Abstract 24

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Title: Lessons Learned from a Retrospective Analysis of the Lean Process in Acute Coronary Syndrome Care

Background:
“Lean” methods from the Toyota Production System model were utilized to meet institutional goals of Quality, Service, and Affordability by improving efficiency and throughput. Multiple workflow changes were successfully made to the environment of care in the ED registration, triage, and clinical lab areas contributing to improved patient throughput. The purpose of this study is to conduct a retrospective analysis to evaluate whether there were any unintended outcomes for acute coronary syndrome (ACS) patients during implementation of rapid process improvement work (RPIW) in the emergency department (ED).

Methods:
A Society of Cardiovascular Patient Care (SCPC) data dictionary guided development of a report of all ED patients in 2013 and 2014. A second report was created to include a subset of ACS patients as defined by the following ICD-9 codes 410 – 410.91, 411.10, 413.90, 786.50, and 786.59. The data was used to determine if there were any differences in the following measures comparing 2013 and 2014 in context of RPIWs which began in February 2014: time to ECG, time to provider, time to discharge, 72 hour readmission rate after an initial ED discharge, and ACS mortality. Additionally, the clinical lab report was used to determine if there were any improvements in ED baseline troponin TAT.

Results:
The data specific to ACS patients in 2013 and 2014 showed the following: •The total ED census increased from 45,382 to 46,900 •The total ACS census dropped from 4% down to 2.9% •The median minutes from door to ECG remained at 6 minutes from year to year (National average door to ECG is 7 median minutes - Centers for Medicare & Medicaid Services, 2013 time period) •The median minutes from total ED time to provider decreased from 20 to 11 minutes •The median minutes for total ACS ED time to provider decreased from 10 to 7 minutes •Troponin TAT in the clinical laboratory improved: 90% resulted in 42.0 minutes versus 90% resulted in 28 minutes •The total median minutes from ED arrival to discharge decreased from 145 to 137 minutes •The total median minutes from ACS ED arrival to discharge decreased from 198 to 188 minutes. •The 72 hour readmission rate with a primary diagnosis of ACS increased from 3.6% (n=1818) to 4.6% (n=1348) •The ACS mortality rate in the ED decreased from 0.17% to 0.07% (p>0.05)
Conclusion:
This retrospective analysis evaluated whether there were any unintended outcomes for ACS patients during implementation of RPIWs in the ED. Results revealed that the interdisciplinary collaboration of simultaneous RPIWs in registration, triage, clinical lab, and ECG departments improved process and clinical outcomes for ACS patients with regard to: time to ECG, time to provider, troponin TAT, arrival to discharge, and ACS mortality rate. Though 72 hour readmission for ACS patients trended up slightly, ACS mortality decreased from 0.17% to 0.07% (p>0.05). Additional research is needed to explain the variances in ACS readmission rate and length of stay.