HealthCatalyst
ignite outcomes improvement™

# How to Reduce Heart Failure Readmission Rates: One Hospital's Story

## HEALTHCARE ORGANIZATION

Large Medical Center

## TOP RESULTS

- 29 percent reduction in 30-day HF readmissions
- 14 percent reduction in 90-day HF readmissions
- 120 percent increase in follow-up appointments
- 78 percent increase in discharge medication reconciliation
- 87 percent increase in follow-up phone calls
- 84 percent increase in teach-back interventions

## PRODUCTS

- Key Process Analysis (KPA)
- Late-Binding Data Warehouse™
- Cohort Finder
- Population Health – Heart Failure Advanced Application

## SERVICES

- Installation Services
- Improvement Services

## HEART FAILURE READMISSION RATES

Heart failure (HF) affects an estimated 5.3 million people, mostly the elderly, and is the underlying cause for 12 to 15 million office visits and 6.5 million hospital days each year.[1] Because of inadequate treatment, discharge guidance, and follow-up, an estimated 24 percent of patients who are discharged are readmitted to the hospital within 30 days.[2]

Like most healthcare systems facing the transition to value-based reimbursement, this large healthcare system found it necessary to assess its overall quality improvement program. Leadership realized it needed to be able to analyze and better manage specific patient populations, especially patients with chronic conditions and those at greatest risk for readmission.

## PRIORITIZING QUALITY IMPROVEMENT INITIATIVES

The Health Catalyst Key Process Analysis (KPA) Application identified heart failure as one of their highest cost care processes. The decision to begin its cardiac services improvement initiative

by focusing on heart failure was a logical choice based on the KPA results and The Centers for Medicare & Medicaid Services (CMS) readmissions reduction program (Figure 1 sample visualization). In 2014, CMS withheld up to 2 percent of regular reimbursements for hospitals that have too many 30-day readmissions for HF. The proposed rule for 2015 would increase the maximum penalty under the program to 3 percent. The healthcare system was determined to improve HF care for its patients and avoid CMS penalties.

### KEY PROCESS ANALYSIS

- Used the Pareto Principle (80/20) rule
- Identifies the top Care Processes consuming the most resources
- Ability to drill down and analyze variations

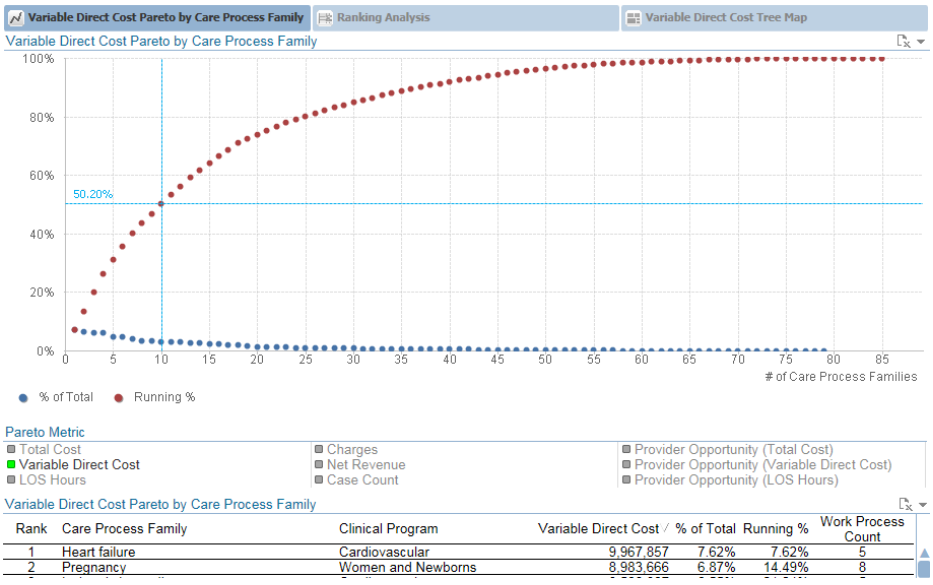


Figure 1: Sample Key Process Analysis visualization

> We have deployed evidence-based practices — medication reconciliation, follow-up phone calls and appointments, and teach back— to help reduce heart failure readmission rates. Analytics are enabling us to correlate our interventions with readmissions and trend readmissions over time for comparative purposes.
>
> Associate Chief Medical Officer

## USING ANALYTICS TO HELP REDUCE HEART FAILURE READMISSION RATES

The healthcare system initially deployed a traditional enterprise data warehouse (EDW) to help them in their quality improvement initiatives. But it found that this type of EDW took years to fully deploy and failed to enable the near-real-time analysis of clinical data required for success under value-based care. The healthcare system then turned to Health Catalyst's Late-Binding Data Warehouse™, an agile platform that not only supports the fast-changing rules and use cases of healthcare data, but delivers value in a matter of weeks. The healthcare EDW was fully deployed within just 12 weeks.

The new healthcare EDW quickly pooled clinical, patient satisfaction, operational and other relevant data. To be successful, the Associate Chief Medical Officer and the Vice President of

> Our data is now accessible to stakeholders throughout the organization, including multidisciplinary teams of clinicians, operations and business intelligence who can use it to drive improvements in care processes, care quality and patient outcomes. The integration of data management with evidence-based practices, operational data and financial metrics has given us a much more comprehensive perspective of care delivery.
>
> Vice President of Business Intelligence

Business Intelligence knew they needed to engage physicians and build a culture of trust — through transparency and collaboration — and align on the vision of improved outcomes. They could choose to go fast, without clinician engagement. But they knew they could go further with the support of clinicians.

They organized a multidisciplinary team that included physicians, nurses, informaticists, quality, analytics, IT, operations and finance. The multidisciplinary team analyzed the pooled data using the Health Catalyst Key Process Analysis (KPA) Application. Armed with that insight and its new analytics capabilities, the healthcare system applied for and received a grant from a major foundation to support a transitional care program for heart failure patients. The center borrowed the grant's objectives to define its long-term AIM statement:

> *To achieve and sustain a 30 percent reduction in the 30-day and a 15 percent reduction in the 90-day all-cause readmission rates for patients with HF by [date] and sustained reduction in readmission rates through [date].*

## EVIDENCE-BASED PRACTICES HELP ACHIEVE GOALS

To achieve the goals set forth in its AIM statement, the multidisciplinary team worked together to define the patient cohort and to define four evidence-based, HF-specific best practice interventions, which were rolled out over a few months:

- **Medication reconciliation** – Physicians review a list of the patient's medications with explicit instructions on how to properly take them.
- **Post-discharge appointments** – Before being discharged, patients are scheduled for follow-up care. When possible, patients at high risk for readmission are scheduled to be seen within seven days of discharge; others are scheduled to be seen within 14 days.
- **Post-discharge phone calls** – Within a specified time frame following discharge (again based on the patient's level of risk for readmission), a member from the coordinated care team calls patients to assess their condition and see if they have any questions or are having any problems with their medications.

- **Teach back interventions** – Patients are asked to explain the information that is presented to them to confirm the patient comprehends the information.

An integrated dashboard (Figure 2 sample visualization) was created in the healthcare EDW platform for each of the four interventions so clinicians and administrators could easily visualize the impact the changes were having on readmissions. Additionally, the healthcare EDW and the Population Health – Heart Failure Advanced Application allowed the multidisciplinary team to assess the interventions' impact on costs and patient satisfaction.

### HEART FAILURE ADVANCED APPLICATION DASHBOARD

1. Key outcome, process and balance measures with easy-to-understand results versus targets
2. Trended summary of patient discharge, 30- and 90-day readmit counts and rates
3. Filters that enable data stratification by a number of variables (e.g. discharge unit, admit unit, age, gender, etc.)
4. Integrated risk filters (e.g. Charlson Index, comorbidity count, etc.)

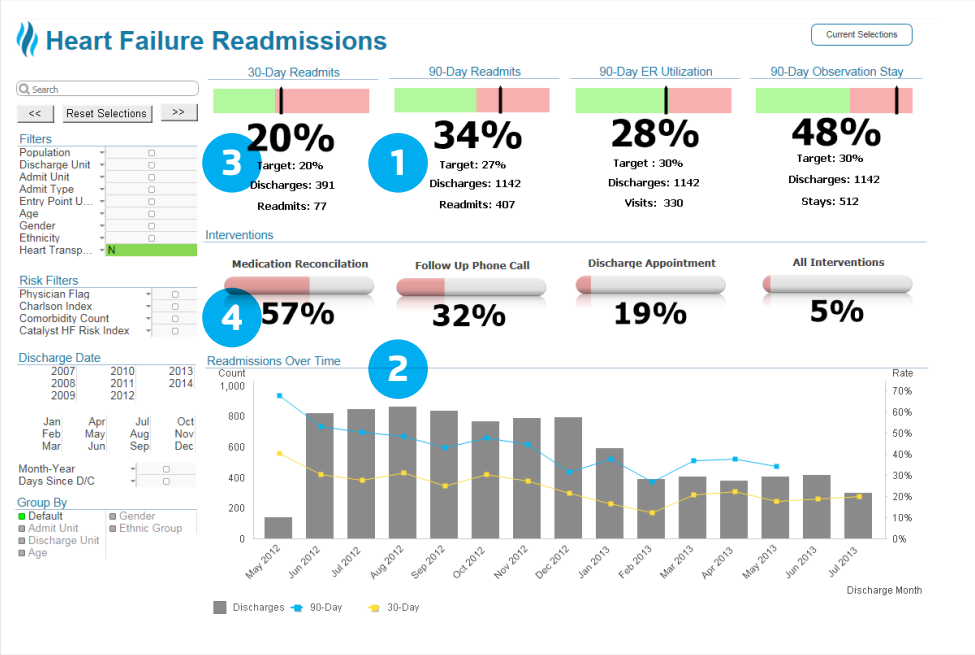


Figure 2: Sample Population Health – Heart Failure Advanced Application dashboard

To ensure that the focus on reducing readmissions did not have an unintentional effect in other areas, such as an increase in emergency department (ED) visits or a decrease in patient satisfaction, the center built in balance measures including the tracking of ED encounters, observation stays, length of stay and patient satisfaction rates.

Eight months after implementing the four evidence-based interventions, the medical center had experienced a:

- **29 percent reduction** in 30-day HF readmissions
- **14 percent reduction** in 90-day HF readmissions
- **120 percent increase** in follow-up appointments

### HEART FAILURE ADVANCED APPLICATION MED REC VISUALIZATION

1. Trended summary of medical reconciliation, with review counts and rates
2. Easy-to-understand, color coded medication reconciliation by location

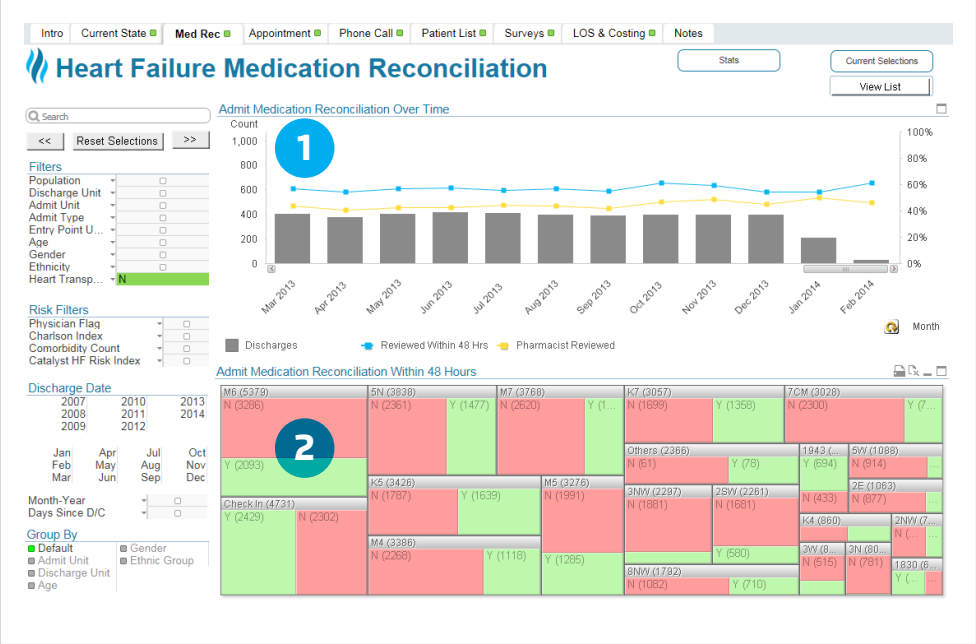


Figure 3: Sample Population Health – Heart Failure Advanced Application med rec visualization

> Today, we have a solution that integrates data management with evidence-based practice, operational data and financial metrics to allow us to understand the bigger scope of care delivery. This is a dream come true. We have never had the opportunity to do that before because so many silos of data existed. Now we can put patients first because we can see the data.
>
> Cardiologist

- **78 percent increase** in medication reconciliation (Figure 3 sample visualization)
- **87 percent increase** in follow-up phone calls
- **84 percent increase** in teach-back interventions

The Population Health – Heart Failure Advanced Application also includes tabs for Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey results, length of stay (LOS) and cost analysis, and the ability to drill to the individual patient level.

## LEVERAGING THEIR SUCCESS

As a result of these successes, the healthcare system is deploying the healthcare EDW, Health Catalyst Population Health Advanced Applications, evidence-based practices — and its executive performance improvement governance structure and multidisciplinary team approach to manage the health of its employees and the patients it serves — and to drive and sustain performance improvement in a number of care processes including sepsis and infectious disease, and its general medicine, surgical and oncology clinical programs.

## REFERENCES


1. Institute for Healthcare Improvement. (2014). Congestive heart failure. Retrieved from http://www.ihi.org/Topics/CHF/Pages/default.aspx.

2. Desai, A.S., & Stevenson, L.W. (2012). Rehospitalization for heart failure. Circulation. 126, 501-506. Retrieved from http://circ.ahajournals.org/content/126/4/501.full.


## 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.

For more information, visit www.healthcatalyst.com, and follow us on Twitter, LinkedIn, and Facebook.