

# Reducing Peripheral Intravenous Catheter Infiltration Events in Pediatric Surgical Patients in a Tertiary Care Children's Hospital: a Quality Improvement Study

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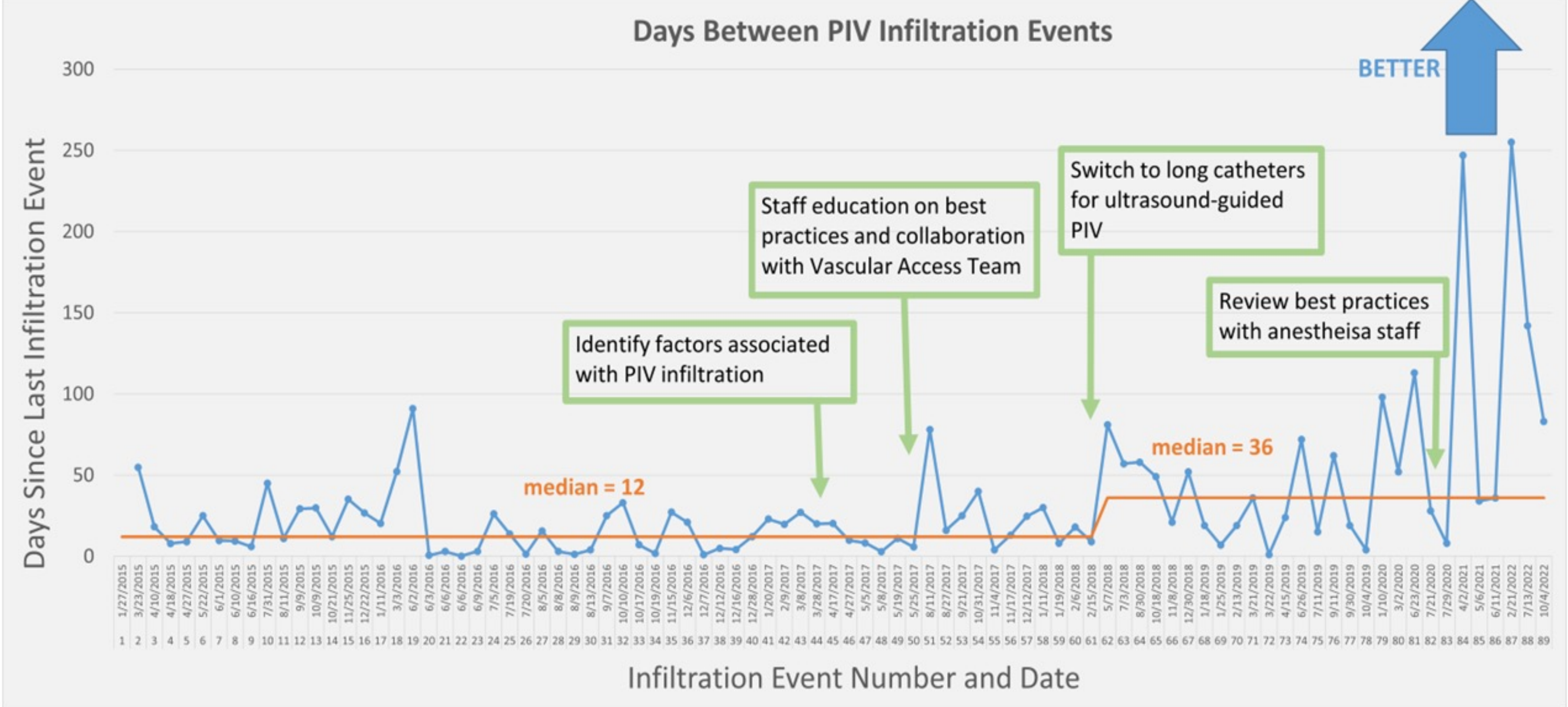


## Introduction

- Peripheral venous access is an essential component of safe anesthesia care in perioperative patients
- Infiltration is the unintended leakage of fluid or medication into the surrounding tissue and is a potential serious complication of peripheral venous catheter (PIV) placement
- Monitoring PIV sites can be a particularly challenging in the operating room due to surgical draping, tucked extremities, and desire to avoid surgical disruption
- We initiated the following project to reduce PIV infiltrations in perioperative patients
- Our specific aims were to 1) increase days between PIV infiltration events in the operating room from 12 to 18 days (50% increase) from January 1, 2017 to January 1, 2019 and 2) show sustained improvement

## Methods

- A standard measurement tool was used to track PIV infiltrations with swelling >30%
- Plan Do Study Act cycles included:
  - Identifying factors associated with PIV infiltration
  - Developing best practices for monitoring PIVs in the operating room
  - Staff education
  - Real-time event reviews
- We standardized the routine use of long PIV catheters when using ultrasound to ensure at least 50% of catheter was in the vessel (2)
- Regular education updates were held for anesthesia staff regarding best practices



## Results

- Baseline data showed a median 12 days between PIV infiltrations from 2015-2017
- Interventions increased median number of days between infiltration events from 12 to 36 days
- Days between infiltration events did not decrease following study period

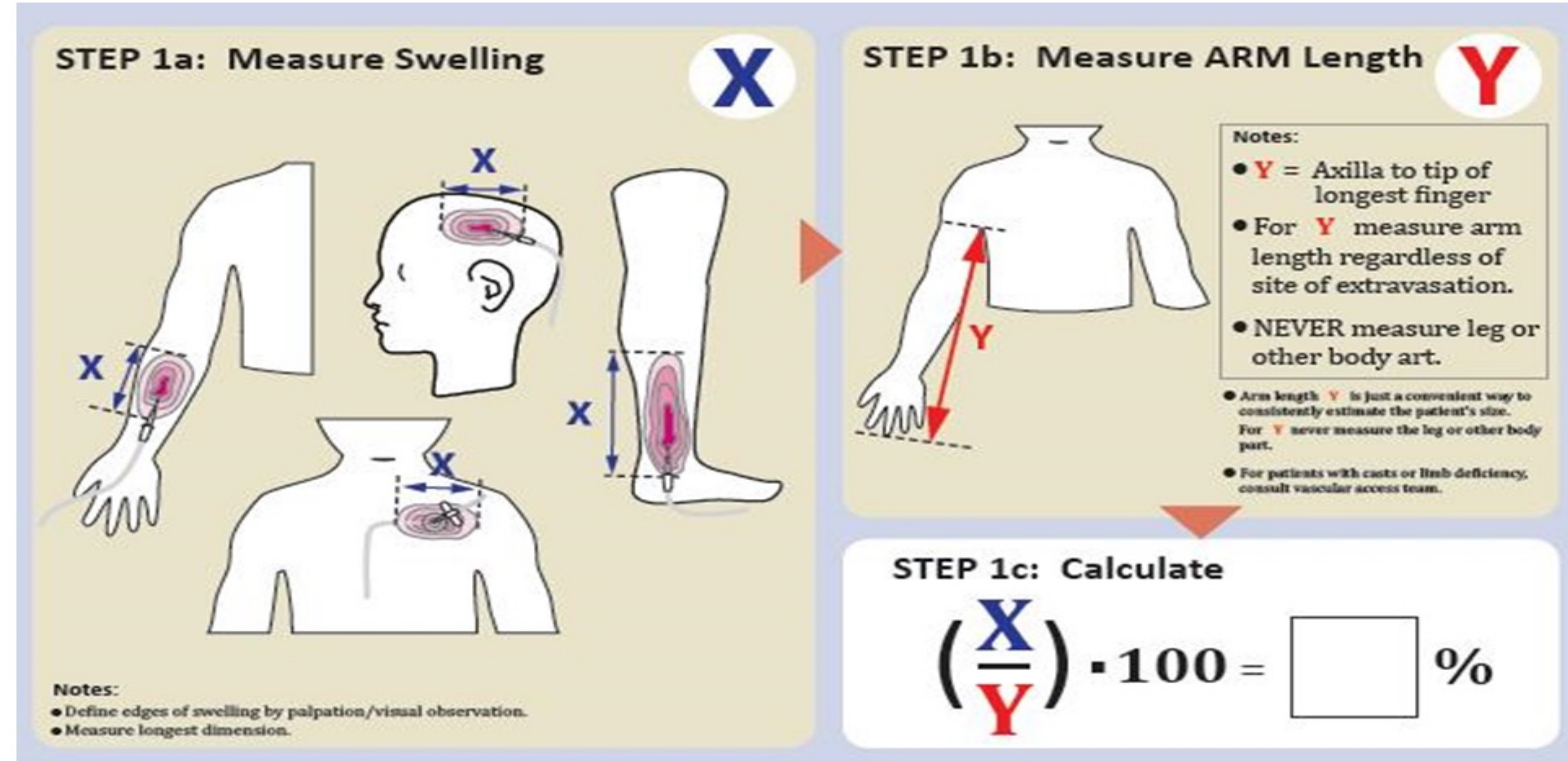


Figure 2

Run chart of days between PIV infiltration events in pediatric surgical patients between 2015 and 2022.

## Discussion

This project accomplished the smart aim of increasing days between PIV infiltration events by more than 50% within a two-year period. Staff education on best practices, real-time event review, and routine use of long catheters in ultrasound-guided PIVs may reduce PIV infiltration events in the operating room. Routine staff education on best practices may lead to sustained improvements.

## Conclusions

Using quality improvement methodology we were able to sustainably reduce PIV infiltration events in pediatric patients in the operating room.

Figure 1

CCHMC assessment tool used for measuring size of PIV infiltration (3)

## References

- Paquette V et al. Can J Hosp Pharm 2011; 64: 340-5
- Elia MD et al. American Journal of Emergency Medicine, 2012, 30:5, 712-716
- Mecoli et al. Anesthesia Intensive Care 2022; 50(4):306-311