


Postoperative Management After Tracheostomy and Laryngectomy: Improving Nursing Knowledge With Bedside Posters

Sam DeVictor, MD¹, Adrian A. Ong, MD¹, Andrew P. Kelly¹, and Mark S. Burke, MD^{1,2,3}

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Abstract

This study sought to improve nursing staff understanding regarding the differences in postoperative management between patients who have undergone tracheostomy and laryngectomy. The intervention involved a brief didactic session followed by the placement of an informative poster and anatomic diagram above the bed of tracheostomy and laryngectomy patients over a 6-month period. Data were collected before and after the didactic session and poster implementation. Of the 50 nurses surveyed, 32% believed oral ventilation is appropriate for laryngectomy patients compared to 0% of nurses after the intervention. The percentage of nursing staff reporting self-assessed clear understanding of the patient care differences between laryngectomy and tracheostomy improved after the intervention. The use of informational posters and didactic sessions significantly improves nursing staff understanding of the differences between tracheostomy and laryngectomy patients.

Level of Evidence: IV

Keywords

tracheostomy, laryngectomy, quality improvement, management

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Complications associated with tracheostomies and laryngectomies are rare, but they can have devastating outcomes if not managed appropriately.^{1,2} An understanding of surgically altered airway anatomy is necessary to address emergencies to avoid hypoxic brain injury.³ Nurses are often the first line of defense in airway management, and a well-informed nursing team can facilitate better patient care and communication among health care professionals.

Surveys carried out at various institutions have shown deficits in understanding of the relevant anatomy following these procedures.^{4,5} El-Sayed et al⁴ showed that 19% of physicians, nurses, and respiratory therapists did not understand

that patients who had undergone a laryngectomy no longer had an oral or nasal airway. McDonough et al⁵ demonstrated that 22% of nurses surveyed could not communicate the difference between a tracheostomy and a laryngectomy.

Attempts to address these concerns include the use of didactic sessions, simulations, and mandatory signage near patient beds.^{4,6} These have been shown to be a simple, cost-effective intervention to improve knowledge of health care professionals. The purpose of this study was to determine whether a didactic session and informational posters confer improvement in knowledge of surgically altered airways (tracheostomy and laryngectomy) among nursing staff.

Materials and Methods

Approval by the institutional review board of the University at Buffalo was obtained. An 8-question preintervention survey (see Suppl. Figure S1 in the online version of the article) was given to the nurses of the surgical floor as well as the surgical intensive care unit (ICU) at a single institution. The survey was given to nurses who primarily care for head and neck patients with various levels of experience.

¹Department of Otolaryngology, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo, The State University of New York, Buffalo, New York, USA

²Department of Surgery, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo, The State University of New York, Buffalo, New York, USA

³Department of Head and Neck and Plastic and Reconstructive Surgery, Erie County Medical Center, Buffalo, New York, USA

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Corresponding Author:

Sam DeVictor, MD, Department of Otolaryngology, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo, The State University of New York, 1237 Delaware Avenue, Buffalo, NY 14209, USA.
 Email: samdevictor2022@gmail.com



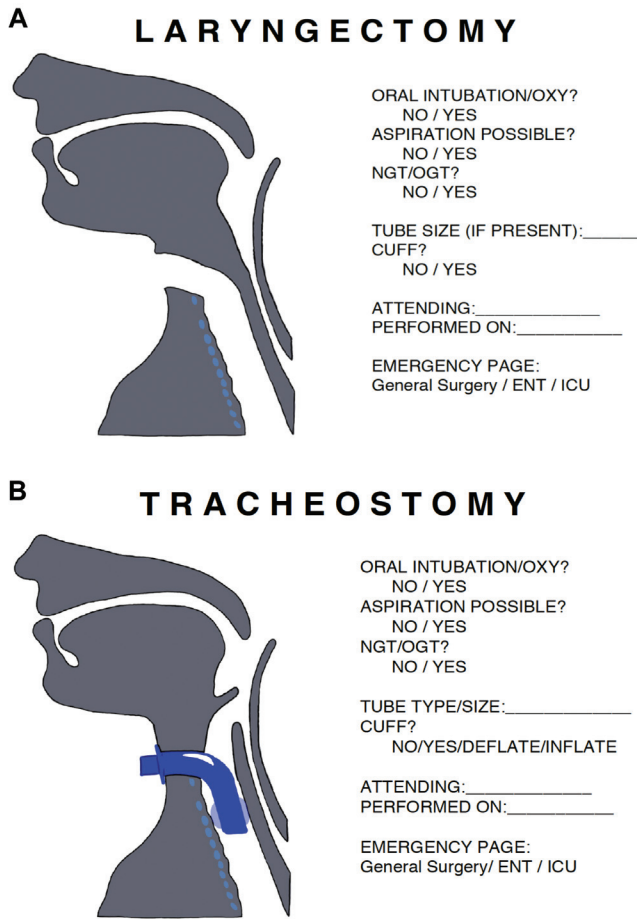


Figure 1. (A) Poster placed above bed of patients with laryngectomy. (B) Poster placed above bed of patients with tracheotomy.

The survey assessed nurses’ basic understanding of anatomy, aspiration risk, and ability to place a nasogastric tube (NGT). After completion of the preintervention survey, a brief 10-minute didactic was given to the nursing staff to review differences between laryngectomy and tracheostomy patients as well as instructions on how to use the interventional posters.

Two interventional posters were created: one for laryngectomy patients (**Figure 1A**) and one for tracheostomy patients (**Figure 1B**). The posters included a diagram of the anatomical differences between the 2 sets of patients, along with descriptions of the ability or inability to orally ventilate, risk of aspiration, NGT placement, tracheostomy/laryngectomy tube type and size, and whom to contact in case of an emergency. These posters were placed above patients’ beds for a total of 6 months. At the end of the study period, the survey was administered for a second time in an anonymous fashion. Continuous variables were analyzed using a paired *t* test or Wilcoxon signed rank-sum test while McNemar’s test was used to analyze nominal variables. A *P* value of <.01 determined the cutoff for statistical significance.

Results

A total of 50 nurses from the surgical floor and ICU completed the pre- and postintervention surveys. Sixteen (32%) nurses believed oral ventilation is “sometimes” or “always” appropriate for laryngectomy patients compared to zero nurses after the intervention (*P* < .01). In addition, 29 (58%) nurses believed that oral ventilation is “never” appropriate for patients with a tracheostomy compared to 4 (8%) following the 6-month period (*P* < .01). Most nurses understood there is no longer an oral airway after laryngectomy both before (41 total, 82%) and after the intervention (48 total, 96%), *P* = .07. Only 6 (12%) participants believed tracheostomy patients were at risk of aspiration compared to 50 (100%) after the intervention (*P* < .01). While most understood that an NGT can be placed in a tracheostomy patient (44 preintervention vs 45 postintervention, *P* = 1.00), few understood that an NGT could be placed in a well-healed laryngectomy patient prior to the intervention (24 preintervention vs 50 postintervention, *P* < .01). Self-reported understanding of the patient care differences between laryngectomy and tracheotomy improved after the didactic and poster implementation (8 preintervention vs 40 postintervention, *P* < .01) (**Figure 2**). There was a total of 11 laryngectomy and 34 tracheostomy patients over the study period.

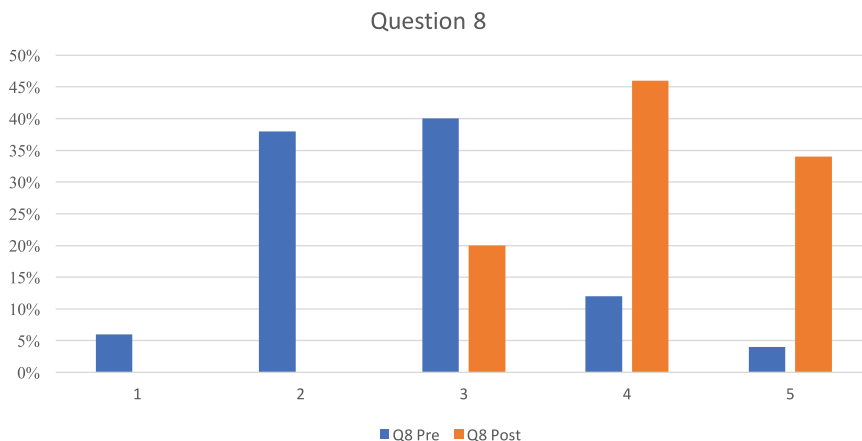


Figure 2. Responses for question 8 before and after the intervention.

Discussion

Nurses are typically the first-line health care professionals during airway emergencies. In this study, we demonstrated that there continues to be a lack of understanding regarding the management of these surgical airways. This study achieved significant improvements in nurse knowledge and self-efficacy. However, these conclusions are limited as we were unable to assess their impact on clinical outcomes.

Other institutions have attempted similar interventions to improve their nursing teams' confidence in managing these complicated airways. However, their interventions (training sessions, online modules, high-fidelity mannequins) required significant time and resources, which can be potential barriers for sustainable improvements.⁴⁻⁶ Our study offered a brief intervention that is easily implemented with negligible cost. This lends itself to future studies that may assess the sustained efficacy of this intervention.

This study was unable to account for varying levels of experience with surgical airways among our participants as well as how many emergent airway events the nurses encountered following the intervention. Finally, we were unable to separate the effect of the didactic session from that of the posters, as nurses were only evaluated following their exposure to both interventions. Further studies need to be performed to address sustainability of outcomes.

Conclusion

Didactic lectures and the use of informational posters and anatomic diagrams significantly improved nursing staff understanding about the differences between tracheostomy and laryngectomy patients. Understanding the anatomical differences between these patient populations may improve patient care both during routine postoperative management and in airway emergency settings.

Author Contributions

Sam DeVictor, substantial contribution to conception, acquisition of data, analysis, and design; substantial contribution to drafting and revising manuscript for critically important intellectual data; approves final version of manuscript and agrees to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved; **Adrian A. Ong**, substantial contribution to conception, acquisition of data, analysis, and design; substantial contribution to drafting and revising manuscript for critically important intellectual data; approves final version of manuscript and agrees to be accountable for all aspects of the work in ensuring

that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved; **Andrew P. Kelly**, substantial contribution to conception, acquisition of data, analysis, and design; substantial contribution to drafting and revising manuscript for critically important intellectual data; approves final version of manuscript and agrees to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved; **Mark S. Burke**, substantial contribution to conception, acquisition of data, analysis, and design; substantial contribution to drafting and revising manuscript for critically important intellectual data; approves final version of manuscript and agrees to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Disclosures

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Supplemental Material

Additional supporting information is available at <http://journals.sagepub.com/doi/suppl/10.1177/2473974X20971185>

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