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Research Abstracts

Concise and Effective Simulation-Based Tracheostomy Education for Preclinical Medical Students

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Introduction: Tracheostomy management training is critical, yet medical students often encounter it late or not at all. Previous programs focused on non-surgical residents and senior medical students. A gap in the literature remains in tracheostomy simulation in the preclinical training. This quality improvement pilot program evaluated whether a concise simulation-based tracheostomy module, embedded in a preclinical head and neck examination course, could enhance knowledge and confidence in caring for tracheostomy patients.

Methods: Academic otolaryngologists from multiple subspecialties delivered a structured simulation module during a mandatory preclinical head and neck course. Two simulators were used: Tracheostomy T.O.M. for pertinent anatomy, and the Life/Form Simulator for more clinical fidelity. Each small group was assigned a simulator and participated in hands-on exercises, followed by guided discussion and independent practice. Students completed pre- and post-course surveys assessing knowledge and confidence using a 4-point Likert scale (1 = not confident, 4 = very confident). Paired t-tests compared outcomes.

Results: Seventy-nine preclinical students participated, of whom only 10% had prior tracheostomy exposure. Confidence scores more than doubled (110% increase, $p < 0.005$), and knowledge scores increased from 50% to 80% correct ($p < 0.005$). Feedback highlighted simulation fidelity, hands-on practice, and concise delivery. Most requested additional resources or extended time (89%), while very few cited drawbacks (5%).

Conclusions: A concise simulation-based tracheostomy module is feasible and effective in the preclinical setting, improving student confidence and knowledge. Simulation can introduce advanced skills earlier in training while remaining efficient and well-received. Integrating simulation into curricula supports early competence in managing complex scenarios and preparing students for later encounters. This pilot supports refinement and longitudinal evaluation of tracheostomy simulation as a model for early exposure to other critical skills.