

Lean and Patient Safety

Blood Patient Safety Initiative

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Goals

- Define Roles and Responsibilities for all team members
- Improve patient safety and quality of care through process standardization
- Reduce blood waste by increasing awareness of time and temperature limitations associated with blood in iced coolers
- Reduce Platelet waste by increasing awareness of platelet units in coolers with blood units
- Create a culture of continuous improvement
- Instill discipline through accountability



In late 2006, St. Luke's Episcopal Hospital (SLEH) in Houston, Texas, began a five-year initiative to institute Lean process improvements across more than 100 different departments. The most distinctive project undertaken during the early months of SLEH's Lean campaign didn't address the normal efficiency and cost opportunities arising from the world-famous Toyota Production System that SLEH hoped to emulate. The Lean-improvement project associated with the transport of blood between the hospital's Transfusion Medicine Laboratory (TML), cardiovascular operating rooms (CVORs) and CV recovery room was focused exclusively on patient safety.

"I think this is important," says Mike Reno, SLEH's Vice President of Operations, "because we want to show that we've taken Lean and applied it to a specific patient safety and quality project. It hasn't just been circumstantial that we have had an impact on patient safety and quality. It was the intention right from the start."

To learn how to utilize Lean to upgrade its blood-transport safety, SLEH turned to RWD—long-time experts in Lean methodologies. A team of SLEH managers, nurses, an anesthesiologist, and RWD personnel was created to identify the Lean solutions that would work and to implement them. The Blood Cooler Transport Initiative was the result.

Opportunities

- Lack of defined roles and responsibilities prevent accountability of team members through-out Blood Cooler Transportation Process
- Approximately \$113,000 scrap cost per year due to platelets in coolers and time limits to ensure blood temperature doesn't exceed acceptable levels
- One recorded Sentinel Event in 2006 due to wrong blood transfused to patient
- Five JCAHO recordables in last 12 months (blood not with patient/ wrong blood with patient)



Blood transport “a little bit loose”

SLEH is part of the St. Luke's Episcopal Health System. It's an acute-care teaching hospital in the Texas Medical Center and the primary adult teaching hospital for Baylor College of Medicine. It has 627 beds in service, a medical staff of 624, and nearly four thousand employees. Its annual revenues total \$1.5 billion. The hospital is also home to The Texas Heart[®] Institute, founded by the celebrated heart surgeon Dr. Denton A. Cooley.

Because of the nature of cardiovascular surgery, patients being operated on often need blood transfusions. At SLEH, the units of blood for a given CV patient are placed on ice in coolers and made available in the CVOR. The blood units have a “life” of eight hours before unused units have to be returned to the TML or have the ice refreshed. At SLEH coolers were passing through a number of hands between the TML and the CV recovery room.

“The transport of blood, when it left the transfusion laboratory and got to the patient, was a little bit loose, in terms of people coming up and picking up blood,” says Mark LaRocco, Ph. D, Assistant Vice President and Team Leader of the initiative. “There didn't seem to be a good process for that, and I thought this was amenable to a Lean project. That's really how things got started.”

“We needed to make sure that the correct blood was getting to the correct [OR] for the correct patient every time,” recalls Rhonda Gordon, Director of the CVORs. “We also had issues with blood being transported with the patient post-operatively to the intensive care unit. We needed to make sure all products are getting there. So it was a huge patient safety issue.”

RWD Senior Lean Consultant Greg Laurenz examined the “current state” of blood transport for the CVORs and found certain deficiencies. From that he devised a “value stream map” that revealed opportunities for improvement.

“We had points in the transport system where, basically, the blood itself was lost track of,” he says. “There were points where nobody had recognition of the blood—where it was, who was responsible for it. What we also saw there was a lack of a system, as far as metrics and controls for recording this information. There were incidents of wasted platelets, wasted blood.”

More accountability

The major opportunity for process-improvement came with the recognition that the old documentation attached to a cooler was

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inadequate—the patient’s information, return time and who issued the blood from the TML. Nothing more was recorded for the duration of the cooler’s round-trip journey from the TML to CVOR and back. Standardization and training were needed, to assure consistent, repeatable results.

“So we modified that to have a tracking method, so that every time there was a hand-off of the cooler, there would be a ‘from’ for the person who was giving it to someone else, to the ‘to,’ the recipient of that,” says Carol Schmoll, Administrative Director of Pathology. Each deliverer and recipient in the transport chain now has to initial and write his or her badge number on the new documentation attached to the coolers. At certain points along the way, the coolers’ contents are checked, to make sure they contain what the label specifies. Now—with more accountability from employees who transport blood and an auditable paper trail—there’s far less chance of coolers ending up where they shouldn’t be.

“I think its created communication amongst [staff who transport blood],” says LaRocco. “It’s sort of like [a chain of custody]; in that folks are most attentive in making sure the blood gets to its appropriate destination. We’ve been focused on medication safety for quite some time. I think we need to treat blood in the same way that we treat medications.”

Another important improvement came with the elimination of one of the blood coolers’ stops on the way to the CVOR. Just prior to arriving in the operating rooms, patients and coolers were kept in a pre-operative holding area. Such a layover for the coolers had no functional value and only provided an extra chance for errors to occur. Now coolers bypass the holding area altogether and go directly to the CVOR.

“We didn’t feel comfortable with that many patients being there and then the blood being there,” says Kristi Custard, Assistant Nurse Manager of the CV Recovery Room. “So we all brainstormed together and asked: ‘Why are we even dropping the blood off at holding?’ There’s one more person to hand-off to, to pay attention to the cooler.

“[Lean] allows you to ask the question ‘why?’ I truly believe that one of the biggest benefits is that you ask ‘why?’ frequently. It allows you to cut out processes that really aren’t necessary, once you start thinking about it.”

In the CVOR itself, a simple piece of visual management helped to secure the coolers where they’re needed most. Formerly, they were positioned randomly in the OR—set down in no particular spot. Now, a colored-tape footprint on the floor marks the spot where the cooler has to be placed.

“When you’ve got that visual management,” LaRocco

Various Lean methodologies were employed during the initiative, including:

- Standardization
- Job instruction training
- Metrics for tracking waste
- Visual management
- 5S
- Kaizen (continuous improvement)



Summary

- Core Team performed a process walk-thru to investigate the current state and process specific information
- Current State Map developed, highlighting the various process, people, and information flows within the area
- Performed a gap analysis of current situation and the desired state, within a specific timeframe
- Began work on the development of the Future State Map highlighting Kaizens (improvements), along with a “Master Schedule” to implement project timing and Roles and Responsibilities of the needed process changes
- Lean Overview Training was conducted for Core Team personnel (JIT, PPS, Standardized Work, 5S/Visual Management)

observes, “people just recognize that the cooler ought to be there. If it’s not, then something’s amiss.”

Wayward coolers had been an issue, requiring TML staff to waste precious time on phone calls and tracking expeditions. That problem has been dealt with, now that coolers are meticulously accounted for.

Immediate patient safety improvement

As of early May, 2007, the Blood Cooler Transport Initiative achieved several important metrics:

- 97 percent reduction in late coolers
- 100 percent reduction of platelet scrap due to being in coolers
- 100 percent reduction of blood wastage from late coolers
- 97 percent reduction of calls from TML inquiring after late coolers

But the most important achievement was the 100 percent reduction in occurrences of recordables (close-calls) and sentinel events (serious or fatal errors). The initiative is indeed achieving the primary goal of the improved patient safety that SLEH had aimed for in the first place. In fact, SLEH intends to place its Blood Cooler Transport Initiative in competition for a John M. Eisenberg Award for Patient Safety and Quality—hoping to make it a widely-known test case for Lean’s capabilities in the realm of patient safety.

“[Lean] is a consistent way to immediately improve patient safety,” concludes Rhonda Gordon. “It’s the same way every time in every room. The process is consistent. You’re mentally more at ease because you know you have a process in place that can assure that you’ve got patient safety as your primary goal.”