ProcessVSA:

CONGESTIVE HEART FAILURE DISCHARGE





CASE STUDY

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At a Glance

Organization
Not-For-Profit Healthcare System

Industry
Healthcare

Business Issue
Core Measure Performance for Congestive Heart Failure Discharge

Methodology Applied
Process VSA

Business Impact
- Improved Core Measure Performance by 10% in less than 90 days, first time ever above state average
- Reduced Patient Wait Time by 33 minutes
- Reduced LOS
- Reduced Readmission Rate
- Increased CMS Reimbursement

Financial Results
- Validated savings of $296K in less than 90 days

Tools Applied

- Process VSA
- VOC Analysis
- SIPOC
- Pareto Analysis

About the Organization

The healthcare organization discussed in this case study is an integrated not-for-profit healthcare system founded in 1981. It provides comprehensive healthcare services to several communities in upstate NY and northern Pennsylvania. In addition to a community-based university-affiliated teaching hospital, the system includes three acute-care community hospitals. Primary and specialty care services are provided in twelve family health centers. The system includes home health, nursing home and long-term care, and other community health services and agencies. The system has a combined medical staff of more than 500 physicians, is licensed to provide more than 800 inpatient beds, and is one of the region's primary employers with more than 4,500 employees.

Project Definition

The Congestive Heart Failure (CHF) Discharge Process was selected by the organization's leadership as the inaugural effort for a process-level value stream assessment, or ProcessVSA. The opportunity was identified as a priority during the two-week JumpStart planning workshops (for more on SystemCPI and the JumpStart deployment planning process, read our white paper "Introducing SystemCPI"). Performance Gap Analysis, System Value Stream Analysis, and System Constraint Analysis had identified more than 100 process improvement opportunities. A prioritization matrix of weighted criteria was used to rank order potential events and projects and ensure alignment with the system's business strategy. Commitment to 'the patient first' was evidenced by assignment of greater weight to impact on the patient than to any other criterion.

The Methodology

A ProcessVSA is a disciplined approach to analyzing the activities and the flow of materials and information through which a product or service is delivered to the customer. The overall objective is to reveal non value-added activities (or waste), constraints, and process improvements. A well-executed ProcessVSA transcends the real and artificial boundaries of department, function, and discipline to analyze the entire value stream from the customer's perspective.

The primary tool utilized in ProcessVSA is the Value Stream Map (VSM), a visual representation of the process. An interdisciplinary team of subject matter experts map the current state of the process. Each step in the process is then evaluated and assigned a value classification. Value is defined from the customer's perspective. The Current State Map serves as the baseline for future process improvements. The Ideal State Map defines the ultimate, long-term goal for the value stream. The Future State Map is the team's vision of the process as it will be when process improvements are implemented, typically within a six-month period. An action plan captures process improvements required to transform the process from the Current to the Future State. Actions plans include different types of improvement methods such as Just Do Its (JDIs), Rapid Improvement Workshops (RIWs), and DMAIC projects.

The Problem

Congestive Heart Failure (CHF or HF) is a leading cause of mortality and morbidity in the US, affecting more than five million people. With the prevalence and incidence of CHF rising, the rate of hospitalization is increasing. The estimated cost of CHF in 2008 was nearly $35 billion. A readmission rate of 24.5% is a key cost driver and compelling evidence that existing approaches to managing CHF are inadequate. CHF/HF is a Centers for Medicare and Medicaid Services (CMS) National Clinical Focus Condition and a Joint Commission National Hospital Quality Measure. Core Measure Performance impacts Reimbursement

and accreditation, and is used by payors and consumers to compare hospital performance. The CHF Discharge process clearly and directly linked to each of three the healthcare system's strategic goals: Clinical Excellence, Market Growth, and Financial Strength.

Approximately 600 patients are admitted to organization's two hospitals annually with a CHF diagnosis. Core Measure performance for CHF/HF did not meet the CMS benchmark (90th percentile) and lagged behind the state average and regional competitors. For two years, a CHF Core Measures team had been working to improve the process, but compliance and sustainment of improvements over time had not been realized. The CHF discharge process was selected as the first SystemCPI event based on prioritization matrix scoring and the need for an initial high-visibility success at the hospital.

CMS Core Measures for HF

1. Complete Discharge Instructions
2. Left Ventricular Function Assessment
3. ACE Inhibitor or ARB Prescribed
4. Adult Smoking Cessation

Performing the Value Stream Analysis

Pre-Event Planning

Preparation for the CHF Discharge PVSA began during the SystemCPI JumpStart. Lean Experts and Champions completed on-site training. A preliminary problem statement was drafted and approved by the Deployment Team. Subject matter expertise necessary to fully evaluate the process was identified. Team members included two nurse managers of the telemetry units, a physician hospitalist, a care manager, a pharmacist, a special projects director, and two staff nurses. Unit managers of team members were notified so that calendars could be accommodated for the event. In the hospital, diverting professional staff from the bedside for up to five days is no small commitment on the part of the organization. It was imperative that the event be considered time well invested by the team and the hospital's leadership.

Event planning was guided by a Pre-Event Checklist. The Checklist ensured that tasks and logistical arrangements necessary to ensure a successful event are completed. A timeline for the event was finalized and incorporated into a work plan. The work plan provided the team with a timeline and task dependencies and served as a real-time scorecard for the event. The workshop charter, the most important deliverable of the Pre-Event phase, defined the problem to be addressed, the business case for improving the process, and the goals to be achieved.

Getting Started

The team included members from both the organization's hospitals. Some team members were meeting face-to-face for the first time. Others had worked together for many years. Team building and facilitation tools were introduced to encourage individual participation and promote 'forming' of the team. Ground roles were established and a Parking Lot was created. The event checklist set expectations for the event. Roles were clarified, emphasizing the value of each team member's unique perspective and intimate knowledge of the process.

The work plan was adjusted to accommodate the availability of the hospitalist. This flexibility proved critical to event success. Four members of the team had attended Lean Expert Training. The remaining members had no or very little knowledge of SystemCPI or Lean tools. Just in Time (JIT) training focused on Fundamentals of Lean and included an introduction to value stream mapping, types of waste, visual management and 5S. Handouts were provided for ready reference. Initially, at least two members of the team were clearly unconvinced that the event was a good use of their time.

The charter was reviewed and discussed by the team. The strategic rationale for selecting the CHF Discharge process as the focus of the event was clearly understood by the team.

The work plan was adjusted to accommodate the availability of the hospitalist. This flexibility proved critical to event success.

Team members voiced their hope that the event would "make a difference" for the CHF Discharge process. The project scope was refined to exclude CHF patients being discharged to tertiary care or to Intensive Care or Skilled Nursing Units. The Champions approved this change when they attended the event "kick off."

Data collected during the Pre-Event phase and performance relative to existing metrics and regulatory requirements was reviewed. The team created a SIPOC, a high-level process map that identifies suppliers, inputs, five to seven high-level process steps, outputs, and customers of the process. The SIPOC was used to ground and to focus the event. Already, some hints of opportunities for improvement emerged. Inputs and Outputs identified by the team led to additional questions about the process. No maps of the process existed. Voice of the Customer (VOC) data was available but was not specific to CHF. The hospital's policies and guidelines related to CHF Discharge were reviewed and compared to CMS and Joint Commission requirements. Finally, the team walked the process, noting details about the process from both patient and staff perspectives.

Assessing the Current State

A functional format was used to create the Current State Map because, like most healthcare processes, handoffs between functions or departments are key variables. Each team member's perspective on the process was limited to their own experience. No one person or department's view of the process captured the whole truth. Mapping the true Current State of the process required the input of every member of the team. Considerable discussion and debate was necessary for the team to reach a consensus. Excitement grew as the team began to truly "see" the process for the first time. The hospitalist's participation was critical and made possible by flexibility in the work plan. Initially, she could stay for "just a little while," but she became actively involved in mapping the Current State and continued to be a vital part of the team thereafter. She later led a related RIW team to revise Pre-Printed Orders for CHF.

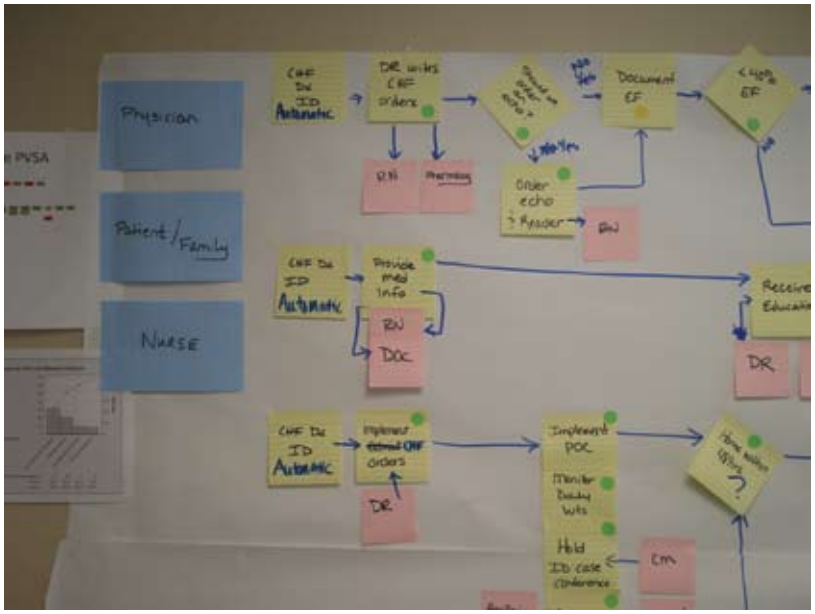

Figure 1. Value stream map of CHF Discharge.

When completed, the Current State Map included 99 process steps and 36 handoffs. Each step was then classified as value added, non-value added, or non-value added but necessary. The team determined that 30 steps (37%) did not add value from the customer's perspective. Other waste, such as redundant documentation, and constraints, such as limited access by nurses to computer workstations and printers, were identified and documented on the Problem List. Cycle time for CHF discharge (from physician order to patient departure) averaged two hours and 36 minutes. More than 54% of this time was non value-added. Nurses preparing to discharge a CHF patient were required to search or to wait for a computer workstation and then for an available and operable printer in order to print the 14-page packet of discharge instructions that, by CMS regulation, must be provided at discharge. Meanwhile, the patient waited to go home.

One of the team's Ground Rules, "For every problem, offer at least one solution" generated a growing list of potential process improvements collected on the Solutions List. Both hospitals were designed and built decades before an influx of modern technology and equipment. Hallways were congested and storage spaces overflowing. Tower units at the hospital are configured as wedge-shaped patient rooms surrounding a circular hallway and a central nurses' station. Every inch of space is a precious commodity. Multiple opportunities for 5S and Visual Management were identified.

Figure 2. Tower units at the hospital.

A Pareto Analysis of the causes of Core Measure failure revealed that, in most instances, the appropriate actions (such as ejection fraction assessment or discharge instructions provided to the patient) had been taken. The exception, errors in medication reconciliation, had been identified as a future Six Sigma project and was added to the Parking Lot. The remaining causes of CHF Core Measure failure were related to documentation, a complex and multi-redundant sub-process that would be the focus of a Rapid Improvement Workshop (RIW) to follow the PVSA.

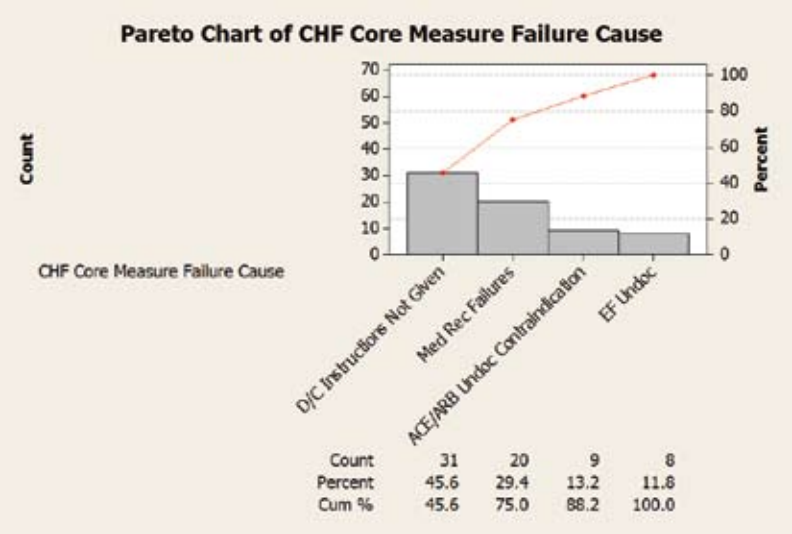

Figure 3. Pareto chart of reasons for CHF Core Measure Failures.

Identifying Process Improvements

Mapping the Ideal State seemed, initially, to be a relatively pointless activity to a team so fully involved in problem-solving that they had completed twelve 5S events and JDIs during lunch breaks. The team struggled to understand the rationale for the sudden change in focus. Then, once ideas began to be articulated and "what if" scenarios explored, the team's creative energy surged. The completed Ideal State Map represented the team's vision of the process in a perfect world, without waste or constraint or the limitations of time, space, or other resources. It would serve as the "ultimate" long-term goal for the CHF Discharge process when Computerized Physician Order Entry and a fully integrated Electronic Medical Record had become a reality.

With a clear understanding of the reality of the Current State and the limitless possibilities of the Ideal State in mind, the team created a Future State map. Each problem identified was addressed. Each solution was evaluated for viability and impact on the Future State. Non value-added activity, other waste, and root causes of CHF Core Measure failure were eliminated or mitigated. Handoffs were minimized. When completed, the Future State included 69 steps, a 30% reduction. Non value-added steps were reduced by 83% and the number of handoffs reduced to 21, a 41% reduction.

Creating an Action Plan

An action plan captured each process improvement necessary to transform the process from the Current to the Future state. A selection chart was used to determine whether each proposed improvement was a 5S event, a JDI, a RIW, or a Six Sigma project. Eight JDI improvements, such as mounting computer monitors on the wall to provide additional workspace and moving or adding equipment (telephones, printers and faxes) required management approval or assistance from someone outside the team. Adding a pop-up in NurseVu to alert staff that a diagnosis of CHF had been identified would require a small software modification. The pop-up, a key process improvement, would cue the nurse to print the discharge instructions when a diagnosis of CHF was identified, eliminating the bottleneck at the discharge end of the process.

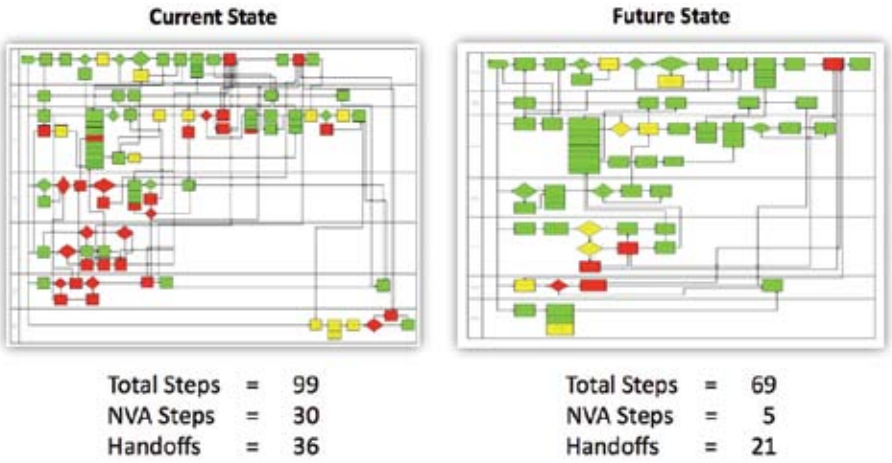

Figure 4. Process improvements

Other process improvements, such as a visual management tool to identify the medical records of CHF patients and a new process for scheduling follow-up appointments were piloted before full-scale implementation. Four RIW events were indentified. The CHF Core Measure Documentation RIW charter was drafted and Lean Experts and a Champion were assigned. At the close of the ProcessVSA event, more than half of the improvements identified had been completed. The Action Plan, including enrollment in the Hospital to Home (H2H) program and Nurse Direct contact of CHF patients following discharge would be completed within three-weeks.

Post-Event Tasks

Preliminary calculations of return on investment were reviewed and approved by the hospital's "Money Belt". Response to the workshop outbrief was positive. Current and Future State maps elicited comments such as "Wow!" and "No wonder this process is so difficult!" from the audience assembled in the Doctor's Auditorium. Each member of the team spoke about their experience with excitement and a new understanding of their work. Team members were presented with certificates of accomplishment by the Deployment Leader and the Post-Event Checklist included a team dinner to celebrate success.

A Control Plan was developed to ensure completion of the Action Plan within the anticipated timeframe, monitor key process indicators, and define the response necessary if performance does not improve as projected. The plan was reviewed weekly with the process owners until all milestones had been achieved and then at three-month intervals until the process is stable and consistently meeting performance objectives. This ensures sustainment, which is a primary objective articulated by leadership during the SystemCPI planning phase, and a measure of SystemCPI deployment success.

The Results

The CHF Discharge ProcessVSA resulted in an immediate improvement in CHF Core Measure performance. For several weeks following the event, there were no CHF Core Measure failures unrelated to medication reconciliation. Composite CHF Core Measure performance exceeded the NY state average for the first time ever, an improvement of nearly 10% in less than 90 days. If current projections are realized, the hospital will exceed the CMS benchmark in 2010.

Benefits attributed to the workshop include improved patient, physician, and nursing staff satisfaction. Soft savings associated with re-allocation of staff to value-added activities are estimated to exceed $16K per year. Each CHF patient waits 33 minutes less to go home after the discharge order has been written. While hard savings cannot currently be attributed to improved CHF clinical outcomes (as evidenced by improved Core Measure Performance and a reduced 30-Day readmission rate), future savings related to non-reimbursement for CHF re-admissions exceed $296K per year. Similar savings will be realized as CMS value-based purchasing is implemented and failure to meet benchmarks result in reductions in reimbursement by as much as 5%.

Summary and Conclusions

The process improvements implemented as a result of the CHF Discharge ProcessVSA will be replicated for other CMS Core Measures and at other system hospitals. The number of Core Measures is expected to increase significantly in the near future. As pay-for-performance and other financial incentives intended to improve quality of care are implemented, the savings realized will increase and the work of the CHF Discharge team will continue to pay dividends well into the future. The success of the event was also measured by the energy and enthusiasm exhibited by the team. Members of the team agreed that the event was "fun!" and asked to participate in future events and to be included in the next Lean Expert Training course. The hospital's staff response to changes implemented has been enthusiastically positive.

Next steps included the completion of four RIW events and one Six Sigma DMAIC project. Two RIWs were combined and completed within two weeks. The remaining events and projects are currently being chartered and are expected to be completed within the six-month timeframe. At that time, time studies will be completed and Core Measure Performance and readmission rates reassessed to validate that the projected improvements have been sustained.

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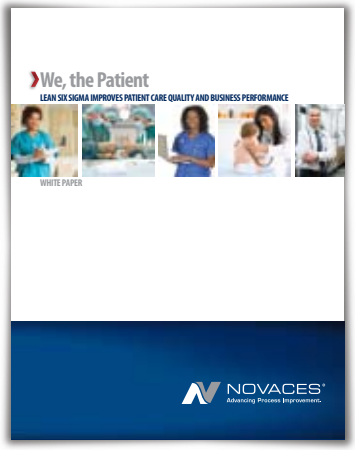

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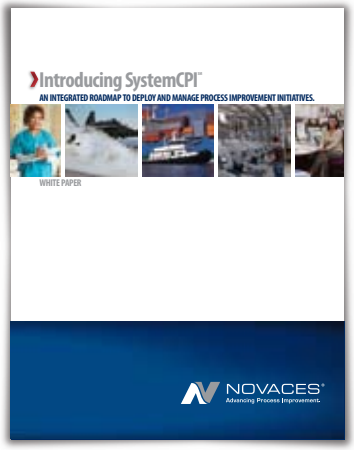

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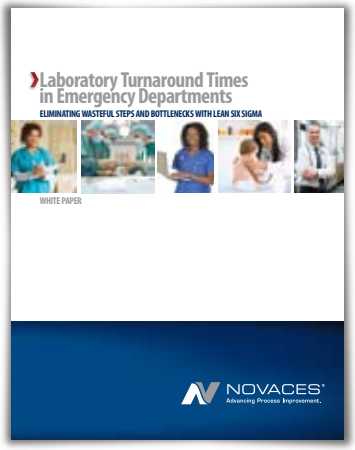

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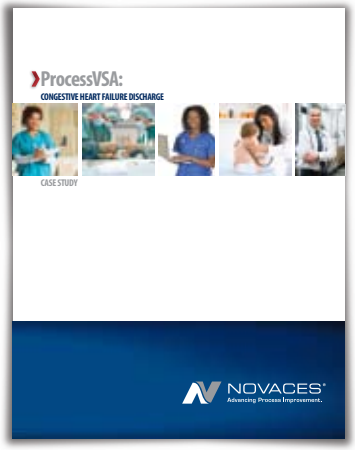

ProcessVSA
Congestive Heart Failure Discharge

Case Study

ProcessVSA
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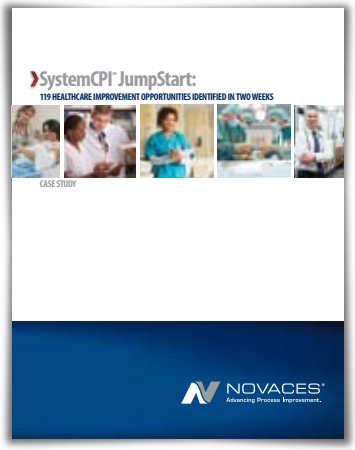
Case Study



SystemCPI JumpStart
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Case Study

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