Utilizing Simulation to Enhance Knowledge and Skill in Management of Tracheostomy and Laryngectomy

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INTRODUCTION

Tracheostomy and laryngectomy are specific surgical techniques that create an airway which communicate with the anterior neck to allow respiration in patients with upper airway obstructions among other indications. While these may have similar superficial appearance; the upper airway can never be used in total laryngectomy, but may possibly be used in tracheostomy patients. Physicians not trained in performing these surgical procedures often have inadequate knowledge to properly manage the airways of these patient populations.1 Individuals with surgically constructed upper airways often have additional co-morbid medical conditions and require care from a variety of physician specialists, increasing the chances that they could receive care from providers with little to no training in management of their airway. This prospective study is an educational research and quality improvement project aimed to determine if high fidelity simulation combined with didactics is an effective strategy in educating physicians in tracheostomy and laryngectomy care. A similar educational intervention has been used in tracheostomy education in other studies with encouraging results.2-4

METHODS

Sixty-four physician trainees from internal medicine, internal medicine-pediatrics, emergency medicine, and pediatric emergency medicine training programs participated in this educational study and comprehensive, simulation-based curriculum. The curriculum included a tracheostomy and laryngectomy didactic session, hands on experience performing a tracheostomy change, and practicing emergency scenarios on interactive, high fidelity simulation mannequins. Pre- and post-intervention assessments were performed which included a Likert scale based assessment of self-perceived comfort, an objective multiple choice assessment of knowledge, and a checklist assessment of routine tracheostomy change proficiency performed by staff experienced in tracheostomy care. Pre- and post-assessments were individually matched using anonymous identifiers and results compared.

RESULTS

Pre- and post-intervention assessment of self-perceived comfort showed a statistically significant improvement in median Likert score from 2.21 to 4.40 (p < 0.001).

Assessment of objective knowledge showed a statistically significant improvement in mean multiple choice score from 58.8% to 84.6% (p < 0.001).

DISCUSSION

Patients with laryngectomy and tracheostomy are commonly cared for by many physician specialties, some of which have had minimal training on the unique features of tracheostomy and laryngectomy care. This study has shown that comprehensive tracheostomy and laryngectomy education, which combines enhancement of knowledge with simulation of both routine and emergent aspects of care, was effective in improving confidence, knowledge, and procedural proficiency. This should result in improved outcomes for these patient populations. Similar education courses would be a useful addition to the curriculum of physician trainees likely to manage patients with tracheostomy or laryngectomy.

REFERENCES