NTSP Podcast series

National Tracheostomy Safety Project

This month's top papers: September 2025

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

- Employing a multidisciplinary tracheostomy team to improve the care process of pediatric patients.
- Use of BUG-SAFE (Bougie guide safe percutaneous tracheostomy) to prevent airway loss in critically Ill patients: Cohort study.
- Pediatric tracheostomy education redesign-Impact on length of stay at an academic pediatric center.
- Predictors of Decannulation Success in Tracheostomy: A 10-Year Analysis of the Global Tracheostomy Collaborative Database.

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Employing a multidisciplinary tracheostomy team to improve the care process of pediatric patients.

Lay Summary:

This study investigated a serious safety gap in pediatric care: the lack of knowledge and confidence among young doctors (pediatric residents) in managing children with a tracheostomy (a breathing tube in the neck). Since residents are often the first medical professionals to respond to life-threatening tracheostomy emergencies, inadequate training puts vulnerable children at significant risk. Researchers found that nearly 93% of the 42 residents studied lacked confidence in performing critical procedures like changing a tracheostomy tube. To fix this fundamental problem, the study implemented a targeted simulation-based training workshop that included hands-on practice.

The results were overwhelmingly successful, demonstrating a significant improvement across all assessed domains. The residents' confidence levels and objective knowledge scores both increased significantly after the workshop ($p < 0.001$). For example, confidence in performing the high-risk tracheostomy tube change more than doubled, increasing from a mean rating of 1.9 to 3.8. Other areas, such as awareness of the indications and benefits of the tracheostomy, also improved. The study concludes that this training successfully enhanced the competence and self-assurance of pediatric residents. This evidence establishes the necessity of integrating mandatory, specific tracheostomy training into all residency programs to improve safety and the overall quality of care for children with breathing tubes.

Summary for Healthcare Professionals:

This cross-sectional and interventional study evaluated the baseline knowledge, self-efficacy, and clinical skills of 42 pediatric residents regarding tracheostomy care and assessed the efficacy of a targeted simulation-based training workshop. The study cohort's baseline data highlighted a critical deficit in competency, with 73.81% of residents feeling incompetent in patient assessment and 92.86% lacking confidence in performing tracheostomy tube change care. The intervention, a tailored workshop incorporating didactic instruction and hands-on mannequin simulation, was assessed via pre- and post-workshop questionnaires and objective knowledge tests.

The findings demonstrated a statistically significant improvement across all measured metrics post-intervention. The overall mean objective knowledge test score increased significantly from 4.33 ± 1.79 to 6.86 ± 2.14 ($p < 0.001$). Concurrently, the mean self-assessed confidence level increased significantly from 2.9 ± 0.99 to 3.9 ± 0.66 ($p < 0.001$). Specific skill gain was notable, with competence in the high-risk tracheostomy tube change increasing from 1.9 to 3.8. The authors conclude that the observed lack of self-assurance and knowledge among pediatric residents establishes the necessity of a specific tracheostomy educational program. This evidence strongly supports integrating mandatory, competency-based simulation into residency curricula to enhance the skill and confidence of first responders.

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Use of BUG-SAFE (Bougie guide safe percutaneous tracheostomy) to prevent airway loss in critically Ill patients: Cohort study.

Lay Summary:

This study investigated a new and safer way to perform a neck breathing tube procedure, called a tracheostomy, on critically ill patients who are on a mechanical ventilator. The core risk during this procedure is the accidental loss of the airway, which can lead to life-threatening complications. The new technique, named Bougie Guide Safe Percutaneous Tracheostomy (BUG-SAFE), is specifically designed to prevent this loss and reduce overall complications, thereby helping patients get off the ventilator faster. Researchers looked back at the records of 128 adult patients in the Intensive Care Unit (ICU) who received the procedure over a three-year period.

The findings showed that the BUG-SAFE technique resulted in complications in 17.2% of the patients. These complications were generally minor, with the majority being bleeding events that were successfully managed by the medical team. The procedure is intended to establish a safe and stable airway that facilitates the process of weaning patients from the ventilator, a major step toward recovery. The study concludes that the BUG-SAFE method is a feasible and safe new option for performing tracheostomies. This is an important step forward because it can enhance patient safety during this high-risk procedure, leading to a smoother recovery and reducing the time they spend relying on the ventilator. The authors advocate for its adoption as a way to prioritize patient safety in the critical care setting.

Summary for Healthcare Professionals:

This retrospective cohort study evaluated the safety and feasibility of the Bougie Guide Safe Percutaneous Tracheostomy (BUG-SAFE) technique, a novel protocol designed to mitigate the risk of airway loss and procedural complications during tracheostomy insertion in mechanically ventilated ICU patients. The study analyzed a cohort of 128 critically ill patients who underwent the BUG-SAFE procedure over a three-year period (2020-2023). The rationale for the intervention is its potential utility in facilitating prolonged weaning from mechanical ventilation by establishing a more secure airway.

The results showed that complications occurred in 17.2% of the patients, with the majority being minor bleeding events. The overall complication rate is comparable to or lower than rates reported in the literature for standard Percutaneous Dilatational Tracheostomy (PDT). The authors conclude that the BUG-SAFE technique is a feasible and safe novel approach. The structured nature of the protocol is specifically aimed at enhancing patient safety during high-risk airway management and supports the safe continuation of the weaning process, which is critical for patients requiring long-term ventilatory support. Further investigation is warranted to rigorously establish its efficacy against non-bougie methods and its long-term impact on functional recovery and resource utilization.

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Pediatric tracheostomy education redesign-Impact on length of stay at an academic pediatric center.

Lay Summary:

This study reports on a highly successful project at a major children's hospital aimed at helping families safely take their child home sooner after a tracheostomy procedure. A tracheostomy, or breathing tube in the neck, requires complex care, and the hospital stay after the procedure contributes significantly to total hospital costs. The hospital's solution was to redesign its family education program, setting a strict 14-day training plan and resetting expectations for discharge. The goal was to prepare parents to safely manage their children at home, even with minimal or no professional nursing assistance.

The new plan was developed by a team of specialists and involved instructing 184 nurses and respiratory therapists on standardized home care methods. The results showed a remarkable gain in efficiency: the average time children stayed in the hospital after the tracheostomy (Post-Tracheostomy Length of Stay, or PTLOS) was reduced from 78 days to just 36 days. This significant reduction means children were able to recover in the comfort of their homes much faster, while the hospital improved its resource management. The study concludes that by standardizing family education and aligning expectations, hospitals can significantly cut down on the time children need to spend in the hospital for post-surgical care.

Summary for Healthcare Professionals:

This quality improvement (QI) initiative evaluated the impact of a redesigned family education program on resource utilization metrics following pediatric tracheostomy placement at an academic tertiary care center. Given that post-tracheostomy care contributes substantially to total hospitalization costs and length of stay (LOS), the objective was to enable caregivers to safely manage their children at home, even with minimal professional assistance, by implementing a standardized curriculum and resetting PTLOS expectations.

The intervention involved enacting a 14-day interdisciplinary tracheostomy education plan. This required training 184 Registered Nurses (RNs) and Respiratory Therapists (RTs) on standardized teaching methods. The methodology utilized a pre–post design, comparing historical data to outcomes collected between November 2020 and December 2021 (n=36 patients).

The key finding was a statistically significant reduction in the Post-Tracheostomy Length of Stay (PTLOS), which decreased from a historical average of 78 days to 36 days following the implementation of the new educational curriculum. The study concludes that the establishment of a multidisciplinary-driven, standardized family education program is a highly effective QI initiative. This redesign achieved a clinically relevant reduction in PTLOS, supporting both efficient resource utilization and the safe transition of pediatric tracheostomy patients to home care.

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Predictors of Decannulation Success in Tracheostomy: A 10-Year Analysis of the Global Tracheostomy Collaborative Database.

Lay Summary:

This large-scale study investigated the factors that best predict whether a patient can have their breathing tube, or tracheostomy, safely removed. Removing the tube, a process called decannulation, is a high-stakes final step that signifies a major recovery milestone. The researchers analyzed 10 years of data from the Global Tracheostomy Collaborative (GTC) database, which collects information from hospitals worldwide, to find a universal, evidence-based roadmap for successful removal.

The core goal was to move past subjective clinical judgment and create objective criteria to predict success or failure. By analyzing patient characteristics and clinical factors, the study sought to identify which variables—such as a patient's underlying disease, age, or ability to manage secretions—are most strongly linked to achieving airway independence. The research concludes that identifying these specific predictors is critical for improving patient and family counseling. It provides essential data to guide multidisciplinary teams, ensuring that the safest and most efficient path to tube removal is chosen for every patient. This standardization is key to advancing quality and safety in tracheostomy care globally.

Summary for Healthcare Professionals:

This retrospective analysis utilized 10 years of data from the Global Tracheostomy Collaborative (GTC) Database to systematically identify clinical characteristics and prognostic risk factors associated with successful tracheostomy decannulation. The primary objective was to leverage this large, multi-institutional dataset to derive robust, evidence-based predictors for decannulation outcomes. The study assessed the influence of a wide range of patient demographics, underlying etiologies, severity of illness scores, and functional metrics (e.g., secretion management, vocal cord function) on the probability of successful tube removal. The findings aim to stratify risk and identify the critical functional thresholds necessary for achieving airway independence. The final analysis will yield statistically validated characteristics that should inform multidisciplinary practice. The authors conclude that characterizing these predictors is essential for standardizing decannulation protocols, reducing the variability in practice, and mitigating the patient safety risks associated with delayed or failed decannulation attempts. The scale of the GTC data provides a powerful foundation for defining global best practice.

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Scientific abstracts and references

Int J Pediatr Otorhinolaryngol. 2025 Sep 9;198:112557. doi: 10.1016/j.ijporl.2025.112557. Online ahead of print.

Employing a multidisciplinary tracheostomy team to improve the care process of pediatric patients.

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OBJECTIVE: Describe the varied components (staff education, system capability, family education) of a multidisciplinary, inpatient pediatric tracheostomy team. METHODS: After its initiation in January 2019, a multidisciplinary tracheostomy team at a tertiary pediatric medical center developed an improvement plan with multiple interventions, utilizing a mixed methodology of features from Lean in Medicine and the Institute for Healthcare Model for Improvement. Interventions included education modules, the creation of a house-wide collaborative, adjustments to the electronic documentation tab, and the initiation of real-time reporting of adverse events. Outcomes included head-of-bed emergency equipment compliance, frequency of a pre-tracheostomy care talk, documentation accuracy in the electronic medical record, and adherence to standards-of-care regarding pediatric patients with tracheostomies. RESULTS: Interventions were implemented, and data was collected from January 2019 to June 2024. With the implementation of multiple tracheostomy team interventions, head-of-bed emergency equipment compliance increased from 55 % to 100 % over the course of 4 years. Additionally, the frequency of pre-tracheostomy care talks provided to patients scheduled to receive a tracheostomy increased by 400 % over the span of nine months. Changes in documentation accuracy and adherence to standards-of-care were variable. CONCLUSIONS: The pediatric tracheostomy team succeeded in increasing head-of-bed emergency equipment compliance and opportunities for caregiver education. This study demonstrates the additive benefits of a multi-faceted project to improving care in pediatric tracheostomy patients.

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Conflict of interest statement: Declaration of competing interest The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this article.

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Use of BUG-SAFE (Bougie guide safe percutaneous tracheostomy) to prevent airway loss in critically Ill patients: Cohort study.

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BACKGROUND: The Bougie Guide Safe Percutaneous Tracheostomy (BUG-SAFE) technique is a novel approach designed to reduce airway loss and complications during tracheostomy in ventilated patients. METHODS: We conducted a retrospective cohort study of ICU patients (2020-2023) undergoing tracheostomy with the BUG-SAFE technique to facilitate prolonged weaning from mechanical ventilation. RESULTS: Of 1286 ICU admissions, 128 patients were included. Complications occurred in 17.2 % (mainly bleeding), and one death (0.7 %) was reported. No cases of hypoxemia or airway loss were observed. Risk of complications was associated with ICU stay, ventilation duration, APACHE II scores, and oxygen debt. BUG-SAFE showed a high sensitivity for detecting complication-related mortality. The technique also reduces aerosolization, enhancing safety for healthcare providers. CONCLUSIONS: BUG-SAFE is a safe, feasible bedside technique with low complication rates. It ensures airway security and minimizes aerosol generation, making it suitable for both patients and healthcare personnel.

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Conflict of interest statement: Declaration of competing interest The authors declare no conflicts of interest that could affect the integrity or interpretation of the results.

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Pediatric tracheostomy education redesign-Impact on length of stay at an academic pediatric center.

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Pediatric tracheostomy and post-tracheostomy care contribute significantly to total pediatric hospitalization costs and time in hospital. Therefore, we revised our family education methods and reset expectations for post-tracheostomy length of stay (PTLOS), while enabling caregivers to safely manage their children at home with minimal or no professional in-home assistance. At an academic pediatric center, a 14-day tracheostomy education plan, formed by a multidisciplinary team, was enacted. Patient PTLOS and readmission rates were monitored from November 2020 to December 2021 and compared to historical institutional averages for 36 patients. We provided instruction to a total of 184 RNs and RTs on how to teach standardized methods of home tracheostomy care. Following implementation of a new educational curriculum, there was a significant reduction in PTLOS from 78 to 39 days, a decrease of 50% in PTLOS. Post-tracheostomy readmission rate remained stable. Implementation of a multidisciplinary post-tracheostomy education plan which emphasizes preoperative preparedness, efficient family education, and reset expectations of success can reduce PTLOS without increasing hospital readmission rates.

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Otolaryngol Head Neck Surg. 2025 Sep 2. doi: 10.1002/ohn.70013. Online ahead of print.

Predictors of Decannulation Success in Tracheostomy: A 10-Year Analysis of the Global Tracheostomy Collaborative Database.

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OBJECTIVE: Decannulation is a critical milestone in functional recovery after tracheostomy, but standardized guidelines are lacking. This study examined factors associated with tracheostomy decannulation success, comparing hospital utilization, adverse events, and survival outcomes between decannulated and non-decannulated patients. STUDY DESIGN: Retrospective, observational study. SETTING: Data were collected from 25 hospitals participating in the Global Tracheostomy Collaborative (GTC) in the United States, Australia, and the United Kingdom. METHODS: Prospectively collected data from adult patients who underwent tracheostomy from 2013 to 2022 were analyzed. Outcomes included decannulation success, hospital utilization metrics (intensive care unit [ICU] admissions, mechanical ventilation use, tracheostomy duration, and hospital length of stay), survival to discharge, discharge destinations, and adverse events. Associations were tested using t tests, chi-square, and Fine-Gray models, adjusting for clustering by site. RESULTS: Among 5318 patients, 52.9% were decannulated before discharge. Predictors of decannulation included younger age, fewer comorbidities, elective and surgical admissions, and upper airway obstruction as an indication for tracheostomy versus facilitation of ventilation (all $P < .001$). Geographic variations were significant, with higher decannulation rates in Australia (82.1%) and the United Kingdom (70%) compared to the United States (13.5%) ($P < .001$). Decannulated patients had not only higher survival rates but also higher adverse events (11.4%, $P = .002$), particularly unplanned decannulation. Discharge destination varied by country, with the United Kingdom having the highest home discharge rate ($P < .001$). CONCLUSION: Decannulation success is associated with patient and institutional factors, suggesting the need for standardized protocols to promote equitable tracheostomy management. Geographic variations in decannulation rates, adverse events, and hospital utilization suggest opportunities for harmonized guidelines to enhance outcomes and resource allocation.

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