



## Summary

### Organization

BayCare Health System

### Industry

Health Care

### Business Problem

Decrease in first case surgeries starting on time

### Methodology

DMAIC

### Solution

Preventative measures and positive reinforcement

### Benefits/Results

- First case surgery on-time starts improved by 20%
- Project replicated across other facilities

## The Challenge

In a hospital operating room, the first scheduled surgery of the day is the only guaranteed start time. If it's late, the rest of the day may be adversely affected, causing delays for patients and their families, scheduling conflicts for surgeons and possible overtime for OR staff. When first case on-time starts decreased by 28 percent at BayCare Health System's Mease Dunedin Hospital, a Six Sigma project was commissioned to get to the root of the problem.

At this particular hospital, a case is considered "late" if it starts just five minutes past schedule. As BayCare Master Black Belt Pam Guler explains, many variables can affect the actual start time (when the first incision is made). Some of these variables are beyond the hospital's direct control, such as the patient, surgeon, or anesthesiologist arriving at the hospital or in the OR late. But many variables are controllable, including problems with the patient's IV or with operating room equipment, and required paperwork that needs to be filled out before surgery.

Guler wasn't sure which variables were contributing to the problem of late starts, but her team's goal was to find out and improve the on-time percentage by 20 percent. The project team included three operating room nurses, a surgeon, an anesthesiologist and the Director of Surgical Services for the hospital.

## The Process

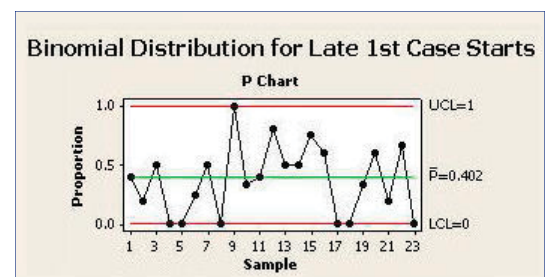
Guler was one of the first Black Belts trained at BayCare Health System, but her background is in Information Systems. She recalls that when the project team first met, team members were open and helpful, but curious about Six Sigma, which was new to BayCare at the time. "They were also curious," she says, "about how a Black Belt who was not clinical could lead them through improving this process."

Throughout the course of the project Guler followed the DMAIC methodology, demonstrating that its structured approach to problem solving could move the primary metric in the right

direction. To start with, she introduced her team members to Six Sigma tools that helped them document the process inputs. "They really enjoyed tools like the C&E Matrix and the FMEA," she recalls. "Allowing them to put a score around their thoughts was very beneficial."

Since the hospital's computerized system didn't account for all the tasks that have to be completed after the patient enters the OR but before the surgery actually starts, Guler spent a month observing first case start times in the OR.

During this period of observation, 40 percent of the first case surgeries started late. For each one, the team documented which parts of the process contributed to the defect (late starts).



Next, the team used a Pareto Chart to show which variables contributed most often to the late starts. Given that the project had been initiated in response to surgeon requests, the results were somewhat surprising.

The top two reasons for the documented late starts were surgeons arriving late to the hospital, or arriving in the OR longer than five minutes after they were paged for surgery. "The surgeons don't work for the hospital, they work for themselves," Guler explains. "So we had to work closely with them to improve the metric."

To gain surgeon buy-in, the team concentrated on positive reinforcement. Working with the project's surgeon representative, the team came up with a way to encourage physicians to help improve on-time starts. For surgeons who perform at least six first case surgeries per quarter, the hospital recognizes those who arrive on time for all of

(continued)

## Key Tools Used

### Define

- Process Walkthrough
- SIPOC Analysis
- Stakeholder Analysis

### Measure

- Surveys
- Process Flow Diagram
- Measurement Analysis
- C&E Matrix
- Capability Analysis

### Analyze

- FMEA
- Pareto Chart
- One-Proportion Test
- Chi-Square Test
- Multi-Vari Analysis
- Input Verification Matrix

### Improve

- Plan/Do/Study/Act
- Pilot

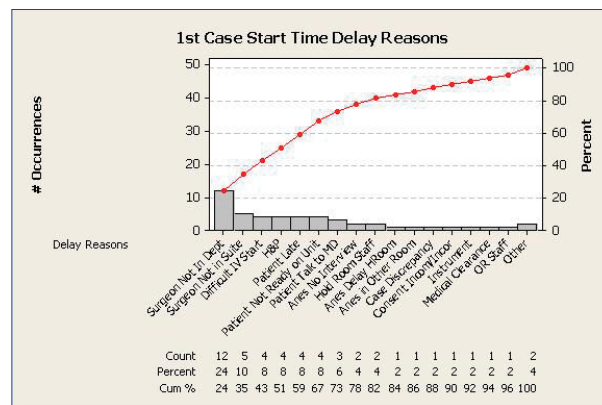
### Control

- Control Plan
- Transition Action Plan
- Updated Process Map

their cases that quarter. The physicians receive a letter of congratulations and the OR displays their pictures.

In addition to the on-time surgeon recognition program, the project team took advantage of Plan/Do/Study/Act to brainstorm ways to alleviate the other primary factors causing surgery delays. Working with the entire OR staff and the Surgery Board of Directors, the team developed several improvements.

To reduce delays due to difficult IV sticks, the process now stipulates that the holding room nurse should call for assistance from the Certified Registered Nurse Anesthetist or anesthesiologist after two tries.



To avoid late starts due to incomplete paperwork, the hospital's Ambulatory Care Unit faxes the operating room every morning with a list of patients who need to complete their History and Physical forms, or who didn't complete Pre-admission Testing and Teaching and still need to meet with the anesthesiologist before surgery.

And, although patients arriving late was not a huge problem, the project team proposed that the Ambulatory Care Unit call all first case patients the night before surgery to remind them of their arrival time. "They've had a lot of great success with that," Guler says. "It's a very simple thing but it's helping."

The process variables that the Ambulatory Care Unit, the OR and the holding room staff can control are documented on a "Quality Datasheet" — a spreadsheet developed during the course of the project that tracks on a daily basis the total number of first cases, the percentage of late cases and the reasons for each late start.

If these variables contribute to 100 percent of first cases starting on time for the quarter, the staff is recognized. Guler says the staff has achieved this more than once since the system was implemented. "It's amazing what positive interaction and teamwork can do," she notes.

## The Results

After all the suggested improvements were put in place, the project team re-sampled the first case surgery process to make sure that the percentage of on-time starts had significantly increased. The results were promising. During a two-week period, the overall on-time percentage rose by 18 percent over the initial observation period; on-time starts due to controllable factors improved by 20 percent.

To sustain these improvements, the team implemented a Process Control System that calls for daily monitoring of the critical input variables and the key output (on-time percentage). A year later, the hospital has maintained the gains. In addition, the project was successfully replicated at two other BayCare hospitals.

Although hard financial returns were not tracked for these projects (considered to be "service" projects by BayCare), it is possible that the hospitals have reduced OR staff

overtime due to the increase in on-time first case starts. There is no question that BayCare has improved scheduling predictability, reduced patient wait time and moved one step closer to full OR utilization.

Perhaps one of the biggest benefits of Guler's initial project was the difference she observed in her team's opinion about the effectiveness of Six Sigma. At the end of the project, Guler says her team members were amazed at how taking the time to go through the structured DMAIC process allowed them to solve a problem that they had battled for years. They also realized that having a Black Belt lead them, regardless of the person's background, could bring them back to basics and help them identify issues and brainstorm solutions they might have otherwise overlooked.

"It was really rewarding to have them get on board with Six Sigma," says Guler. "Now they love it!" ■