inventory of applications is a critical initial step."
>
> –Sue Schade, Principal, StarBridge Advisors; Interim CIO, Stony Brook Medicine

Amidst potential M&A activity, health systems must focus on rationalizing legacy IT systems. The legacy systems' instability introduce complexity and risk in managing clinical IT environments. As healthcare becomes more complex, the benefits offered by an integrated EMR system that can provide a longitudinal view of patient charts and enable insights into population health increase. Buying a set of best-of-breed IT systems can be more costly not as provider friendly, and can sometimes pose challenges for patient care.

Efficiency and Automation

EMR implementation can generate cost reductions up to 10% through gains in operational efficiency. It is true that there is some loss in productivity during the first year or two because of training programs, investments in maintenance staff, lags in adoption and shortcomings that can occur in the integration of clinical process changes. But more immediate savings from IT automation gains, such as reduced transcription expenses, can be attained, Meanwhile, vendors are offering more competitive pricing to improve their value proposition and that can significantly reduce the time to ROI.

> "I think the training piece is critical, as you have to connect those two to the extent that for what you do roll out, your users have to be very well trained, they need to know how to use all the functionalities, and they need to know how to use it efficiently. Sometimes when an optimization or a change is requested, when you really look at it, it could be a training issue, in that the users don't know how to do something or lack awareness into something that is possible within the system. You should have those two tied very tightly together.
>
> –Sue Schade, Principal, StarBridge Advisors; Interim CIO, Stony Brook Medicine

Clinical Optimization Comes in 12+ Flavors

- Functional optimization: tasking, worklists, menu, chart structure, flowsheet, preferences
- Specialty-based notes & templates
- Nomenclature harmonization: dictionary synchronization & consolidation
- HMP workflows, care guides & QSets
- Infection prevention & syndromic surveillance
- Automation: macros, scripting
- Integrated clinical decision support through alerting and notifications
- Specialty-based note template, chart structure, flowsheet, preferences & security
- Rationalization and consolidation of duplicative legacy & ancillary clinical systems
- Clinical quality benchmarking - clinical pathways from HIMSS (markers that indicate comorbidities or an increased infection risk)
- Leverage full capacity and capabilities of EMR note functionality
- Alerting and notifications - driving actionable insights to the point of care

The most important deciding success factor for an optimization project is focusing effort and ensuring the scope is not too large. Further, it is of critical importance to set measurable and attainable metrics and KPIs to gauge the success and ROI of the initiative. Quantification of staff effort and IT investment is also important. Consult our optimization matrix and planner for guidance to get started. For the purposes of this whitepaper, we examine the top 5 areas that have historically produced tangible ROI.

- Rationalization of legacy clinical systems
- Clinical Quality Benchmarking – clinical pathways from HIMSS (markers that indicate comorbidities or an increased infection risk)
- Efficiency and automation
- Elimination of care variation
- Leverage full capacity and capabilities of EMR Note functionality
- Alerting, Notifications – driving insights to the point of care

EMR Optimization Key Success Factors

1. Prioritize and Address the Basics: Reliability, usability, security, privacy, training and application support
2. Redesign Workflows: Eliminate gaps in care and support continuity of care, improving efficiencies
3. Involve Clinical Staff: Give end-users skin in the game and make sure that they understand that IT can assist in the transformation of care.
4. Incorporate Professional Project Planning & Design
5. Create a Realistic Budget: Include dedicated staff.
6. Make the initiative continuous and interdepartmental
7. Ensure interoperability: Both within the HDO and externally among other providers, HIEs and HDOs.

Measuring Success: Quantifying the ROI of Data-Driven Optimization

An implemented EMR does not guarantee a return. Organizations that fail to properly integrate and leverage EMR capabilities can quickly find themselves trapped in post-implementation purgatory, paralyzed by disenchanted users and underwhelming provider performance. Adopting a data-driven approach to optimization provides organizations with the ability to diagnose and correct problems by measuring and evaluating performance across specific metrics.

Data: It is objective

A function of an EMR is collection of data in a fashion that can be easily reportable

- Operational Data Gathering
  - Reporting off of messaging/tasking to help better understand where workflow opportunities lie
  - Can project goals be benchmarked prior to optimization efforts
- Data can influence priorities surrounding build/ configuration efforts
  - E.g. Care guides/plans based on diagnosis assessed in specific time windows

Problem	Suggested Metrics
Providers' workdays are unsustainably long, and/or they have not returned to pre-EMR productivity levels	• System hours per day • Proportion of encounters that include use of EMR documentation tools (versus free text)
Providers report that the amount of time they spend with patients has decreased and that patient wait times have increased	• Total patient wait time per encounter • Total clinician face time per encounter
Nursing staff resports that it is taking longer to follow up with patients	• Average time to respond to patient calls • Average time to contact patients regarding abnormal test results
Care teams are concerned that they are not effectively managing their diabetic patients	• Compliance rates with preventative screening measures • Average HbA1c scores

Clinical Optimization

In implementing EMRs out of the box, HDOs often leveraged prescriptive, templated workflows. Often, this came at the expense of efficiency, as best-practice, canned workflows may work for some groups, but also are likely to introduce unnecessary clicks. Customization of workflow to streamline is a large area of opportunity for optimization. Not only does it translate to tangible dollars and cents, but it positively impacts end-user satisfaction, enhances clinical decision support, and allots more time for your providers to interact with patients.

While we must be cognizant of documenting the encounter for the purposes of billing and reporting, often times there are low-hanging fruit to address when it comes to notifications and tasking, alert fatigue, and the like that make providers disenchanted with their greatest and most powerful utility – the EMR. A study published in JAMA Internal Medicine concludes alarm fatigue to be a significant burden for physicians, as it found that physicians spend approximately 66.8 minutes per day processing notifications from EMR use. Researchers found that primary physicians received a mean of 76.9 notifications per day and 15.5 of those notifications were related to test results while specialists received 29.1 notifications per day, 10.4 of which were related to test results.

4,000

mouse clicks per shift, per doctor

IF 1 CLICK = 1 SECOND

66 **minutes clicking per shift, per doctor**

365 days per year

x

2 doctors per shift

=

803 hours spent clicking

At 2.1 patients per hour...

1,686 **patients could have been seen**

IF CASH/PATIENT = $100

THE COST OF THESE CLICKS IS

168,630

Clinical Optimization Effort & ROI Matrix

OUTCOME	VALUE	LEVER	COST OPTIMIZATION	REVENUE MAXIMIZATION	QUALITY IMPROVEMENT	EFFORT	MONETARY ROI
Improve Caregiver Productivity & Patient Throughput	• Decrease length of stay and increase the number of patients seen • Access to care through greater efficiency	• Charting tools • Bed management • Access to imaging • Discharge planning	Little to no impact	Direct impact	Secondary impact	4	$$$$$
Improve Patient Safety Support	• Mitigate risks associated with hospital acquired conditions, adverse drug events and readmissions	• Infection control • Virtual patient monitoring	Direct impact	Secondary impact	Direct impact	3	$$$$
Streamline Key Patient Access Functions	• Standardize processes and centralize quality assurance to reduce denials and limit back-end rework	• Scheduling • Insurance verification • Registration	Little to no impact	Direct impact	Secondary impact	3	$$$$
Reduce Variability of Care	• Use the software and workflows as designed and enhance EMR and operational governance • Improved Clinical Pathways • Standardization on best practice workflows	• Organizational change management • Clinical adoption • Workflow standardization • Insights gathered from advanced analytics	Little to no impact	Direct impact	Secondary impact	3	$$$$
Reduce Volume Leakage	• Keep patients in network	• Identification of patients' comorbidities	Little to no impact	Direct impact	Little to no impact	2	$$$$
Improve Clinical Decision Support	• Drive care delivery and manage acute and chronic diseases by evaluating the patient's problem list in clinical documentation	• Automated rules & documentation	Little to no impact	Secondary impact	Direct impact	3	$$$
Improve Operations	• Real-time performance tracking	• Business intelligence & integrated dashboards	Little to no impact	Secondary impact	Direct impact	4	$$$
Improve Quality of Care	• Enhance patient care while minimizing provider risk associated with reduced reimbursement • Decrease clinical variability	• Population health & disease management • Quality monitoring & reporting • Transparent performance metrics	Secondary impact	Little to no impact	Direct impact	5	$$$
Increase Patient Satisfaction	• Increase volume of select services and procedures • Enable patients to better manage their health	• Wait times & throughput • Access to information (patient portal, online statement review, mobile technology)	Secondary impact	Secondary impact	Direct impact	2	$$
Optimize supply usage	• Flag tests, orders and medications as high cost • Embed alternate suggestions reducing unnecessary costs	• Rules engine allows for outlining additional protocols in documentation and ordering tools	Direct impact	Little to no impact	Secondary impact	3	$$

Conclusion: Driving Outcomes Through Optimization

EMRs have not yet achieved their full potential, providers are weary of the inefficiencies, and more resources must be spent to optimize the original investments. A properly integrated and fully utilized system can establish the foundation for significant and sustained organizational improvements in HDO efficiency, end-user satisfaction, and data quality.

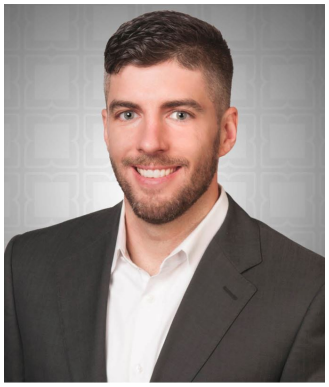
Optimization Keys to Success

- Proposal-based change management utilizing legged stool governance
  - Clinical informatics and physician champions
  - Operations management
  - IT management
- Communication: test and refine
- Provider engagement
- Ensure workflows are functional within the scope of current staffing models
- Leverage SMEs and organizational leadership to create appropriate standards
- Data: use it

Full utilization of an EMR to its capacity as an efficiency and productivity utility positively rationalizes and justifies investment. To accomplish this, HDOs must address deficiencies that threaten productivity - including proper training and IT support, full utilization of automation capabilities, and workflow optimization – resulting in increase in provider capacity. By increasing provider capacity an additional three patient visits per day (averaging $150 per visit in reimbursement), HDOs have the potential to increase revenue by more than $60K per provider each year.
With the move from fixed-fee reimbursement to value-based care, HDOs are required to demonstrate and document their effectiveness measuring and reporting outcomes. With outcomes measures directly linked to financial incentives and reimbursement rates, data liquidity and quality is of greater importance, rendering accurate information an invaluable asset.

> "You kind of need to think of optimization as 'this is a list of things we want to do.' We are going to funnel it down to what we think we can do. You run a lot of things concurrently, and if things gain traction, you push the gas pedal on it. I thought optimization was going to be a little more integrated – we are going to tackle this, this, and this problem and wrap under optimization label. For us, it was a little fragmented - not that it was a bad thing - because we had the dedicated resources and project management to pull it all together. But it was doing a lot of different things across the board and not just one specific thing or two specific things."
>
> – Jim Boyle, VP of IS, St. Joseph Heritage Healthcare

Insight into performance and outcomes data allows for HDOs to achieve quality metrics and foster sustained performance improvement. A robust EMR optimization strategy can help HDOs realize the promised value from implementation of an EMR. EMR optimization is the driver of strategic value, and can become a sustainable competitive advantage through leadership, innovation and measurement. Success requires a disciplined, data-driven, outcomes-based approach to meet a defi ned set of objectives. Selection of the right partner plays a pivotal role in determining that success.



About Jim Boyle

Jim Boyle, MPH, CGEIT is a Vice President of Information Services of St. Joseph Heritage Healthcare (Anaheim, Calif.). Jim Boyle is nationally recognized as part of a new generation of health care informatics professionals who understand IT's full potential to greatly improve peoples' lives. In his current role Jim oversees the delivery of applications and technology and is a member of the executive leadership team for St. Joseph Heritage Healthcare, which comprises over 860 medical group providers and 1300 affiliated physicians across California. Since joining St. Joseph Health 12 years ago, he has held eight different positions, including project manager, application analyst and IT director at Fullerton, Calif.-based St. Jude Medical Center. Jim can be found on Twitter at @JBHealthIT and LinkedIn.

About Sue Schade

Sue Schade, MBA, LCHIME, FCHIME, FHIMSS, is a nationally recognized health IT leader and Principal at StarBridge Advisors providing consulting, coaching and interim management services.

Sue is currently serving as the interim Chief Information Officer (CIO) at Stony Brook Medicine in New York. She was a founding advisor at Next Wave Health Advisors and in 2016 served as the interim CIO at University Hospitals in Cleveland, Ohio.

Sue previously served as the CIO for the University of Michigan Hospitals and Health Centers and prior to that as CIO for Brigham and Women's Hospital in Boston. Previous experience includes leadership roles at Advocate Health Care in Chicago, Ernst and Young, and a software/outsourcing vendor.

Sue can be found on Twitter at @sgschade and writes a weekly blog called "Health IT Connect" – http://sueschade.com/

About Justin Campbell

Justin is Vice President, Strategy, at Galen Healthcare Solutions. He is responsible for market intelligence, segmentation, business and market development and competitive strategy. Justin has been consulting in Health IT for over 10 years, guiding clients in the implementation, integration, and optimization of clinical systems. He has been on the front lines of system replacement and data migration, and is passionate about advancing interoperability in healthcare and harnessing analytical insights to realize improvements in patient care. Justin can be found on Twitter at @TJustinCampbell and LinkedIn

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