

REVIEW ARTICLE

## A comparison of ramping position and sniffing position during endotracheal intubation: a systematic review and meta-analysis



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### KEYWORDS

Ramping position;  
Sniffing position;  
Endotracheal  
intubation;  
Laryngeal exposure;  
Intubation success

### Abstract

**Objectives:** Positioning during endotracheal intubation (ETI) is critical to ensure its success. We aimed to determine if the ramping position improved laryngeal exposure and first attempt success at intubation when compared to the sniffing position.

**Methods:** PubMed, EMBASE, and Cochrane CENTRAL databases were searched systematically from inception until January 2020. Our primary outcomes included laryngeal exposure as measured by Cormack-Lehane Grade 1 or 2 (CLG 1/2), CLG 3 or 4 (CLG 3/4), and first attempt success at intubation. Secondary outcomes were intubation time, use of airway adjuncts, ancillary maneuvers, and complications during ETI.

**Results:** Seven studies met our inclusion criteria, of which 4 were RCTs and 3 were cohort studies. The meta-analysis was conducted by pooling the effect estimates for all 4 included RCTs ( $n = 632$ ). There were no differences found between ramping and sniffing positions for odds of CLG 1/2, CLG 3/4, first attempt success at intubation, intubation time, use of ancillary airway maneuvers, and use of airway adjuncts, with evidence of high heterogeneity across studies. However, the ramping position in surgical patients is associated with increased likelihood of CLG 1/2 (OR = 2.05, 95% CI 1.26 to 3.32,  $p = 0.004$ ) and lower likelihood of CLG 3/4 (OR = 0.49, 95% CI 0.30 to 0.79,  $p = 0.004$ ), moderate quality of evidence.

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