



Harnessing Patient Flow Data To Transform Care Delivery at St. Luke's Episcopal Hospital

THE ORGANIZATION

St. Luke's Episcopal Hospital in Houston is an 850-bed teaching hospital with more than 30,000 admissions and 80,000 ER visits each year. Internationally recognized for its cardiovascular services, St. Luke's is one of six major hospitals in the Houston Medical Center, a one-square-mile area comprising the largest concentration of medical research and healthcare services in the world.

RESULTS

- Freed up OR capacity for 750 additional cases per year, while shuttering two rooms
- Increased utilization of the OR Block Schedule by 22%
- Reduced bed request to assignment time by 42%

In March 2011, St. Luke's began the Care Optimization Project, an initiative undertaken in collaboration with GE Healthcare to improve capacity management, better manage patient length of stay, and enhance staff satisfaction.

"In today's healthcare environment, caregivers are often burdened by operational inefficiencies. We're entering an era where capacity management is becoming one of the biggest challenges faced by hospitals and health systems—clinically, operationally, and financially," said Margaret M. Van Bree, DrPH, chief executive officer of the hospital and senior vice president of St. Luke's Episcopal Health System Corporation.

STRATEGIC PLANNING: Defining the goal, testing scenarios

Strategic planning was the first step in transforming hospital operations. In working sessions facilitated by capacity management experts from GE Healthcare Camden Group, Dr. Van Bree and the senior leadership team discussed growth plans in the context of changing marketplace demographics and the need for greater operational efficiency.

"Our plan was for modest growth—about 2% to 3%—with the goal of better utilizing our fixed infrastructure relative to patient flow in order to support that growth," says David M. King, MSHA, assistant vice president of the health system and project manager of the Care Optimization Project.

The St. Luke's-GE team developed multiple capacity scenarios that factored in growth objectives, utilization data, and demand projections as well as the goals of reducing bed assignment wait times and patient length of stay (LOS). These scenarios were tested and validated with GE's proprietary simulation modeling, which creates a risk-free virtual environment to determine how various changes—such as opening and closing capacity for operating rooms or redistributing daily discharge times or changing the bed mix—might affect staffing, workflow, and the operational cost structure.

The exercise took on added significance because the hospital is planning to replace its aging flagship facility. "Projecting true bed demand is a multi-million-dollar question for us," King says. "For a hospital in St. Luke's current environment, the cost difference between building a one-for-one replacement facility of 700-plus beds against an optimized chassis of 500-plus beds, for example, is over a hundred million dollars."



SURGICAL SCHEDULING: Reducing variation, enforcing good practices

St. Luke's has a large surgical department with 46 operating rooms and close to 500 surgeons. Because surgeries account for 40% of the admissions and are a major driver of capacity issues on the inpatient units, the OR was the first care area targeted for capacity management improvement.

With the help of the GE team, St. Luke's uncovered data showing that elective surgery schedules were six times more variable than the ED with respect to patient volume. "It seemed counterintuitive," King says. "The one area where we have complete control, in our elective surgical schedule, was more variable than our emergency department, a pathway where we conceivably have no control over volume."

This variation was driven in large part by surgical scheduling practices that had evolved over time and no longer reflected actual utilization. "We didn't have good numbers on our volume and we didn't have a strong process to assess the way that we were handling the block time," says Kristen Turner, RN, MBA, vice president of surgical services at St. Luke's.

In analyzing utilization data pulled from the hospital's surgery information system, the GE team discovered that more than 90% of the time in the main and outpatient OR rooms was blocked but only 60% of that reserved time was utilized. The solution was to develop a more realistic surgical schedule and support it with strong governance policies and procedures. This involved:

- Creating a standing OR block committee of representatives from administration, anesthesia, nursing, and surgery that meets regularly to monitor scheduling and utilization issues.
- Surveying physicians on their preferences to construct a surgical schedule that fit their personal practice patterns while maximizing capacity. "GE helped us create a block schedule that allocated time more equitably across the week so we didn't have huge spikes in patient volume one day and nothing the next," Turner says.
- Defining key metrics and creating an algorithm to arrive at a "utilization score" that could be applied to each surgeon.
- Developing rules and policies on such issues as releasing block time, acquiring more block time, and pulling block time from surgeons who weren't using it.
- Monitoring utilization patterns. "GE built a dashboard that made it very easy to access usage data," Turner says. "We look at the data, by physician, to determine: Who's using their block? What percentage is being used? Is it trending up or down? Are they releasing the room early so we can make it available to other surgeons?" If block time is not being used on a consistent basis over a period of three months, the block time is adjusted.
- Converting a fully staffed OR into a flex room to accommodate urgent and add-on cases. This change has improved physician and patient satisfaction with speed of care, Turner says, and allows more efficient personnel utilization.

"Managers are being more thoughtful in allocating OR resources. And physicians are becoming more responsible in using the time they have been given. As a result, utilization is improving," Turner says.

"GE brought sound business practices, operational tools, and processes that enabled us to be more objective and data-driven, and instill greater accountability among all parties in the OR."

Kristen Turner, RN, MBA

Vice President of Surgical Services
St. Luke's Episcopal Hospital
Houston, TX

PATIENT FLOW: Using technology to expedite care delivery

The Care Optimization Project also addressed overall patient flow within St. Luke's. A team met with representatives from nursing, transportation, environmental services, and patient access services to define the current state of their workflows and opportunities for improvement.

Based on that information, the hospital worked with GE to deploy AgileTrac* operational software to track staff, patients, and equipment so that process flow information is available in real time to improve capacity management. "We didn't just bolt modules onto a framework," King says. "We put together an intelligent, customized system with interrelated functionality." That functionality encompasses:

Bed Management—"We wanted to create a smart system that reduces variation in how patients get placed," King says. AgileTrac Bed Manager automates all key bed management processes, including discharge scheduling and tracking, bed request tracking and management, and transport and environmental services (EVS) requests. "It's not a bed board," King says. "It's an entirely integrated patient placement system, starting from the way you register a patient to how they are discharged and their room is cleaned for the next patient."

EVS Management—Integrating EVS into patient flow was new for the hospital, King says. Once the patient is discharged, EVS is automatically notified through AgileTrac that the room needs cleaning. This replaces the manual and often fallible process of relying on someone from the unit calling EVS. EVS personnel communicate with AgileTrac via an interactive voice response system. AgileTrac continuously posts the status of each room so that the patient placement department can project availability.

Transport Management—St. Luke's has about 40 FTEs in Transport who are available 24/7/365 to move patients to various care locations and, ultimately, out the door at discharge. The AgileTrac Transport application automatically notifies Transport Management when services are needed and tracks Transport personnel throughout the facility. Managers can see the real-time location of all transporters and assign them as needed "on the fly" to pick up a patient. "This has been a tremendous success story," says Elizabeth Jones, RN, CNOR, MBA, vice president of professional services. "We are doing almost three times as many transports with the same number of people and completing assignments faster." Before the Transport Management system was installed, nurses called for Discharge Transport only about 20% of the time because of the long wait time. Nurses were off the floor for about 30 minutes per discharged patient. Now, Transport arrives quickly and Jones says that requests from nursing have risen to the 80% to 90% range.

St. Luke's also wired the hospital for radiofrequency and infrared identification to provide real-time visibility into the location of patient and mobile medical devices. More than 4,000 devices were tagged, King says. "The most important, by far, were the infusion pumps," he says. "Nurses were spending upwards of three hours a day looking for pumps." The tagged pumps can now be tracked by AgileTrac. The hospital also instituted forward-stocking "mini-marts" to ensure that nurses could quickly access clean pumps. As a result, pump utilization improved and the hospital was able to reduce the number of new devices it had planned to order, resulting in \$1.2 million in cost avoidance.

"Having one integrated information system that ties bed placement to environmental services, to transportation, and to case managers, social workers, and unit secretaries enables us to put resources where they are maximally effective."

David M. King, MSHA

Assistant Vice President of the Health System
and Project Manager of the Care Optimization
Project
St. Luke's Episcopal Hospital
Houston, TX

EXPEDITING DISCHARGES: Becoming more proactive and aggressive

Reducing patient LOS was a core goal of the Care Optimization Project. In looking at admit-discharge-transfer data, St. Luke's discovered that discharges did not outpace admissions until 5 p.m. on most days. "Basically, we were backlogging ourselves until late afternoon each day," King says. To address this issue, a Care Optimization team:

- Consulted with case managers, nurse managers, social workers, physicians, and others to define the activities needed—beginning with the patient's arrival at the hospital—to ensure a timely discharge that would result in the proper level of care at home or an alternate site. "We want to be more aggressive in planning for an effective discharge—to accelerate activities sooner in the care process to create an optimal flow," King says.
- Initiated multi-disciplinary discharge rounds to engage all caregivers—as well as the patient—in the discharge process. "Discharge planning is something every hospital struggles with, especially big, complex institutions with lots of consulting physicians and house staff. It requires incredible coordination and teamwork," King says.

RESULTS: Quantifiable improvements in capacity utilization

Approximately 20 months into their operational transformation efforts, St. Luke's Episcopal Hospital has made significant progress toward their goals:

OR Capacity

- Freed up OR capacity for 750 additional cases per year, while shuttering two rooms
- Increased utilization of the OR Block Schedule by 22%
- Created an urgent/emergent room to reduce variation caused by urgent cases bumping elective cases and reduced the number of cases starting after 3 p.m. from 59% to 28%, thereby increasing patient, staff, and physician satisfaction

Patient Flow

- Reduced average LOS by 0.35 days
- Reduced bed request to assignment time by 42%
- Achieved an 85% increase in pre-11 a.m. discharges, reducing bed assignment backlogs
- Removed 45 minutes of slack time in room turnover due to earlier EVS notification

By engaging new information tools and using data differently, St. Luke's is now managing capacity in ways that will keep their organization moving forward no matter what challenges lie ahead. "The hospital is a complex organism. We can now draw data from multiple information sources and make nonlinear references between seemingly disparate areas of the organization to better manage capacity today and in the future," says Karen K. Myers, MSN, RN, NEA-BC, vice president and chief nursing officer of St. Luke's Episcopal Hospital.

