

## INTRODUCTION

Pediatric tracheal intubations (TI) outside of the operating room (OR) are associated with adverse events. In particular, the training level and type of provider is associated with success and outcomes (1-3). While the ACGME sets competence standards for TI for various learners, studies have demonstrated varying numbers of TI before a learner demonstrates competence (4-6). The OR offers a safe learning environment for trainees to acquire TI skills. The primary aim of this study was to provide a descriptive analysis of TI being performed at a tertiary, academic, children's hospital. The secondary aim was to investigate the educational needs of rotators to help identify best practices.

## METHODS

After IRB approval, we reviewed 67,033 pediatric anesthetics at our institution from July 2014-June 2017. We identified 28,037 TI and characterized them by provider category, age, weight, and ASA classification. Differences between demographic data groups were determined using Kruskal-Wallis ANOVA by ranks and differences and in ASA classifications by group using expected versus observed Chi-Square. We then reviewed the literature for educational requirements and number of TI for competency for rotating trainees. Finally, we analyzed TI performed by PICU fellows outside of the OR over ten years to assess for adequacy of experience.

## RESULTS

A descriptive analysis of TI performed is in Table 1. In a large number of cases the attending anesthesiologist performs the TI and most of the youngest patients are intubated by fellows. A review of trainee requirements for TI proficiency, anesthesia case requirements, and the literature for competency of TI is demonstrated in Table 2. Figure 1 shows that over 10 years PICU fellows are getting minimal exposure to TI outside of the operating room.

Table 1: Characteristics Of Operating Room Intubations At A Tertiary, Academic, Children's Hospital

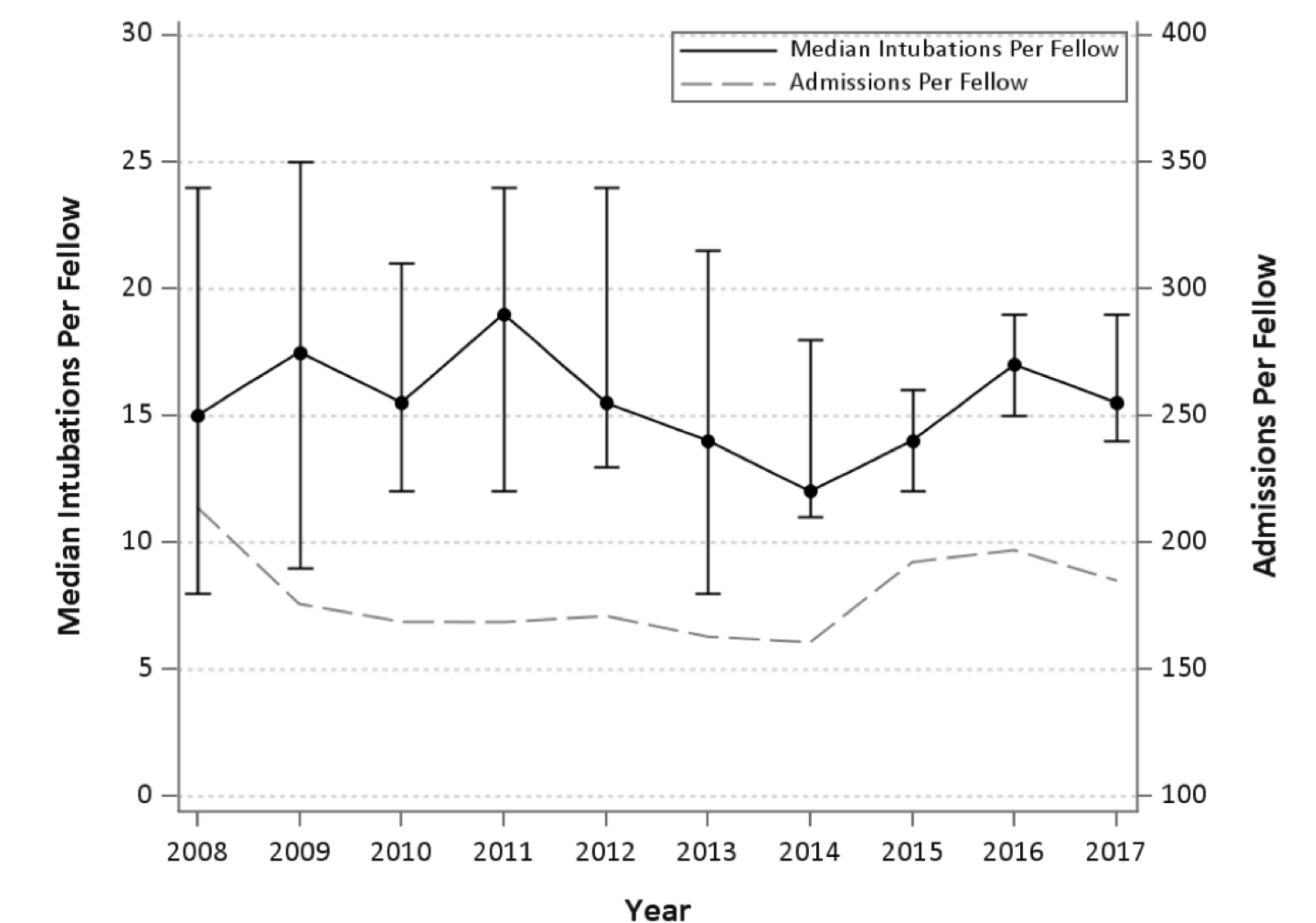
Characteristic	Attending	Fellow	CRNA	Trainee*	p value
Number of TI: n (median per provider level: 1st IQ, 3rd IQ)	3258 (22: 10-54.5)	7146 (201: 188-235)	3828 (122:148-228 )	13805 (36:22-49)	< 0.001
Age in years: median (1st IQ, 3rd IQ)	6.3 (1.3, 13.0)	5.0 (0.9, 11.9)	6.0 (1.9, 11.6)	7.9 (3.1, 13.7)	< 0.001
Weight in kg: median (1st IQ, 3rd IQ)	20.9 (9.9, 46.0)	18 (8.2, 39.4)	20.4 (11.5, 42.9)	25.8 (13.7, 49)	< 0.001
ASA 1: n (% of total for provider level)	553 (17.0%)	775 (10.8%)	656 (17.1%)	3070 (22.2%)	< 0.001
ASA 2: n (% of total for provider level)	898 (27.6%)	1991 (27.9%)	1324 (34.6%)	5183 (37.5%)	< 0.001
ASA 3: n (% of total for provider level)	1104 (33.9%)	2830 (39.6%)	1118 (29.2%)	5106 (37.0%)	< 0.001
ASA 4: n (% of total for provider level)	695 (21.3%)	1517 (21.2%)	718 (18.8%)	444 (3.2%)	< 0.001
ASA 5: n (% of total for provider level)	8 (0.25%)	33 (0.5%)	12 (0.3%)	2 (0.01%)	< 0.001

\*Trainee includes Anesthesia Resident, SRNA, DDS Resident

Table 2: Characteristics Of Trainees Rotating In The Operating Room

Trainee	ACGME Requirement for TI Proficiency	Case Requirements Total Number of Cases	Number of TI to Gain Proficiency: n (competency %)
Anesthesia Resident	Yes	< 12 years old: 100 < 3 years old: 20 < 3 months: 5	57 (90%)
SRNA	Yes	< 12 years old: 30 < 2 years old: 10 < 4 weeks old: 0	undetermined
Dental Resident	No	n/a	undetermined
Pediatric Critical Care Fellow	Yes	n/a	52 (90%)
Emergency Medicine Fellow	Yes	n/a	75 (90%)
Pediatric Resident	Yes (neonatal)	n/a	20 (50%)
Transport Nurse	n/a	< 5 kg: 3 5-15 kg: 3 >15 kg: 3	undetermined

Figure 1: Median Intubations Performed by PICU Fellows



## DISCUSSION

Anesthesia trainees gain adequate experience with TI; however, most of their cases involve older children. While it is imperative to balance safety and education, a large number of TI are performed by attendings, fellows, and CRNAs of which some could be redistributed to trainees. PICU fellows are experiencing a low number of procedures. To help support colleagues, a systematic approach could be used to design future learning opportunities for both anesthesia and non-anesthesia trainees in the OR setting.

## REFERENCES

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