HealthCatalyst
ignite outcomes improvement

How Partners HealthCare is Leveraging Episode-Based Data to Improve Care Delivery

PARTNERS HEALTHCARE

HEALTHCARE ORGANIZATION

Integrated Health Care Delivery System and ACO

TOP RESULTS

- Integrated hospital, provider, and claims information for the first time
- Developed on-demand access to 48 standardized episodes of care, with costs and coefficient of variation
- Enabled patient care and service performance improvement initiatives based on analytic insights

PRODUCTS

- Late-Binding™ Data Warehouse Platform
- Key Process Analysis
- Bundled Payments

SERVICES

- Installation Services

For population health management to be meaningfully implemented, accountable care organizations must have access to information about the full scope of services provided to their patients, including cost and outcomes of care. Broader views of certain patient cohorts are also increasingly important. Healthcare organizations need to understand which cohorts drive the margins, costs and service utilization of their institutions in order to align resources with the appropriate patient services.

There is currently an active effort in the U.S. to shift healthcare from a procedure or visit focus to a longitudinal view of patient care grouped according to logical episodes that encompass all the major care delivered to a patient for a condition or related to a procedure. The Centers for Medicare & Medicaid Services (CMS) launched a "Bundled Payments for Care Improvement Initiative" to support this shift in approach. Under this program, participating organizations enter into payment arrangements that include financial and performance accountability for 48 episodes of care as defined by one of four models. The program has far-reaching implications, even for non-participating organizations like Partners HealthCare, New England's largest health system.

As a delivery system long focused on care for conditions across inpatient, ambulatory and post-acute settings, Partners recognized the value of looking at costs, margins and service utilization organized by episodes of care as defined under the Bundled Payments for Care Improvement Initiative Model 2.[1] In this model, an episode of care includes all of the services a patient receives for a certain health

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> The real power of this tool was our ability to take claims, hospital billing, and physician billing data and add them all together around the patient episodes.
>
> Sree Chaguturu, MD
> Vice President
> Population Health Management
> Partners HealthCare

event, beginning with a qualifying inpatient admission and ending 30, 60 or 90 days after discharge.[2] This approach also aligned well with a comprehensive set of tactics Partners created to address population health, value-based purchasing and accountable care.

Along these lines, Partners determined that developing a consistent and standard way to evaluate the clinical and financial performance for specific patient cohorts, such as those inherent in the 48 episodes of care, would provide key strategic information for making decisions. Partners could use the data to identify promising opportunities to improve care delivery and outcomes, while reducing cost and waste.

COMBINING THE RIGHT DATA FOR COMPREHENSIVE EPISODES OF CARE ANALYSIS

To inform these decisions, Partners required a solution that showed the cost and utilization of all aspects of care related to a particular clinical event, whether the care was provided within Partners or outside of it. However, these deeply insightful views could only be possible by merging data from the hospital, providers, and patient claims—a combination that Partners had not yet successfully integrated.

Data validity was a particularly important consideration. Partners needed to be able to structure inquiries and analysis around consistent, standard clinical categories. It needed an easy way to consistently visualize relative performance of different groups of patients in two dimensions, cost and variation, and to look at different views of the same data—such as looking at costs, margins and utilization by provider, payer or sites of care. Most importantly, users had to trust the data they were seeing, and be willing to use it to identify areas of focus for clinical, financial, and operational performance improvement.

HARNESSING ENTERPRISE-WIDE HEALTHCARE DATA

Partners determined an advanced analytics solution was needed, particularly one that users could quickly learn to access and trust. To that end, Partners worked with Health Catalyst to define an advanced analytics solution for providing the desired metrics and analytics related to episodes of care. To shorten the time to value, Partners decided to base the application on the definitions and inclusion and exclusion criteria from the CMS 48 Episodes of Care as defined in Model 2, rather than defining their own groupers, and leveraged their existing development and deployment methodology.

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For this particular analytics solution to be effective, it was critically important that prior to application design stakeholders identify what questions they would be asking about episodes of care, costs, margins, variation and utilization. Accordingly, Partners brought together a group of engaged stakeholders to study different clinical and business use cases, and determine the appropriate analytic paths to the desired insights. By performing this detailed analysis of use cases using analytic paths prior to designing the application, developers were sure that the end product produced the desired stakeholder results.

These efforts also identified which databases and data sources should be integrated to provide the right information. In one use case analysis, for example, it became evident that plotting episodes of care against cost and the coefficient of variation was a key strategic visualization to support prioritization efforts. This in turn revealed the data sources (data marts) that were needed to supply hospital, provider and claims information. A series of use cases showed that Partners needed a combination of multiple data sources to be able to assess variation in the experience of patients across inpatient and outpatient, primary and specialty care services, and continuing care (e.g. rehab, skilled nursing facilities, home care) environments.

USING ENTERPRISE-WIDE HEALTHCARE DATA TO MAKE INFORMED CLINICAL AND FINANCIAL DECISIONS

Partners wanted the ability to look at all associated costs related to bundles/episodes, and then use this information as a foundation of decision support to optimize care delivery and resource allocation through well-focused improvement efforts. By using the Pareto approach, also known as the 80/20 rule, Partners was able to identify the bundles/episodes that consumed the most resources and represented the greatest opportunities for cost reduction (see Figure 1). Cost is frequently a good proxy for variation in clinical practice, so identification of these opportunities frequently led to evaluation and improvement of clinical practice as well. This approach provides a visualization that is easy to use to identify opportunities for improvement at a high level.

However, through the stakeholders' use case analysis, they knew that to make well-informed decisions they also needed the ability to look deeper at specific episodes, or groups of episodes, and look at the information by payer, provider, sites of care, and at times even drill down to the patient level. To address this need, bubble chart capability was developed to allow multiple and different types of comparisons based on the filters selected. Cost is on the x-axis, and the coefficient

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FIGURE 1: SAMPLE BUNDLED PAYMENTS VISUALIZATION

1. Graphical view of top payments by bundle/ episode of care
2. Filter that enables easy selection by bundle type, MSDRG, payers, and demographics
3. Ability to change episode length
4. Detail on payments and patient volume by bundle

Figure 1: Sample Bundled Payments visualization

of variation (the ratio of the standard deviation to the mean), is displayed on the Y-axis. This has become an important strategic concept for Partners in determining the appropriate area of focus (see Figure 2). Using this visualization, bundles/episodes that are highly variable and resource-intensive are found in the chart's upper right quadrant, making them easy to identify and further investigate.

FIGURE 2: SAMPLE BUNDLED PAYMENTS VARIATION DASHBOARD

1. Graphical view of cost and coefficient of variation by bundle to identify opportunities
2. Filter that enables easy selection by bundle type, anchor visit MSDRG, payer, PCP, and care management flag
3. Ability to change episode length
4. Detail on payments by bundle

Figure 2: Sample Bundled Payments variation dashboard

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> Our advanced analytics application allows us to drill on expenses in episodes of care, and look at performance on individual bundles.
>
> Bill Alberghene
> Data Architecture Manager
> Enterprise Data Warehouse
> Partners HealthCare

The stakeholders also identified the need for specific financial information to guide well-informed decisions. Built into the application are graphs of the average spend per bundle across the service providers/sites of care, stratified by the service categories inpatient, outpatient, professional, additional, and others. Selecting two or more service providers allows users to compare average spend across service providers and potentially identify opportunities for improvement that could be enacted by standardizing care approaches, or the tests, supplies, and equipment used for a particular group of patients. This gives Partners the ability to identify and eliminate unnecessary variation in the care routines of providers, while monitoring to see that patients do receive those critical best practice interventions that lead to improved outcomes.

Using the application gives Partners the information needed to take action or drive decisions that will result in better care for patients, and thus better population health, with lower costs.

EFFECTIVE USE OF DATA AND ANALYTICS SUPPORTS DATA DRIVEN DECISIONS

For the first time, Partners has successfully integrated hospital, provider, and claims information—an accomplishment that's made a broad impact on decision-making across the entire health system. The advanced analytics application pulls data from multiple data marts in a way that enables Partners to easily compare and contrast information, while different views of the data answer questions about utilization, cost, and opportunities for improvement.

Having all of this information readily available in such a visual framework, has made it easy for Partners to evaluate and compare clinical and financial performance for the 48 episodes of care and drill down into key business questions. Being able to view specific episodes of care graphed on the two dimensions of cost and variation has provided quick insight into their relative performance, and relative opportunity for improvement. Use of the CMS definitions to define the 48 bundles/episodes, in addition to saving development time, has paved the way for them to compare themselves to other providers, and to communicate effectively with payers.

In recognition that making good decisions requires more than just data, the health system has incorporated non-analytic aspects into their prioritization process to account for critical factors, such as the presence or absence of a strong clinical champion to drive change, or the operational implications of expanding or contracting services in a particular location.

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All of these new initiatives and capabilities lay the groundwork for a data-driven culture. Indeed, Partners can better drive patient care and service performance improvement initiatives based on these analytical insights.

WHAT'S NEXT?

Partners is interested in analyzing episodes of care that CMS has not yet addressed, such as cancer bundles. While it will need to determine how to build groupers for oncology patients, an essential component of such an initiative is already in place: Partners has excellent oncology champions.

More immediately, focus now turns to increasing adoption, implementing more improvements, and tracking outcomes and effectiveness. Partners' journey to a data-driven culture continues, and is well on its way to the use of advanced analytics across the entire organization.

REFERENCES

1. BPCI Initiative Episodes: Details on the Participating Health Care Facilities. (n.d.). Retrieved September 2015, from Centers for Medicare & Medicaid Services website, http://innovation.cms.gov/initiatives/Bundled-Payments/Participating-Health-Care-Facilities/index.html

2. Bundled Payments for Care Improvement Initiative Fact Sheet. 2014, January 30, from Centers for Medicare & Medicaid Services website, http://www.cms.gov/Newsroom/MediaReleaseDatabase/Fact-Sheets/2014-Fact-sheets-items/2014-01-30-2.html

ABOUT HEALTH CATALYST

Health Catalyst is a mission-driven data warehousing, analytics, and outcomes improvement company that helps healthcare organizations of all sizes perform the clinical, financial, and operational reporting and analysis needed for population health and accountable care. Our proven enterprise data warehouse (EDW) and analytics platform helps improve quality, add efficiency and lower costs in support of more than 50 million patients for organizations ranging from the largest US health system to forward-thinking physician practices.

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