

Cuff Pressures in Pediatric Patients: Does Leak Pressure Correlate with Pressure Manometry

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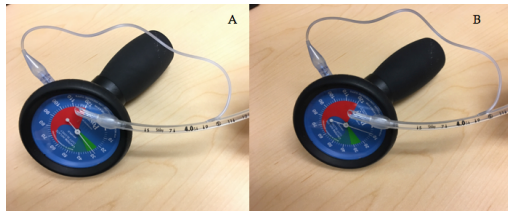
Introduction

- Cuff pressure measurements is standard of care in pediatric anesthesia.
- Technique for cuff pressure measurement varies.
- Cuff pressure that is too low may be harmful if the patient is at risk for aspiration (1).
- Cuff pressure that is too high >25cmH20 may increase the risk of tracheal injury(2).
- Cuff pressure manometers may be more accurate at assessing pressure than the standard leak test(3,4).

Methods

- Data were collected from Lucile Packard Childrens' Hospital at Stanfrd from June – July 2017.
- Study personal would enter the room after induction and intubation. The demographic data was collected and the anesthesiologist was asked to report a leak pressure.
- Anesthesiologist were aware that the QI project was occurring but were unaware which days.
- The manometer was then used to measure the cuff pressure. See figure one for an example of the manometer used (fig 1).

Figure 1: A. The Posey Cufflator is the manometer that was used in this QI study cuff pressure spot check This initial value was recorded. B After re-checking the same cuff pressure was reduced because of the leak intrinsic to the manometer.



Results

Figure 2: Distribution of cases assessed.

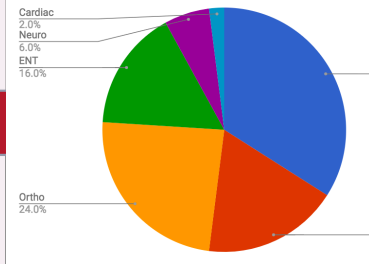
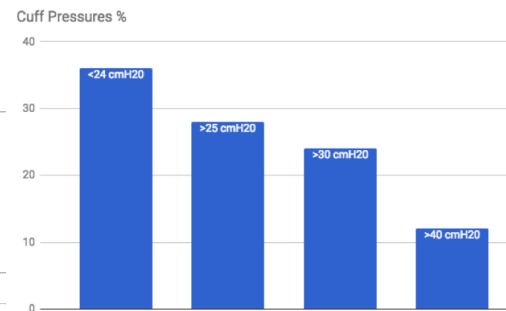


Figure 4 – Selected results from QI data.

		P-value	Effect size (Cohen d)
Age (years-Median+IQR)	5 (2,14)		
Wt (Kg-Median +IQR)	36 (12,57)		
Cuff pressure (cmH20 mean + SD)	23.2 +/- 19		
Leak (cmH20 mean + SD)	19.3+/- 2.8		
Mean difference Pressure-Leak (cmH20)	11.3	0.09	0.27
Staff over pressure	24% (3/12)		
Learner over pressure	23% (9/38)		
Cuff pressure <20 in emergency	50% (2/4)		
ETT size diff (Act-Pred)	0.17		

Figure 3: Proportion of cuff pressures above target or <25cmH20).



Results

- A convenience sample of 50 patients was selected for cuff-pressure manometry.
- Leak testing had been done in all cases by the anesthesiologist or fellow in the room.
- Patients were distributed among major surgical sub-specialties (Fig 1)
- Despite 85% of leaks being reported between 18-22 24% were > 30 cmH20 (Fig 3).
- Mean difference between reported and measured cuff pressures was not statistically significantly different (p=0.09) however had a moderate effect size (Cohn d=0.27) (Fig 3).

Discussion/Conclusion

- Despite compliance with leak testing 24% of cuff pressures were over 30 cmH20. There was a moderate effect size for this difference
- Cuff pressure manometers were fast and easy to use and require less time than a standard leak test.
- When using cuff pressure manometers it is critical to understand that each measurement results in some air being removed from the cuff and in small endotracheal tubes this may cause a leak (fig 1)
- Cuff pressure manometers should be used to inflated the cuff then air released to desired target.
- The clinical impact of cuff pressure manometry remains unclear at this point and more investigation is needed.

References

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