

Endotracheal Tube Cuff Pressures: A Need for Change Quality Improvement Initiative

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Background

- Endotracheal tube (ETT) cuff pressures are frequently out of the recommended range of 20-30 cmH2O
- Cuff manometer is considered the “gold standard” for cuff pressure management but is rarely used in the clinical setting
- Complications related to cuff pressures range from cough and sore throat to more serious issues like tracheal stenosis, aspiration, nerve injuries, and tracheal rupture
- Current methods to inflate endotracheal tube cuffs vary between anesthesia providers
- Multiple meta-analyses, randomized controlled trials, and systematic reviews have established a correlation between cuff pressure and airway complications
- Guidelines, protocols, and recommendations are lacking

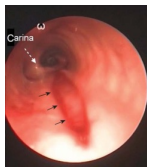


Figure 1: Tracheal lesion from endotracheal tube cuff

Key Driver Diagram

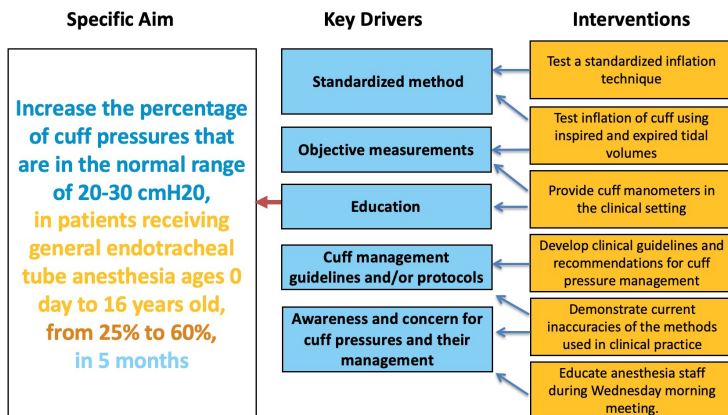


Figure 2: Key driver diagram

Methods

- This project was deemed exempt from our institutional review board’s approval
- Four Plan-Do-Study-Act (PDSA) cycles were completed
- Convenience sample used
- Age, weight, endotracheal tube size, volume of air in cuff, and cuff pressure recorded



Figure 3: List of PDSA cycles performed

Results

- Primary outcome measure was the percentage of ETT cuff pressures within the recommended range of 20-30 cmH2O
- The removal of air method was the most effective in achieving cuff pressures within the recommended pressure range ($p < 0.001$)

	Proportion of Cuff Pressures between 20 and 30 cm H ₂ O
Preimplementation	6 of 25 (24%)
PDSA cycle 1	9 of 25 (36%)
PDSA cycle 2	2 of 25 (8%)
PDSA cycle 3	13 of 25 (52%)
PDSA cycle 4	23 of 50 (46%)

Figure 4: Proportion of cuff pressures in the recommended range

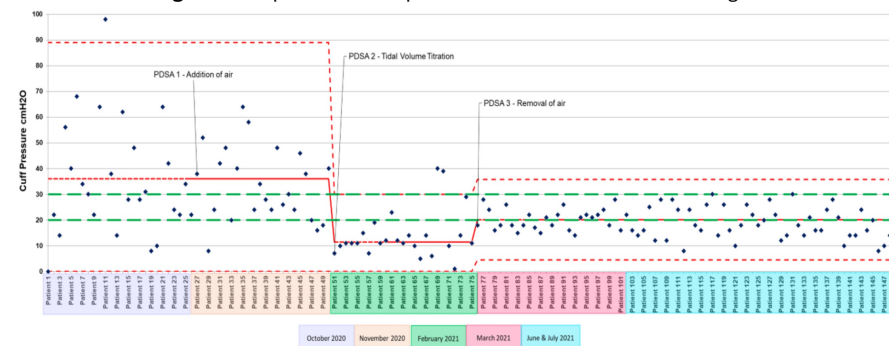


Figure 5: Control chart

Discussion

- Removing air until auscultation of an audible air leak may be an effective and practical tool providing additional safety in the anesthetic management of pediatric patients
- No increase in cost to perform removal of air method
- Percentage of cuff pressures between 20-30 cmH2O improved, but still high
- Injuries related to the mismanagement of ETT cuffs are preventable

Recommendations

- Decreasing variation of cuff inflation methods used in clinical setting should be a focus
- Subjective techniques may not be best for clinical practice
- Further research to improve the accuracy of cuff pressures

References

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