

# INSIDE EDGE

Volume 18, Number 8

## Analytics across the Continuum

### EXECUTIVE SUMMARY

Healthcare analytics or business intelligence (BI)—we use the terms interchangeably—combines a wide array of IT-enabled software tools to mine healthcare data, detect patterns and guide treatment and strategy. Analytics ranges from applying real-time intelligence at the point of care with CDS to retrospective analyses of patient populations to guide accountable care.

As healthcare reform quickens, value becomes the lodestar and data becomes the vehicle to reach it. Dropping Medicare reimbursement, rising reporting requirements, commercial pay-for-performance programs, value-based purchasing and the move to accountable care are all driving energetic investment in analytics and BI solutions.

Analytics knows no borders. It both enables and accelerates the drive to integration: clinical and operational, inpatient and ambulatory, provider and payer, clinical and financial information. Given the morass of big data and the disparate data sources in healthcare, health-system CEOs are desperate for a single source of truth to steer their increasingly galactic-size ships into the future—and they see analytics as the answer.

### Growing demand

“BI becomes more important each day that passes,” says Joe Van De Graaff, BI research director for KLAS. “It’s largely driven by healthcare reform’s requirement for data to measure providers on outcomes and to link care delivery and processes.” In speaking with provider organizations for KLAS’ most recent BI report, more than half said they plan to purchase or replace BI software, he says.

Healthcare analytics covers many different elements, including leadership dashboards, quality metrics, standardized and scheduled reporting and “back-end BI” like data governance, data repositories and data warehouses. Adding to the complexity is the need to draw data from multiple data sets in multiple organizations. “BI is not likely to be confined to a single vendor. There are too many variables,” he says.

Like an onion, analytics has multiple layers and the vendor market reflects it. The outside layer or front end of dashboards and visualization includes well-known vendor names such as IBM, SAP, McKesson, Dimensional Insight, Information Builders, QlikTech, and Oracle. The back end of data integration and data warehouses includes companies like Microsoft, Oracle, Informatica and

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IBM. More specific BI applications include examples such as Lawson BI, Humedica, Harris (CareFx), Altosoft and Omnicell. “The

common thread and goal for each of the solutions,” says Van De Graaff, “is to facilitate better insight into decision-making.”

### A long time coming

Analytics, however, is much more than a product marketplace.

“I take the long view on analytics and IT-enabled quality improvement,” says Linda Kloss, principal of Chicago-based Kloss Strategic Advisors and former CEO of the American Health Information Management Association (AHIMA). Prior to her 15 years with AHIMA, she worked for two decades on quality measurement and participated in early efforts at using clinical findings to assess quality and adjust for differences in severity of illness. “It became clear that analytics and QI could not be executed using paper medical records. A lot of good work is coming full circle now that health data are increasingly digital,” she says.

Analytics historically encompassed scorecards focused on traditional quality measures such as aspirin on arrival for MI patients. But as the business model of healthcare shifts from fee-for-service to fee-for-value, the analytic focus has shifted to population health.

“We are finally gaining access to useable digital databases, advanced analytics, software-as-a-service and other building blocks to support high impact population analytics. Many organizations are coming to understand the difference between electronic health records as transactional systems and databases optimized for advanced analytics. We’re on the cusp of rapid development but there remain a number of challenges in realizing value from the use of health data,” says Kloss.

### New capabilities and new challenges

“Analytics is really about helping people make better decisions and this requires data you trust, leadership to advance a culture of analytics and the right incentives,” she says. “Success also presupposes that staff has the requisite competencies to manage and use data. Value-based purchasing and ACOs hold promise to align the incentives and are certainly spurring organizations to accelerate analytics. We need to find ways to shorten the learning curve as we don’t have decades,” Kloss says.

The data issues are challenging. While we have had to rely on analysis of claims data for decades, clinical data are essential to population analytics as is the ability to bring ambulatory and inpatient data together. Given the disparate systems, interoperability and data quality issues, health systems must address significant data-management issues.

Kloss encourages health-system CEOs to nurture a culture of analytics by strengthening the infrastructure of



Linda Kloss, Principal,  
Kloss Strategic  
Advisors

information asset management and data governance. The data from electronic health records are not necessarily accurate and complete. Information is a strategic asset that must be managed. This requires health systems to adopt best practices that incorporate a policy framework, workflow and methods to increase the value of the information needed to support analytics.

### **Analytics for an ACO**

Houston-based Memorial Hermann HealthCare is one of the largest not-for-profit healthcare systems in Texas and serves the Greater Houston community through 11 hospitals, 20,000 employees and a vast network of affiliated physicians, specialty programs and services. Among the organization's numerous recognitions, the National Quality Forum awarded Memorial Hermann the 2009 National Quality Healthcare Award.

In July the health system launched a Medicare Shared Savings Program under an ACO model that enables it to manage population health. Memorial Hermann is also extending the ACO beyond the 20,000 lives covered under the Shared Savings program to its Medicare Advantage program and to contracts with commercial insurers. The ACO strategy builds on the health

system's five-year-old clinical integration program aimed at achieving coordinated care among its nearly 4,000 affiliated physicians.

Memorial Hermann developed its own analytics software suite which was acquired by The Advisory Board Co. and now marketed as the Crimson product. "When we looked at the market two years ago, we did not find any systems that could analyze more than claims," says Shawn Griffin, MD, chief quality and informatics officer for the Memorial Hermann Physician Network (MHMD). "The ACO program further exposed our islands of care and the need to analyze time-lapsed claims data as well as real-time EMR data."

Memorial Hermann is a microcosm: a mix of academic medical center, suburban and rural hospitals and 4,000 physicians of whom fewer than 200 are employed and most of whom work in small practices of one or two doctors. "We have what I call lots of cats-and-dogs EMRs used by 2,500 clinically integrated physicians. Trying to draw information from those EMRs is a real challenge," he says.

The health system's first cut is to analyze the claims data from these disparate sources aggregated into a data warehouse. "Claims data is not very deep, but it allows you to do risk stratification, especially prospective risk stratification, to identify patients before they even get to the hospital," says Griffin. Claims data provides a complete population overview because it extracts data from all claims at all locations in the continuum. Claims data also allows primary care physician attribution, official contract metrics

*"People talk about comparing apples and oranges. This is apples and concrete."*

## TELECONFERENCES

## November 14

*Health Insurance Exchanges and Implications for Providers*

- Brian Keane, principal, Deloitte Consulting LLP
- Sally Finger, senior manager, Deloitte Consulting LLP

## November 15

*ACO 2012: The Train Has Left the Station*

- Colin Buckley, director, Strategic Operations, KLAS

## November 19

*SI-Cerner Users Collaborative No. 48: Hardwiring Quality Measures*

- Ted Daniel, MD, CMIO, St. John Providence Health System, Ascension
- Alexa Hodgins, director, Quality Improvement, St. John Providence Health System, Ascension
- Linda Mazur, manager, SJPHS IT Clinical Information Systems
- Nancy Earp, team lead, SJPHS IT Clinical Information Systems
- Brian Conway senior systems analyst, SJPHS IT Clinical Information Systems

## November 27

*Sustainable Community HIE: A Birds-eye Perspective and Vision*

- Doug Dietzman, executive director, Michigan Health Connect

## November 28

*SI Readmissions Collaborative Kickoff*

- Erica Drazen, ScD, senior advisor, Scottsdale Institute, and former VP, Global Institute for Emerging Practices, CSC

*continued on next page*

such as HEDIS measures and information about generic prescribing.

**Claims data makes a claim**

“Claims data is the only place you can get generic prescribing information because it’s recorded on the physician’s EMR. But the patient can switch to a non-generic when he or she gets to the pharmacist. A physician may be prescribing 90 percent from the generics list, but patients may be filling those generics only 75 percent,” he says.



**Shawn Griffin,**  
MD, Chief Quality/  
Informatics Officer,  
Memorial Hermann  
Physician Network

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The biggest negative about claims data is the time lag—it could be as much as three to six months old. “You have to be able to leverage that incomplete data for the information you need,” says Griffin. Office EMR data present another set of challenges. To start, a slew of information recorded in an EMR never makes it into claims data, making the claims data blind to much of the care a patient actually receives.

Office-EMR data’s biggest advantages are that it’s both real-time and comprehensive in terms of physician’s practice population—not just about patients covered by a certain payer. EMR data often differ from claims data in other ways. “Some physicians have well documented that a patient is diabetic in the chart, but the claims data does not show that on every claim,” says Griffin.

Even EMRs in the same clinic may vary in the kinds of data for which they’re used. “One physician may be using the EMR as filing cabinet. Another may enter information in a form that can’t be reported. We’ve had to change the training of some physicians,” he says, in order to instill more standardized EMR use.

But analytics’ greatest challenge may be the blending of claims data and EMR data into a coherent form that’s amenable to managing population health. It’s a lot of work. “People talk about comparing apples and oranges. This is apples and concrete,” says Griffin.

**Human judgment call**

Ironically—given that it’s all about merging digital data—analytics at this point momentarily shelves its technical hubris and calls for human intervention. Enter care coordinators. True knowledge workers, care coordinators—or case managers, as Memorial Hermann calls them—act as extensions of the physician office in reconciling EMR data with claims data. They compare claims data with official and “unofficial” EMR data that might never have been documented. “If you intervene with a patient, where do you document that? You need to track all patient contacts. If you call a patient to come in for a colonoscopy what do you do then?” he asks.

Case managers swarm data like tacklers on a ball carrier—and get results. “We’ve been able to move contract metrics like asthmatic-medicine compliance by 10 percent in a month and a

half once we gave our coordinators the data,” declares Griffin.

A big reason such movement is possible is because much of the data that care managers help clean and assimilate is delivered to users on dashboards for effective decision-making. Memorial Hermann has developed dashboards for population health that take claims data and tell, for example, how well the organization is doing per member per month compared to benchmarks. It mines all the data to identify opportunities for improvement in areas like the ED, generic drug utilization and imaging. It’s also possible to drill down for detailed information in each of those focus areas.

A contract dashboard identifies contract metrics the organization must hit to trigger savings or bonus distribution. “We’ll build a dashboard for each metric,” says Griffin. A readmission dashboard is critical because—despite its multiple hospitals in the Houston area—the health system still experiences a number of readmits that don’t occur at its facilities.

Before the ACO project, Memorial Hermann’s analytics-driven clinical integration (CI) initiative produced a lower average length of stay (LOS) of 3.71 days compared to a national average of 5.26. Patients discharged by CI physicians incur average charges of \$23,430 compared to an average of \$34,885 in charges for patients treated by other physicians in Memorial Hermann facilities. Also, patients discharged by CI physicians have a rate of complications (4.67 percent) 18 percent lower than

those treated by other physicians within Memorial Hermann facilities. [An in-depth case study on Memorial Hermann’s analytics initiative can be found in the Oct. 4, 2012 teleconference “Analytics Tools for ACO” archived on the SI website. Members log in at [www.scottsdaleinstitute.org](http://www.scottsdaleinstitute.org) and select the “Teleconferences” link at the far left of the top navigation bar.]

### Pioneering analytics in Illinois

Peoria, Illinois-based OSF Healthcare System is an 8-hospital system that rings the geographic heart of Illinois. With experience heading OSF’s health plan, which was sold in 2008, Robert Sehring was assigned the job of overseeing ACO activities, including analytics in his current role as CEO of OSF’s ambulatory services.



**Robert Sehring, CEO,**  
Ambulatory Services,  
OSF HealthCare



“It’s been a great help,” he says of the managed-care experience. “Aside from our Pioneer ACO, OSF has various arrangements with managed care payers that include pay for performance, risk-sharing and shared savings initiatives. And all of them need data. More importantly they need data to turn into information that can be delivered to clinicians at the right time in the right setting. That’s been a lot of the work we’ve done in the past two years.”

The analytics journey began with implementation of an Epic EHR in

*continued*

#### **December 4**

*Innovating with Telehealth: An Example for Emergent Care*

- Deborah Hunt, RN, specialist leader, Deloitte Consulting LLP
- Saurabh Vyas, MD, consultant, Deloitte Consulting LLP

#### **December 5**

*Leveraging Business Intelligence to Achieve Strategic Objectives*

- Andrew W. Proctor, MS, senior director, BI, Medical Operations Division, Southpointe Hospital, Cleveland Clinic
- Brian Harte, MD, medical director, BI and President, Southpointe Hospital, Cleveland Clinic

#### **December 11**

*Care Coordination Capability for Accountable Care*

- Jane Metzger, research principal, Emerging Practices, CSC

#### **December 12**

*Timelines/Nuances of Reporting and Penalties*

- Laura Kreofsky, PMP, CPHIMS, principal, Impact Advisors
- Jason Fortin, senior advisor, Impact Advisors

#### **December 17**

*SI-Cerner Users Collaborative No. 49: Physician Productivity*

- Adem Arslani, MS, RN, director, Information Systems & Clinical Informatics, Advocate

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*“Administrative claims data allows us to fill out the picture by bringing in patient encounters outside the system, specialists and other facilities.”*

2009, a platform that today links the vast majority of OSF’s 700+ employed physicians and mid-level providers in both inpatient and ambulatory sectors. “That’s been a wonderful starting place. All the data exists in a single place, which allowed us to seriously consider applying as a Pioneer ACO in the first place. Without that backbone of a single EHR platform we wouldn’t have had the connectivity that enables closer coordination of care,” he says.

OSF has also relied on data warehousing and analytical tools whose scale and numbers continue to expand at an accelerating rate. The data is administrative claims data combined with clinical data from the EHR. “Epic gives us a good but partial view of the care provided to the beneficiaries that are part of the ACO. Administrative claims data allows us to fill out the picture by bringing in patient encounters outside the system, specialists and other facilities,” says Sehring.

### **Populations are different**

“That’s all going into the same data warehouse. We link patients across the EHR with claims data,” he says. OSF is continuing to work with multiple analytics tools. An analytics engine from HBI provides the primary capability to view data and analyze it. “For population health it’s really different. There are three different buckets of analytics.”

The first bucket, risk stratification, uses a software algorithm that considers multiple comorbidities, diagnoses and psychosocial factors to rank the highest risk to lowest in terms of

expected future costs and expected readmissions. OSF uses both Milliman and Verisk products for this purpose. The basis for these tools: Medicare-developed factors that look at diagnoses and build predictive models. “You want to devote the resources of a care-management team to those individuals who present the greatest risk and would most benefit from increased care coordination,” he says.

A second analytics bucket contains various types of activity or utilization and creates management reports on rates of admission, LOS, utilization of surgery, office visits and so on. It shows how OSF performs against benchmarks—is it greater or less than other organizations? It highlights, for example, the percentage of prescriptions accounted for generic drugs.

A third bucket analyzes clinical performance associated with wellness and chronic diseases. “Do we have care gaps such as flu, pneumonia or pertussis?” asks Sehring. It focuses on chronic disease such as COPD, CHF and diabetes, querying data as to whether diabetics are receiving eye exams, for example. Are patients getting the care they need? Is it appropriate? OSF is working on a number of next steps. To the extent there are gaps, how should the health system communicate to its physicians? How does it develop care plans to fill those gaps? Develop alerts to remind physicians of appropriate steps?

### **Not a light switch**

“It begins to reach into the EHR, which has its own internal analytics tools

that we augment with the Crimson product. We are just at the early stages of this journey, but the traditional leaders—Geisinger, UPMC, Intermountain, Kaiser—do not have all of the answers either. Analytics is not a process you turn on like a light switch. It's an evolution over time; you refine them, continually looking for new and improved," he says.

While it's too early to formally document strategic benefits—OSF launched its Pioneer ACO in January and has limited first quarter data for the 24,000 covered lives under the ACO—Sehring says top management is encouraged by the progress, including a reduction in ED visits and hospital readmissions.

Care-management teams face many obstacles. "You assign care managers to those patients most at risk and part of the challenge is getting information to them. It must be as complete as possible, combining clinical needs, opportunities and psychosocial information from the data warehouse to create a patient profile so the case manager can then begin the work. What you really want is the ability to pull data from the warehouse based on what case managers want to see before they even call the patient," he says.

The care-management program is headed by a physician who works with office staff and nurse care managers. OSF is now expanding the team to include social workers and medical office assistants. It's difficult to overestimate the significance of a person's psychosocial needs. "You can try to treat clinical conditions but unless you understand the context it may be for naught.

A patient may have no support at home, no transportation, can't afford pharmaceuticals, or may have trouble choosing which pills to take and not take."

### Cleveland Clinic

With experience at data-based reporting at the executive level since the 1990s, the Cleveland Clinic has a long history of using business intelligence informally. But the health system's formal investment in BI tools began in 2004 when medical operations and finance partnered to launch a data-warehouse initiative and to develop better visualization into its overall performance.

## Cleveland Clinic



**Andrew Proctor,**  
Senior Director, BI  
Medical Operations,  
Cleveland Clinic

"Up to that point, medical operations and finance could each produce LOS numbers—and they didn't match up," says Andrew Proctor, MS, the clinic's senior director of business intelligence for medical operations. "You'd get into debates as to which figure was right. That was the impetus to partner—to come up with a single source of truth."

With 3,000 physicians and scientists at the Cleveland Clinic, getting to a single source of truth was a critical but not always easy objective. Adding to the challenge was the fact that the organization was plagued by a classic mix of disparate systems, especially in finance.

*"You'd get into debates as to which figure was right. That was the impetus to partner—to come up with a single source of truth."*

***“The CEO’s role in BI development cannot be underestimated. First, the output of the BI tools had to be easily interpretable by the CEO. Second, it had to be strategically important to the CEO. The first dashboards we built were designed with both factors in mind.”***

Proctor cites three factors for the clinic’s successful analytics strategy: One, a CEO who was very data oriented and an avid, engaged user of BI tools; Two, partnerships that crossed silos like the one between finance and medical operations; Three, centralization of all data analysts in a single department which enabled easier translation of enterprise-level analytics.

“We needed better visualization. The idea was a common look and feel between financial and medical operations. At that time our CEO was relatively new and wanted to focus on the three areas of clinic access, patient experience and quality metrics,” he says. Within two months the team produced four executive dashboards for the CEO: the first was financial, second, clinical access, third, patient experience and fourth, quality metrics. “Within a couple of months we had BI tools on things our CEO was speaking about,” says Proctor.

### **CEO-shaped BI**

Tom Wadsworth, Director, Business Intelligence for Harris Corporation Healthcare Solutions, who helped develop the BI strategy when previously at the Cleveland Clinic, says the CEO’s role in BI development cannot be underestimated. “First, the output of the BI tools had to be easily interpretable by the CEO. Second, it had to be strategically important to the CEO. The first dashboards we built were designed with both factors in mind,” he says.

**HARRIS**® Of course, those dashboards have seen much refinement in the past seven years. For example, the clinic-access dashboard which is aimed at improving patient access, today identifies what patient slots are available, how each clinic is filling the appointment slots, how long patients have to wait to get an appointment, and patient satisfaction with access. Use of the dashboard by senior management helped add more than 100,000 appointment slots per year, improving access for patients and significantly improving revenue as well. Today, patients calling for an appointment are offered same-day access.

Cleveland Clinic has further developed scorecards for quarterly reviews on patient experience, quality, safety, access, and financial performance. “We can add new metrics to address strategic initiatives that the CEO wants,” says Proctor, whose team goes through an iterative process in any initial “build” that gets buy-in from impacted executives, determines data sources, ensures that the data is clean and identifies any gaps. Prior to publishing a scorecard, it is vetted with executives and target audiences to ensure accuracy and understanding of the definitions and source. An executive BI leadership team composed of the CFO, CMO and CIO must approve all projects, which are ranked based on a variety of factors.

Despite the maturity of Cleveland Clinic’s BI strategy from a process and technical standpoint, it still has gaps.

For one it is based on retrospective data. Proctor says the clinic is addressing that by developing “short-cycle” or real-time BI tools. Also, they are actively developing next-generation predictive analytics. “If you can start predicting what’s going to occur, you can intercede. That’s where we really need to go. Everybody talks about it, but it’s very hard to deliver.”

### Oversight and accountability

Cleveland Clinic’s Enterprise Business Intelligence (EBI) initiative addressed the need to blend different data types, says Brian Harte, MD, SFHM, medical director of BI for Cleveland Clinic Medical Operations. “Medical Operations and Finance partnered to develop a data warehousing solution that allowed us to combine data from disparate financial and clinical systems across the health system. Dashboards and data marts are produced from the EBI data warehouses providing the source of truth to support strategic initiatives.” Further efforts to produce data marts that enable self-service reporting are ongoing.

“We’ve used BI tools to support many initiatives including access, hospital throughput, patient experience, quality and safety, blood utilization, and ICU operations,” he says. “In addition to the dashboards, all of these organizational goals are aligned through the quarterly review process which establishes executive oversight and accountability. During the quarterly reviews the CEO meets with Institute leadership teams to discuss the successes

and challenges experienced in trying to achieve the goals. Nearly all of the objectives show improvement utilizing this process and our EBI methodology.”



**Brian Harte, MD,**  
Medical Director,  
BI, Cleveland Clinic  
Medical Operations

Many of the principles for ACO success will require a successful BI program demonstrating a single source of truth, executive oversight, linking EHR to bedside tools, aggregating data from multiple

data sources and clear presentation of defined metrics and targets.

“There are numerous variables influencing the proper management of an ACO. Without a strong BI environment it will be difficult to manage and report accurately. Many ACO requirements already touch on areas that BI has invested in, for example patient experience, population health quality measures and readmission rates,” says Harte.

### Conclusion

Analytics or BI is ultimately about making healthcare smarter. That requires aggregated, standardized and cleansed data that can be summarized for strategic use. Says OSF’s Sehring: “None of us lacks for data for analysis. The challenge is how do you take that data, change it into useful information and then deliver it to the physician at the point of care and the executive at the point of decision?”

*“If you can start predicting what’s going to occur, you can intercede. That’s where we really need to go. Everybody talks about it, but it’s very hard to deliver.”*



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