Healthcare Systems and Services Practice

Achieving ROI from EHRs: Actionable insights that can transform care delivery

Bede Broome, MD, PhD; Nikita Sharma; and Sri Velamoor

Achieving ROI from EHRs: Actionable insights that can transform care delivery

Traditional arguments for EHR implementation such as efficiency gains and meaningful-use incentives are insufficient to maximize a health system's returns on its technology investments. However, clinically and operationally oriented sources of value can generate an additional $10,000 to $20,000 per bed in annual margin.

US health systems invested more than $10 billion in electronic health record (EHR) systems between 2008 and 2013, and were projected to spend another $10 billion to $15 billion by 2016.[1] For most health systems, these investments constitute their largest capital expenditures, but few if any systems have maximized the return on those investments. To capture the full impact of their investments, health systems must look beyond traditional arguments for EHR implementation, such as efficiency gains and meaningful use incentives. (To understand why, see the sidebar on p. 2). Instead, they should emphasize both clinically and operationally oriented sources of value, including better supply utilization, improved clinical outcomes, and new labor practices that optimize both care quality and service efficiency. When done right, these approaches can generate 10% to 20% of additional contribution impact—which, on a per-bed basis, can amount to an additional $10,000 to $20,000 in annual margin.[2]

In this paper, we will describe the opportunity health systems have to maximize the value derived—directly or indirectly—from EHR systems. First, we will discuss 11 ways in which EHRs, together with linked IT systems and applications, can transform hospital operations through cost reductions, revenue enhancements, and quality improvements. Next, we will introduce an EHR maturity curve that lays out the phases of implementation and value capture. Finally, we will discuss the steps health systems need to take to achieve more value.

A clinically oriented definition of value

To derive lasting impact from EHR and other technology investments, health systems must optimize their clinical and nonclinical workflows to transform care delivery and patient interactions. The data within an EHR system, if properly analyzed, can support a number of approaches for improving operations (Exhibit 1). Which approaches should be prioritized first will depend on a health system's starting position and strategic goals.

The following are examples of how these levers can be deployed.

Cost optimization

A dynamic staffing model can be used to optimize staffing levels. We developed such a model using EHR-derived historical patient census data, broken down by unit and acuity. The EHR data was adjusted to incorporate likely future growth (e.g., in specific service lines) and matched with payroll data to identify staffing costs by type (registered nurses, technicians, orderlies, etc.). The model's output identified the optimal staffing schedule for each unit, including the types of staff needed and the best mix of full-time, part-time, flex, and float personnel. In our experience, such an approach can save a health system 0.5% to 1.5% in total labor costs when compared with what traditional manual approaches to staffing optimization can achieve.

Bede Broome, MD, PhD; Nikita Sharma; and Sri Velamoor

Why traditional sources of value from EHRs fall short

Collectively, meaningful use incentives, efficiency/automation, and rationalization of legacy clinical systems often deliver only about 25 to 35 cents on each dollar spent on an EHR system. Not only do they fall short in achieving incremental value above the original investment, but they typically also fail to create sustainable strategic advantages.

Meaningful use incentives
Although the 2009 American Recovery and Reinvestment Act gave health systems a financial incentive to achieve meaningful use of EHRs, many hospitals have struggled to capture this source of value. Among the challenges that have impeded them are complications related to migration from legacy systems; problems in implementing, stabilizing, and optimizing the new EHR systems; and difficulties in achieving high provider adoption rates. We estimate that, for most health systems, the incentives translate to only 15 or 20 cents on each dollar of capital investment in an EHR system.

Efficiency/automation
After reviewing a broad swath of industry case examples, we found that, when done right, EHR implementation can result in 5% to 10% cost reduction through gains in operational efficiency. However, most EHR implementations tend to reduce productivity during the first year or two because of the need for significant training programs, investments in maintenance staff, lags in adoption, and the failure to integrate clinical process change into installation.

More immediate savings of about 5% of IT operations spending can be obtained primarily through IT automation gains (e.g., reduced transcription expenses). However, these savings contribute virtually nothing in terms of increased clinical operations efficiency. Leading EHR vendors are starting to offer more competitive pricing to improve their value proposition and shorten time to ROI.

Rationalization of legacy clinical systems
At most hospitals, IT operations feature an assortment of disconnected software products from various eras, on incompatible platforms, often with overlapping functionality. Most large health systems have anywhere from 250 to 5,000 IT applications deployed across the enterprise. The total cost of ownership (TCO) can range between $5 million and $500 million per year, depending on the size of the health system, and often requires between 40% and 60% of incremental annual IT operating spend on top of licensing spend.

Most health systems estimate that rationalizing such systems can lead to a 10% to 15% reduction in TCO over five years. To put these numbers into practical terms, consider as an example a $10+ billion health system that has upwards of 1,200 applications and spends about $120 million annually in application development and maintenance. For this organization, the TCO for this diverse application footprint is about $220 million, once the technical infrastructure required to support it is accounted for. EHR implementation could enable this health system to rationalize hundreds of applications, reducing its run-rate spending by perhaps $40 million to $50 million. However, once the health system accounts for the needed investments and migration costs, as well as the timeframe required for EHR implementation, the potential opportunity likely decreases to between $20 million and $30 million, most of which accrues as soft-dollar savings.

Nevertheless, health systems must continue to focus on rationalizing legacy IT systems lest potential M&A activity and the legacy systems' instability exponentially raise the complexity tax associated with managing their clinical IT environments. As the provision of healthcare becomes more complex, the benefits offered by an integrated EHR 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 and not as provider-friendly, and can sometimes pose challenges for patient care.

Clinical supply usage can be improved by integrating the EHR, supply chain (e.g., inventory, purchase orders), and pharmacy (e.g., drug inventory) systems. Combining the data enables a health system to better understand variability across facilities, especially for expensive equipment such as hip and knee implants (Exhibit 2), and use that objective understanding to drive change with staff and physicians. In our experience,

this approach can result in 3.5% to 6.5% reduction in overall supply costs.

Variability in clinical performance that results in unnecessary costs and uneven levels of care can be reduced through the targeted use of EHR data. For example, transparent, consistent performance metrics can be used to identify when expensive biologic drugs may have been prescribed inappro-

EXHIBIT 1 **EHR systems can improve hospital operations in multiple ways**

Legend: ■ Direct impact ■ Secondary impact ☐ Little or no impact

Lever	Cost optimization	Revenue maximization	Quality improvement
Dynamic staffing models based on census trends, payroll data, and acuity	Direct impact	Little or no impact	Little or no impact
Optimized supply usage through closer integration of the EHR with other systems	Direct impact	Little or no impact	Little or no impact
Decreased clinical variability through transparent performance metrics	Direct impact	Little or no impact	Secondary impact
Population health management to identify at-risk patients	Direct impact	Secondary impact	Secondary impact
Reduced volume leakage through identification of patients' comorbidities	Little or no impact	Direct impact	Little or no impact
Improved clinical pathways through insights gathered from advanced analytics	Little or no impact	Direct impact	Secondary impact
Increased access to care through greater efficiency	Little or no impact	Direct impact	Secondary impact
Improved charge capture rates and billing accuracy through full integration between EHR and RCM systems	Secondary impact	Direct impact	Little or no impact
Greater patient satisfaction by enabling patients to better manage their health	Secondary impact	Secondary impact	Direct impact
Real-time hospital performance tracking via integrated dashboards	Little or no impact	Secondary impact	Direct impact
Improved physician satisfaction through better access to patient data and clinical decision-support improvements	Secondary impact	Secondary impact	Direct impact

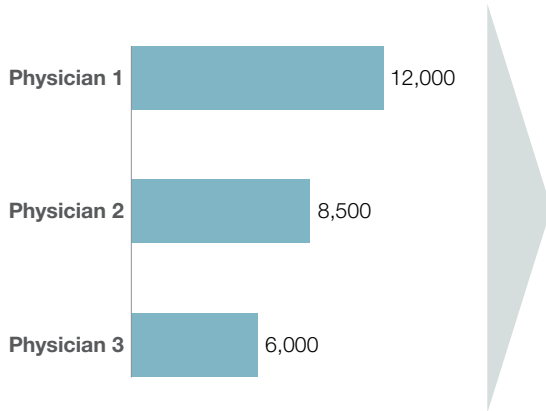EHR, electronic health record; RCM, revenue cycle management.

EXHIBIT 2 **A sophisticated analytic approach can improve clinical supply utilization**

(ILLUSTRATIVE CASE)

EHRs allow identification of cost variations among physicians …

In the traditional approach, conclusions often center around the different brands of implants used and the cost per implant

… while big data allows quick diagnosis on appropriateness of supply utilization

A next-generation approach provides insights into the appropriateness of supply utilization to improve implant mix. This approach requires mapping encounter-level data (including financial information) with clinical and supply data at the patient and physician level

Average cost per case, $

Physician 1	12,000
Physician 2	8,500
Physician 3	6,000

% of cohort receiving each implant type

	Standard implant	Premium implant	% of patients
Physician 1			
Low needs cohort	100	—	20
High needs cohort	—	100	80
Physician 2			
Low needs cohort	—	100	70
High needs cohort	—	100	30
Physician 3			
Low needs cohort	100	—	80
High needs cohort	100	—	20

In the chart at right, green indicates appropriate device use; red indicates inappropriate use.
Source: Disguised client data; McKinsey analysis

priately and when physicians transfused more blood than clinical guidelines recommend (Exhibit 3). Consistent metrics can also reveal variations in operating room time for the same procedure, length of stay, and readmission rates, identifying opportunities to improve both quality and cost. In our experience, an across-the-board reduction in clinical variability via a data-driven approach can lower overall costs by as much as 1.5% to 3.3%.

Population health management can be undertaken efficiently only by deeply marry-

ing EHR data with financial and other data systems. This type of analysis can identify at-risk patients who should be enrolled in appropriate wellness, disease management, or case management programs to decrease the risk of future hospitalization or other adverse outcomes. The impact of this type of analysis can vary greatly, depending on the population in question and the specific risk stratification approaches employed. One study, using data from two health assessments roughly two years apart, found that the health management program participants were 1.8 to 3.5 times more likely than the

nonparticipants to have lowered their risk in six of seven risk categories (back care, eating habits, exercise, stress management, tobacco use, and weight control).[3] A Rand study determined that seven years of continuous participation in disease management programs decreased healthcare costs by an average of $136 per member per month, driven by a 29% reduction in hospital admissions.[4]

Revenue maximization

Volume leakage can be reduced if EHR data is used to identify patients needing follow-up care and services are scheduled proactively. For example, if a patient who seeks emergency department care for a broken arm is found to be morbidly obese, he or she can be scheduled for follow-up not only with an orthopedist,

but also with an internist or endocrinologist, and possibly other experts. We have found that better control of volume leakage by leveraging analytics can increase revenue 1% to 2%.

Clinical pathways can be enhanced when advanced analytics are applied to EHR data to identify both the clinical factors that contribute to good outcomes and those that increase the risk of bad outcomes (e.g., markers that indicate comorbidities or an increased infection risk). In our experience, clinical pathway improvements can produce a 1% to 2% increase in revenues.

Access to care can be increased when EHR systems are used to optimize patient scheduling procedures (e.g., by giving patients
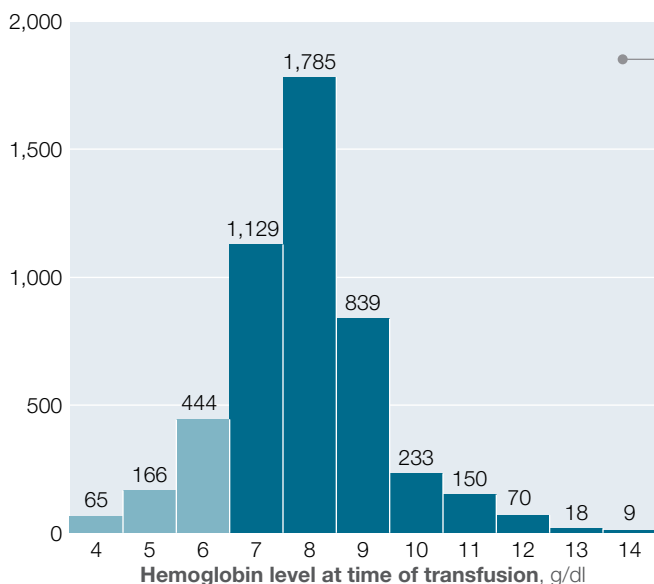

EXHIBIT 3 **Analytics can reveal unnecessary variability in clinical practice**

Red blood cell transfusion thresholds   (ILLUSTRATIVE CASE)

Order threshold, number of transfusion orders   ◼ Below guideline threshold (7 g/dl)   ◼ Above guideline threshold (7 g/dl)

Requires mapping the time blood was administered to the patient's previous hemoglobin lab value (analysis can be further broken down by service line and by physician)

At one hospital:
- >85% of transfusion orders occurred at hemoglobin level ≥7 g/dl
- Average of 2.2 units of red blood cells per transfusion (guidelines call for 1 unit per transfusion initially)

Other high-value use cases include antibiotic and biologics utilization

Source: Disguised client data; McKinsey analysis

[3]Gold DB, Anderson DR, Serxner SA. Impact of a telephone-based intervention on the reduction of health risks. *American Journal of Health Promotion.* 2000;15(2):97–106.
[4]Caloyeras JP, et al. Managing manifest diseases, but not health risks, saved PepsiCo money over seven years. *Health Affairs.* 2014;33(1):124–131.

EXHIBIT 4　**Data transparency can increase physician engagement by demonstrating variability**

Longer extubation times

Average time patient is on ventilator, hours

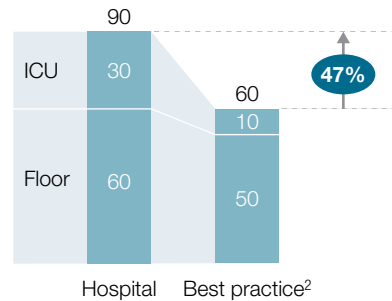|	
Hospital	9.1
STS[1]	7.4
Best practice[2]	3.0
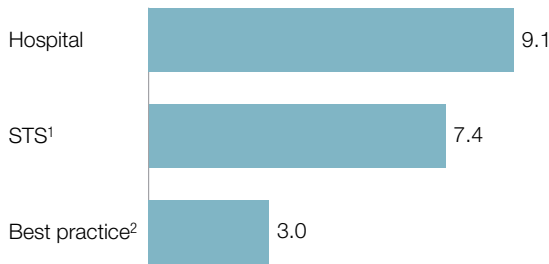
Experienced centers routinely extubate their patients within 2–6 hours after surgery

Longer ICU stays　　(ILLUSTRATIVE CASE)

LOS per patient, days
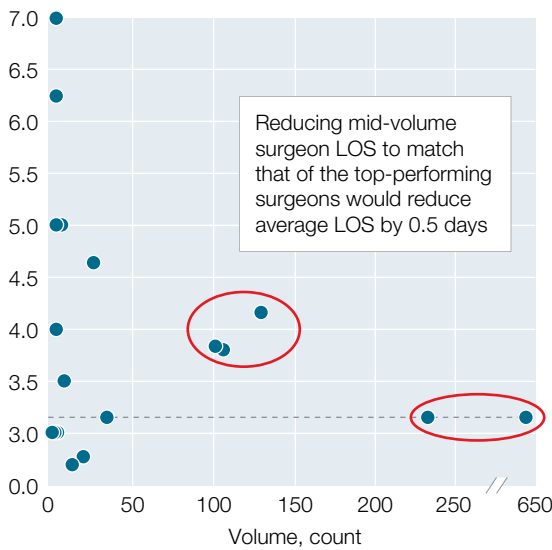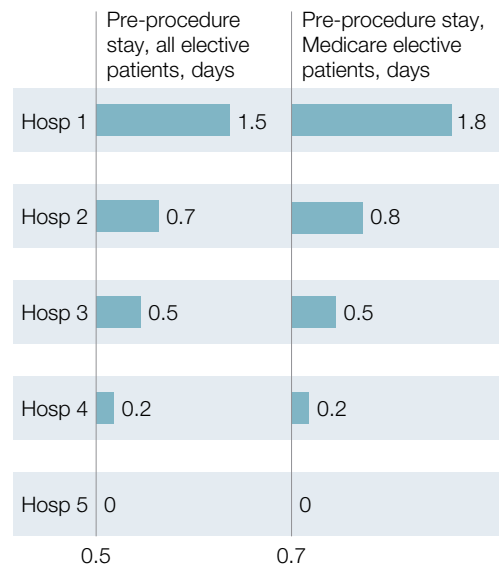
90

ICU　30
60

Floor　60
10

50

47%

Hospital　　Best practice[2]

Experienced centers discharge >50% of their patients in <5 days, compared with 30% at case hospital

Surgical LOS by surgeon

LOS, days

Reducing mid-volume surgeon LOS to match that of the top-performing surgeons would reduce average LOS by 0.5 days

Volume, count

Pre-procedure LOS

	Pre-procedure stay, all elective patients, days	Pre-procedure stay, Medicare elective patients, days
Hosp 1	1.5	1.8
Hosp 2	0.7	0.8
Hosp 3	0.5	0.5
Hosp 4	0.2	0.2
Hosp 5	0	0

0.5　　　　0.7

ICU, intensive care unit; LOS, length of stay; STS, Society of Thoracic Surgeons.
[1] Average number of hours reported by STS members.
[2] Definition of best practice was based on research and McKinsey experience.

Source: Disguised client data; McKinsey analysis

the ability to see available time slots, self-schedule appointments, and enter information in advance). Improving patient access can boost volumes and bolster efforts to maximize revenue.

Charge capture rates can be improved when EHR systems are fully integrated with the revenue cycle management (RCM) process. Charge capture can be strengthened through increased coding accuracy, better timeliness of charge submissions, decreased accounts receivable, and fewer charge write-offs. Major EHR vendors have expanded their offerings to include more integrated and robust RCM features. In our experience, optimized RCM capabilities can generate a 2.5% to 5% increase in revenues.

Quality improvement

Patient satisfaction can be increased by giving patients and their caregivers greater information transparency, easier access to their records, decreased time to care (a result of more efficient operations), and more user-friendly payment systems.

Real-time hospital performance tracking becomes possible through analysis of EHR data and can help identify areas for continuous improvement. A health system can create integrated dashboards to track physician performance, infection risk levels, nurse staffing levels, bed availability, service line performance, and other variables (Exhibit 4).

Physician satisfaction levels can increase when the EHR and clinical systems are set up to provide more flexible work flows, reduce work time, and offer greater information transparency (e.g., through the availability of decision support tools, access to patient

Taken together, the approaches ... can generate an additional 10% to 20% in contribution margin, as well as a marked improvement in clinical care.

charts through mobile devices, and cost performance dashboards) (Exhibit 5).

Overall impact

Taken together, the approaches described above can generate an additional 10% to 20% in contribution margin, as well as a marked improvement in clinical care (Exhibit 6). Although realizing value through all these channels may seem aspirational, some leading health systems have already achieved this level of performance.

For example, one large national health system with more than 40 facilities has become a leader in clinical operations through its thoughtful EHR use. In addition, this system realized impressive cost and revenue improvements by developing distinctive insights from its EHR data. The health system combined several of the approaches described above and built a clinical data warehouse to bring together vast amounts of information from multiple IT systems, including its EHR system. Employing advanced analytics on the data helped support a successful clinical excellence program. As a result, more than 70% of the health system's hospitals were included on the Joint Commission's 2014 list of Top Performers on Key Quality Measures, compared with 37% of hospitals nationwide.

EXHIBIT 5 **Transparency into the cost of care is crucial for helping physicians achieve total cost targets**
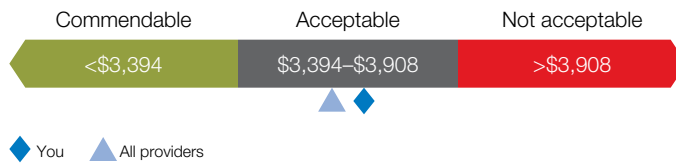
Sample provider report: Perinatal (excerpts)

1 OVERVIEW

Total episodes: 262   Total episodes included: 233   Total episodes excluded: 29

2 COST OF CARE COMPARED WITH OTHER PROVIDERS

Commendable	Acceptable	Not acceptable	Gain/risk share
<$3,394	$3,394–$3,908	>$3,908	$0

◆ You   ▲ All providers

You are not eligible for gain-sharing
- Selected quality metrics: Met
- Average episode cost: Acceptable

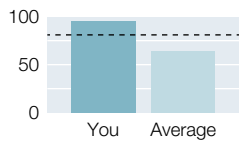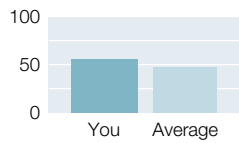**3 QUALITY SUMMARY**

✔ **You achieved selected quality metrics**
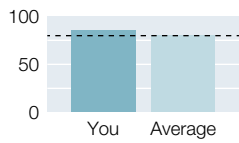
Linked to gain-sharing
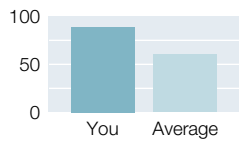
- - - - Standard for gain-sharing, %

HIV screening

Gestational DM screening

Group B strep screening

Bacteriuria screening

4 COST SUMMARY

✔ **Your average cost is acceptable**

Your total cost overview, $

850,000	815,500
You (non-adjusted)	Average (adjusted)

Average cost overview, $

3,500	3,400
You	All providers
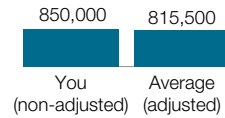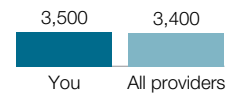
Distribution of provider average episode cost

Cost, $

■ You ■ Commendable ■ Acceptable ■ Not acceptable
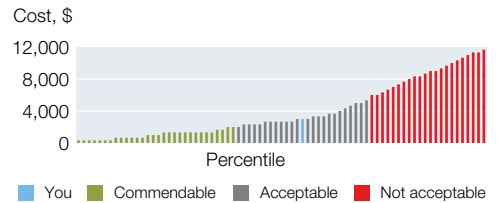
5 KEY UTILIZATION METRICS

C-section rate, %

17 / 30
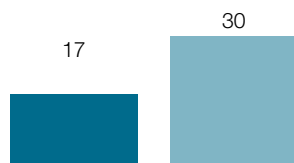
Average number of ED visits per episode

1.3 / 2.1

■ You ■ All providers

C-section, cesarean section; DM, diabetes mellitus; ED, emergency department; HIV, human immunodeficiency virus.

How can your health system capture this value?

Despite the tremendous value that EHRs and linked IT systems can create, they are not being used to their full capacity today. Currently, EHRs serve more as a "system of record" (with a focus on report generation) than as a "system of engagement" that produces actionable insights to transform care delivery models. To capture full value, health systems must set up an EHR/technology enablement program so they can begin linking their EHRs with other systems. This approach will enable them to start migrating to open IT architecture so that future innovations in healthcare IT can be adopted rapidly.

EXHIBIT 6 **Better use of EHR data can generate ~10%–20% in added contribution margin**

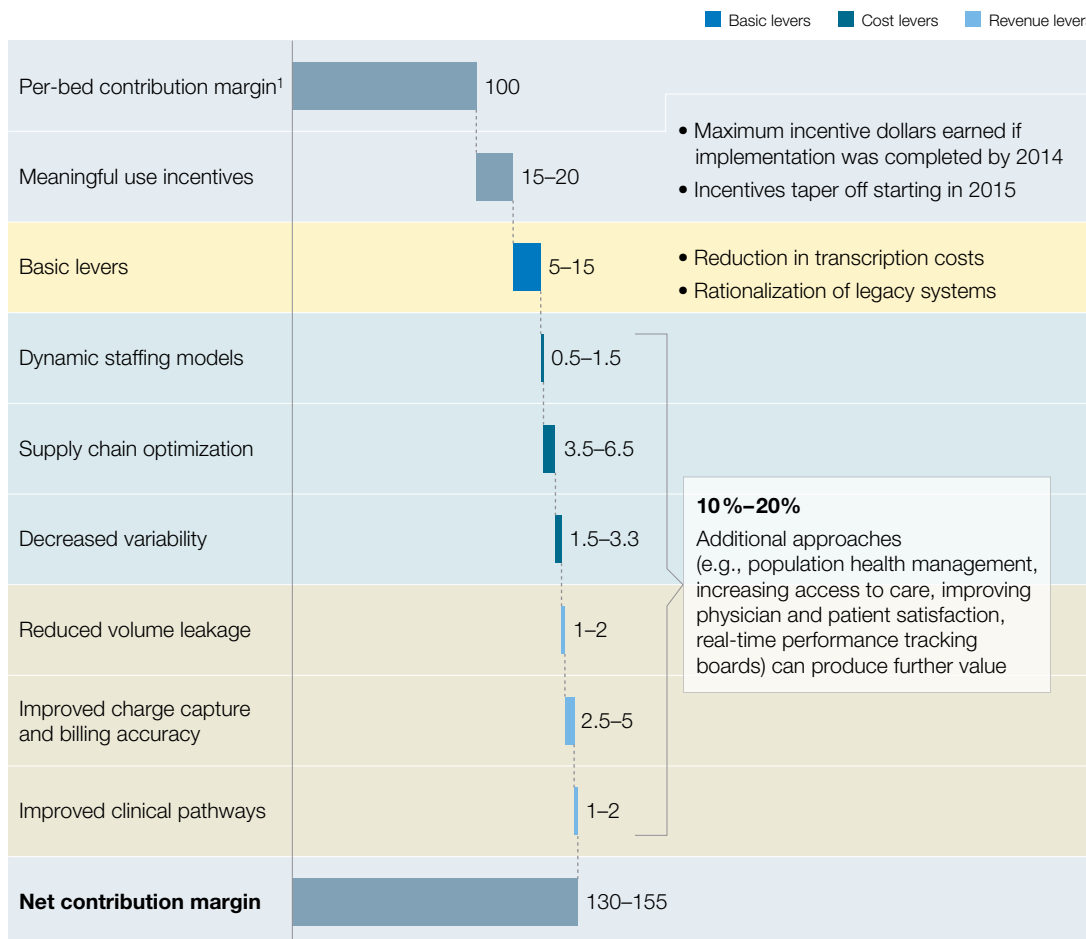**Impact on per-bed contribution margin**, $ thousand   (ILLUSTRATIVE CASE)

| | | Basic levers | Cost levers | Revenue levers |

Per-bed contribution margin[1]	100	
Meaningful use incentives	15–20	• Maximum incentive dollars earned if implementation was completed by 2014 • Incentives taper off starting in 2015
Basic levers	5–15	• Reduction in transcription costs • Rationalization of legacy systems
Dynamic staffing models	0.5–1.5	
Supply chain optimization	3.5–6.5	
Decreased variability	1.5–3.3	**10%–20%** Additional approaches (e.g., population health management, increasing access to care, improving physician and patient satisfaction, real-time performance tracking boards) can produce further value
Reduced volume leakage	1–2	
Improved charge capture and billing accuracy	2.5–5	
Improved clinical pathways	1–2	
Net contribution margin	130–155	

[1]Assuming revenue/bed = $1 million, 10%–15% profit margin for a not-for-profit hospital system.

Source: Disguised client data; McKinsey analysis

Health systems that want to undertake such a program can use our five-phase EHR maturity curve as a road map (Exhibit 7). The steps outlined below can help them reach phase 3 on the EHR maturity curve and then progress to higher levels of value capture.
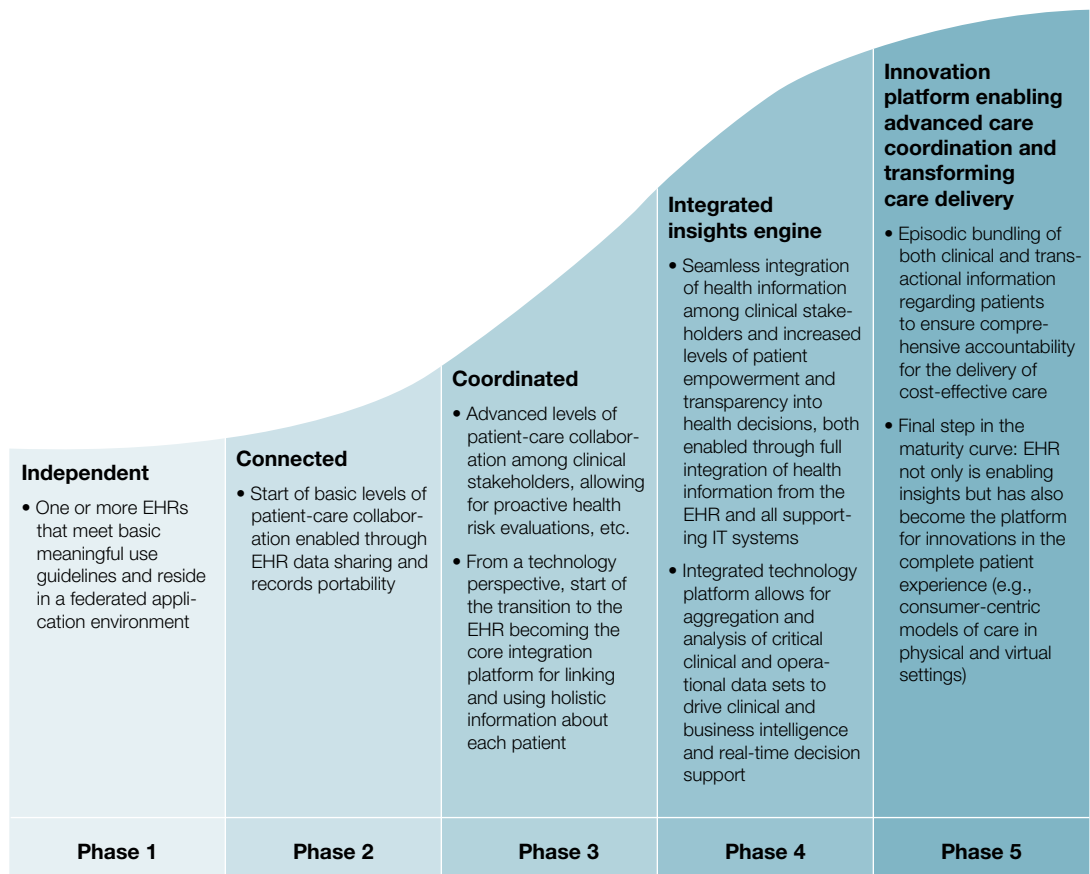
Establish a robust governance model

Advancing up the EHR maturity curve requires significant early investments in human and financial capital, and the process typically takes a number of years. Having a robust governance model with clear executive sponsorship is a baseline requirement if the journey is to succeed. Such a model helps ensure that all the necessary cross-functional stakeholders are engaged early and remain engaged throughout the EHR/technology enablement program. It can also accelerate alignment and collaboration on key issues related to work flow, operations, technology, and change management.

In our experience, most successful implementations of this nature rest on three governing principles:

EXHIBIT 7 **The maturity curve for EHR implementation**

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Independent	**Connected**	**Coordinated**	**Integrated insights engine**	**Innovation platform enabling advanced care coordination and transforming care delivery**
• One or more EHRs that meet basic meaningful use guidelines and reside in a federated application environment	• Start of basic levels of patient-care collaboration enabled through EHR data sharing and records portability	• Advanced levels of patient-care collaboration among clinical stakeholders, allowing for proactive health risk evaluations, etc. • From a technology perspective, start of the transition to the EHR becoming the core integration platform for linking and using holistic information about each patient	• Seamless integration of health information among clinical stakeholders and increased levels of patient empowerment and transparency into health decisions, both enabled through full integration of health information from the EHR and all supporting IT systems • Integrated technology platform allows for aggregation and analysis of critical clinical and operational data sets to drive clinical and business intelligence and real-time decision support	• Episodic bundling of both clinical and transactional information regarding patients to ensure comprehensive accountability for the delivery of cost-effective care • Final step in the maturity curve: EHR not only is enabling insights but has also become the platform for innovations in the complete patient experience (e.g., consumer-centric models of care in physical and virtual settings)

EHR, electronic health record; IT, information technology.

First, healthcare providers should control the development/configuration agenda to ensure that clinical benefits are achieved.

Second, an open-architecture approach should be adopted for all existing and anticipated applications. Given the rapid pace of innovation in the broader healthcare IT space, it is critical that health systems give themselves the flexibility needed to partner with the start-ups and large technology companies developing the innovations.

Third, the program should be overseen by multidisciplinary teams of leaders who have a shared understanding of clinical, analytic, technology, and operational concerns. These teams enable "unnatural collaborations" across functional and organizational silos to emerge. The following multidisciplinary teams, working in conjunction to ensure collaboration and successful implementation, are typically needed:

Strategy and design. This team should be headed by administrative and clinical leaders (e.g., the chief medical officer), as well as technology leaders. The administrative and clinical leaders define the desired clinical workflows and functions that will help achieve the health system's strategic goals and produce value. The technology leaders provide insight into cutting-edge capabilities and tools that can be used to realize the strategy.

Technology and data architecture definition. This group, led by IT leaders (e.g., the chief information officer or technology director), establishes the overall technology and data-architecture approach that will bring together the EHR system, all other technology assets, and leading third-party solutions. Clinical

To ensure that value capture is front and center through every phase of the EHR/technology enablement program, cross-functional ... teams should oversee the implementation and deployment of each prioritized project.

representation on this committee ensures that the clinical strategy determines the technology solution—not other way around.

Portfolio management. This multidisciplinary team, which includes administrative, clinical, and IT leaders, weighs clinical, regulatory, financial, and strategic considerations so it can determine which opportunities should be pursued and prioritize their implementation. This approach helps ensure that the EHR/technology enablement program focuses on areas with clear value targets to avoid investment of resources over several years in projects with significant ambiguity about actual outcomes.

Implementation and value capture. To ensure that value capture is front and center through every phase of the EHR/technology enablement program, cross-functional (e.g., clinical, IT, finance) teams should oversee the implementation and deployment of each prioritized project. These teams should be responsible for tracking end-to-end value capture, not just the installation of technology widgets.

Ongoing performance management. This cross-functional team helps oversee the

long tail of an EHR/technology enablement program by defining and tracking key performance indicators and other metrics for measuring progress. This team also provides guidance to the implementation teams when challenges arise and helps resolve conflicts between clinical and technology priorities.

Understand organizational readiness

Establishing a baseline understanding of the readiness of people and systems to move toward greater value capture is essential for shaping the implementation plan. We recommend an organizational readiness assessment and information audit. This knowledge helps identify the types of programs and communication channels required to promote adoption and transform mind-sets and behaviors. Furthermore, it provides insight into any skill gaps that need to be addressed. If EHR/technology enablement programs are to succeed, health systems must have the right mix of technical, analytic, clinical, and business skills, as well as cross-functional resources. A ready organization can undergo an EHR implementation with fewer cost overruns in a shorter time line, and is better prepared to capture value once the EHR system is in place.

A health system should identify everyone within the organization who is or will be affected by the EHR system and conduct a usage survey to determine how they currently interact with the EHR and other IT systems, and how ready they are to adopt new approaches to value capture. The health system should also conduct in-depth interviews with key influencers (e.g., physicians who could become champions of the new system) to develop a holistic understanding of the current state of technology adoption.

The information audit focuses on technology. The health system should assess the availability, quality, response speed, and integration potential of all related data elements. Critical areas to evaluate include the existing interface engine, single sign-on functionality, wireless capabilities, and network security. This information will help shape the scale and scope of the project.

Emphasize a focus on value

Although the organizational readiness assessment provides insight into the full set of mind-sets and behaviors that need to be altered, the first and most critical change is for stakeholders is to adopt a focus on value. This requires the stakeholders to shift from a report mind-set to an insight mind-set. The EHR system and all information assets must be set up to deliver actionable insights to ensure that stakeholders remain laser-focused on capturing value, not simply on creating copious statistical reports.

Identify and size opportunities for value creation

Only by identifying and sizing opportunities can a health system determine how and where organizational resources should be deployed to maximize value delivered.

All key stakeholders (clinical, operational, and financial) should help identify what functionality gaps and information asymmetries currently exist within the health system, and they must thoroughly understand how value is being left on the table as a result. This understanding will make it easier for stakeholders to align on the use cases most likely to deliver significant operational, revenue cycle, and/or clinical impact. Once these use cases are defined, the health system

can develop the specific algorithms and identify the data elements from other IT systems that must be combined with the EHR system to estimate the value to be captured.

Note that defining, sizing, and prioritizing the use cases should not be the domain of just the technology team or clinical department. Rather, a multidisciplinary effort combining expertise from a variety of groups—clinical operations, supply chain, technology, HR, analytics, and finance—is required.

Facilitate broad adoption

Achieving phase 3 on the maturity curve requires that all physicians and nurses consistently and substantively use the EHR system as part of their daily workflow. This change will occur only if the physicians and nurses can see concrete examples of how EHR use will improve patient outcomes and help them work more efficiently. To ensure that such examples can be found, both physicians and nurses should be involved from the beginning in the EHR/technology enablement program to confirm how the EHR system is currently being used, identify value capture opportunities, and design the new EHR work flow.

To further encourage adoption, physician champions can be enlisted to encourage their peers to increase their EHR use. Tailoring communication and training programs can also help achieve this goal.

Mitigate the 'complexity tax' and have a clear approach to value capture

Content must trump tools. Thus, a health system should reassess its technology infrastructure to identify the key sources of complexity currently impeding data sharing.

It should then develop solutions based on information liquidity, extensibility, and scale. Often, this requires the health system to migrate toward an open-architecture design and away from closed-loop systems tethered to the existing EHR system.

We recommend health systems adopt a two-speed architecture approach so that it can begin to use the EHR system in new ways (e.g., to improve consumer engagement) while continuing to derive value from traditional EHR functions. As part of this process, it must decide which opportunities it wants to prioritize. The answer to this question will help the health system decide which approach to value capture it wants to pursue: should the EHR system encompass all care delivery, or will it be part of a broader set of tools that are interconnected to enable advanced analytics and other benefits?

Technology experts should have primary responsibility for designing and building the end-state system. However, the right mix of clinical, business, and analytics leaders should be included throughout the design process to validate the data, check that it is correctly interpreted, and ensure that the final product delivers the insights required. Leading EHR vendors are starting to offer data analytics

Content must trump tools. Thus, a health system should reassess its technology infrastructure to identify the key sources of complexity currently impeding data sharing.

capabilities (not just reporting) as part of their "out of the box" functionality.

Develop 'test and learn' capabilities

Health systems should adopt a more agile, iterative approach to technology deployment. Capturing value from EHR investments cannot be achieved through a "big bang." It instead requires patience so that multiple pilot projects can be designed and deployed to generate quantitatively and qualitatively validated insights. To keep implementation costs low, the pilots should include workable prototypes of analytic and collaboration tools. Creating the prototypes and running the pilots requires focused development and analytics capacity, the ability to scale the current state "control" environment up and down rapidly, and tremendous executional discipline (especially the willingness to close down pilots that do not meet established testing criteria). This approach can yield significant value at a fraction of the capital investment committed to the overall project and often becomes self-funding.

•   •   •

EHR systems can be used to create or destroy value for health systems. Today's health systems have a gold mine of data within their IT, clinical, and business systems—data that can be used to develop new insights into how to capture value. The EHR system can be used as the catalyst for this effort. By combining data from other systems with EHR records, health systems can identify the approaches that will best enable them to improve care quality, optimize costs, and/or maximize value. This approach has the potential to revolutionize both care delivery and health system economics. It can also position providers to begin making dramatic changes to their cost structure and prepare to become the hospitals of the future. ○

Bede Broome, MD, PhD (Bede_Broome@McKinsey.com) is a partner in McKinsey's Southern California office. Nikita Sharma (Nikita_Sharma@McKinsey.com) is an associate partner in McKinsey's Chicago office. Sri Velamoor (Sri_Velamoor@McKinsey.com) is a partner in McKinsey's Southern California office.