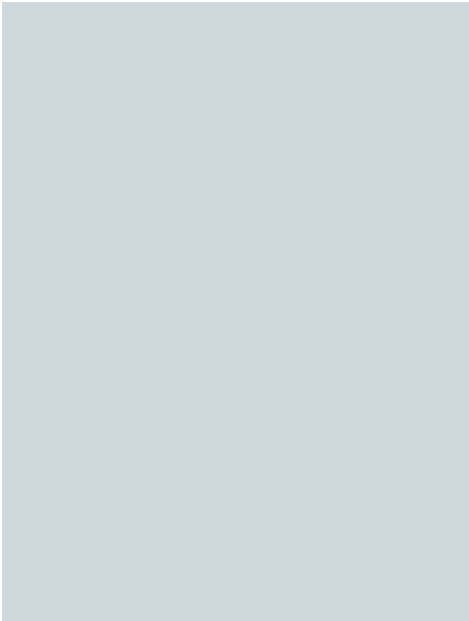


Siemens Patient Identification Check as a Process Improvement Enabler

Customer Case Study: Jackson-Madison County General Hospital

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Specimen Collection Accuracy and Efficiency

At Jackson-Madison County General Hospital in Jackson, Tennessee, a combination of strategic thinking, farsighted management planning, and advanced information technology is making specimen collection accuracy and clinician efficiency an integral part of the Medical Center Laboratory process.

Medical Center Lab is an early adopter of the Lean process management methodology for improving efficiency and minimizing waste at this 612-bed hospital. It embarked on a fundamental and far-reaching program to re-engineer all of its laboratory processes. The effort was literally from the ground up: the hospital built a new lab designed around Lean principles, setting the groundwork for redesigned workflows geared toward achieving maximum patient safety and process efficiency.

“The imperative that drove us to take this approach was patient safety,” says Jamie Boone, Manager of Laboratory Services at Medical Center Lab. “By standardizing processes, you remove waste, streamline workflow, and reduce opportunities for error.”

Medical Center Lab was responding to the need to satisfy one of the requirements of one of the Joint Commission’s National Patient Safety Goals: “To improve the accuracy of patient identification through the use of at least two patient identifiers whenever administering medications or blood products, taking blood samples and other specimens for clinical testing, or providing any other treatments or procedures. Use two identifiers to label sample collection containers in the presence of the patient.”

Whereas phlebotomy workflow before the implementation of Lean principles at Jackson-Madison was reasonably effective, the lack of a deliberate, top-down approach to defining practices left opportunities for waste and, potentially, clinical error.

“We perform about 20,000 venipunctures per month,” says Boone. “It was like an air traffic control situation. With our old system, it could take three hours to get the morning pickup organized. There were a lot of logistical issues to manage.”

Standardizing Processes

Standardizing the phlebotomy practice addressed an array of factors. The first target was the lack of a standardized format for phlebotomists' trays. This meant that each phlebotomist would organize specimen vials in an idiosyncratic way. Standardizing the trays yielded a number of improvements to the workflow. Further, the hospital's pneumatic tube system used to transport specimen vials from patient floors to the lab wasn't used to its greatest potential.

The most noticeable opportunity for workflow improvement, however, was the method by which phlebotomists were dispatched to floors, where they collected specimens in batches and walked vials back to the lab.

"When a physician entered an order, you had to wait for a unit record specialist or nurse to put the order into the system and then wait for the laboratory dispatch supervisor to pull the label out of the system to initiate the collection," Boone says.

At the beginning of a work shift, each phlebotomist would gather a collection of specimen labels at the lab and then leave for a hospital floor. He or she then went from room to room, intermittently stopping to respond to pages for add-on tests or be sent to a floor to collect a "stat" — an unplanned, immediately needed order issued by a physician — with a label sent via the tube system. "We were doing batch collections," says Boone. "You'd go up to a floor, get some 15 to 30 specimens, and return the samples to the lab. This would occur throughout the day, with a large collection of samples in the early morning pickup.

Only when phlebotomists had completed several orders and had a batch of specimens would they return with the samples to the lab for processing. Stat samples were sent via pneumatic tube to the lab.



"The first process we changed after standardizing our collection trays was the initiation of single-piece flow collection of one patient sample followed by sending that sample to the lab via the pneumatic tube station," Boone says. "We allowed some batch tube transactions during high-volume morning pickup. This resulted in a great reduction in the time taken between the collection of samples to receipt of samples in the lab. It also level loaded the work coming to the processors."

A year into the effort, the lab relocated to a remote site connected to the hospital by tunnel and pneumatic tube.

Here's what Medical Center Lab at Jackson-Madison County General Hospital achieved through strategic redesign of lab processes, enabled with Siemens Patient Identification Check technology:

- Zero specimen collection errors to date
- Overall time spent on collection reduced by 36%
- Collection turnaround time reduced by 75%

At Jackson-Madison County General Hospital, Siemens Patient Identification Check plays a key role in enabling a strategic Lean process management initiative by introducing the following workflow improvements:

- **Positive identification of the collector, the patient, and the specimen with barcode accuracy**
- **Immediate communication of what tests have been ordered, for what patient, and when to both lab personnel and phlebotomists**
- **Printing of barcoded specimen labels at the point of collection in the presence of the patient**
- **Delivery of detailed management reports to support decision making on phlebotomy productivity, process quality, and materials management**

Where Improvements Were Needed

“Our workload was more manageable when the lab was in the middle of the hospital,” Boone says. “A phlebotomist could come down from a floor to the lab fairly easily. But we became more of a remote operation when the lab relocated. Then we had a more pressing problem with resource productivity. We started having trouble getting everything collected on time.”

There was a lot of wasted time handling and tubing labels for collections. When collections were late or missed, Boone and her staff perform a risk management analysis.

“I would have six to eight risk management reports every morning,” she says.

Further, avoidable delays persisted, as phlebotomists continued to need to bring pre-printed batches of labels from the lab, locate the right one at bedside, and then label tubes after collection. It was time-consuming for phlebotomists and delayed processing of results on which clinicians and patients depended.

Finally, as long as the process still allowed for specimens to be collected in the wrong container, redraws were sometimes needed – having an obvious impact on patient satisfaction and collection turnaround times.

Improvements to the process were limited in large part by the collection capabilities of the laboratory information system. “The system showed only how many orders there were for each collection time,” Boone says, “but not for what test. To get detail, you’d have to print the label — at 6 cents per label — or print an outstanding list.”

To address these remaining patient safety and process efficiency issues, the hospital began looking for advanced patient identification technology. It had specific selection criteria:

- The ability to track specimen collections with the existing laboratory information system
- Wireless client-side computers, enabling phlebotomists to receive communications and update order information anywhere, at anytime
- The ability to read barcoded patient identification information from the patient’s wristband, the clinician collecting the sample, and the vial in which the sample is captured

The New Process – 70% Improvement in Turnaround Time

The technology sourcing process culminated with the selection of Siemens Patient Identification Check, which included the critical components needed: wireless handheld client devices for clinicians, barcode scanning, and the capability to print barcoded labels at bedside.

Enabled by these technologies, the hospital was able to follow through with its vision for improved process management as defined by the Lean methodology.

Today, instead of starting the day with an armful of labels printed at the lab, phlebotomists each have an individual printer that comes with a standardized collection cart.

Phlebotomists can act on an order immediately when notified via their Patient Identification Check handheld computer client, taking a patient sample and then immediately sending it via the pneumatic tube delivery system to the lab.

The result is a 70% improvement, from an average of 21 minutes to 6.5, to complete a full cycle of collection and delivery of patient samples.

In turn, the hospital is now able to capitalize on that faster collection cycle, achieving a 32% improvement in the time it takes to receive a result – from an average time of about 1 hour to 40.5 minutes.

What the hospital values above the productivity improvements yielded by the system is the role it plays in protecting patient safety.

“By handling one collection at a time with bedside printing of the label, there is less error,” Boone says.

Barcoding provides the high level of accuracy needed to confirm that the right kind of test is taken from the right patient. At bedside, the phlebotomist scans the barcode on his or her badge and on the patient’s wristband, and then prints a label, in front of the patient, for the sample immediately after the sample is taken. The label includes the name of the phlebotomist, the patient’s name, the date and time of the collection, the container type, and the test ordered.

Perhaps the most significant benefit of the new system is revealed when the Joint Commission and College of American Pathology (CAP) audits practices at the hospital that involve patient safety.

“When the Joint Commission and CAP come in, they know that we have this new system,” Boone says. “It makes the reviewing process a lot smoother because it validates what they’re trying to enforce.”

The hospital’s readiness for such visits is a result of constant process improvement, enabled by reporting capabilities provided by the system, which provides a window to day-to-day operations. “Even from my desk, I can see what’s going on,” says Boone.

“The data is there so you can mine it. The system comes with standard queries that you can customize. So you can track processes performed by each phlebotomist – dates, times, when collections were made. It gives us specifics we need to do production studies. For example, you can get detail on the name of the patient and other specifics in the case of a near-miss.” That reporting capability gives managers better information for supporting long-term strategic objectives.





Handling the Unexpected

The advantages of the redesigned workflow are highlighted when phlebotomists need to respond to stat orders for an immediate specimen collection. These orders are typically urgent, and the need for speed, efficiency, flexibility, and accuracy is pronounced.

“When stat orders were made, the dispatcher would have to beep the phlebotomist and pull a label to tube up to the phlebotomist. The phlebotomist had to respond to the beeper, interrupt what she was doing, go find a phone, and get the new label,” Boone says.

Once it implemented Siemens Patient Identification Check, the hospital was able to provide both the dispatcher in the lab and each phlebotomist with the ability to monitor stat orders immediately, as they happen.

Phlebotomists can get order information wherever they are, at any time in the work day via their mobile computing devices, so they can act on a dispatcher’s text message in the beeper and locate the patient and the patient’s room moments after the physician’s stat order is given. Many times they see the order at the same time the dispatcher sees it.

Labels are now printed at bedside in the presence of the patient, eliminating delays that were once imposed by the need to get labels printed by the laboratory information system, sorted, placed in bins, selected, and retrieved.



A Boost to Clinician Job Satisfaction

Phlebotomists are often the unsung heroes of patient safety in the hospital. Few processes can be as labor intensive and, at the same time, critical to the accurate and effective diagnosis of disease.

"Phlebotomists are the unseen workers at a hospital – the ambassadors to the lab," Boone says.

Whereas the hospital used to address its mounting specimen collection workload by adding resources, Siemens Patient Identification Check System has allowed the hospital to limit the number of full-time employees devoted to specimen collection. At the same time, it has helped to improve employee satisfaction and a sense of pride among phlebotomists.

"You develop super users and help them grow professionally," Boone says. "Now phlebotomists are helping nurses learn how to use the system."

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