# Pediatric Emergency Department Throughput Improvement with Workflow Redesign

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## Introduction

The Emergency Department (ED) is a useful resource used world-wide for urgent-to-non-urgent medical needs. ED throughput and workflow have been an exhaustive issue for decades in EDs nationwide—especially within inner city hospitals. Ineffective patient workflow leads to increased length of stay (LOS) within the emergency department, increased door-to-provider (DTP) times and an overall negative experience for both patients and staff members. These metrics are compared to state and national averages in order to set guidelines that assure patient wellness and safety is made a priority. The purpose of this project was to improvement ED throughput in the pediatric ED by implementing an ED throughput nurse. ED length of stay (EDLOS), door-to-provider (DTP) times and staff satisfaction were measured.

## Background and Significance

Throughput times in an urban, inner-city pediatric ED have exceeded national averages over the years. In 2014 The Joint Commission's "Patient Flow Standard" suggested that patient boarding not exceed 4 hours from decision to admit (Rogers, 2020). According to the January 2021 newsletter at this pediatric ED in an inner-city hospital, there were 523 admissions in January of 2020. The high admission rate and decreased bed availability led to patients being held for longer periods of time in the ED; this affects LOS target times. This is linked to adverse patient results including mortality and morbidity, medical errors, and deferred or neglected provider orders. Moreover, the patient care experience is directly affected, leading to poor patient satisfaction surveys and added rates of patients leaving without being seen. Staff members are also directly affected by crowding, leading to increased nurse-to-patient ratios, increased physician-to-patient ratios, fatigue, and high turnover rates (Deanda, 2018).

## Methodology

1. Staff members were educated on the role of the ED throughput nurse
2. Daily interdisciplinary team huddles
3. ED Throughput sheets were created
4. Subjects recruited via their work email to participate in a 6-question Likert Scale Survey
5. A QR code for the survey placed in unit
6. Data retrieved from the EPIC documentation system and exported into an excel spreadsheet.
7. The data was then transferred into SPSS and analyzed
8. Survey results were analyzed via SurveyMonkey

## Results

### Mann-Whitney U for EDLOS and DTP

- Post-intervention there was a decrease in EDLOS for treated and released ($M$ = 660.84, $SD$ = 18.38; $Z$ = -10.9, $p$ < .001) but an increase amongst admitted patients ($M$ = 787.32, $SD$ = 36.73; $Z$ = -.84, $p$ = .404).
- The DTP times for treated and released patients ($M$ = 50.38, $SD$ = .57; $Z$ = -10.91, $p$ <.001) and admitted patients ($M$ = 37.60, $SD$ = 1.25; $Z$ = - 4.13, $p$ < .001) both decreased post-intervention.
- The results also show a weak but statistically significant correlation between DTP and EDLOS times over the entire period pre and post-intervention when controlling for volume ($p$ < .001).

### Survey Results


| Year | EDLOS Pts Analyzed: TR | EDLOS Pts Analyzed: Admitted | EDLOS Pts Total | DTP Pts Analyzed: TR | DTP Pts Analyzed: Admitted | DTP Pts Total |
|---|---|---|---|---|---|---|
| 2019 | 399 | 204 | 603 | 6,993 | 911 | 7904 |
| 2021 | 2,764 | 540 | 3,304 | 6,901 | 789 | 7,690 |

Staff Survey

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## Implications

**Clinical Practice**
A focus group on attitudes towards this role could be formulated to validate the continued use of the ED throughput nurse and its efficacy through DTP and EDLOS timing and a repeat survey for feedback.

**Organizational Policy**
A change in policy that includes budgeting for a throughput nurse and is adjusted by volume could benefit this facility

**Economic/cost benefits**
The average cost of a visit to the ED is estimated at $1387 compared to $104 for a visit to a primary care doctor (Alltucker, 2019).

## Discussion

- The ED throughput nurse decreased DTP times for all patients in this dataset.
- The ED throughput nurse decreased EDLOS times for treated and released patients.
- Increased EDLOS amongst admitted patients could be due to several factors, such as, bed availability.
- Admitted patients who stayed in the ED longest were those with behavioral health issues.
- Although many saw the implementation of an ED throughput nurse as a valuable role to the ED that can lead to improvements in ED workflow, some still need to be convinced.

## References

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