Saint Luke's Health System

Case Study

Saint Luke's

Saint Luke's Health System is a faith-based, not-for-profit health system based in the Kansas City region, with 16 hospitals and campuses, dozens of physician practices, home care and hospice, behavioral health care, and more.

Background:

- 16 hospitals
- Kansas City, MO
- $1.6B net patient revenue

Challenges:

- Achieve systemness
- Optimize flow across facilities
- Predict bottlenecks in advance
- Reduce queuing and backlogs
- Accelerate discharges
- Reduce LOS
- Automate manual discharge processes
- Optimize elective surgeries during Covid

Qventus Solutions:

- Inpatient
- Command Center
- Covid-19

The Challenge: Achieving Systemness and Accelerating Throughput

Two hospitals within the system, Saint Luke's Hospital of Kansas City and Saint Luke's East Hospital, are particularly high-volume, high-demand facilities. They consistently have a waiting list for inpatient beds, while other hospitals in the system typically have a lower census and the capacity to handle more patients. As a result, they wanted to develop a more structured and organized approach to achieve "systemness."

According to Debe Gash, Senior Vice President and Chief Digital Officer, Saint Luke's Health System, "We were looking to evolve to a command center that can help manage throughput across the system. We currently have a solid systems infrastructure based on our EHR, which gives us a real-time perspective on what's happening right now. However, it doesn't predict what's coming, so we wanted to complement the EHR with predictive capabilities."

"We wanted to be able to recommend to surgery, ED, and other units that they should take specific actions now — including working with our transfer center to load balance across facilities — to keep from running out of capacity in a few hours," said Gash.

Another goal was to address throughput challenges within their busiest facilities. According to Dr. Anthony Fangman, Division Chair of Hospital Medicine, Saint Luke's Health System, "We are known for providing high-quality care, which is reflected in our performance on quality metrics such as infection rates and readmission rates. As a result, we're in high demand for patients transferring into the Saint Luke's System."

While their length of stay metrics were better than industry benchmarks, they still experienced queuing in the ED, PACU backlogs, and other delays. They needed to find ways to discharge patients earlier and further decrease length of stay. In particular, they were looking for ways to reduce their reliance on manual processes, identify barriers to discharge earlier in a patient's stay, and better prioritize the sequencing of patient care.

"The EHR provides information on geometric mean LOS for patients based on their diagnoses, but doesn't tell you where to focus to resolve barriers to discharge. You get a list of patients, each of which has a long list of open items, and it's a highly manual process to chase everything down via phone calls and messages. We were looking for a way to proactively surface the key barriers to discharge for each patient, and to standardize — even hardwire — the discharge planning process across units," said Debe Gash.

The Solution: Automated Operations for Healthcare

To address these challenges, as part of their digital health strategy Saint Luke's embarked upon a hospital capacity management and throughput initiative. As they evaluated options, they decided to expand their partnership with Qventus, a software company they had originally engaged with to plan and optimize critical resource utilization during the Covid-19 pandemic (see sidebar at end: Accurate, AI-Based Modeling for Covid-19).

Qventus provides a system for automating hospital operations. At its core is a technology platform that integrates with EHRs and applies artificial intelligence (AI), machine learning (ML), and behavioral science to identify and predict operational issues, orchestrate actions among frontline teams and ancillaries, and manage accountability to drive continuous improvement. On top of the platform the company delivers solutions — predefined software and best-practice processes — that address key operational challenges within inpatient, ED, perioperative, and system operations settings. It also offers Covid-19 planning tools.

For their capacity and throughput needs, Saint Luke's selected the Qventus Inpatient and Command Center Solutions.

The Qventus Inpatient Solution streamlines and standardizes the discharge planning process. It processes millions of data points in real-time and uses AI to predict the expected date of discharge, disposition, and barriers to discharge days in advance of the actual discharge date. It applies ML to prioritize orders for ancillaries and enables care teams to collaborate in real time. And finally, it uses statistical engines to monitor processes and automatically escalate issues for real time intervention as necessary.

The Qventus Command Center Solution provides real-time situational awareness across the system and facilities. Using AI and ML, the solution automatically surfaces patient flow and resource utilization issues. It then engages frontline teams and helps them proactively resolve bottlenecks through the identification of available capacity, balancing of patient loads, and management of centralized resources. It hardwires escalation pathways and standardizes processes to optimize resource usage across the system.

Benefits of Real-Time Operations

The Qventus platform and solutions are delivering numerous operational benefits to Saint Luke's, including:

- **Reduced variability.** The Qventus platform enables Saint Luke's to standardize their discharge management processes, ensuring consistency across units and facilities.

  "We're a big system with a lot of autonomous teams. We have really good processes on the front end, when patients are admitted, but there's a lot more variability in the 24 - 48 hours prior to discharge," said Denise Mogg, Director of Patient Care Services at Saint Luke's Health System.

  "With Qventus, we're able to layer in modern technology and performance improvement best practices on top of our existing processes, reduce variability, and take things to the next level."

- **Decreased length of stay.** Qventus enables Saint Luke's to identify barriers to discharge much earlier in a patient's stay, so care teams can more quickly resolve the barriers and reduce length of stay.

  "We like the way Qventus complements the EHR for discharge planning. Qventus uses AI to sort through all of the data in real-time and highlight the key barriers to discharge on a patient by patient basis," said Dr. Fangman. "This information is visible to the entire care team, so everyone is on the same page. What's more, the system shares prioritized patient lists with ancillaries, and communicates messages directly to the people who can have the most impact, which significantly accelerates throughput."

- **Reduced "noise."** By predicting barriers to discharge, prioritizing patient lists, and hardwiring workflows, Qventus reduces the overall volume of messages, decreases interruptions, and lowers the cognitive burden on teams.

  "Because it prioritizes work intelligently, Qventus makes physicians more efficient in seeing patients," said Dr. Fangman. "And just as importantly, at the end of the day we can have greater confidence that things were done correctly."

  "Qventus helps give clinical experts the information they need to do their jobs," added Denise Mogg. "Instead of spending hours looking at every chart to understand how to manage the patient load, the system 'nudges' us in the right direction, telling us where to focus and setting priorities for ancillary teams in PT, OT, and radiology."

- **Improved data-based decisions.** Additionally, Saint Luke's will benefit from the ability to close the loop and analyze the operational data over time, supporting continuous improvement.

  According to Dr. Fangman, "As physicians, we're very interested in learning from the underlying data. Not just what are the top barriers by day by facility, but opportunities that are a level deeper, like lab draws that don't consistently come back on time that could prevent patients from being discharged by noon versus 4pm."

  "When you can focus on the data for workflows and outcomes you can remove the emotional and personal elements from conversations," said Mogg. "Instead of people worrying about being blamed, everyone is focused on the data and driving improvements to the processes. Things are factual. And everyone shares in the wins."

- **Better patient experience.** Improved operations — including reduced variability, faster throughput, and better data — all help Saint Luke's provide a better patient experience.

  "All patients want to know when they will be going home. And they all want to be able to leave when they're clinically ready," said Dr. Fangman. "By providing physicians with more complete information for answering patients' questions, and by eliminating unnecessary operational delays, we'll be able to positively impact that patient experience."

- **Higher margins.** As they improve operations and alleviate capacity constraints, Saint Luke's projects a significant financial return from their investment in Qventus, in the range of tens of millions of dollars per year.

"In the current environment, with short-term financial pressures from Covid and long-term pressures from falling reimbursements, we are looking to work smarter — to take out costs by removing friction and inefficiencies," said Debe Gash. "As we improve operations with Qventus, we'll be more profitable, and the organization will be more sustainable and better able to serve patients over the longer term."

Accurate, AI-Based Modeling for Covid-19

As the coronavirus began to spread, the Saint Luke's leadership team initiated their emergency preparedness plan and began supplementing it with Covid-specific data from the public domain. They quickly found that most resources focused on national- or regional-level trends and did not predict impact at a local level, which limited their ability to plan.

During their review of external resources they found the Qventus Covid-19 model and scenario planner. This solution, which uses 450 AI-based local epidemiological models, predicts Covid demand and impact to critical resources, such as ICU and med surg beds, ventilators, staff, and PPE, at a local hospital level. It also provides the ability to model what-if scenarios for different epidemiological parameters, social distancing policies, and more.

"We started using the Qventus model in our incident command center and quickly found that it was far more accurate than other models, which allowed us to do better planning," said Debe Gash. "This was especially relevant when our region 're-opened' in June and we started to see another increase in Covid patients. Prior to using the Qventus model, we would have stopped performing elective procedures, but because the model predicted we would still have capacity, we did not reduce electives. And the model was correct. In July we experienced our highest level of Covid patients to-date, but were able to safely handle that volume in parallel with our non-Covid patients."