Business intelligence and the case for meaningful use

In order to address and comply with meaningful use requirements, many healthcare organizations are turning to Data warehousing (DW) and business intelligence (BI) as a tool for reporting and identifying key strengths and weaknesses within the business. In this E-Guide, sponsored by Cisco, you will learn the different ways that BI & DW, as a collaboration, can help to improve processes within your healthcare organization.

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Resources from Cisco Systems, Inc.
How BI reporting helps address meaningful use

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Data warehousing (DW) and business intelligence (BI) are increasingly becoming relevant technologies for the health care industry. Specifically, they have been pegged as the best method to address the quality reporting requirements spelled out in the meaningful use criteria. However, BI is a potent tool for health care organizations in general. It can support other types of regulatory reporting, as well as a plethora of other analytic uses.

This article will explore why meaningful use and BI reporting are a perfect collaboration. We will discover how BI programs can help health care providers address the proactive tracking of measures for process improvement to not only meet but exceed goals. Next, we will determine when it's necessary to integrate data from disparate source systems, specifically multiple electronic health record (EHR) systems, while applying the complex business rule logic. Finally, this article will briefly address how to drive the outcomes for subsequent measurement years.

Why meaningful use, BI reporting fit hand in glove

Completing an exhaustive analysis of the meaningful use requirements is beyond the scope of this article. However, a brief examination shows that most measures require an encounter view of the data and a unique patient view. For example, if a patient comes to the hospital via the Emergency Department and is admitted to an inpatient department, that patient should only be counted once.

Simple data transformation rules such as these are increasingly easy in a data warehousing environment. You have the ability to associate a unique patient ID with multiple encounters. Within any encounter, you can have multiple procedures, diagnoses, lab results, medications and so on.

Conducting business rule abstraction outside the context of a clinical data warehouse can be difficult, generally resulting in a series of disparate tables with varying business rules applied. The consistency that BI and DW provides, on the other hand, is a key consideration
for meaningful use -- not just today, but more so for future reporting years as additional tracking and outcomes are driven as a result of higher EHR adoption.

There are other advantages to taking a business intelligence approach to meaningful use. Regulatory reporting is not a new concept to health care providers. I recently learned of a hospital in Minnesota that, because of its status, was creating more than 1,200 reports for multiple constituents. BI reporting can certainly address the complex meaningful use requirements. Tackling that effort also means you will be able to create all required regulatory reports from one source, drastically reducing FTE time.

In addition, defining and governing data becomes quite manageable when there is a single source of the truth. This is a primary advantage of a data warehouse. Another is the ability to manage data definitions for a broad set of regulatory requirements. In turn, consistent definitions enable a broader use of data. This often involves self-service BI reporting, and it allows multiple departments to proactively pull reports of measures long before submission, giving you the extra time needed to make process changes and exceed goals.

**Tracking health quality measures**

Because so many hospitals and providers are new to the data side of EHR systems, many organizations may fail to meet the goals identified by the Centers for Medicare & Medicaid Services (CMS) because they didn’t have time to proactively manage process improvements that would improve performance on health quality measures.

Recent surveys of the members of the College of Healthcare Information Management Executives (CHIME) and the Medical Group Management Association (MGMA) suggest that hospitals are feeling less secure about completing meaningful use attestation in the first measurement year, which began April 1. Members of both professional organizations said that the meaningful use objectives that require pulling data directly from an EHR system were proving to be the most difficult to address.

Whatever the reason for the potentially surprising situation, the solution for health care organizations is to have the ability to track these measures for a period of time prior to submission, in order to make process changes that will allow them to meet the goals.
Moreover, tracking measures will allow organizations to determine the best way to report on a measure. Simply selecting between the different ways to count an admission could impact the measure in unintended ways. Tracking both measurement approaches will tell you which one has the highest effective rate and will give you the best chance of meeting those goals.

**Integrating data key to meeting meaningful use requirements**

Most health care organizations turned to their EHR vendors to address the meaningful use reporting requirements. It was an easy and appropriate solution for most organizations. In order for an EHR system to be certified, it must provide functionality for calculating all core quality measures and submitting that data to CMS. If you are a hospital with one EHR system, then using the vendor's meaningful use reporting functionality is a good choice, at least initially.

However, many hospitals used multiple EHR systems to address workflow considerations of different departments. In some cases, the use case is different suites of the same product. In other cases, completely different products are in use. It remains critically important that the EHR workflow aligns to the department to ensure limited interruption of patient care. For example, radiology and cardiology should not be forced to use the same EHR system for no other reason than report creation.

However, leaving data in disparate systems will limit your ability to meet the goals and, more importantly, impact your ability to submit meaningful use reports. Therefore, you will need all of the data to meet the goals. (Remember, the bigger a patient population, the better chance you have to meet the quality goal.) As such, you will have to tackle data integration.

Data integration is no small feat. In fact, the main reason business intelligence projects fail in health care is because integrating clinical and financial data is so challenging. The good news about meaningful use is that it does not require that type of data integration. The bad news, though, is integrating data from disparate EHR systems, many of them with customizations, multiple codes, limited standardizations and challenging requirements.
The CMS requirements are quite helpful, but there is still room for interpretation. It's tempting to make this an IT project because of the data integration work, but don't make your IT department solely responsible for this. It will be very important to have your quality team leading the charge, with your regulatory department close at hand. There is no easy way out of this work, but getting the right people participating in the project is a good first step for success with health care business intelligence.

**Using BI reporting to drive long-term patient outcomes**

I started my career as a research coordinator of an extensive outcomes protocol in a Midwest hospital. Outcomes have always been a part of my work DNA. With so much data associated with these meaningful use measures, the potential for long-term outcomes is really exciting. But what impact would an outcomes requirement have on a health care organization?

The most impactful scenario may be the need to store the data in a repository, which will likely be driven by the clinical quality measures. In this case, the tracking of a specific population over time to ensure improved outcomes is a job best met by a data warehouse.

This isn't a requirement today, but measuring outcomes and tracking clinical quality measures is something that federal regulators have hinted at. Many of the measures provide a great deal of value and information to a health care provider. The value of tracking these outcomes would help offset some of the pain of the change management associated with both EHR adoption as well as data management.

The discussions that have started as a result of the HITECH Act and its meaningful use requirements have finally brought BI reporting into the front-line for health care organizations. Without question, health care organizations will now have to manage their data. Determining how to best do that is still up for discussion, but I believe that BI is the best platform for health care data management of the future.
How BI enhances evidence-based decision making in health care

By Reda Chouffani, Contributor

Business intelligence (BI) refers to the technology associated with the integration and analysis of collected information. In a health care system or hospital setting, having access to large amounts of information -- whether clinical or financial -- can lead to better evidence-based decision making.

Traditionally, information in health systems has been compiled in static, text-based memoranda. BI helps shape that information into visual data that provides a basis for evidence-based decision making in many different departments.

In recent years, health care's adoption of BI systems is on the rise. This is due to continued implementation of electronic health record (EHR) systems, the storing of clinical data in more discrete formats and a variety of federal mandates. The U.S. Department of Health & Human Services requires organizations to submit specific clinical quality reports as part of the meaningful use incentives program, as well as additional quality measures through the Physician Quality Reporting System (PQRS) and The Joint Commission.

The motivation for data mining and analysis does not stop there, though. As health care shifts toward the accountable care organization (ACO) model and other pay-for-performance initiatives, many organizations will be required to provide proof of improved patient outcomes. This would be directly tied to their reimbursements.

In a typical hospital, there are several areas where BI tools can be used to drive evidence-based decision making. Productivity, efficiency, financial performance and customer service are covered below. The use of business intelligence for clinical analysis is covered in a separate tip, as is an examination of common health care data analysis methods.

Performance analysis is related to the review of effectiveness and productivity of staff in the hospital. This can measure how specific departments perform while drilling down to the actual employee level for further productivity analysis.
In this type of review, for example, performance can be based on how well a lab performs compared to other labs in the same health system. Another example would be reviewing the revenue and reimbursement generated per physician.

**Financial performance analysis** is, of course, commonly used in many markets besides health care. Hospitals would typically use BI tools to review trends and receive a snapshot of financial performance in terms of profits, reimbursements, write-offs, AR by aging days, collections, margins, and revenues. Patient length of stay and payer reimbursements may be analyzed as part of financial performance as well. On many occasions, hospitals use the results of this financial analysis to renegotiate the contracts of payers.

The key to success for many organizations is their ability to constantly assess themselves and their ability to improve different aspects of their business. A hospital can benefit from **process efficiency measurements** of internal processes and workflows. This can have a big impact on patient care and satisfaction. In some cases, for example, simply measuring and improving patient wait times can help identify the different delays in the workflows, and vice versa.

Hospitals are also businesses. This means they compete for patients. For many organizations, measuring patient satisfaction is important. BI tools can help identify **customer service** measures such as a patient's average hold time on the phone and hospital satisfaction ratings per department, subspecialty and even individual hospital ward. While there are several other standardized methods being used in the market, such as the Consumer Assessment of Healthcare Providers and Systems (CAHPS) surveys that hospitals use to gather patient input, a hospital can still perform self-assessments to identify areas for improvement.
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