Bringing Order to Orders at the

Nebraska Medical Center

by Jane-Ellen Robinet

Employees at the Nebraska Medical Center's cancer center often found themselves searching for what seemed to be their own medical Holy Grail: patients' physician orders. Individual orders would arrive in the cancer center through any one of 15 locations across the entire organization, or they could be faxed or phoned in. With so many possible entry paths, orders would sometimes arrive incomplete; then, they might be subsequently misplaced, inevitably landing in a catch-all drawer nicknamed the "black hole."

"In a nutshell, there were a lot of challenges with orders," recalls Jason Lebsack, manager of the Nebraska Medical Center's Six Sigma program. "The staff couldn't find them or they found them after the patients had arrived. They would have to create multiple copies of the orders and then try to find out which were the most current."

In fact, 29 percent of orders weren't available prior to patients' arrivals. Another significant concern was that orders were incorrect, incomplete, or illegible 59 percent of the time. To make matters worse, the confusion was beginning to jeopardize patient safety.

Understanding that they urgently needed to find a solution, the cancer center's leadership requested that the organization launch a Six Sigma project addressing order completeness and availability. The quality initiative was familiar territory to leaders at the Nebraska Medical Center, as the hospital had initiated a Six Sigma program in December 2002 (see sidebar "Six Sigma and Lean at the Nebraska Medical Center").

At a Glance . . .

- The Nebraska Medical Center launched a Six Sigma project to target problems with the completeness and availability of physician orders for patients.
- As a result of the project, the incidence of incomplete orders fell from 59 percent to 4 percent; the number of orders that were unavailable upon a patient's arrival dropped from 29 percent to 7 percent.
- The improvements occurred within a Six Sigma program deployed in 2002 that has returned about $7.5 million in savings for the medical center.

Cancer Center's Strategic Role

The Peggy D. Cowdery Patient Care Center (CPCC), a hospital-based treatment center, is part of the 690-bed Nebraska Medical Center. The CPCC provides primary treatment for cancer outpatients/inpatients and services for solid organ transplant. More than 260 doctors write orders for the 26-bed CPCC, which is open 24 hours a day, seven days a week, and serves more than 100 patients a day.

Because the Nebraska Medical Center's well-regarded reputation is derived, in part, from its cancer services, the CPCC is of great strategic importance to the organization. The CPCC is one of only 19 cancer centers in the country that comprise the National Comprehensive Cancer Network, and it is the only National Cancer Center in the region.

Problems with orders accounted for the primary source of frustration among CPCC staff. As orders were often misplaced, CPCC nurses had to take the uncomfortable step of verifying appointment details with patients. Lebsack says that while the medical center didn't conduct a formal survey of CPCC staff to rank their main concerns, the order chaos continually came up in nursing staff meetings as the top issue.

Moreover, patients began to complain about treatment delays. The confusion reached a peak in 2003 when CPCC staff reported 19 incidents, including two errors that caused temporary harm to the patient.

Lining Up the Troops

Citing three failed efforts to address the order-processing problem in the previous five years, the staff was not optimistic about the likelihood of success. Nevertheless, senior management resolved to confront the problem using Six Sigma and devoted the personnel and time to see the project through.

Two members of the hospital's senior leadership team co-sponsored the orders project: Theresa Franco, executive director of the Cancer Service Line, and Rita Van Fleet, chief nursing officer and vice president of Patient Care Services. Franco assigned four members of the CPCC staff to the project and conferred with leaders in the center's lab, pharmacy, and university to ensure buy-in and completion of the project.

Four of the eight team members did not work under the CPCC budget, yet they were given time to attend and actively participate in meetings on the project. In addition, senior leadership assigned a Six Sigma Black Belt and a Master Black Belt to the project. The entire team met weekly for at least two hours for the first eight months of the undertaking.

The team set an initial goal of reducing the number of incomplete orders to 10 percent from 59 percent, and the number of unavailable orders to 10 percent from 29 percent. Ultimately, the team hoped to eliminate those problems completely.

Chaos Comes Clean: The Solution

The Orders Project began in January 2004 and its final ongoing phase was initiated the following September. During that nine-month period, team members followed the traditional Six Sigma problem-solving method known as DMAIC (define, measure, analyze, improve, and control).

Define and Measure

Defining the orders problem certainly wasn't rocket science. The team easily highlighted several key problems around order entry and order storage, as follows:

Order entry:

- Physician orders arrived in the CPCC from multiple entry points
- All eight clerks in the treatment center entered orders
- The clerk responsible for entering future orders, situated in the middle of a hectic nursing station, also had to answer phones and run errands throughout the hospital

Six Sigma and Lean at the Nebraska Medical Center

Striving for quality improvement is more than just a part-time avocation at the Nebraska Medical Center. As illustrated by the scope of its Six Sigma program, continuous improvement is a goal that is infused throughout the organization, from the chief executive officer, Glenn Fosdick, on down:

Begun in December 2002, the Six Sigma program has:

- Deployed nine full-time employees
- Launched more than 40 quality projects, about 30 of which have reached the final control/monitoring stage
- Achieved savings, in both hard and soft dollars, of about $7.5 million

"They have a terrific team there," says Carolyn Pexton of GE Healthcare's Performance Solutions Group. The medical center "has a visionary leader in Glenn Fosdick and they've been able to sustain very impressive results across the organization," she adds.

Almost four years ago, Fosdick decided to commit the organization to quality initiatives and improvements by contracting with GE Healthcare for two years of training so it could make its Six Sigma quality improvement program self-sustaining. "One of his passions is quality improvement and while we had an existing quality improvement program, he wanted to take it to the next level," says Jason Lebsack, manager of the center's Six Sigma program and a Six Sigma Master Black Belt.

According to Pexton, GE Healthcare's Performance Solutions group has delivered more than 3,000 consulting engagements in healthcare organizations since 1998; so far about 250 to 300, or 10 percent, have opted for self-sufficiency in Six Sigma. As part of Nebraska Medical Center's training, GE Healthcare provided project-based education in Six Sigma, as well as the Lean, Change Acceleration Process (CAP), and Work-Out processes.

In addition to the project to streamline order tracking within the hospital's cancer center, some of the projects that the medical center has undertaken to date include making its billing process more patient-friendly, improving nursing staff scheduling, improving patient flow, and upgrading its pain-management process.

Projects are chosen and prioritized by the medical center's senior executive team, including Fosdick, the center's chief operating officer, the chief financial officer, and the chief medical officer. To be considered, a project must positively affect one of what Fosdick calls the medical center's quality improvement "goods" or goals:

- Improve clinical quality or service to patients and families
- Improve the medical center's operational effectiveness and efficiency
- Make jobs easier for the staff and physicians

"If we can, in a sustained and significant fashion, achieve any of those goods, he is happy," Lebsack says.

"We do set financial benefit goals on an annual basis for quality improvement projects. Our execs would be less than thrilled if that is our only focus, however. It's a part, and a significant part, but only a part of the reason why we do this work," he further explains.

Savings are measured in both hard and soft terms. Hard savings are those that increase the medical center's revenue and decrease its costs. Soft savings are those that eliminate unnecessary work, create capacity, and avoid expenses.

Pexton says Nebraska Medical Center's commitment to the Six Sigma quality process is significant for a hospital its size. For a 650-bed hospital, having a nine-person Six Sigma staff is "a little more than the norm but they're doing that because they see the benefits," she says.

Order storage:

- Filing cabinets for storing orders were located at least 100 feet from the entry clerk's desk
- Orders for patients with infrequent appointments were hastily placed in a drawer
- Since there were no clear filing guidelines, orders might accumulate in a filing cabinet, a drawer, at one of multiple order drop-off points, or in a nurse's chart

The Six Sigma team created a way to measure these specific problems to obtain baselines. This led to tracking how often orders were incomplete and how often they weren't available when a patient arrived. "Sometimes the measurement to get that baseline already exists. In our case, it did not, so we had to create the process to measure," Lebsack says.

Analyze

Team members used the "Lean" approach during the analysis phase, identifying and removing waste, as well as improving the flow of people and information. Lebsack says the approach revealed that no one specific factor, such as a certain day of the week or certain employees, caused the order problems: "Lean showed us that it was the systemic layout of the process" that caused the inadequacies.

Improve

Enter "Order Central," the physical solution to the persistent problems with order availability and completeness. Team members created the space for Order Central by relocating two billers who sat in an area between the check-in and check-out desks. A triage nurse and an Order Central clerk staffed the new operation.

Specific solutions implemented within Order Central included:

- All charts were relocated to filing cabinets within Order Central, and the catch-all drawer was no longer used
- Order delivery points were cut from 15 to three: one at check-out, a bin near Order Central for upcoming orders, and a bin above the Order Central clerk's desk for orders requiring immediate entry
- The Order Central clerk's phone was programmed to limit incoming calls
- In-services were held to increase awareness of incomplete orders
- Case managers, doctors, and midlevel practitioners were given summaries of their individual performance in assembling complete orders
- The order form itself was simplified for easier completion

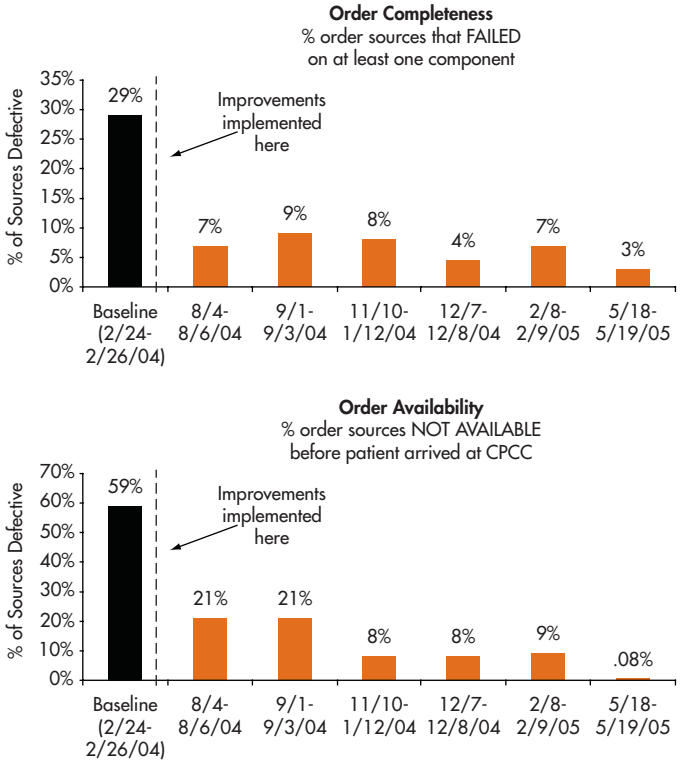
The new system was tested and refined, which led to its current status in the control phase.

With no formal budget for the project, sponsors agreed to secure funds necessary to implement solutions. The Order Central solution ultimately necessitated only a modest expenditure of resources, such as moving work stations and filing cabinets, as well as purchasing minimal filing supplies.

The Bottom Line

As Figure 1 shows, the Six Sigma project was incredibly successful in reaching its goals for improving order completeness and availability. The incidence of incomplete orders fell from 59 percent before the project began in February 2004 to 4 percent by September 2005. The number of orders unavailable before a patient arrived at the CPCC dropped from 29 percent to 7 percent in that 15-month time period.

Figure 1 *CPCC Orders Project Improvement/Control Data*



Sources: Baseline Study, 593 Sources; 8/4-8/6/04 Study, 272 Sources; 9/1-9/3/04 Study, 252 Sources; 11/10-11/12/04 Study, 283 Sources; 12/7-12/8/04 Study, 318 Sources; 2/8-2/9/05 Study, 268 Sources; 5/18-5/19/05 Study, 159 Sources

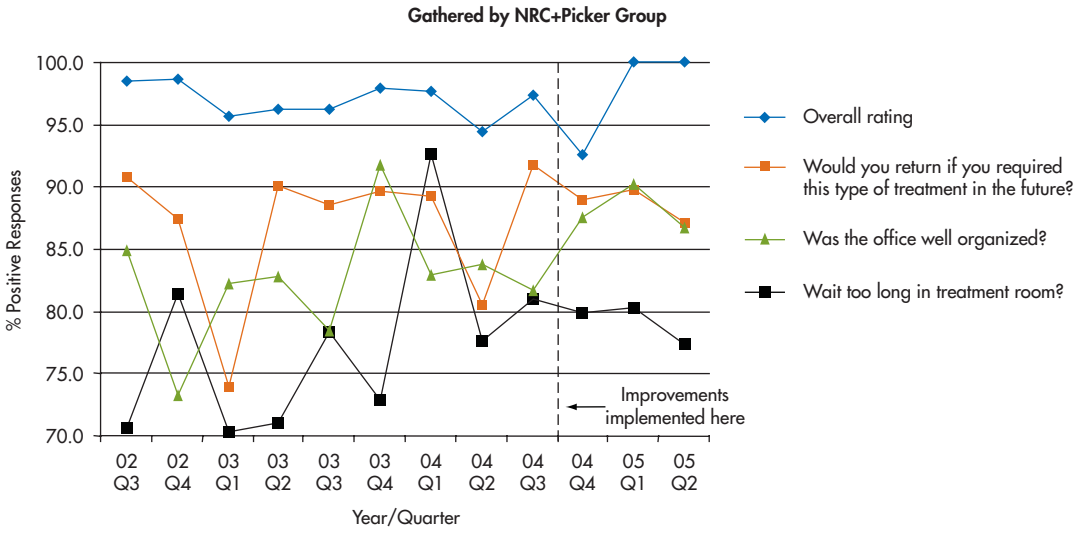
Additionally, the medical center has documented gains in overall patient satisfaction. Figure 2 charts responses to routine patient satisfaction surveys, revealing improvement in some areas after CPCC implemented changes through the Six Sigma project.

The Six Sigma Difference

While the CPCC order completeness and availability solution seemed simple in its final stages, Lebsack says it couldn't have been achieved without Six Sigma. The process "gets you focused on the few major things that are the problem, rather than on the 100 major or minor things that could be the issue. It helps isolate and prioritize," he explains.

Lebsack uses a funnel analogy to describe the crucial role played by Six Sigma and Lean: The DMAIC methodology and Lean

***Figure 2** CPCC Patient Satisfaction Data*



techniques take a plethora of information, toss it into the funnel, and then narrow it down so only a few concrete pieces of information remain. From there, it is the job of an organization's "subject experts" to find the solution. Lebsack notes that while the Six Sigma Black Belt guides the process, he or she does not come up with the ultimate solution.

"It takes a tremendous amount of discussion, consensus, and refinement of ideas. Then you don't just assume the idea will work. With Six Sigma, you test it for a defined period of time, sending it through trials, and only when it's been demonstrated that the idea is addressing those issues do you know it was the right idea," he says.

The CPCC is currently using Six Sigma and Lean in a project to improve patient flow and another to improve billing processes. Team members of the new project cite the CPCC order endeavor as a source of encouragement and hope.

For More Information

- To learn more about the Nebraska Medical Center, visit http://www.nebraskamed.com/.
- Access more case studies, how-to articles, and other information about using Six Sigma in healthcare by visiting http://www.asq.org/healthcaresixsigma/.

Article Contributors

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