

# Reducing Emergency Department Length of Stay for Patients Requiring Admission to the Intensive Care Unit: A Rapid Cycle Quality Improvement Project

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## Background and Significance

- Emergency Department (ED) crowding is a worsening public health problem in the U.S., posing serious safety risks to patients
- Hospitals with EDs have decreased by 25% in the past two decades while ED visits continue to rise each year
  - ↑ 12% the last decade
- In 2016, 1 in 5 patients (20%) admitted from an ED waited > 6 hours for an inpatient bed
- ED crowding occurs when demand for patient care exceeds available resources to provide services within a reasonable timeframe. This mismatch impairs the provision of quality care.
- Critically ill patients are at greater jeopardy for poor outcomes due to their compromised health status and the challenge of sustaining necessary resources to provide critical care in an ED setting for long periods of time

## Objectives

1. A rapid cycle quality improvement (RCQI) project was performed to explore the impact of an expedited handoff process between the ED and intensive care unit (ICU)
2. A primary aim of the study was to perform a retrospective analysis of historical LOS data for all ED admissions for two matching three-month periods in FY 2017 and FY 2018
3. A secondary aim examined post-implementation contributory data (i.e., time of disposition, type of admitting provider, & percentage of ED boarder patients) that would inform further improvements in ED-to-ICU patient flow.

## Methods

### Design:

- RCQI Single group, pre/post-test design

### Setting:

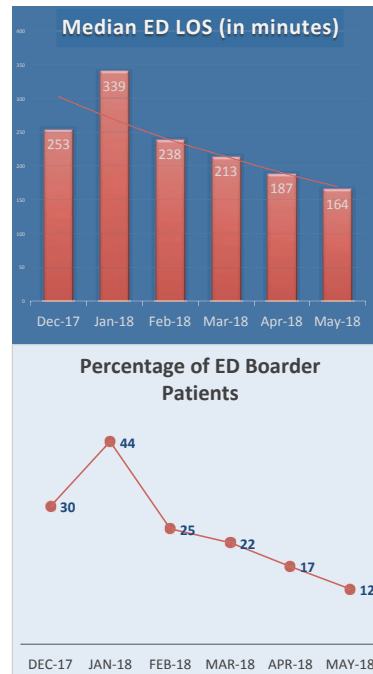
- Private, not-for-profit, AHC system-affiliated hospital in a metropolitan mid-Atlantic city
- ED: 28-bed, Level II, 40,000 visits/year medically managed by physicians & APPs
- ICU: 12-bed general, medical/surgical ICU managed by intensivists physicians & ACNP

### Data Collection:

- Daily executive report provided median ED LOS data & ED volume
- Contributory data extracted from EMR using de-identified data

### Sample:

- Retrospective analysis of ED LOS and ED volume data from FY 2017 and FY 2018
- Contributory data:
  - 120 admissions during 90 day implementation
  - 10 records eliminated from analysis: 8 missing either ED provider disposition time or ED departure time and 2 had inverse ED LOS calculation
  - 110 records considered for analysis; 45 were missing one or two elements of data comprising the ED LOS. These 45 were analyzed for ED LOS only. The remaining 55 were analyzed for all contributory data.



## Quality Improvement Intervention

- "One & Done" expedited handoff process
  - Partnered with inpatient leaders
  - Prompt communication of impending admissions
  - Implemented "no delay" nurse report
- Lean design; detailed steps, timeline & accountability

## Results

- Reduced ED LOS by 89 minutes
  - 277 minutes → 188 minutes
  - p = 0.062; approaches significance
  - Operationally significant
- Reduced percentage of ED boarder patients 48%
  - 33% → 17%
  - p = 0.66; not significant
  - Operationally & clinically significant
- 37% of ICU admissions met organization target of an ED LOS ≤ 120 minutes

## Discussion

- No change in ED volume pre/post implementation; only hospital in the region to experience notable increase in ED volume over previous three years; other area hospitals remained flat or ↓
- New clinical services have been introduced and others have expanded (i.e., GI, Oncology, Bariatrics, etc.) contributing to ED volume of critically ill patients and ICU admissions
- Impact of other purposeful patient flow improvements taking place simultaneously
- Contributory factors data showed an improvement in "inpatient order time to ED departure" → the time period when NURSING has greater impact on patient flow than providers

## Conclusion

- Improving a targeted handoff process demonstrated operationally significant improvement in this project
- RCQI is a useful strategy to understand what works well in a given setting
- Findings from the contributory factors can identify areas where further study is needed because the **problem is growing, demand for care is increasing** and **availability of hospitals is decreasing**
- Additional study would enable healthcare organizations to target specific improvement efforts aimed at reducing ED LOS.



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