

# EHR Implementation Planning & the Need to Focus on Data Reusability

*An Encore Point of View*

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## “IT’S ALL ABOUT THE DATA...”

Healthcare is at the nexus of the biggest data collection effort ever undertaken with the biggest demand for information ever experienced. While healthcare has always been “data rich and information poor,” the real financial impact of not having current, accurate information about cost, quality and satisfaction is raising awareness that the data collected in electronic health records (EHRs) across all care settings has additional value. And that data in other systems – scheduling, practice management, patient accounting, materials management, time and attendance, general ledger – must be combined with the clinical data across all care settings to provide a holistic view of how an organization is performing. And, to ensure that the right data is available in the right format at the right time, EHR workflow and implementation design must factor in these data re-use requirements. Healthcare as an industry is embracing the notion that data is a valuable asset that must be nurtured, managed and protected.

## “IT’S ALL ABOUT THE DATA...” cont’d

*The re-usability of data is using data captured in any “source system” for reporting, measurement and analytics.*

*You need to know what data is needed to measure and analyze what is important and to ensure data can be consistently, reliably and accurately captured at the point of origin.*

Harnessing the intrinsic value of data across a healthcare enterprise is a journey, though, and not a task. It requires the perspective of time and the realization that the foundation established today must be sound, extensible and scalable. It also requires the recognition that leveraging data as an enterprise asset and being able to turn it into actionable information is not only about technology; people and process are equally important and perhaps more difficult to align. And while there are certain fundamentals that apply to all organizations, any approach to managing enterprise data must fit the size, scope and culture of an organization. One thing to keep in mind, however, is that the use of data to support measurement, reporting and analytics always begins at the point when the data is initially captured. The single biggest source of enterprise data is the EHR; and with many organizations embarking on their first EHR implementation or preparing to migrate to a different EHR, keeping in mind the secondary use of the data captured as a by-product of care delivery should be one facet of implementation decision-making.

Implementing an enterprise-wide EHR is a massive, complex undertaking. The needs of many stakeholders must be considered when defining the build requirements; workflow must support ease-of-use and not interfere in patient care delivery and related work processes. Many implementation decisions focus on driving clinician adoption to ensure both quality and efficiency objectives are met (not to mention regulatory requirements related to Meaningful Use). With all the multi-threaded work streams and decision processes involved in planning and executing an EHR implementation, the re-usability of the captured data frequently falls out of scope.

### **Re-usability of data? What IS that?**

Quite simply, using data captured in any “source system” (e.g., EHR, admitting/discharge/transfer [ADT], materials management, patient accounting, registration, operating room, emergency department, etc.) for reporting, measurement and analytics. Re-using the data captured in these source systems accelerates the value realized from implementing these systems and supports a virtuous cycle of performance improvement across the enterprise. It all relates to the old adage “you can’t manage what you don’t measure;” you can’t measure something if you don’t have the right data. And that leads back to the decisions made in implementing EHRs and other systems. You need to know what data is needed to measure and analyze what is important to the organization and ensure that data can be consistently, reliably and accurately captured at the point of origin (e.g., at registration, in the care process).

*It is helpful to begin with  
the end in mind.*

## “BEGIN WITH THE END IN MIND”

### Take a simple example – patient temperature

Most EHRs have a discrete field where patient temperature MAY be entered (i.e., a specific place in the EHR where patient temperature is entered in a specific numeric format – xxx.x in Fahrenheit or xx.x in Celsius). But most EHRs don’t “enforce” that temperature be entered in this field; the “requirement” that temperature be entered in the specific field is a decision made during implementation. Frequently, organizations also allow temperature to be documented in progress notes or other text fields to allow flexibility in workflow. So, while the information is available to care givers when reviewing the patient chart, the temperature value (along with the associated date and time stamp) are not always in the same place for a given patient; sometimes it’s in the specific field while other times it’s in the notes.

#### ***Why would this matter?***

If the physician or nurse can readily see the patient temperature – either in the hospital or physician office – what difference does it make that sometimes the specific field is used while other times the information is in a note? The reason is actually quite straightforward – if the data is needed for measurement, reporting or analytics, it’s not reliably available from a consistent place.

#### ***Imagine if...***

Your organization wanted to use patient temperature as part of an automated infection surveillance program. You might want to identify patients with temperatures over a certain value with no culture ordered or with no antibiotic ordered and send an alert to a clinician to evaluate a possible infection. Or, you might want to track how quickly patient temperature is brought back to normal after starting antibiotic therapy to measure effectiveness of the selected treatment.

If patient temperature isn’t always available in the same place, it can’t be reliably re-used to support this measurement. If sometimes it’s in the structured field and other times in the notes, there will be gaps in the data that could lead to erroneous conclusions about patient care. To accurately track patient temperature, the implementation of your EHR needs to reinforce consistent capture of the data in the correct field.

This is just one example; and patient temperature may not be the most important data element for your organization to track discretely but there are data elements every organization needs to support measurement, reporting and analytics.

## BALANCE EASE-OF-USE WITH DATA REUSABILITY

It is unrealistic to expect that every bit of data about a patient should be captured in a discrete form for re-use. There needs to be a balance between supporting ease-of-use in the appropriate workflow and the availability of data for reusability. A good way to strike this balance is to create a list of data elements your organization agrees are necessary for analytics. Frequently this initial list of data elements is driven by the metrics required to support Meaningful Use (MU) utilization and quality eMeasure reporting. Because of the leeway allowed in making implementation decisions, having an MU-certified system does not automatically guarantee all the data needed to meet reporting requirements is captured discretely and consistently. Some detective work is required; it starts with identifying the data needed for each metric and continues by tracing the journey of that data back to the source system and ensuring each data element is captured as expected in the intended workflow. This requires collaboration across a multi-disciplinary team involving experts in quality reporting, data analysis and clinical (or operational) workflow.

The resulting inventory of data elements will likely be shorter than anticipated. Most (if not all) metrics require some data about the patient – patient demographics. So there is a good bit of repetition of this type of data; once you've accounted for a data element, it's in the inventory and available for use as many times as needed. And as you progress through the list of metrics, there will be fewer and fewer net new data elements you need to account for.

### **“Data Chain of Trust”**

Once you've created your inventory of data elements, you need to identify where each data element can be captured in the source system (e.g., EHR, ADT, etc.). This is the “data chain of trust.” Going through this process it is critical that you work across the inevitable silos of EHR implementations. As stated above, EHR implementations are complex and multi-threaded. Different implementation teams could be making contradictory decisions about data capture that do not adversely affect patient care but DO impact the reusability of the data. Discussion and compromise will be needed to design workflow that both supports ease-of-use and captures data reliably and consistently.

To ensure you're making coordinated decisions, you need to involve all the various teams – nursing, physician, lab, pharmacy, imaging, registration, scheduling, etc. – in “interlock” sessions. And you need to document all the decisions that support the “data chain of trust” for each data element for each metric so as system refinement occurs you know the consequences of changing how a particular data element is captured. Sometimes in this decision process, organizations decide that the trade-off between ease-of-use and data reusability is too great and will opt for ease-of-use. These decisions need to be documented and communicated as well so expectations about what can be measured and analyzed can be managed.

*Having a Meaningful Use-certified system does not automatically guarantee all the data needed to meet reporting requirements is captured discretely and consistently. Some detective work is required.*

*This involves collaboration across a multi-disciplinary team and creating the “data chain of trust.”*

## VALUE REALIZATION & DATA

With your documented inventory of data elements married to how that data will be captured in the source systems, data can start flowing into a measurement and analytics environment. There are multiple options available to organizations – from custom data warehouses to purpose-built applications – but the common need for all of them is consistent, reliable data. Applying sound data governance principles (see Enterprise Data in Healthcare: An Untapped Asset for Performance Improvement Analysis and Measurement<sup>1</sup>) and implementing a data profiling discipline to monitor the data (see The Role of Data Profiling in Health Analytics<sup>2</sup>) will ensure that consistency and reliability. This is where value acceleration begins.

While MU compliance may be the first reason many organizations focus on data reusability, improving performance across the organization quickly follows. Using metrics to determine opportunities for improved quality or efficiency, organizations can then use the aggregated data to analyze differences in workflow, resource utilization and outcomes to determine how process might change.

### **Sepsis Mortality Rate Example**

For example, your organization might currently have a sepsis mortality rate of 13.25%. Wanting to lower this rate you first need to understand what the current state is and then where you might initially focus your intention to achieve improvement.

#### ***Define the Population.***

You might start with one year of data identifying all patients with a final diagnosis of Sepsis (ICD-9 = 995.51). Next, you might profile the population to see what characteristics are prominent – average age, admit type, discharge disposition – and discover that the average age was 59, 97% were admitted urgently or emergently, 76% were admitted from home and 20% were discharged to hospice or expired.

Next, focusing on the expired population you might discover that this population – compared to the total Sepsis population – had the longest Length of Stay (LOS), longest Intensive Care Unit (ICU) LOS and the highest variable cost per case. The question then follows – what could be improved in the expired population?

*Value acceleration can begin when data is consistent and reliable.*

*Applying sound data governance principles and implementing a data profiling discipline to monitor the data enables that consistency and reliability.*

*Improving organizational performance requires a focus on data reusability – aggregated data to analyze how a process might change.*

You first need to understand the current state and then where you might initially focus your intention to achieve improvement.

- Define the population
- Analyze the data
- Interpret the data
- Identify improvement opportunities
- Apply the knowledge

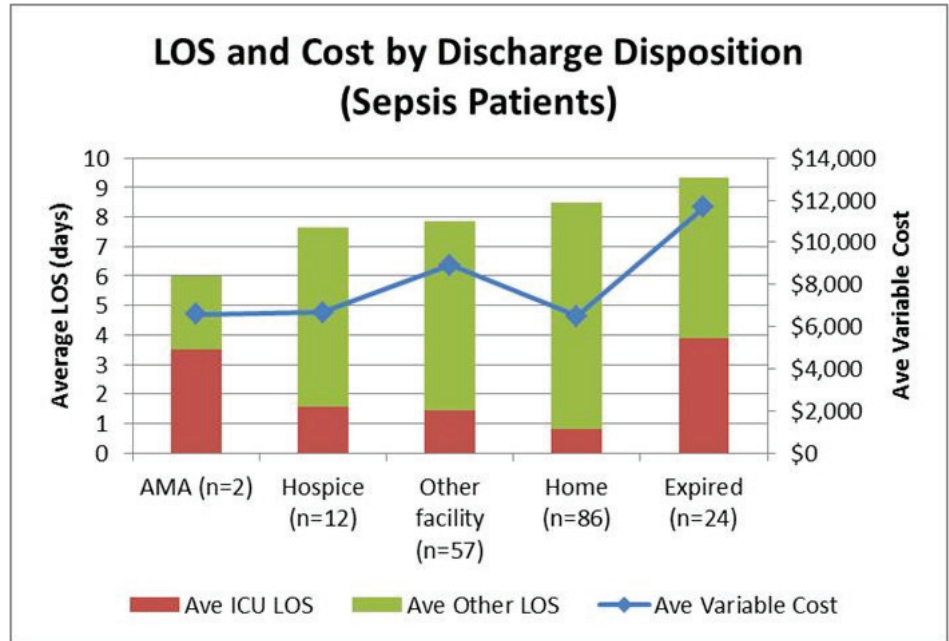


Figure 1. Average LOS and Variable Cost per Case

**Analyze the Data.**

To determine what might influence improved outcomes, you could investigate the following areas:

- Order set usage
- Physician differentiation based on volumes related to outcomes
- Infectious disease consults and timing
- Antibiotic usage

Your analysis of Sepsis order set usage revealed a low utilization overall but an even lower usage among those patients who expired.

- Only 7% (n=12) of Sepsis patients used the Sepsis order sets; only 1 patient that expired was ordered the Sepsis order set.
- 22% (n=39) of Sepsis patients were never ordered an order set
- 29% (n=52) of Sepsis patients were ordered order sets other than Sepsis, infection related or ICU

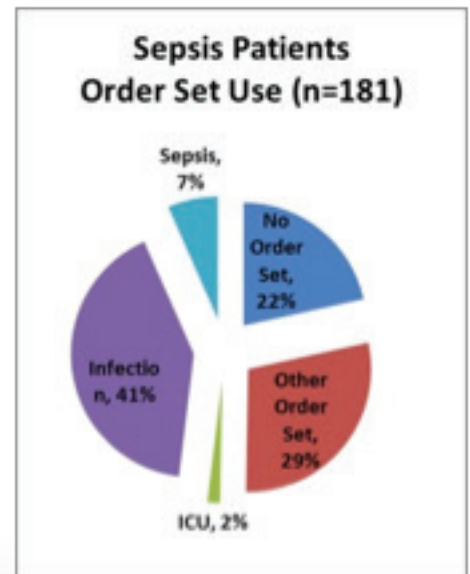


Figure 2. Order Set Use



Value realization is enabled by the availability of reliable data to measure performance, evaluate where changes can occur and monitor results over time.

### Interpret the Data.

Could lack of appropriate order set use be negatively affecting outcomes?

Next, looking at physician volumes and outcomes you discover that patients cared for by high volume physicians had a shorter LOS and were less likely to be transferred. It also appears that all physicians struggle with use of order sets – and no orders for Infectious Disease consults were found in the data. (Note – are these orders being captured discretely? This might require some additional data discovery.) With long ICU LOS for expired non-ICU patients, did Sepsis go unrecognized by low volume physicians?

Finally, you evaluate the start times of antibiotic therapy and discover that physicians with higher patient volumes tended to start antibiotics sooner than physicians with lower patient volumes and a larger percentage of patients with later antibiotic start times fell into the expired group.

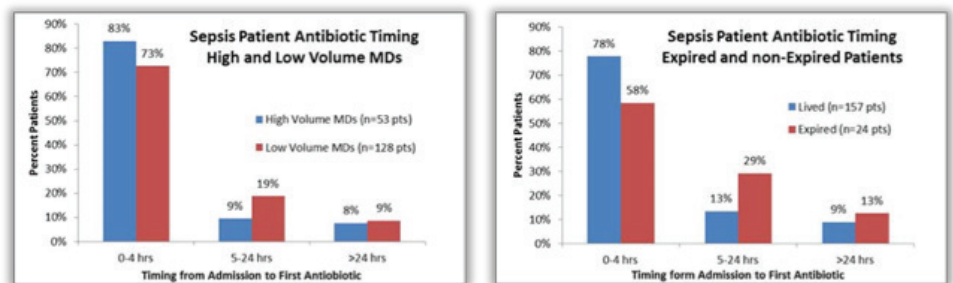


Figure 3. Antibiotic Timing

### Identify Improvement Opportunities.

Through this initial analysis you identify four concrete next steps that are practical, implementable and measurable – so you can determine if you are achieving the desired reduction in Sepsis mortality over time:

- Educate physicians on use of dedicated order sets for specific populations
- Evaluate early recognition criteria, such as vital sign changes and lab results so antibiotics can be given sooner
- Evaluate appropriate antibiotic therapy
- Evaluate internal consult/transfer policy so experienced physicians are involved in care

### Apply the Data Knowledge.

Beginning with a metric – Sepsis mortality rate – you then use the available data to determine where you can positively influence performance to reduce that rate. The result is improved value realized by the organization through better quality and lower cost. This value realization is all enabled by the availability of reliable data to measure performance, evaluate where changes can occur and monitor results over time.

*To accelerate value realization you need to begin with the data most important to your organization and ensure that data can flow from origin to analytics in a “chain of trust” that is known and transparent.*

### **Realize the Value**

Organizations don't have to begin with a large set of discrete data – but any level of measurement, reporting and analytics requires consistent, reliable, accurate data that starts at the point of capture in the source systems. To accelerate value realization you need to begin with the data most important to your organization and ensure that data can flow from origin to analytics in a “chain of trust” that is known and transparent. From there you can incrementally increase the available data as the organization comes to understand why it's important to capture data discretely and accurately as more stakeholders benefit from access to that data. With increasing value realized comes the understanding that – “it's all about the data”!

### **REFERENCES**

1. Enterprise Data in Healthcare; An Untapped Asset for Performance Improvement Analysis and Measurement. By Encore Health Resources: Randy L. Thomas, Sherie Giles, David Greenwalt, and Karen Knecht; May 2013.
2. The Role of Data Profiling in Health Analytics. By Encore Health Resources: Randy L. Thomas; October 2013.

### **ABOUT ENCORE**

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