

# Trainee Involvement in Bedside Invasive Procedures— Time for a Paradigm Shift

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## Background

Involvement in invasive bedside procedures is a requirement for Pediatric, Pediatric Emergency Medicine (PEM), and Emergency Medicine (EM) trainees during Pediatric Emergency Department rotations.

## Objectives

Quantify the number of invasive bedside procedures trainees attempt on pediatric emergency department rotations.

## Methods

Chart review of providers performing lumbar puncture (LP) and skin abscess incision and drainage (I&D) at a tertiary, pediatric emergency department between 2017-2019, excluding consultant procedures. We included all patients evaluated in our ED, and all ED providers during the study period. We included trainees that completed either a 2- or 4-week rotation. As unsuccessful procedure attempts may not be captured by billing or structured data, we created a natural language processing (NLP) model to capture attempts. We calculated prevalence with Bayesian credible intervals.

Trainee bedside procedure involvement in our ED is minimal and unevenly distributed.

If other sources of exposure are not adequate for developing competence, mitigation strategies should be considered.



## Results

We identified 1,113 LP and 798 I&D attempts during the study period. There were 928 resident rotations through the ED; 552 (59%) were pediatric residents, 359 (39%) EM trainees, and 17 (1.8%) visiting residents, in addition to 18 PEM fellows working in the ED each year.

### Lumbar Punctures First Attempts by Level

Category	Percent (Count)
Pediatric Emergency Medicine Attending	23% (256)
Pediatric Emergency Medicine Fellow	24% (267)
Pediatric Resident	28% (310)
Emergency Medicine Resident	16% (174)
Other	10% (106)

Calculating resident LP attempts per rotations resulted in a range of 0-5, with a median of 0.33 (IQR 0-1). During the study period, **199 residents (43%) did not perform an LP** while 126 residents (27%) performed a range of 2-15 LPs.

For PEM fellows the average was 5 LPs throughout the entire 3-year fellowship and for PEM attendings it translates to under 1 LP a year.

### Incision and Drainage First Attempts by Level

Category	Percent (Count)
Pediatric Emergency Medicine Attending	33% (263)
Pediatric Emergency Medicine Fellow	22% (176)
Pediatric Resident	22% (176)
Emergency Medicine Resident	19% (152)
Other	4% (31)

Calculating Residents I&Ds attempts per rotation resulted in a range of 0-3 with a median of 0 (IQR 0-0.75). During the study period, **281 residents (60%) did not perform an abscess I&D** during their rotations, while 64 residents (14%) performed a range of 2-8 I&Ds.

For PEM fellows it was an average of 9 I&Ds throughout the entire 3-year fellowship and for PEM attendings it translates to 1-2 I&D a year.

Patients seen by an attending with no trainee involvement were more likely to have the procedures done by an attending.

## Conclusion

The current bedside procedure involvement in our ED is minimal and unevenly distributed. If residents perform these procedures on other rotations in similar or smaller numbers, mitigation strategies should be considered such as expectation adjustments and simulation.