

The Effectiveness of Head-of-Bed Elevation During Intubation in Obese Surgical Patients

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ABSTRACT

Head-of-bed elevation during preoxygenation and induction of general anesthesia provides a longer safe apnea time for endotracheal intubation. During the induction of general anesthesia with tracheal intubation, oxyhemoglobin desaturation and hypoxemia can occur, especially for the obese patient. Preoxygenation of the patient increases the safe apnea time to perform mask ventilation and tracheal intubation. The purpose of this evidence-based practice project was to describe the evidence on the effectiveness of the head-of-bed elevation during preoxygenation prior to the induction of general anesthesia at prolonging the time to oxyhemoglobin desaturation in the obese population. A change in practice has been proposed based on this evidence.

PICOT QUESTION

Do obese surgical patients undergoing general anesthesia (P) with head-of-bed elevation (I) compared to similar patients in the supine position (C) have a longer time to oxyhemoglobin desaturation (O) during intubation (T)?

EVIDENCE TABLE

Author and Year	Study Type	Results
F. R., Muñoz, H. R., Delfino, A. E., & Cortínez, L. I., 2005.	RCT	Obese surgical patients in the 90° back up position had a prolonged apneic time to SpO2 desaturation.
Boyce, J. R., Ness, T., Castroman, P., & Gleysteen, J. J., 2003.	RCT	Morbidly obese surgical patients in the 30° reverse Trendelenburg position had an increased safe apnea period (SAP).
Couture, E. J., Carrier-Boucher, A., Provencher, S., Tanoubi, I., Marceau, S., & Bussièrès, J. S., 2023.	RCT	Morbidly obese surgical patients in the reverse Trendelenburg position at 25° had a higher SAP compared to patients in the ramped position.
Dixon, B. J., Dixon, J. B., Carden, J. R., Burn, A. J., Schachter, L. M., Playfair, J. M., Laurie, C. P. & O'Brien, P. E., 2005.	RCT	Morbidly obese surgical patients in a 25° head elevation had an increased desaturation safety period.
Lane, S., Saunders, D., Schofield, A., Padmanabhan, R., Hildreth, A., & Laws, D., 2005.	RCT	Non-obese patients in a 20° head-up position had a longer apnea time by 103 seconds compared to patients in the supine position.
Hung Tsan, S. E., Viknaswaran, N. L., Lau, J., Cheong, C. C., & Wang, C. Y., 2022.	SR	Seven RCTs of non-obese and obese 508 patients undergoing general anesthesia with endotracheal intubation had an increased SAP when preoxygenated in the head-elevated position compared to the supine position.

SYNTHESIS OF THE EVIDENCE

Five randomized clinical trials (RCTs) and one Systematic Review (SR) with meta-analysis consistently found prolonged safe apneic times for patients with the head of bed elevated at least 20 degrees.

PROPOSAL FOR PRACTICE CHANGE

- From this evidence it is recommended that obese surgical patients be preoxygenated with the head-of-bed elevated prior to the induction of general anesthesia.
- Anesthesia providers will be observed prior to implementation to determine in obese surgical patients during induction:
 - Patient position during induction.
 - The lowest SaO2 during induction.
- A presentation will be given during the monthly meeting of anesthesia providers on the evidence of the head elevated positioning of obese patients to improve oxygenation.
- Laminated flyers will be posted on or near all anesthesia machines and carts to encourage proper positioning during preoxygenation.
- Anesthesia providers will then be observed to determine if there was an increase in the frequency of head elevation of obese surgical patients and the SaO2 during induction.
- This information will determine if a change in practice was made.

