A Platform for Automation and Success with Care Management

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Goals of the project

North Shore-LIJ is a health system serving the needs of over seven million people through 17 hospitals, 400 ambulatory practices, and three skilled nursing facilities as well as home and hospice care. Our healthcare system, including its CareConnect insurance company, is at the forefront of payment reform and population health management.

With our rapid and ongoing growth, the operational complexity of being so large and diverse, and the changes driven by accountable care reforms such as bundled payment, we’ve had to overcome several challenges. Among the first is improving care coordination and outcomes for our highest risk patients. Our vision was to aggregate and normalize all information about each patient from across our entire provider network, regardless of which electronic health record (EHR) is used, and then make it actionable in real-time. Examples include automating alerts that can help prevent unnecessary admissions when a known patient presents in the emergency room, or notifying providers when there’s a significant change in a patient’s clinical data.

To support these innovations, North Shore-LIJ made the strategic decision to invest in HealthShare, the health informatics platform from InterSystems. We used HealthShare as the foundation for building a care coordination application with rule-based systems for identifying high-risk patients, assessing needs, sharing care plans across providers and locations, supporting efficient workflows, and providing quality metrics for continuous improvement.

Project description

High-risk patients disproportionately account for the greatest healthcare costs in terms of care delivery and management. Some studies show 10% of the patient population accounting for 64% of total costs.¹ For healthcare systems like North Shore-LIJ, success with accountable care models requires real-time identification of these patients and rapid stratification into care management programs.

Our survey of commercial care management applications found none that fit our vision of a flexible, agile, and intelligent system built around a comprehensive health record spanning all venues of care. Having already invested in the HealthShare platform, we had the technology foundation and a running start on building our own care management application. We were able to focus project efforts on understanding user requirements, automating routine data gathering, and creating an optimal workflow. The platform provided nearly all of the additional capabilities – enterprise service bus, business process management, patient matching, business rules engine, workflow, alerting, and analytics – we’d need to complete the project. We augmented this environment with an Agile development methodology using modern Web user interface technologies for delivering a highly responsive application.

The result is Care Tool, an evolving care management application suite. Care Tool leverages large volumes of data from EHRs and intelligently presents it to actively engage its users – from the call center to the clinician – in the coordination of care for each patient.

Project details

Care Tool benefits from the real-time information flowing through HealthShare, and HealthShare’s integrated capabilities for capturing, sharing, understanding, and acting on data. Most commercial care management applications are stand-alone systems where the care manager has to manually enter information, such as an appointment reminder. In Care Tool, that appointment is an HL7 message that’s already flowing through HealthShare, so the system can evaluate the message and automatically generate reminders from it. In the same way, the tool leverages HealthShare to monitor the flow of information, evaluate rules, and alert providers to relevant patient events such as admissions, readmissions, and changes in clinical status.

Even before this point has been reached, Care Tool has monitored clinical data in real time to identify and stratify high-risk patients into populations for care management programs. Initially we’re focusing on five programs – stroke, COPD, cardiac valves, CABG, and hip and knee replacement – across four of our hospitals.

In upcoming releases, Care Tool will use HealthShare to generate care plans for patients, and HealthShare’s workflow engine to orchestrate tracking, sharing, and completion of those plans as the patient moves among different clinicians, providers, and facilities, including home care.

Investments, staffing, and timeframe

A detailed workflow analysis and time spent with providers showed us where a software solution could improve care management processes and outcomes. Our providers wanted a solution quickly and gravitated toward off-the-shelf products. It took education and close collaboration with the IT team to understand the benefits of a fully integrated, custom solution.

Our Agile development methodology enabled us to deliver incremental functionality to users and rapidly incorporate their feedback in each iteration. The same providers who were hesitant about taking a custom approach are now the biggest advocates for Care Tool throughout our health system.

- Investments: We are using the enterprise HealthShare platform in a $20 million multi-year initiative to build out a comprehensive integrated clinical health record.
- Staffing: Because several components of Care Tool were already in HealthShare, the project was completed with a relatively small staff of three developers, two business analysts, two testers, and one trainer.
- Timeframe: The first version of Care Tool was released in four months and since then we have been iteratively adding features. At the time of this writing the application has been live for over nine months.

Outcomes, results, lessons learned

Care Tool bridges the silos of data, disjointed processes, and disparate technology stacks common in and between healthcare organizations. It demonstrates the benefits for care managers and providers of a care management solution built on a platform with aggregated patient data and capabilities for rule-based decision making and workflow.

We are already seeing productivity gains from our investment. Prior to the rollout of Care Tool, care managers had to be trained on five different EHRs to be able to manually locate and integrate patient data. Now they have all the information in one place, pre-populated for them on one screen. Information they enter in Care Tool is instantly available to the entire care team and in the comprehensive health record. Extensive rules in Care Tool evaluate the data to automate provider notifications, alerts, and other tasks so the case manager can handle more patients, with less effort, and can provide much higher levels of service.

Data about care outcomes is just starting to come in, but we’re already seeing the benefits of tracking patients across care settings and the re-engineering of care processes enabled by HealthShare and Care Tool. For comparisons of 2014 year-to-date versus 2013 we’re seeing:

- 6% reduction in readmissions for cardiac valve replacement patients
- 10 to 28% increase in the number of patients, depending on surgical procedure, being discharged to home instead of a skilled nursing facility
- Up to a 56% increase in patients using in-network home care, enabling better control of care quality
- Greater patient satisfaction and lowered risk of infection and readmissions as fewer patients are placed into rehabilitation facilities and more are going home
Resources and contact information

**North Shore-LIJ Health System** delivers world-class clinical care throughout the New York metropolitan area, and has an integrated delivery network of 17 hospitals, more than 6,000 beds, nearly 400 outpatient physician practices, 3 owned skilled nursing facilities and 19 affiliated nursing facilities. North Shore’s CIO, John Bosco, can be reached at: **JBosco@nshs.edu**

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