Title: Riddle Hospital “No Divert”: Utilizing Lean Six Sigma Principles in Process Re-Design to Improve Patient Flow

Objectives: To improve Emergency Department (ED) and hospital-wide patient Input, Throughout, and Output in order to prevent divert. Create additional revenue opportunities for the hospital by improving ED efficiency and capacity.

Planning/Research Methods: Utilizing operational statistical analyses, the team identified opportunities to improve Emergency Department and hospital-wide patient input, throughput, and output. A comprehensive Emergency Medicine literature review and consulting engagement led to the adoption of a Rapid Evaluation Unit (REU) concept. While addressing ED input and throughput, the REU concept breaks down without optimizing the hospital’s output. Literature also shows that EDLOS increases inpatient length of stay\(^1\), thereby increasing cost, and improved ED efficiency creates revenue opportunities\(^2\).

Implementation Methods:

Input & Throughput: An interdisciplinary team of ED Physicians, Physician Assistants, Nurses, Patient Care Technicians and a Clinical Educator “operationalized” the REU concept. Using process mapping exercises, the team reviewed existing care processes and developed the future state, including action items and barriers for implementation. Serving as the Champions for the REU, the team conducted mandatory ED Medical Staff and staff training using a board game with actual clinical presentations and patient arrival times simulating ED flow. The future state clinical process maps were integrated into ED expansion architectural plans to ensure the facility design maximizes the impact of the REU care model.

Output: Based on a literature review, an interdisciplinary team from Nursing, Environmental Services (EVS), and Patient Transport conducted a three-day Kaizen event to address processes that impact the time from ED Admit Order to Unit Arrival\(^3\). The team identified the biggest barrier to be a lack of communication and visibility related to patient discharge. In order to improve communication and visibility, electronic bed boards were created in Microsoft Excel utilizing conditional formatting to convey patient status, such as isolation status, social concerns, gender, and discharge status. Demand and capacity patient flow tools were also implemented on each unit that provide a high-level view for the organization at the 9:30am Safety Huddle to quickly assess if bed availability is at risk. “Green” designates that capacity exceeds demand and “Red” that demand exceeds capacity. This allows the organization to easily focus on resolving bed availability issues to minimize boarding admitted patients.

Results:
A 42.8% decrease in the average number of boarder hours per month and EDLOS (Admitted – 12.6%; Treat & Release – 16.5%) resulted in increased ED capacity and potential income contingent on volume growth totaling $190,000/month ($2.28 million annually)\(^2\). Patient Arrival to ED Bed and Patient Arrival to Provider Evaluation decreased by 63.0% and 39.0%, respectively. ED Hallway Bed Utilization/Day decreased by 74.6% and LWOT by 66.9%. Lastly, ED Admit Order to Unit Arrival decreased by 36.9%.
References


Shane Flickinger, MHA
Riddle Hospital – Main Line Health System