



ACO Case Studies: A Look at How IT Enables, Reporting, Quality, and Transformation

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Introduction

An accountable care organization (ACO) is a network of providers or providers and hospitals that receives financial incentives for sharing the responsibility (i.e., risk) and savings of providing efficient, quality care to a given population's health. It is a new way of looking at care collaboration, delivery, responsibility, and payment in a holistic effort to drive transform health and healthcare toward increase quality and value.

In contrast, many patients today receive healthcare services and care through disparate and uncoordinated efforts. This is somewhat akin to ordering the major parts that comprise an automobile and assembling them at home. In reality, automakers contract with many suppliers for products, each providing specialized automotive components and subsystems. Similarly, an ACO is designed to bring together the different subsystems required to deliver patient care (primary care, specialists, hospitals, home health care, etc.), offering a finished product where all of the parts “work well together” to benefit the patient.

Just as consumers depend on automobile dealers to sell completed automobiles, they—as patients—depend on an ACO to create a complete healthcare product that works better and costs less than the current “a la carte” process.

The key point of engaging in any transformation of care delivery involves multiple stakeholders, which is an effort that engages the entire community. Many variables should be carefully considered before entering into an ACO, among which are responsibilities, liabilities, economics, and a governance model. Many participants such as interest groups, community coalitions, and stakeholders (due to the complexity of providing the required continuum of care a 'population' needs) are motivated to implement an ACO. If all parties are engaged and committed to success, many obstacles can be overcome. In the end, improved patient care is the outcome.

The following case studies on Sisters of Mercy and Dartmouth were developed by the HIMSS Business Intelligence Work Group of the Management Engineering and Process Improvement Committee. They provide hospitals and other providers with information and learnings from organizations that have utilized an ACO-model to drive toward transformation and improved value of care.



ACO Case Study

Sisters of Mercy Health System –

Event-Driven Architecture Enables Three Clinical Improvement Projects Supporting MSSP ACO Reporting Requirements

Introduction

In 2006, Sisters of Mercy Health System embarked on a long-term strategy to establish a platform of intelligence, speed, and agility that would enable real-time evidence based care. Specifically, they wanted consistent knowledge of every patient regardless of which Mercy facility he or she visited. The focus was to ensure they treat patients with dignity, extend Mercy expertise to all their facilities, and standardize clinical best practices. Toward that end, three clinical improvement projects focused on

1. chronic disease management,
2. virtual ICUs, and
3. early detection of sepsis.

This case study focuses on Sister of Mercy's event-driven architecture enabled three improvement projects and the impact on meeting Centers for Medicare and Medicaid Services (CMS) Medicare Shared Savings Program (MSSP) Accountable Care Organization (ACO) requirements.

Background

Sisters of Mercy Health System Mercy¹ is the sixth largest Catholic health care system in the U.S. and serves millions of people annually. Mercy includes 32 acute care hospitals, four heart hospitals, two children's hospitals, three rehab hospitals and one orthopedic hospital, nearly 700 clinic and outpatient facilities serving Arkansas, Kansas, Missouri and Oklahoma. Mercy also has outreach ministries in Louisiana, Mississippi and Texas. Hospital statistics include the following:

- Co-Workers: 40,000+
- Acute Licensed Beds: 4,231
- Clinic Physicians: over 2,100

¹ See <http://www.mercy.net/newsroom-mercy-quick-facts>



- Acute Inpatient Discharges: 158,768
- Outpatient Visits: 8,361,683
- Traditional Charity Care: \$116.6 million

Drivers

In recent years, federal programs through the CMS such as MSSP ACO,² Meaningful Use, CMS bundled payments, as well as tactical needs to replace an aging HL-7 system and install EPIC, drove change at Sisters of Mercy. However, they also wanted to create a clinical and financial “information super highway” (or event-driven health architecture) capable of moving and transforming all Mercy discrete (and non-discrete) data throughout the system, with the ability to monitor, detect, and alert for critical business events.

Business Solution

The new dynamic, real-time (event-driven architecture) systems with intelligent matching greatly simplified the tasks of connecting new systems and creating new processes. The event-driven architecture allowed them to make sense of the data flowing in and across their enterprise, from partners and from outside sources. It was robust and reliable.

This enabled their Early Detection of Sepsis Solutions connected all lab applications, systems, and devices using robust adapter technology with micro sensors to enable monitoring and ensure high reliability. With experts in Sepsis, they used a real-time, in-memory complex event-processing (CEP) engine to detect patterns of severity and risk of Sepsis and automatically trigger meaningful alerts to physicians. That is, the alerts needed to be accurate with full information and not false alarms. They learned during Phase 1 that it was absolutely critical that the CEP engine scale run in-memory and in real-time; otherwise, the meaning is lost because there is no time for look-ups and queries. (For more information, see <https://www.youtube.com/watch?v=yKwQ9Z0omVA>).

Benefits

Now, Sisters of Mercy is enabling evidence-based care and continuous improvement through real-time and automatic visibility to clinical data stored in disparate systems in the enterprise, with partners, and on the cloud.

² Sister of Mercy became a CMS MSSP ACO in July 2012.



Event-Driven Architecture. The event driven health architecture was absolute integral to meeting a terrible challenge when their Joplin, Missouri hospital was destroyed by a tornado during the summer of 2011.³ In just five days, Sisters of Mercy was able to establish a fully functional, temporary hospital and surgery center, with all patient data and systems connected.

Early Detection of Sepsis Solutions. The benefits of Sisters of Mercy's Early Detection of Sepsis Solutions include:

- Real-time capture of 40 indicators for Sepsis by exact patient, the relationship to other factors and timing
- Early detection system for Sepsis based on a CEP engine that scales to detect patterns, covering huge amounts of data and complexity beyond human capabilities
- CEP engine tailored by experts rather than software developers, so that experts can scientifically test and improve their diagnoses, treatment, and outcomes for continuous improvement
- Evidence-based care platform that is extensible to other conditions such as COPD and CHF
- Improved assessment of care quality and patient outcomes in many areas

Results

Solution #1: Early Detection of Sepsis. In 2012, this enabled, Sisters of Mercy early detection of Sepsis solution improved outcomes and reduced length of stay by 3.3 days across 700 beds. As explained by Chief Medical Officer Dr. Glenn Mitchell, this represents a savings of \$500,000 per quarter. They implemented this solution in all the system's 28 hospitals in 2012.

Solution #2: Virtual ICU and Chronic Disease Management. This best practice was reused in Virtual ICU and Chronic Disease Management Solutions which resulted in

- Enhanced patient quality and safety
- Real-time care management driving down re-admissions
- A Virtual ICU providing 24x7 intensivist coverage spanning disparate geographies and computer systems
- The opportunity to gain \$140M of Meaningful Use incentives over five years
- Increased business agility

³ See also <http://www.mercy.net/newsroom-st-johns-regional-medical-center-joplin-quick-facts>



Solution #3: Applying Results to CMS' MSSP ACO Reporting Requirements. With its event-driven healthcare, Sisters of Mercy Healthcare is able to measure and demonstrate their quality performance in real-time with great completeness and context, surpassing CMS' MSSP ACO quality measure⁴ requirements.

- The Sepsis early detection solution is used on Diabetes, Coronary Artery Disease, and more and will address ACO quality measures #22-33.
- Related to ACO quality measures #1-7, they are beginning to capture patient-experience related data points that can be used to validate and surpass surveys.
- Related to ACO quality measures #14-21, they are able to correlate preventative health actions with results over many hospitals, many claim systems, and many indicators.
- Specifically regarding ACO quality measure #8 *Risk Standardization, All Condition Readmission*, they monitor conditions and key indicators at admission, during treatment, and at discharge in overwhelming detail to detect patterns and eliminate safety risks and improve clinical outcomes.
- Related to ACO quality measure #12 *Medication Reconciliation*, their Chronic Disease Management program correlates large population data to give tailored treatment plans to patients at discharge, which has greatly reduced readmissions.

Conclusion

The 33 CMS MSSP ACO quality measures are designed to promote long term goals of improved overall patient health and reduce overall healthcare costs for a significant population segment of the community that the ACO serves. Mercy's event-driven architecture enabled three key improvement projects, including their effort as an MSSP ACO to report on these measures. The event-driven architecture, however, did more than facilitate reporting, it addressed key clinical areas covered by the measures and enabled improvements in care and outcomes.

As shown by Mercy, this set of measures, thoughtfully weaved into any healthcare provider network, will allow the member providers in that network to measure and improve the effectiveness with which they delivery healthcare to their community.

⁴ For a listing and description of the MSSP quality measures, see <http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharedsavingsprogram/Downloads/ACO-Shared-Savings-Program-Quality-Measures.pdf>



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ACO Case Study

Dartmouth/Brookings ACO Learning Network – Measures: The Process is the Product

Introduction

The Dartmouth/Brookings Accountable Care Organization (ACO) Learning Network⁵ was started in late 2009 to provide participating organizations with the tools⁶ necessary to successfully implement accountable care. One core component of the Learning Network was to engage four pilot site organizations,⁷ consisting of a wide range of provider types, to assist them in the process of implementing shared savings. These four —Healthcare Partners in Torrance, California, Monarch Healthcare in Irvine, California, Norton Healthcare in Louisville, Kentucky, and Tucson Medical Center in Tucson, Arizona—were engaged in an in-depth process to establish quality measures and other key characteristics of ACOs, including a share of saved costs.⁸

Business Need

These organizations wanted a robust set of data measures that they could use to both track care quality within their organizations and to compare service delivery across them. Therefore, the performance measurement goals in the pilot included:

- Create consistent, actionable information on quality and utilization for providers to make improvements within the ACO
- Provide an assurance to patients and payers that any shared savings accumulated by the ACO was not gained at the expense of patient care
- Create a template for performance measurement that is nationally replicable and available for use by private payers and the Medicare program
- Establish a foundation for public reporting of quality and utilization data by the ACO

⁵ See <http://www.acolearningnetwork.org/>

⁶ For example, see <http://tdi.dartmouth.edu/images/uploads/ACO%20Toolkit%20January%202011.pdf>

⁷ See <http://tdi.dartmouth.edu/initiatives/accountable-care-organizations/implementation>

⁸ For additional information, see also Larson, B., Van Citters, A., Carluzzi, K., et al. “Insights From Transformations Under Way At Four Brookings-Dartmouth Accountable Care Organization Pilot Sites” Health Affairs. November 2012 vol. 31 no. 11 2395-2406. At <http://content.healthaffairs.org/content/31/11/2395.abstract>



One of the key features of an ACO is a shared risk/savings relationship with a payer. As a result, each participating provider organization in the pilot site project worked with a payer partner. Although practices had intended to make shared savings/risk a key feature of contracts with other payers, they each decided to focus on a single payer to learn from a process that could be replicated at a later date.

Business Solution

Initially, the goal was to develop a set of core measures that all five sites would use to track changes in care quality and costs over time. At the outset, the pilot site participants agreed to work on the basis of consensus where the quality measures were concerned.

The pilot site project participants conceived of a three-part measurement approach that would allow the pilot sites and payer partners to measure performance using increasingly complex measures. The basic measures relied exclusively on claims data. The second, intermediate, measures relied on “clinically enhanced” measures that use both claims and clinical data. And finally, the advanced measures focus was on the patient experience.

In the end, the pilot sites and payer partners identified 23 quality measures they wanted to track: 12 claims-based measures, and 11 “clinically enhanced” measures. A third set of measures was proposed focusing on the incorporation of patient satisfaction information, but these were not fully fleshed out in the context of the project, as many of the sites were using varying patient experience surveys. However, the three stages—claims-based measures to “clinically enhanced” measures to patient satisfaction measures—were consciously conceived and planned to reflect an ACO’s development toward more sophisticated use of data for quality improvement purposes.

Benefits

In order to arrive at the core clinically enhanced measures, the group started with a comprehensive list of more than 400 common, reliable measures—typically associated AMA-PCPI (American Medical Association-Physician Consortium for Performance Improvement), NCQA (National Committee on Quality Assurance), PQRS (Physician Quality Reporting System), PGP (Physician Group Practice), Meaningful Use, Medicare Advantage, Brookings’ Advanced Measurement Best Practices project, Brookings-WellPoint-Society of Thoracic Surgeons project, or Premier ACO (See Resource Section). The team then systematically went through each measure to identify those that were clinically and operationally relevant to evaluating an ACO’s quality. The initial cut reduced this number substantially to about 60 measures.



Next, the remaining measures were categorized by the pilot sites and payer partners as:

- A. Should definitely be used in the pilot.
- B. Should possibly be used in the pilot.
- C. Should not be used in the pilot.

Of the 20 measures that were either A or B, the relative merits of each measure were then discussed through the network to arrive at a final list of 11 clinically enhanced measures.

The claims-based measures address key categories of care such as:

Overuse

- Use of imaging for low back pain
- Appropriate testing for children with pharyngitis
- Avoidance of antibiotic treatment for adults with acute bronchitis
- Appropriate treatment for children with upper respiratory infection (URI)

Population Health

- Breast cancer screening
- Cervical cancer screening
- Diabetes: HbA1c management (testing)
- Diabetes: cholesterol management (testing)
- Cholesterol management for patients with cardiovascular conditions (testing)
- Use of appropriate medications for people with asthma
- Persistence of Beta-Blocker treatment after a heart attack

Safety

- Annual monitoring for patients on persistent medications

The clinically enhanced measures address specific conditions, but include clinical data often found only in the EHR or medical record.

Coronary Artery Disease

- Cholesterol management for patients with cardiovascular disease
- ACE inhibitor or ARB Therapy



Diabetes

- LDL control
- HbA1c poor control
- HbA1c control (<8.0)
- High blood pressure control
- Kidney disease screen

Hypertension

- Blood pressure control

Pediatrics

- Childhood Immunizations
- Immunizations for adolescents

Preventive Care

- Colorectal cancer screening

Importantly, the inclusion or exclusion of an individual measure was based on a number of both clinical and operational factors. For example, some initially considered measures were clinically relevant, but presented operational challenges to reliably obtain data. Others, such as the pediatric immunization measure, were deemed to be so important that they were included despite significant operational challenges (e.g., a child who received an immunization from outside the normal context of care would have no documented immunizations according to the measure).

And collectively, the measures were designed to reflect the quality of an ACO's services regarding both primary and chronic care management. As a result, the initial set of measures includes those that focus on specific chronic conditions, as well as those that address preventive care.

One asset to the project was the inclusion both of multiple providers and multiple payers. The multiple-provider/multiple-payer stakeholder approach had a moderating effect on both parties that helped to drive group consensus.



Conclusion: The Process is the Product

Consistently, change implementations fail because of a poorly managed change process that lacks sufficient stakeholder engagement. In this way, perhaps, the true value of the ACO Learning Network pilot site project was *not* in identifying the specific 23 measures, but rather in the *process* that selected the measures.

By welcoming all parties to the table and building a data and measurement framework from the ground up, the pilot site project effectively engaged both champions and leaders who were committed to the success of the project.

Others looking to repeat their efforts should consider a process that incorporates the four key features of the process.

- A consensus-based decision-making process
- Multiple provider stakeholder organizations
- Multiple payer stakeholder organizations
- The decision to develop a unique list of validated measures

Resources:

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- Physician Quality Reporting System (PQRS): <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/PQRS/index.html>
 - American Medical Association-Physician Consortium for Performance Improvement, (AMA-PCPI): <http://www.ama-assn.org/ama/pub/physician-resources/physician-consortium-performance-improvement.page>
 - National Committee on Quality Assurance (NCQA): <http://www.ncqa.org/>
 - Physician Group Practice (PGP): <http://innovation.cms.gov/initiatives/physician-group-practice-transition/>
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- Meaningful Use: <http://www.cms.gov/site-search/search-results.html?q=Meaningful%20use>
 - Medicare Advantage, <http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/MedicareAdvantage.html>
 - Brookings' Advanced Measurement Best Practices and WellPoint Society of Thoracic Surgeons projects: <http://www.vhi.org/articles/Brookings%20VHI%20technical%20brief.pdf>



- Premier ACO: <http://www.premieraco.com/>

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