



### This month's top papers: April 2023

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

- Sex-related quality of life after total laryngectomy for cancer.
- The Impact of Obesity on Early Complications Following Tracheostomy: An Evaluation of a Nationwide Registry.
- Percutaneous tracheostomy: Comparison of three different methods with respect to tracheal cartilage injury in cadavers-Randomized controlled study.
- Registered nurses' experience of care for adult patients with a temporary tracheostomy at general hospital wards. A phenomenological-hermeneutic explorative study.
- Pediatric Tracheostomy Emergency Readiness Assessment Tool: International Consensus Recommendations.

### Sex-related quality of life after total laryngectomy for cancer.

#### Lay Summary:

This review paper investigated a significant and often overlooked aspect of recovery for patients who have had a total laryngectomy (TL), the surgical removal of the voice box, often due to cancer. While this operation is life-saving, it creates profound long-term physical and psychological changes that affect a person's life, specifically focusing on sex-related quality of life (QoL) and intimacy.



The findings highlight that the challenges extend beyond the physical act of sex. The loss of verbal communication is a major barrier, as speech is crucial for emotional connection and sharing feelings within an intimate relationship. Patients may struggle with a diminished sense of self, leading to withdrawal, depression, and anxiety about engaging in sexual activity. Furthermore, physical factors, such as managing the permanent breathing stoma and changes in breathing patterns, can create practical and psychological complications that interfere with intimacy. Patients may also worry about managing secretions or noise during close physical contact. For the partner, adapting to the body image changes is another significant emotional challenge.

This review concludes that the sexual well-being of TL survivors is a neglected aspect of long-term care. A comprehensive approach to rehabilitation must include counseling and support for both the patient and their partner to address the psychological distress and navigate the practical difficulties associated with these physical changes. Recognizing and validating these complex, sex-related QoL issues is the crucial first step toward developing specialized programs that promote intimacy, reduce isolation, and improve overall wellness for this vulnerable patient population.

#### Summary for Healthcare Professionals:

This mini-review systematically analyzed the available literature to evaluate the impact of Total Laryngectomy (TL) for cancer on sex-related Quality of Life (QoL), identifying a significant and often underrecognized domain of long-term morbidity. The methodology involved a search across major medical databases to synthesize existing evidence on sexual function and intimacy post-TL.



The synthesis confirms that sexual dysfunction and a decline in intimacy are substantial sequelae that profoundly affect the psychosocial adjustment of TL survivors and their partners. The morbidity is driven by multiple primary mechanisms:

1. **Communication Impairment (Dysphonia):** The irreversible loss of verbal speech acts as a direct barrier to intimate communication and emotional expression, leading to a breakdown of rapport.
2. **Body Image Disturbance:** The presence of a permanent tracheostoma and resulting neck scarring contributes to feelings of defect, reduced self-esteem, and subsequent avoidance of physical intimacy or exposure.
3. **Functional and Physiological Concerns:** Practical issues include the management of stoma secretions, altered respiratory mechanics, and anxiety regarding audible breathing during exertion, which complicate sexual activity for both the patient and partner.

The review underscores a clear clinical imperative for oncologic and head and neck surgical teams to proactively integrate assessment and support for sexual health into standard follow-up care. Current evidence suggests these issues are frequently neglected in rehabilitation protocols, contributing to chronic anxiety and depression in survivors. An interdisciplinary approach involving psycho-oncology, nursing, and specialized sexual health therapists is essential to provide effective counseling, psycho-education, and adaptive strategies that enable patients and their partners to renegotiate intimacy and achieve optimal post-treatment quality of life.

### The Impact of Obesity on Early Complications Following Tracheostomy: An Evaluation of a Nationwide Registry.

#### Lay Summary:

This nationwide study investigated whether obesity increases the risk of complications after a standard tracheostomy procedure. A tracheostomy is a life-saving surgery to insert a breathing tube in the neck, and because of the obesity epidemic in the United States, many patients who need this common procedure are overweight or obese. Since excess fat in the neck can make the surgery technically challenging, researchers used a large database of over 205,000 adult patients to compare the outcomes of obese and non-obese individuals.



The findings showed that obesity does not increase the risk of serious complications like internal tracheal injury, major bleeding, or collapsed lung/air in the chest. However, the study identified one specific and significant risk: obese patients had a 60% increased odds of developing a stoma or surgical site infection after the tracheostomy. This type of wound infection typically occurs around the opening where the tube is inserted.

The fact that obesity did not increase the risk of other, more severe complications suggests that surgeons are managing the technical difficulties of the procedure well. Nevertheless, the significantly higher risk of infection highlights a critical area for focused improvement in postoperative care for obese patients. The authors conclude that this finding emphasizes the growing need for strategies to mitigate infectious complications in obese patients undergoing standard tracheostomy.

#### Summary for Healthcare Professionals:

This retrospective cohort study utilized the Nationwide Inpatient Sample (NIS) to evaluate the association between obesity and the incidence of specific early postoperative complications following standard tracheostomy. Analyzing data from over 205,000 adult patients between 2007 and 2017, the study stratified the cohort into obese and non-obese groups.



Multivariable logistic regression analysis revealed a specific, independent association between obesity and an increased risk of wound-related morbidity. Specifically, obesity was associated with 60% increased odds of developing a stoma or surgical site infection following standard tracheostomy (OR 1.60 [1.33-1.92],  $P < 0.01$ ).

Conversely, the study found no statistically significant difference in the odds of the more severe outcomes examined: perioperative hemorrhage, tracheal injury, or pneumomediastinum/pneumothorax between the obese and non-obese cohorts. This lack of association for non-infectious complications suggests that procedural safety is maintained despite the technical challenges of operating on patients with increased cervical adipose tissue. The compelling finding regarding surgical site infection highlights a persistent and specific challenge in postoperative management within this high-risk population. The authors conclude that this nationally representative data reinforces the urgent clinical need for targeted prophylactic and wound care strategies to mitigate infectious complications in obese patients undergoing standard tracheostomy procedures.

### **Percutaneous tracheostomy: Comparison of three different methods with respect to tracheal cartilage injury in cadavers-Randomized controlled study.**

#### **Lay Summary:**

This study compared three different techniques used to perform a common procedure called percutaneous dilatational tracheostomy (PDT) to determine which one is least likely to damage the delicate cartilage of the windpipe. PDT involves inserting a breathing tube in the neck, and cartilage injury during this procedure is a concern because it is believed to contribute to serious long-term complications like tracheal stenosis (narrowing of the windpipe).



Researchers conducted a rigorous randomized study on 150 human cadavers, comparing the two most widely used methods, the Single Dilator and the Griggs forceps techniques, along with a modified Griggs technique. The main finding was a clear distinction in safety based on the tool used. The Single Dilator method was found to be significantly less safe, causing cartilage injury in 82.50% of cases. This outcome is likely because the single dilator is a continuous, round device that applies constant, increasing force against the tracheal wall, making the cartilage prone to breaking.

In contrast, both the standard Griggs (49.02% injury rate) and the modified Griggs (41.82% injury rate) techniques were statistically safer, resulting in fewer cartilage injuries. The final conclusion strongly suggests that based on the risk of immediate cartilage damage, surgeons should prefer the forceps dilatational methods (Griggs) over the Single Dilator technique. The study also found that patient factors like age or gender did not influence the rate of cartilage fracture.

#### **Summary for Healthcare Professionals:**

This randomized observational cadaver study compared the incidence of tracheal cartilage injury across three percutaneous dilatational tracheostomy (PDT) techniques: the Single Dilator (Ciaglia Blue Rhino), standard Griggs forceps, and a modified (bidirectional) Griggs method. The objective was to determine which technique minimizes immediate iatrogenic trauma, which is strongly suspected to be a causative factor in late tracheal stenosis. A total of 146 procedures were analyzed, with a non-operator expert blinded to the technique performing the post-mortem inspection for ring fractures and cannula position.



The primary result demonstrated a highly significant association between the method of intervention and the occurrence of cartilage injury. The Single Dilator technique was found to be significantly less safe, resulting in cartilage injury in 82.50% of cases. Multivariable analysis confirmed the increased risk compared to the Griggs methods: Single Dilator versus standard Griggs (OR: 4.903,  $p=0.002$ ) and Single Dilator versus modified Griggs (OR: 6.559,  $p<0.001$ ). This is attributed to the continuous, unyielding force applied by the tapered dilator.

Conversely, the two forceps methods were significantly safer, with the standard Griggs technique showing a 49.02% injury rate and the modified Griggs showing the lowest rate at 41.82%. No statistically significant difference in injury rate was found between the standard and modified Griggs techniques ( $p=0.583$ ). Furthermore, no statistical difference was observed between any of the three PDT techniques regarding the rate of cannula malposition. The authors conclude that both forceps dilatational methods are superior to the Single Dilator technique in mitigating the risk of critical cartilage injury.

### **Registered nurses' experience of care for adult patients with a temporary tracheostomy at general hospital wards. A phenomenological-hermeneutic explorative study.**

#### **Lay Summary:**

This study explores the difficult experiences of registered nurses (RNs) working on general hospital wards who care for adult patients with a temporary tracheostomy, a breathing tube in the neck. The researchers conducted in-depth interviews to understand the day-to-day reality of this highly specialized task. The findings revealed that caring for these patients is a complex and emotionally heavy experience, summarized by a core theme of "challenges of care".



A major source of difficulty is the emotional burden, with nurses frequently experiencing feelings of fear, high responsibility, and personal inadequacy due to the life-sustaining nature of the care. This emotional stress is compounded by communication barriers, as nurses struggle to interpret and recognize the complex non-verbal cues from patients who are unable to speak. Furthermore, systemic problems add to the workload, including insufficient staffing, poor nurse-to-patient ratios, and a reported lack of competency and standardized skills among general ward staff, particularly in managing complications and emergencies. Nurses felt that this lack of specific knowledge could compromise patient safety and increased their frustration.

The study concludes that improving care quality requires fixing these systemic issues. Hospitals must provide better standardized education, more time dedicated to complex tracheostomy care, and improve collaboration between specialist teams (like the ICU) and the general wards. This support is vital for ensuring high-quality care while enhancing nurses' confidence and job satisfaction.

#### **Summary for Healthcare Professionals:**

This phenomenological-hermeneutic study describes the lived experiences of Registered Nurses (RNs) providing care for adult patients with a temporary tracheostomy in general hospital wards, identifying the complexities and challenges inherent to this setting. The core experience theme revolved around the "challenges of care," which comprised multiple interconnected domains of stress and inadequate resources.



The interpretation highlighted profound knowledge and competency deficits concerning complex tracheostomy care, emergency management, and recognizing potential complications. This lack of standardized education contributed directly to heightened feelings of fear, inadequacy, and professional responsibility among RNs. Furthermore, nurses reported significant distress related to communication barriers, stemming from the difficulty of interpreting complex non-verbal patient cues in the absence of specialized support. These care challenges are exacerbated by systemic pressures on the general wards, notably high patient-to-nurse ratios, increased workload, and fragmented collaboration between the ICU/specialist teams and the general ward staff. This fragmented care model inhibits the consistent provision of specialized tracheostomy expertise outside of the critical care setting.

The authors conclude that addressing these deficits is crucial for patient safety following ICU discharge. The study advocates for immediate quality improvement initiatives, emphasizing the urgent need for standardized, competency-based education that targets emergency skills and enhanced interprofessional collaboration to build general ward nurses' capacity and confidence in managing this complex patient population.



### **Pediatric Tracheostomy Emergency Readiness Assessment Tool: International Consensus Recommendations.**

#### **Lay Summary:**

This paper describes the creation of a new safety checklist designed to help hospital staff respond quickly and correctly to emergencies involving a child's tracheostomy tube. Pediatric tracheostomy emergencies, such as accidental decannulation or tube obstruction, are rare but life-threatening events that require an immediate, coordinated, and flawless clinical response. The goal of this project was to establish an agreed-upon standard for managing these crises that incorporates both technical skill and teamwork.



To develop this tool, researchers used a systematic method called Delphi, gathering input from 171 global experts in tracheostomy and medical simulation. These experts were asked to rate the most critical steps required to manage a pediatric tracheostomy crisis. The resulting tool is a consensus-based assessment, meaning the experts agreed on all the included items. The final recommendations went beyond just the surgical technique, incorporating crucial elements of teamwork and hospital systems. Key safety steps identified included: ensuring there is a clear team leader during the crisis, using "closed-loop communication" (where instructions are verbally confirmed), and designating a "runner" to fetch emergency supplies. Other vital steps focused on correctly checking the tube's position and the tension of the ties, as well as proper use of personal protective equipment (PPE). The study's main conclusion is that this new assessment tool is an invaluable resource for hospitals. It can be used to guide staff training, standardize the response to a pediatric airway emergency, and ultimately improve patient safety outcomes by fostering a predictable and efficient multidisciplinary team response. The successful creation of this international consensus tool marks a significant step forward in preparing hospital teams for these high-stakes pediatric airway emergencies.

#### **Summary for Healthcare Professionals:**

This study utilized a modified Delphi method to establish an international consensus on critical steps for assessing and managing pediatric tracheostomy emergencies. The objective was to develop a validated assessment tool integrating human factors, systems factors, and tracheostomy-specific steps for use in clinical and simulation settings. A high level of engagement was achieved, with 171 experts participating and strong response rates across three rounds (73.1% to 87.2%). Consensus was successfully reached on the final set of critical items.



The resulting Pediatric Tracheostomy Emergency Readiness Assessment Tool (pTREAT) is highly comprehensive. Key consensus domains included: Human/Team Factors (e.g., establishing a clear team leader, utilizing closed-loop communication); Systems Factors (e.g., ensuring appropriate PPE is donned, assigning a runner to obtain supplies); and Tracheostomy-Specific Steps (e.g., confirming tube flanges are flush with skin, ensuring tracheostomy ties are appropriately tight, visualizing the tube tip).

The authors conclude that the pTREAT tool is a valuable resource for standardizing procedural responses and enhancing safety culture during pediatric airway crises. This consensus-driven, systems-based approach provides a crucial framework for interdisciplinary training and performance evaluation, ultimately mitigating the risk of morbidity and mortality associated with accidental decannulation or tube obstruction in this highly vulnerable patient population.

### Scientific abstracts and references



**Eur Ann Otorhinolaryngol Head Neck Dis. 2023 May 2:S1879-7296(23)00051-0. doi: 10.1016/j.anorl.2023.04.001. Online ahead of print.**

### **Sex-related quality of life after total laryngectomy for cancer.**

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**OBJECTIVES:** Analysis of the quality of sexual life after total laryngectomy (TL) for cancer. **MATERIAL AND METHODS:** The Cochrane, PubMed, Embase, ClinicalKey and Science Direct databases were searched using the keywords: "total laryngectomy, sexual function, sexual behavior, sexual complications, sexual dysfunction, sexuality, intimacy". The abstracts of 69 articles were read by two of the authors and 24 articles were selected. The main endpoint was the impact of impairment of quality of sexual life after TL for cancer and the methods used to assess this. The secondary endpoints were the type of sexual impairment, associated variables and their treatment. **RESULTS:** The study population consisted of 1511 TL patients aged 21 to 90 years, with a male/female sex ratio of 7.49. One of the 7 validated Likert scales was used in 79% of the articles to evaluate impairment of sexual quality of life. Impaired quality of sexual life was reported by 47% of patients on average (range, 5-90%). Erectile and ejaculatory function and ejaculatory behavior of male patients decreased after TL. Other impairments comprised decreases in libido, frequency of sexual intercourse and satisfaction. Tracheostomy, advanced disease stage, young age and associated depression were factors for impairment. In all, 23% of patients reported lack of postoperative support in this area. **CONCLUSION:** The quality of sexual life is severely impacted by TL for cancer. The present data are a source of information and should be taken into account before carrying out TL. A common information tool needs to be developed. There is patient demand for improved management of sexuality.

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### **The Impact of Obesity on Early Complications Following Tracheostomy: An Evaluation of a Nationwide Registry.**

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**INTRODUCTION:** The obesity epidemic is an important public health problem in the United States. Previous studies have revealed the association between obesity and various surgical complications. Tracheostomy which is an important lifesaving procedure may prove technically challenging in an obese patient. This study sought to evaluate the association between obesity and early complications following standard tracheostomy using a national registry. **METHODS:** Adult patients who underwent tracheostomy from 2007 to 2017 were analyzed using the Nationwide Inpatient Sample (NIS). The population was stratified into obese and non-obese groups. Early complications following standard tracheostomy were identified and compared between the two groups. Multivariable logistic regression analyses were performed to assess the association between obesity and early complications following tracheostomy. **RESULTS:** Data pertaining to 205 032 adult patients were evaluated. Obese patients accounted for 12.1% (n = 21 816) of the entire cohort. The most common complication in the cohort was perioperative bleeding (4316 [2.1%]). A total of 1382 (0.67%), 949 (0.46%), and 134 (0.07%) patients developed pneumothorax/pneumomediastinum, stoma/surgical site infection, and tracheal injury following standard tracheostomy, respectively. There was no difference in the odds of tracheal injury, perioperative bleeding, and pneumomediastinum/pneumothorax following standard tracheostomy in the obese and non-obese group in multivariable analysis. However, obesity was associated with 60% increased odds of developing stoma/surgical site infection following standard tracheostomy (OR 1.60 [1.33-1.92], P < 0.01). **CONCLUSION:** Obesity is associated with an increased risk of developing stoma/surgical site infection following standard tracheostomy. This adds to the growing need for measures to help curb the obesity epidemic in a bid to improve surgical outcomes.

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**Pathol Oncol Res. 2023 Jan 19;29:1610934. doi: 10.3389/pore.2023.1610934. eCollection 2023.**

**Percutaneous tracheostomy: Comparison of three different methods with respect to tracheal cartilage injury in cadavers-Randomized controlled study.**

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**Background:** Performing tracheostomy improves patient comfort and success rate of weaning from prolonged invasive mechanical ventilation. Data suggest that patients have more benefit of percutaneous technique than the surgical procedure, however, there is no consensus on the percutaneous method of choice regarding severe complications such as late tracheal stenosis. **Aim of this study** was comparing incidences of cartilage injury caused by different percutaneous dilatation techniques (PDT), including Single Dilator, Griggs' and modified (bidirectional) Griggs' method. **Materials and methods:** Randomized observational study was conducted on 150 cadavers underwent post-mortem percutaneous tracheostomy. Data of cadavers including age, gender and time elapsed from death until the intervention (more or less than 72 h) were collected and recorded. **Primary and secondary outcomes** were: rate of cartilage injury and cannula malposition respectively. **Results:** Statistical analysis revealed that method of intervention was significantly associated with occurrence of cartilage injury, as comparing either standard Griggs' with Single Dilator ( $p = 0.002$ ; OR: 4.903; 95% CI: 1.834-13.105) or modified Griggs' with Single Dilator ( $p < 0.001$ ; OR: 6.559; 95% CI: 2.472-17.404), however, no statistical difference was observed between standard and modified Griggs' techniques ( $p = 0.583$ ; OR: 0.748; 95% CI: 0.347-1.610). We found no statistical difference in the occurrence of cartilage injury between the early- and late post-mortem group ( $p = 0.630$ ). Neither gender ( $p = 0.913$ ), nor age ( $p = 0.529$ ) influenced the rate of cartilage fracture. There was no statistical difference between the applied PDT techniques regarding the cannula misplacement/malposition. **Conclusion:** In this cadaver study both standard and modified Griggs' forceps dilatational methods were safer than Single dilator in respect of cartilage injury.

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**Intensive Crit Care Nurs. 2023 Apr 25;77:103443. doi: 10.1016/j.iccn.2023.103443. Online ahead of print.**

**Registered nurses' experience of care for adult patients with a temporary tracheostomy at general hospital wards. A phenomenological-hermeneutic explorative study.**

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**BACKGROUND:** Caring for adult patients with a temporary tracheostomy in general wards can be challenging and complex. Little research has explored registered nurses' experiences with caring for these groups of patients. **OBJECTIVES:** This study sought to interpret and describe registered nurses' lived experiences of caring for adult patients with a tracheostomy in general wards. **RESEARCH DESIGN/METHODOLOGY:** Six registered nurses were interviewed in this study. The interviews were analysed to gain comprehensive knowledge about caring for adult patients with a temporary tracheostomy. The interviews were transcribed, analysed, and interpreted by using Gadamer's philosophical hermeneutics and Kvale and Brinkmann's three steps of understanding. **SETTING:** Three different wards medical, surgical, and neurological of a teaching hospital in Norway. **FINDINGS:** Three themes emerged from data analysis. These included experiencing clinically challenging patients, a lack of clinical support from the intensive care nurses, and a lack of professional confidence. **CONCLUSION:** This study highlighted the challenges surrounding the care of an adult patient with a tracheostomy in the general wards. Identifying these challenges would lead to further improvement in registered nurses' experiences and, in turn, in the quality of competent care for adult patients with a tracheostomy in the general ward. **IMPLICATIONS FOR CLINICAL PRACTICE:** Understanding the registered nurses' experiences will assist the head nurses in planning and providing relevant information and education to provide safe and holistic patient care. Adequate support from intensive care unit nurses and professional development are required to ensure high-quality care. This study recommends that healthcare managers focus on establishing step-down units to improve patient outcomes, especially for high-risk patients and to increase the competencies of registered nurses in caring for adult patients with a tracheostomy as a whole person.

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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 paper.

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### **Pediatric Tracheostomy Emergency Readiness Assessment Tool: International Consensus Recommendations.**

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**OBJECTIVE:** To achieve consensus on critical steps and create an assessment tool for actual and simulated pediatric tracheostomy emergencies that incorporates human and systems factors along with tracheostomy-specific steps. **METHODS:** A modified Delphi method was used. Using REDCap software, an instrument comprising 29 potential items was circulated to 171 tracheostomy and simulation experts. Consensus criteria were determined a priori with a goal of consolidating and ordering 15 to 25 final items. In the first round, items were rated as "keep" or "remove". In the second and third rounds, experts were asked to rate the importance of each item on a 9-point Likert scale. Items were refined in subsequent iterations based on analysis of results and respondents' comments. **RESULTS:** The response rates were 125/171 (73.1%) for the first round, 111/125 (88.8%) for the second round, and 109/125 (87.2%) for the third round. 133 comments were incorporated. Consensus (>60% participants scoring  $\geq 8$ , or mean score  $>7.5$ ) was reached on 22 items distributed across three domains. There were 12, 4, and 6 items in the domains of tracheostomy-specific steps, team and personnel factors, and equipment respectively. **CONCLUSIONS:** The resultant assessment tool can be used to assess both tracheostomy-specific steps as well as systems factors affecting hospital team response to simulated and clinical pediatric tracheostomy emergencies. The tool can also be used to guide debriefing discussions of both simulated and clinical emergencies, and to spur quality improvement initiatives. **LEVEL OF EVIDENCE:** Level 5 Laryngoscope, 2023.

## NTSP Podcast Series

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