NTSP Podcast series

National Tracheostomy Safety Project

This month's top papers: September 2024

Welcome to the latest blog in the literature podcast from the NTSP. We try to bring you a quick roundup of what is hot in the world of tracheostomy and laryngectomy publications by scouring internationally recognised journals and media and bringing you the highlights.

The papers we will discuss this month are detailed below, along with an automated transcript of the podcast. Please note that the transcript is generated by AI and so may not be totally accurate.

You can find the links to the podcast on www.tracheostomy.org.uk and by searching for NTSP on your favourite podcast platform. Some of the podcasts are also uploaded to YouTube if you prefer to get your news that way. Check out the NTSP YouTube channel at https://www.youtube.com/c/NationalTracheostomySafetyProject. Please follow us and/or subscribe to keep up to date! https://x.com/NTSP_UK

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This month's top papers

- Enhancing Communication in Critically Ill Patients with a Tracheostomy: A Systematic Review of Evidence-Based Interventions and Outcomes.
- Mastering tracheostomy care: Refresher programme for tracheostomy training for nurses: Comparison of two training methods based on hands-on simulation-based training alone versus additional complementary self-directed e-learning.
- Ultrasound-Guided Percutaneous Tracheostomy in Cardiovascular and Thoracic Surgery of South Korea: Retrospective Evaluation of Efficacy and Safety in Critically Ill Patients.

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Enhancing Communication in Critically Ill Patients with a Tracheostomy: A Systematic Review of Evidence-Based Interventions and Outcomes.

Lay Summary:

This review addresses the profound challenges faced by critically ill patients with a tracheostomy, who are often voiceless because their breathing tube blocks airflow to the vocal cords. The loss of the ability to communicate is devastating, leading to anxiety, frustration, and social isolation. The study's primary goal was to systematically evaluate various methods—from simple boards to high-tech devices—used to restore a patient's voice and improve their overall well-being.

The findings demonstrate that these communication interventions provide demonstrable benefits. Restoring the ability to speak, even mechanically, is linked to improved quality of life (QoL), better voice clarity (speech intelligibility), and enhanced recovery. Furthermore, these interventions can accelerate clinical milestones, such as sooner initiation of oral intake and a shorter time to have the breathing tube removed (decannulation).

The review concludes that while different devices work for different people, there is a clear benefit to restoring a patient's voice. The key to success is a tailored, patient-centered approach that identifies unique facilitators and barriers for each individual. By prioritizing communication, hospitals can improve the patient's experience, reduce frustration, and enhance clinical recovery. The role of specialized therapists in supporting this process is considered vital.

Summary for Healthcare Professionals:

This systematic review evaluated the efficacy of Augmentative and Alternative Communication (AAC) interventions in critically ill patients with a tracheostomy, assessing outcomes across functional domains, resource utilization, and patient quality of life (QoL). The review synthesized evidence on various communication devices and interventions to provide an updated, evidence-based consensus.

The synthesis confirmed that various interventions demonstrate measurable and desirable impacts on clinical and functional outcomes. Key findings included significant improvements in QoL, speech intelligibility, and voice quality following the use of communication devices. Additionally, interventions were associated with favorable changes in clinical timelines, including shorter time to initial communication device use, oral intake, and decannulation. The identification of facilitators and barriers suggests that a simple, one-size-fits-all approach is inadequate.

The review concludes that the evidence aligns with the desired outcomes of improved clinical response and reduced healthcare utilization. The authors emphasize the necessity of a tailored, patient-centered approach to communication and the central role of Speech-Language Pathology (SLP) expertise in optimizing rehabilitation outcomes for this high-risk population. This synthesis strongly supports the prioritization of communication as an essential component of the multidisciplinary critical care pathway.

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Mastering tracheostomy care: Refresher programme for tracheostomy training for nurses: Comparison of two training methods based on hands-on simulation-based training alone versus additional complementary self-directed e-learning.

Lay Summary:

This study looked at the effectiveness of a refresher training program for nurses who already care for tracheostomy patients, comparing the standard hands-on simulation training with the same simulation combined with an additional self-directed e-learning module. Since continuous, effective education is essential for patient safety, the goal was to find the most efficient way to keep nurses' skills sharp.

The results showed that all nurses who participated in the training significantly improved their confidence, knowledge, and hands-on skills immediately after the course. This confirms that continuous simulation-based training is highly effective. However, the group that also completed the e-learning module performed even better. Nurses who used the e-learning component scored significantly higher in both their knowledge and confidence compared to the nurses who only did the hands-on simulation. The study concludes that while the core benefit comes from the hands-on practice, adding a flexible, self-directed e-learning module provides a superior boost to knowledge and confidence. This blended approach is recommended for ensuring nurses maintain the highest level of competency for safely managing tracheostomy patients.

Summary for Healthcare Professionals:

This study evaluated the impact of a Tracheostomy Refresher Program (TRP) on nurses' competencies, comparing two delivery methods: hands-on simulation-based training alone (TRP-S) versus simulation combined with a complementary self-directed e-learning component (TRP-S+e). The aim was to optimize ongoing clinical education and maintain the proficiency required for efficient and safe tracheostomy care.

The analysis utilized pre- and post-tests, including theory assessments and psychomotor skill checklists, and found that both training methods resulted in significant post-training enhancement across all measured domains: confidence, knowledge, and psychomotor skills ($p<0.001$). Critically, the addition of the complementary e-learning module provided a statistically significant advantage. The TRP-S+e cohort scored significantly higher in both self-reported knowledge and confidence compared to the TRP-S cohort alone ($p<0.001$ for both).

The study concludes that a refresher program incorporating simulation with a self-directed e-learning component is the most effective approach for continuous nursing education in tracheostomy care. This blended approach maximizes the immediate skill transfer of hands-on training while utilizing the accessibility and flexibility of e-learning to reinforce cognitive domains and affective confidence. The authors suggest that future research should focus on optimizing the duration and engagement strategies of such blended educational models.

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Ultrasound-Guided Percutaneous Tracheostomy in Cardiovascular and Thoracic Surgery of South Korea: Retrospective Evaluation of Efficacy and Safety in Critically Ill Patients.

Lay Summary:

This study looked at the safety of performing a tracheostomy on critically ill patients who had recently undergone complex heart or chest surgery. The specific technique examined was Ultrasound-Guided Percutaneous Tracheostomy (UPCT), a less invasive procedure where a doctor uses an ultrasound to guide the breathing tube into the neck. The procedure is often risky for these patients because they frequently require blood-thinning medications, increasing the concern for major bleeding.

Researchers analyzed the records of 81 patients and found that UPCT can be safely used in this vulnerable group. The most frequent problem observed was minor bleeding that did not require a blood transfusion, occurring in 18.5% of patients. Only 8.6% of patients experienced a major complication, and these were all bleeding events that required a transfusion. Crucially, the study found no cases of infection, severe tracheal narrowing, or the need to convert the procedure to open surgery. The rate of complications observed was similar to those reported in other studies. The authors conclude that UPCT is a feasible and effective option for these complex patients in the intensive care setting, but they recommend that further research be conducted to confirm these findings and establish optimal practice guidelines.

Summary for Healthcare Professionals:

This retrospective cohort study evaluated the efficacy and safety profile of Ultrasound-Guided Percutaneous Tracheostomy (UPCT) in 81 critically ill adult patients (age ≥15 years) admitted to the ICU of a South Korean tertiary care center specializing in cardiovascular and thoracic surgery. The objective was to characterize complication rates associated with UPCT, particularly in this specialized, high-risk surgical ICU population.

The analysis found that UPCT is a safe and feasible method. The most common minor complication was bleeding not requiring transfusion, occurring in 18.5% of patients. Major complications were identified in 8.6% of the cohort, with all major events involving bleeding that necessitated blood transfusion. Notably, the procedure was associated with no reported cases of infection, conversion to open surgery, or late tracheal stenosis requiring surgical intervention. The total complication rate was found to be comparable to rates reported in existing literature. The authors conclude that these results demonstrate that UPCT can be safely and effectively implemented in critically ill patients, supporting its use as a standard bedside procedure, although further investigation is warranted to refine the data on long-term outcomes for this patient group.

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Scientific abstracts and references

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Tracheostomy. 2024;1(1):26-41. doi: 10.62905/001c.115440. Epub 2024 Mar 31.

Enhancing Communication in Critically Ill Patients with a Tracheostomy: A Systematic Review of Evidence-Based Interventions and Outcomes.

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BACKGROUND: Tracheostomy, a common procedure performed in intensive care units (ICU), is associated with communication impairment and affects patient well-being. While prior research has focused on physiological care, there is a need to address communication needs and quality of life (QOL). We aimed to evaluate how different types of communication devices affect QOL, speech intelligibility, voice quality, time to significant events, clinical response and tolerance, and healthcare utilization in patients undergoing tracheostomy. METHODS: Following PRISMA guidelines, a systematic review was conducted to assess studies from 2016 onwards. Eligible studies included adult ICU patients with a tracheostomy, comparing different types of communication devices. Data were extracted and synthesized to evaluate QOL, speech intelligibility, voice quality, time to significant events (initial communication device use, oral intake, decannulation), clinical response and tolerance, and healthcare utilization and facilitators/barriers to device implementation. RESULTS: Among 9,228 studies screened, 8 were included in the review. Various communication devices were employed, comprising both tracheostomy types and speaking valves, highlighting the multifaceted nature of interventions. Quality of life improvements were observed with voice restoration interventions, but challenges such as speech intelligibility impairments were noted. The median time for initial communication device usage post-intervention was 11.4 ± 5.56 days. The median duration of speech tolerance ranged between 30-60 minutes to 2-3 hours across different studies. Complications such as air trapping or breathing difficulties were reported in 15% of cases. Additionally, the median ICU length of stay post-intervention was 36.5 days. Key facilitators for device implementation included early intervention, while barriers ranged from service variability to physical intolerance issues. CONCLUSION: Findings demonstrate that various types of communication devices can significantly enhance the quality of life, speech intelligibility, and voice quality for patients undergoing tracheostomy, aligning with the desired outcomes of improved clinical response and reduced healthcare utilization. The identification of facilitators and barriers to device implementation further informs clinical practice, suggesting a tailored, patient-centered approach is crucial for optimizing the benefits of communication devices in this population.

DOI: 10.62905/001c.115440 PMCID: PMC11382609 PMID: 39253605

Conflict of interest statement: Conflict of Interest / Financial Disclosures Other authors report nothing to disclose.

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Aust Crit Care. 2024 Sep 21:S1036-7314(24)00256-X. doi: 10.1016/j.aucc.2024.09.004. Online ahead of print.

Mastering tracheostomy care: Refresher programme for tracheostomy training for nurses: Comparison of two training methods based on hands-on simulation-based training alone versus additional complementary self-directed e-learning.

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BACKGROUND: Effective clinical education is essential for managing tracheostomy patients safely and efficiently. Simulation-based training has shown greater efficacy than traditional methods in various clinical settings. Our internal training programme, called the Tracheostomy Refresher Program (TRP) was used to enhance nurses' skills in tracheostomy care. AIM/OBJECTIVE: The aim of this study was to evaluate the impact of the TRP on nurses' self-reported knowledge and confidence and psychomotor skills comparing hands-on simulation-based training alone (TRP-S) with both the simulation-based training and the e-learning component (TRP-S + e). METHODS: The study was conducted at a large tertiary hospital in Singapore from February 2022 to October 2022, focussing on the TRP. Participants were divided into two cohorts: those receiving TRP-S and those receiving additional complementary TRP-S + e. All participants completed theory tests and affective questionnaires before and after the training to assess knowledge and attitudes. At the same time, their psychomotor skills were evaluated during the simulation using a standardised checklist. The two cohorts were then compared based on the results of these pretests and post-tests and the psychomotor skills assessment to evaluate the effectiveness of the additional e-learning component. RESULTS: Participants reported significantly enhanced confidence, knowledge, and psychomotor skills in tracheostomy care post training ($p < 0.001$ for all). The TRP-S + e cohort showed significantly higher knowledge and confidence scores than the TRP-S cohort ($p < 0.001$ for both). CONCLUSION: Our study suggests that a TRP incorporating hands-on simulation-based training with or without e-learning significantly improved self-reported knowledge, confidence, and psychomotor skills in tracheostomy care. Future research should explore the optimal duration, engagement strategies, and cost-effectiveness of such educational techniques and whether similar approaches can be applied for other clinical skills.

DOI: 10.1016/j.aucc.2024.09.004 PMID: 39307653

J Chest Surg. 2024 Sep 27. doi: 10.5090/jcs.24.057. Online ahead of print.

Ultrasound-Guided Percutaneous Tracheostomy in Cardiovascular and Thoracic Surgery of South Korea: Retrospective Evaluation of Efficacy and Safety in Critically Ill Patients.

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BACKGROUND: In intensive care settings, the maintenance of ventilation is typically essential. Tracheostomy is frequently performed to facilitate long-term ventilation and to minimize associated complications. This procedure can be conducted using several techniques, including traditional surgery, endoscopic approaches, and ultrasound-guided methods. METHODS: We retrospectively examined data from all patients admitted to the intensive care unit of our institution who underwent ultrasound-guided percutaneous tracheostomy (UPCT) between March 2018 and April 2023. The study included a total of 81 patients aged 15 years or older. To assess the incidence of complications, we classified these issues as either minor or major, with major complications encompassing events such as bleeding necessitating blood transfusion. RESULTS: The most frequent minor complication was bleeding that did not require blood transfusion, which occurred in 15 patients (18.5%). Major complications were identified in 7 patients (8.6%), all of whom experienced bleeding that necessitated transfusion. However, we noted no cases of infection, conversion to open surgery, or tracheal stenosis surgery. The complication rate did not significantly differ from those reported in previous studies. CONCLUSION: These results indicate that UPCT can be safely used in critically ill patients, although further research on this topic is needed.

DOI: 10.5090/jcs.24.057 PMID: 39327474