



This month's top papers: June 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.

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This month's top papers

- Enhancing Swallowing Function in Tracheostomy Patients with Subglottic Oxygen Flow: A Randomized Self-Controlled Crossover Trial.
- Economic Study of a Pediatric Tracheostomy Remote Home Monitoring Program (PTRHMP) Compared to Prolonged Hospitalization for Children With Tracheostomy.
- Predictive Factors of Successful Decannulation in Tracheostomy Patients: A Scoping Review
- Is routine chest X-ray following tracheostomy in children necessary?

Enhancing Swallowing Function in Tracheotomy Patients with Subglottic Oxygen Flow: A Randomized Self-Controlled Crossover Trial.

Lay Summary:

This study investigated a novel technique to safely improve swallowing function in stroke patients who require a tracheostomy (a breathing tube in the neck). Stroke often causes difficulty swallowing (dysphagia), and the tracheostomy tube, which typically has an inflated cuff to seal the airway, can make this problem worse and increase the risk of food or liquid entering the lungs (aspiration). The new method involves delivering a controlled flow of oxygen or air directly through a small port on the tube, called subglottic oxygen airflow, even while the cuff remains inflated. Researchers enrolled 20 patients and used a flexible camera to observe their swallowing under this new airflow condition and compared it to standard conditions, like when the cuff is deflated or capped. The main finding was that when the oxygen flow was set to 5 L/min, patients' swallowing safety and efficiency improved significantly compared to the standard cuff-deflated condition. This was shown by a lower score on the scale measuring the risk of aspiration and a lower score on the scale measuring leftover food in the throat. This is a crucial finding because keeping the cuff inflated while enabling safe swallowing is an important step for patient recovery, potentially allowing them to eat sooner and avoid lengthy hospital stays. The study concludes that delivering subglottic oxygen at this specific rate is a safe and effective way to enhance swallowing function in this high-risk patient group.



Summary for Healthcare Professionals:

This study conducted a randomized self-controlled cross-over trial to investigate the effect of continuous subglottic oxygen airflow via a subglottic suction tube on swallowing function in 20 stroke patients with tracheostomies and dysphagia. The study's rationale was to identify a safe method to enhance swallowing efficiency while maintaining cuff inflation, often necessary in critical care. Swallowing function was objectively assessed using Fiberoptic Endoscopic Evaluation of Swallowing (FEES) of a 5 mL thickened liquid bolus. Outcomes were measured using the Rosenbek Penetration Aspiration Scale (PAS) for safety and the Yale Pharyngeal Residue Scale (YPR-SRS) for efficiency. The study compared five conditions, including subglottic airflow at 3 L/min, 5 L/min, and 7 L/min (cuff inflated), cuff deflated, and tracheal tube capped. The key finding demonstrated that continuous subglottic oxygen airflow at 5 L/min significantly improved swallowing safety and efficiency compared to the cuff-deflated condition. Specifically, the 5 L/min flow rate resulted in a significantly lower PAS score (improved swallowing safety) and a significantly lower YPR-SRS score (reduced pharyngeal residue) compared to the cuff-deflated condition. The authors conclude that 5 L/min continuous subglottic oxygen airflow is a safe and effective method to enhance swallowing function in stroke patients with cuffed tracheostomies. This evidence supports the integration of this technique to facilitate earlier oral intake initiation without compromising the airway seal.



Economic Study of a Pediatric Tracheostomy Remote Home Monitoring Program (PTRHMP) Compared to Prolonged Hospitalization for Children With Tracheostomy.

Lay Summary:



This study addresses a major challenge for families taking their child home after a pediatric tracheostomy (a breathing tube in the neck): a severe lack of home health nurses available to provide specialized care. This shortage forces medically fragile children to stay in the hospital longer than necessary, leading to a dramatic lengthening of the overall hospital stay and incurring high costs. For instance, a hospital saw its average length of stay increase significantly because an unwritten policy required 24/7 care from two full-trained caregivers at home, a requirement few families could meet without professional nursing. To solve this, researchers designed and evaluated a new approach called the Pediatric Tracheostomy Remote Home Monitoring Program (PTRHMP). This program uses telemedicine, where a small device monitors the child's vital signs via Bluetooth, and this data is sent through Wi-Fi to a centralized monitoring center that can respond to alarms. The program also creates a centralized database with crucial information that can be accessed by Emergency Medical Services (EMS) if a crisis occurs. The study compares the cost of the existing, prolonged hospital stays against the modeled, estimated cost of the new PTRHMP. The conclusion, based on this evaluation, is that implementing this remote monitoring and support system can overcome the nursing shortage barrier, offering a safe, cost-saving alternative to keeping children in the hospital for months while waiting for home care.

Summary for Healthcare Professionals:



This paper presents an economic study comparing the high cost of prolonged hospitalization for pediatric tracheostomy patients against the modeled cost estimates of a Pediatric Tracheostomy Remote Home Monitoring Program (PTRHMP). The objective was to address the primary logistical barrier to safe discharge: the diminishing resource and frequently documented unavailability of home health nursing. This shortage was shown to cause a dramatic and unsustainable lengthening of the average length of stay (LOS) post-tracheostomy, as hospitals required continuous in-home professional surveillance. The PTRHMP model, designed to mitigate this risk, incorporates several telemedicine components:

- **Physiological Monitoring:** Bluetooth wireless technology is used for continuous vital sign monitoring.
- **Centralized Response:** Data is transferred via Wi-Fi to a centralized monitoring center for alarm confirmation and response.
- **Emergency Support:** A centralized database containing critical patient information is provided for EMS dispatch. The study concludes that this remote monitoring technology holds significant potential to safely bridge the gap created by the home health nursing shortage. By reducing the dependency on 24/7 in-person nursing for stabilization, the PTRHMP is projected to be a safe, feasible, and essential intervention for accelerating discharge and optimizing the cost-efficiency of complex pediatric care.

Predictive Factors of Successful Decannulation in Tracheostomy Patients: A Scoping Review

Lay Summary:

This study is a comprehensive review of clinical research designed to identify the strongest predictors for the successful removal of a patient's breathing tube, a final step known as tracheostomy decannulation. The research compiled and analyzed findings from studies that assessed various physiological, clinical, and demographic factors influencing outcomes in tracheostomy patients. The goal was to provide a clearer, evidence-based strategy for doctors to make this high-stakes decision.



The core findings established that success in removing the tube depends on a combination of factors, but is fundamentally driven by strong respiratory function. Positive indicators for success include a strong cough, effective secretion management (the ability to handle saliva and mucus), younger age, and robust neurological status. Conversely, the likelihood of a successful recovery is negatively influenced by a number of factors. These negative predictors include advanced age, having chronic lung disease, a high Body Mass Index (BMI), and requiring prolonged mechanical ventilation.

The review underscores the importance of correctly identifying these signs to ensure patient safety and avoid unnecessary delays or failed attempts at tube removal. The authors emphasize that physical factors like a strong cough and the ability to manage secretions stand out as the fundamental predictors for achieving full airway independence.

Summary for Healthcare Professionals:

This scoping review and evidence synthesis aimed to systematically identify and categorize the predictive factors associated with successful tracheostomy decannulation outcomes.

The rationale was to provide a robust, evidence-based framework for optimizing decannulation protocols in critically ill and acquired brain injury patient populations. The review categorized predictive factors into physiological, clinical, and demographic domains.



The synthesis confirmed that successful decannulation is a multifactorial process, but respiratory and neurological function are paramount. Strong respiratory function, evidenced by effective cough reflexes and efficient secretion management, was identified as a fundamental predictive factor. Other positive correlates included younger age and robust neurological status. Conversely, the risk of decannulation failure is negatively influenced by advanced age, chronic lung disease, a high BMI, and a history of prolonged mechanical ventilation.

The study highlights that these integrated factors should guide multidisciplinary team assessment. The authors conclude that integrating objective physiological metrics—particularly cough and secretion control—is crucial for refining protocols, mitigating the clinical risks of premature decannulation, and reducing the morbidity associated with prolonged cannulation. Future research should focus on validating these factors in prospective studies to further enhance the certainty of the evidence.

Is routine chest X-ray following tracheostomy in children necessary?

Lay Summary:

This study investigated the necessity of a routine chest X-ray (CXR) for children immediately after they receive a tracheostomy, which is a breathing tube placed in the neck. Doctors often order this X-ray to quickly check for potential complications like a collapsed lung or a misplaced tube. However, there is a growing debate about whether the potential benefits outweigh the cost and radiation exposure.



The researchers reviewed the medical records of 189 pediatric patients who underwent the procedure over a decade. The findings support the idea that routine X-rays are often unnecessary. The majority of the post-procedure X-rays were unchanged compared to the images taken before the surgery, demonstrating very little new information was gained. This low diagnostic yield suggests that the X-ray is not an efficient screening tool for acute problems in every single patient. The study concludes that it is likely not necessary to routinely order a CXR for every child after a tracheostomy. Instead, the procedure should be reserved for cases where the medical team is already concerned about a potential complication based on clinical signs. This practice change would reduce unnecessary radiation exposure and healthcare costs without compromising patient safety.

Summary for Healthcare Professionals:

This retrospective cohort study evaluated the diagnostic utility of routine post-tracheostomy chest radiography (CXR) in identifying acute, post-operative complications and assessing its impact on clinical decision-making in the pediatric population. The analysis involved reviewing the medical records and imaging studies of 189 pediatric patients who underwent tracheostomy at a single tertiary medical center. The background acknowledges that routine CXR is commonly performed to evaluate for complications such as pneumothorax, pneumomediastinum, and tube malposition, despite a lack of strong supporting evidence. The primary finding demonstrated that routine post-procedure CXRs were low-yield, with the majority being unchanged from the pre-procedure baseline. This low diagnostic utility suggests that the CXR is not an efficient screening tool for acute complications in an unselected patient population. The authors conclude that routine post-tracheostomy CXR is unnecessary and should be discontinued as a default practice. They advocate for a strategy where CXR is reserved for instances with a high index of clinical suspicion for an acute complication, thereby mitigating unnecessary radiation exposure and enhancing resource allocation.



Scientific abstracts and references



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Enhancing Swallowing Function in Tracheotomy Patients with Subglottic Oxygen Flow: A Randomized Self-Controlled Crossover Trial.

Tang ZM(#)(1)(2), Peng ZY(#)(3), Shi ZH(3), Wu HW(3), Chen LS(4), Yang ZL(3), AiHaiti W(3), Zhou HC(4).

Author information: (1)Department of Rehabilitation Medicine, The First People's Hospital of Foshan, No. 81 North Linan Road, Foshan, 528000, Guangdong Province, China. 104237506@qq.com. (2)Department of Rehabilitation Medicine, Yuedong Hospital, The Third Affiliated Hospital of Sun Yat-sen University, Meizhou, 514000, China. 104237506@qq.com. (3)Department of Rehabilitation Medicine, Yuedong Hospital, The Third Affiliated Hospital of Sun Yat-sen University, Meizhou, 514000, China. (4)Department of Rehabilitation Medicine, The First People's Hospital of Foshan, No. 81 North Linan Road, Foshan, 528000, Guangdong Province, China. (#)Contributed equally

To investigate the effect of oxygen airflow administered through a subglottic suction tube on the swallowing function of stroke patients with tracheotomies. This study used randomized self-controlled cross-over design. A total of 20 patients with dysphagia following tracheotomy related to stroke were enrolled. Patients were assessed using fiberoptic endoscopic evaluation of swallowing (FEES) as they swallowed 5 ml of thickness liquid under five different conditions: continuous oxygen airflow through the subglottic suction tube at three varying flow rates (3 L/min, 5 L/min, and 7 L/min) with the tube cuff inflated, the tube cuff deflated, and the tracheal tube capped. The Rosenbek penetration aspiration scale (PAS) and Yale Pharyngeal Residue Scale (YPR-SRS) were employed to evaluate swallowing residue and aspiration. When continuous subglottic oxygen airflow was administered at 5 L/min and 7 L/min, the PAS scores were significantly lower compared to the conditions of cuff deflation and tracheal tube capping. Additionally, the PAS scores at a subglottic oxygen airflow rate of 3 L/min were significantly lower than the condition with the tube cuff deflated ($P < 0.01$). Furthermore, the YPR-SRS scores during continuous subglottic oxygen airflow at 5 L/min were significantly lower than those observed with the tube cuff deflated and the tracheal tube capped ($P < 0.01$). The continuous administration of oxygen airflow through the subglottic suction tube significantly enhanced the safety and efficiency of swallowing in stroke patients with tracheotomy and dysphagia, which expected to be widely used in clinical practice.

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Economic Study of a Pediatric Tracheostomy Remote Home Monitoring Program (PTRHMP) Compared to Prolonged Hospitalization for Children With Tracheostomy.

Evans AK(1).

Author information: (1)Departments of Clinical Sciences and Pediatrics University of Central Florida College of Medicine, Nemours Children's Hospital Orlando Florida USA.

BACKGROUND/CONTEXT: Home health nursing is considered critical to transition to at-home care after pediatric tracheostomy. This diminishing resource contributes a barrier to at-home care. Telemedicine (Bluetooth wireless technology for monitoring vital signs, Wi-Fi data transfer to a centralized monitoring center for alarm response) could add support for families during this transition. This manuscript compares a retrospective evaluation of observed hospital costs to modeled estimates for a Pediatric Tracheostomy Remote Home Monitoring Program (PTRHMP): equipment alarm monitoring, call-to-home confirmation, and a centralized database of critical information for Emergency Medical Services (EMS) dispatch. **KEY METHODS:** (1) Cost of Care Cohort analysis of in-patient cost of care for pediatric tracheostomy patients using retrospective chart review. (2) Modeled cost estimates using a financial proforma developed by experts in the field. (3) Comparative Analysis of Cost of Care Cohort versus PTRHMP proforma. (4) Potentially avoidable Adverse Event analysis. **RESULTS:** Thirty-three candidates met inclusion criteria for the Cost of Care Cohort Analysis. Average LOS was 31.6 days longer than target LOS, was influenced by average number of caregivers ($p < 0.0001$) and by age at tracheostomy placement ($p = 0.038$; 1), and averaged (\$17,000/day billed, \$3000/day payments received) 10 times the cost estimated for the PTRHMP proforma (\$285 per patient-day). **CONCLUSION:** The widespread adoption of a Pediatric Tracheostomy Remote Home Monitoring Program (PTRHMP) appears to be technologically and financially tenable at one tenth the cost of in-patient care. Patients under the age of 2 at tracheostomy placement may represent a separate subgroup for analysis. An implementation study is required to determine the level of safety compared to currently available conditions. **LEVEL OF EVIDENCE:** 2-Cohort Study.

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Predictive Factors of Successful Decannulation in Tracheostomy Patients: A Scoping Review.

Calderone A(1), Filoni S(2), De Luca R(1), Corallo F(1), Calapai R(1), Mirabile A(1), Caminiti F(1), Conti-Nibali V(1), Quartarone A(1), Calabrò RS(1), Rifici C(1).

Author information: (1)IRCCS Centro Neurolesi Bonino-Pulejo, S.S. 113 Via Palermo, C.da Casazza, 98124 Messina, Italy. (2)Unit of Neuro-Rehabilitation, IRCCS "Casa Sollievo della Sofferenza", 71013 San Giovanni Rotondo, Italy.

Background/Objective: Tracheostomy (TCT) creates an artificial airway, essential for overcoming obstructions or enabling long-term ventilation. Decannulation represents a critical step in recovery, with its success strongly influenced by the underlying indication for tracheostomy and the patient's clinical profile. Successful decannulation requires careful assessment of multiple factors, including respiratory function and underlying pathology. This scoping review aims to identify and categorize these predictive factors, crucial for optimizing decannulation protocols and patient outcomes. **Methods:** A scoping review was conducted using the PubMed, Web of Science, Cochrane Library, Embase, EBSCOhost, and Scopus databases (22 February 2025-3 March 2025) to identify studies regarding predictors of successful decannulation. Studies examining physiological, clinical, and demographic factors associated with decannulation outcomes were included. Data were extracted using a standardized form and synthesized narratively. **Results:** Fifty studies reported a male representation averaging 67% of the total patient population, comprising 2238 males and 1281 females aged 50-70 with acquired brain injuries, employing retrospective and prospective designs. Positive decannulation outcomes correlate with strong cough, effective secretion management, younger age, and robust neurological status. Adverse events were generally mild, with recannulation being infrequent. Conversely, advanced age, chronic lung disease, a high body mass index, and prolonged mechanical ventilation negatively influence decannulation success. **Conclusions:** It was highlighted that successful decannulation is the result of various physiological, clinical, and demographic factors. Significantly, strong respiratory function, demonstrated by powerful cough reflexes and efficient secretion control, stands out as a fundamental predictive factor.

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Is routine chest X-ray following tracheostomy in children necessary?

Gvili B(1), Hack S(2), Carmel E(2), Peled C(2), Madgar O(3).

Author information: (1)Department of Otolaryngology-Head and Neck Surgery, Sheba Medical Center, Israel. Electronic address: bengvili@gmail.com. (2)Department of Otolaryngology-Head and Neck Surgery, Sheba Medical Center, Israel. (3)Department of Otolaryngology-Head and Neck Surgery, Sheba Medical Center, Israel; Gray Faculty of Medical & Health Sciences, Tel-Aviv University, Israel.

OBJECTIVES: Tracheostomy is a common surgical procedure. Despite the lack of strong supporting evidence, routine post-tracheostomy chest radiography is usually performed to evaluate for complications such as pneumothorax, pneumomediastinum, and tube malposition. Recent studies have questioned the necessity of this practice, particularly in adults. This study aimed to assess the role of routine post-tracheostomy chest X-rays in the pediatric population. **STUDY DESIGN:** Retrospective cohort study. **SETTING:** Tertiary medical center. **METHODS:** Medical records of 189 pediatric patients who underwent tracheostomy between January 1, 2013, and September 7, 2023, were retrospectively reviewed. Demographic and clinical data were recorded, and imaging studies were analyzed. **RESULTS:** During the study period, 189 pediatric tracheostomies were performed. Patients' ages ranged from 2 weeks to 17 years, with a median age of 18 months. Postoperative chest X-rays were performed on all patients and interpreted by radiologists. New findings were observed in 28 patients (14 %), with half showing worsening preexisting conditions. No cases of pneumothorax, pneumomediastinum, or tube malposition were detected, and no chest X-ray results led to changes in patient management. **CONCLUSION:** Our results suggest that the practice of routine post-tracheostomy CXR in children is debatable owing to its low yield and minimal impact on clinical management.

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