Microsoft

Published by **HiMSS** *Media*

Advanced Analytics in Health

New paradigms for health analytics

HEALTHCARE is a data-generating overachiever, of sorts. Consider the following: The industry "generates approximately 30 percent of the world's data," according to a survey conducted by BridgeHead Software. And, the data keeps multiplying daily with images from picture archiving and communication systems (PACS) and data from electronic health records contributing the most to the deluge.[1]

Managing all this data presents many challenges and opportunities for healthcare organizations. Health reform, changing demographics and the ever-present call to improve care and reduce costs are making data-driven decision making at the bedside and in the executive suite a non-negotiable imperative. For organizations to glean valuable insights from their growing stockpiles of data, however, they'll have to do a much better job of

analyzing it.

Fortunately, healthcare organizations now are flocking to analytics in greater numbers than ever before, as innovative technologies, such as those available from Microsoft and its partners, are enabling them to operate under new advanced paradigms. Under this new model, healthcare clinicians, staff and executives are creating data-driven cultures by:

- Harnessing the power of real-time data, instead of relying on retrospective data
- Leveraging data to help anticipate what will happen in the future, instead of merely using the information to understand the past (readmissions, hospital acquired infections, length of stay)
- Helping to make knowledge workers at all levels of the organization more productive by completing "research on demand" with easy-to-use familiar tools
- Making better use of the vast amounts of

machine and sensor data (sometimes referred to as the Internet of Things)
- Helping to make it easier to combine any types of data from internal and external sources to drive more pervasive insights that are actionable against your clinical and operational goals

REFERENCES

1. Milliard, Mike. Deluge of data has hospitals swimming upstream. Healthcare IT News, August 3, 2012. Accessed at: http://www.healthcareitnews.com/news/deluge-data-has-hospitals-swimming-upstream

The Value of real-time, predictive analytics

THE CENTERS FOR Medicare & Medicaid Services (CMS) recently fined a record number of hospitals – 2,610 – for having too many patients return within a month for additional treatments, according to federal records released in October of 2014. In fact, CMS has estimated that total fines will hit approximately $428 million from October 1, 2014 to September 30, 2015,[1] up from $227 million the previous year.[2]

Hospitals need to find a way to ensure that patients won't get on the boomerang track. Fortunately, by leveraging predictive analytics, healthcare organizations can better forecast a variety of important factors related to clinical care including readmissions risk.

Innovative tools, including predictive analytics solutions from Microsoft and its partners, are designed to help anticipate a variety of factors to help improve both the quality and efficiency of delivering healthcare.

Under this new model, healthcare organizations are finding it much easier to explore information in highly flexible ways on both an organizational and individual patient level. What's more, the tools are making it possible to apply this new found knowledge in real-time, enabling clinicians and staff members to take actions that truly make a difference at the point of care.

Carolinas HealthCare System, for example, is leveraging predictive analytics to evaluate the risk of readmission for patients. Based on information culled from 200,000 patient discharges, the healthcare provider has built a predictive model that is now used to evaluate the risk or readmission for each patient. The model has been applied to more than 100,000 patients, making it possible for clinicians to apply interventions based on actual factors that are tied into the actual risk of readmission. Now more than 100,000 patients have had the model applied to them, enabling staff to apply more than 125,000 interventions based on the actual risk of readmission for each patient.

According to Jean Wright, MD, vice president of innovation at the large integrated delivery system, such use of analytics marks the beginning of a "new era where predictive analytics now moves from a backroom function right to the bedside." **(See her interview in the video below.)**

REFERENCES
1. Rau, J. Medicare Fines 2,610 Hospitals In Third Round of Readmission Penalties. Kaiser Health News. October 2, 2014. Accessed at: http://kaiserhealthnews.org/news/medicare-readmissions-penalties-2015/
2. Rau, J. Armed with Bigger Fines, Medicare to Punish 2,225 Hospitals for Excess Readmissions. Accessed at: http://kaiserhealthnews.org/news/readmission-penalties-medicare-hospitals-year-two/

▶ **CLICK HERE TO SEE VIDEO.**

Turning machine-generated data into intelligence

TODAY, THE FASTEST GROWING area of digital data in healthcare is not coming from electronic medical records but from the growing array of sensors and devices that capture information across all care settings. From the monitors in ICU to the maintenance logs of imaging machines to the fitness devices strapped to the wrists of patients, data is streaming in from all kinds of machines and sensors. With the right analysis, healthcare organizations can turn all this data emanating from the Internet of Things into actionable intelligence that can improve care.

For example, Epimed, a Brazilian company, is using real-time analytics from Microsoft to combine machine and other data types to drive improvements in clinical care. Almost one-third of the intensive care units at hospitals across Brazil now rely on the Epimed

Monitor System to tap into the data from one billion hospitalized patients. The intelligence derived from this data has been used to generate near real-time clinical scoring systems and risk assessment tools. With these tools turning data into actionable intelligence, one hospital has successfully reduced infection rates by 20 percent.

"Machine data is a key factor for both predictive analytics and also to generate robust information regarding the special evaluation of risks and the assessment of outcomes of individual patients but also as a means to evaluate the performance of units over time," said Jorge Salluh, MD, COO and one of the co-founders of the company.

Another example: Aerocrine, a medical technology company based in Sweden, and Microsoft are working together to collect information from monitoring devices that are used to manage asthmatic patients – helping

to make it possible to more purposefully care for these patients.

"The ability to collect vital telemetry data from deployed devices has been a key objective of ours. A cloud-based solution allowing us to collect data on device performance in real-time helps us to be more proactive in our customer support and ensure that our NIOX devices help the physicians deliver the best possible outcome for the patient," said Scott Myers, CEO of Aerocrine.

Hear Jorge Salluh, MD, COO, Epimed Solutions, discuss risk-adjusted mortality rates

▶ **CLICK HERE TO SEE VIDEO.**

The Cloud solves data woes

NNOVATIVE HEALTH ORGANIZATIONS are beginning to move data and analytics into the cloud in keeping with security and compliance standards. Those organizations that are taking a progressive approach by moving certain data to the cloud in keeping with a data classification system are reaping the benefits of cost-effective agile analytics.

And, it appears as if many organizations are opting for this option, as the use of the cloud to store personal health information is on the rise – moving from 9 percent of healthcare organizations in 2012 to 30 percent in 2013, according to a survey from Imprivata.[1]

Leaders at Helse Vest, Norway's second largest health system, can be counted among those who have spurred some of this growth. Realizing the inherent value of the cloud, these executives wanted to collect, visualize and share data to support a quality improvement initiative. But all of the information existed in silos, making it difficult to bring the disparate data into one consolidated view.

A cloud solution, however, enabled the large delivery system to gather and analyze data from separate databases across the enterprise. The system was initially used to support a safe surgery practices initiative, making it possible to create and act upon reports in one day – instead of weeks.

"We can visualize our medical data much more quickly and easily than before. Our reports are more dynamic and more detailed than anything we've seen before," said Anund Rannestad, head of innovation for Stavanger University Hospital, the second-largest hospital in the system.

Leaders at Virginia Tech also are trusting the cloud. With the volume of genome research information became positively overwhelming – as the organization was producing 15 petabytes of data annually – leaders worked with Microsoft to create an on-demand, cloud-based computing model.

"The model enables the easy sharing of public data sets and helps to facilitate large-scale collaborative research," said Wu Feng, professor of computer science.

REFERENCES

1. Millington, J. New Survey: Cloud Computing in Health on the Rise . . . Sort of. Imprivata. August 27, 2013. Accessed at: http://www.imprivata.com/blog/new-survey-cloud-computing-healthcare-rise%85sort

See how Virginia Tech leverages the cloud for DNA sequencing

▶ **CLICK HERE TO SEE VIDEO.**

Empowering the front line

A RECENT STUDY DESIGNED to assess the value of data analytics found that 72 percent of 557 healthcare executives perform their own data analyses. And "nearly 90 percent of the respondents believe analytics are helping their organizations make better decisions," according to the survey, which was conducted by the American Health Information Management Association and Health Data Management.[1]

Indeed, healthcare executives now understand the value associated with rolling up their proverbial sleeves – and becoming more directly involved with health analytics. Fortunately, Microsoft is providing the advanced analytics tools that can help to enable this self-service, on-demand research.

Case in point: Oslo University Hospital in Norway is leveraging an advanced analytics system to help leaders make data-driven decisions based on current information. Formerly, analysis required programming skills that administrators lacked. The IT department would run reports and unfortunately results were often slow to surface. For example, if hospital executives wanted to know why a test type was more commonly used at one facility, and what best practices could be identified to increase utilization rates, they had no practical way to do so in a timely manner. Now, with advanced analytics in place, data is analyzed in just a few hours instead of a few months, and executives can make informed, real-time decisions on the spot.

"This is a dream," says Eli Marie Sager, MD, CEO at The Clinic for Diagnostics and Intervention at Oslo University Hospital. "We can understand what is happening in the departments in a few hours, rather than after months."

REFERENCES

1. Health Data Management. Healthcare Leaders Doing Own Analytics. March 1, 2015. Accessed at: http://www.healthdatamanagement.com/issues/23_3/Healthcare-Leaders-Doing-Own-Analytics-49904-1.html

Read how Oslo University Hospital gains faster, fuller data insights

CLICK HERE TO READ MORE.

RCM EMR ERP

Leveraging analytics for optimal gain

ABOUT 90 PERCENT of hospitals have implemented electronic health records — and 59 percent have an EHR with at least basic functionalities, according to a report issued by the Office of the National Coordinator for Health IT in 2014.[1]

These organizations are working to leverage these systems to achieve greater efficiency, improved costs and better quality of care. The problem: There's a huge difference between information collecting and actually creating the intelligence needed to achieve goals.

Advanced analytics solutions from Microsoft can help bridge this gap. For example, these solutions can help:

- Clinicians and knowledge workers turn data into actionable insights that can be used to make immediate improvements
- Care teams rally around key decisions and

processes, enabling them to improve the clinical experience

- Patients access data that will empower them to become more involved in their own care

Certainly, the gap between system implementation and the finish line clearly emerged as a challenge at Meriter Hospital, Madison, Wisc. Leaders realized that they had plenty of data, but still were not realizing technology's promise. When staff members had to access data, they would pull it from each system individually, a time-consuming process that often did not result in creating the intelligence needed to support performance-improvement initiatives.

"The process that we had was very labor intensive, so we needed a better solution for how to get at data and make it more meaningful," said Sue Erickson, vice president of professional services.

Relying on advanced analytics solutions from

Microsoft, the hospital is now able to pull data from clinical, financial and supply chain systems into one consolidated view, making it easy for staff members to take action. For example, the use of the analytics solutions enabled the hospital to launch an initiative that resulted in reducing surgical implant costs by 18 to 20 percent.

REFERENCES

1. ONC Data Brief. No. 16. May 2014. Adoption of Electronic Health Record Systems among U.S. Non-federal Acute Care Hospitals: 2008-2013. http://www.healthit.gov/sites/default/files/oncdatabrief16.pdf

Hear how Meriter Hospital turns disparate data into meaningful, actionable insights

▶ **CLICK HERE TO SEE VIDEO.**

Creating a data-centric culture

HEALTHCARE ORGANIZATIONS SET out on a mission to improve clinical care and reduce costs through the use of information technology many years ago. One of the biggest challenges for making full use of IT in healthcare is that vast amounts of data have been locked away in many disparate systems – or never digitized in the first place. Fast-forward to today – and data is becoming a new currency of sorts.

Instead of merely focusing on collecting data, healthcare organizations are now focused on turning this information into the intelligence that can truly make a difference. As such, some leaders are discovering that the road toward a brighter future involves leveraging advanced analytics solutions, such as those available from Microsoft, to create data-driven cultures.

Such solutions can help support real-time and predictive decision-making; empower frontline workers to use data almost anytime, anywhere; and optimize various information technology systems by turning disparate data into actionable intelligence. Additionally, it can aid health professionals with leveraging many types of data including information collected from various machines and accessing various data from across and outside the enterprise.

"Increasingly innovative healthcare organizations are empowering clinicians and staff at all levels to manage change by creating data-centric cultures and harnessing the power of new analytics solutions from Microsoft and its partners," said Tom Lawry, director of worldwide health analytics at Microsoft.

Contact: Tom Lawry
Director of Worldwide Health
Microsoft
digitalhealth@microsoft.com
Click here for more information