Lean ED & Lab Workflow Redesign – Hemolysis

The Problem

A symptom of congested workflow in the Emergency Department is hemolysis in blood samples, a defect in blood specimen quality that can falsely impact test results. The baseline rate of hemolysis for all lab specimens drawn in the ED was 23.2%, approximately five times higher than that of the West Campus inpatient units (3.9%). Hemolyzed blood samples require redrawing and re-testing of the specimen, which results in an average increase of the patients' length of stay by 56 minutes. As timely turn around of specimens and accurate results are of great importance, this problem presented a chance to examine methodology and current workflow to improve patient care. A multidisciplinary team was brought together to identify opportunities and implement improvements.

Hemolyzed Normal

Aim/Goal

- Reduce the rate of hemolysis for ED specimens
- Improve quality through better specimen integrity
- Create standard work flow and methods for blood draws in the ED
- Build teamwork and communication between departments with a focus on patient care

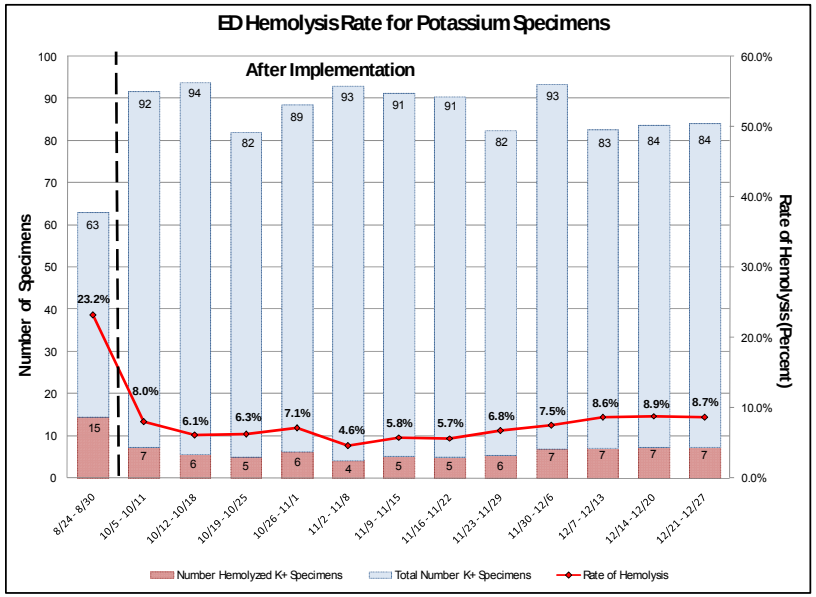
The Team

- Kirsten Boyd, ED
- Brian Orsatti, ED
- Kellie Glynn, ED
- Susie Fontes, ED
- Christine Yennaco, ED
- Jane Dufresne, ED
- Lawrence Mottley, ED
- Gina McCormack, Pathology
- Tammy Galloway, Chemistry
- Manny Alves, W. Lab
- Blanche Murphy, Phlebotomy
- Pam Hulme, Phlebotomy
- Alice Lee, Lean
- Kim Eng, Lean
- Bonnie Baker, Lean
- Brandan Holbrook, Lean
- Jenine Davignon, Lean
- Samantha Ruokis, Lean

The Interventions

- Study #1- Determined rate of hemolysis for all ED potassium specimens
- Study #2- Determined rate of hemolysis due to varying methods for specimen draws
- Created standard work for drawing and labeling lab specimens
- Designed improved workflow focusing on communication between RN's and technicians in which all blood specimens are drawn via a peripheral stick

The Results



Metric	Baseline	Target	Results to Date (Dec '08)	% Change
Rate of Hemolysis for ED potassium Specimens	*23.2% (Aug '08)*	*3.9%*	*6.9%*	*-69%*
Metric	**Minutes per Redraw Avoided**	**Hours of ED Bed Availability**	**Additional ED Patient Capacity**	**Potential Revenue**
Potential Revenue Resulted from Decreased Redraw of Specimens	*56**	*↑ 12** (per weekday)	*2* (per weekday)	*↑ $16,118* (as of 1/09)

*ED time savings analysis, L. Mottley, 10/08

Lessons Learned

- Standard work = ↑ specimen quality & ↓ variation in the # of defects
- The root cause of hemolysis was masked by complicated & congested workflow
- Communication & teamwork is key to sustaining improvements

Next Steps/What Should Happen Next:

- Redesign ED lab requisition form to improve accuracy
- Apply 5S methods to ED hallway bed spaces with color-coded floor tape

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