NTSP Podcast series

National Tracheostomy Safety Project

This month's top papers: November 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

- Trends in Medicare Utilization and Reimbursement of Tracheostomy From 2000 to 2022.
- Improving Outcomes for Patients With Tracheostomy Through Implementation of AARC Clinical Practice Guidelines.
- Evaluation and Treatment of Acute Laryngeal Injury at Time of Tracheostomy for Prolonged Intubation.
- Assessing the Comprehensibility and Trustworthiness of Online Tracheostomy Care Resources.

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Trends in Medicare Utilization and Reimbursement of Tracheostomy From 2000 to 2022.

Lay Summary:

This study analyzed the financial trends and use of tracheostomy procedures for patients covered by Medicare, the U.S. government health program for people aged 65 or older and certain younger individuals. The research tracked national data over a 23-year period (2000 to 2022) to understand how the prevalence and cost of these essential breathing procedures have changed.

The findings showed a major and sustained decrease in the number of tracheostomies being performed. The number of planned procedures dropped by nearly 49%, and emergency procedures saw an even steeper decline of 75%, leading to an overall reduction of 51%. This decrease in usage was mirrored by a large drop in the total amount of money the government paid for these procedures: total reimbursement for planned tracheostomies decreased by almost 60% after adjusting for inflation.

The study concludes that tracheostomy procedures are being used less often, which is a trend that began well before the COVID-19 pandemic. While the procedure remains a vital intervention, the analysis suggests a significant evolution in critical care and surgical practices.

Summary for Healthcare Professionals:

This retrospective cross-sectional study analyzed longitudinal trends in the utilization and reimbursement for tracheostomy procedures among the U.S. Medicare population from 2000 to 2022. The data, sourced from the Centers for Medicare & Medicaid Services (CMS) databases, included both planned and emergency tracheostomy procedures (CPT codes 31600, 31601, 31610, 31603, 31605).

The analysis identified a massive and sustained decrease in procedure volume over the 23-year period. Specifically, there was a 48.9% decrease in planned tracheostomies and a 75.3% decrease in emergency tracheostomies, resulting in an overall volume reduction of 51%. This reduction in utilization was mirrored by a substantial decrease in inflation-adjusted reimbursement. Total reimbursement for planned tracheostomies decreased by 59.3%. The authors conclude that the utilization and reimbursement for tracheostomy procedures have significantly declined over the past two decades. This finding reflects evolving critical care and surgical practice patterns in the management of prolonged mechanical ventilation.

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Improving Outcomes for Patients With Tracheostomy Through Implementation of AARC Clinical Practice Guidelines.

Lay Summary:

This paper examines how a synchronized approach involving Education, Evidence-Based Practice (EBP), and Quality Improvement (QI) has revolutionized care for patients with a tracheostomy over the last decade. The core goal is to standardize care to reduce the severe risks associated with breathing tubes.

The process begins with EBP, which establishes the safest and most effective care methods through robust research. This research is then translated into competency-based education (CBE), using active learning and simulations to ensure that doctors, nurses, and therapists master critical, practical skills. Finally, QI turns these skills into hospital-wide action through standardized protocols and team-based care models, resulting in demonstrably improved safety and efficiency.

Despite this progress, the review identifies ongoing and persistent challenges that must be addressed. These include inconsistent staff training, insufficient patient and family education, and resource limitations that hinder care. To overcome these hurdles, the authors suggest innovative solutions, such as using virtual reality and AI for remote training, and continuously updating protocols based on the latest research. The study concludes that maintaining this continuous, interconnected cycle is the key to ensuring all patients receive consistently safe and high-quality care.

Summary for Healthcare Professionals:

This paper provides a critical synthesis of the coordinated integration of Competency-Based Education (CBE), Evidence-Based Practice (EBP), and Quality Improvement (QI), which serves as the foundational model driving progress in tracheostomy care. The authors establish that these three elements must reinforce one another: EBP generates the clinical data, which informs the content of CBE (delivered through simulation and active learning), leading directly to successful QI implementation (standardized protocols and multidisciplinary teams).

This integrated model has resulted in demonstrable improvements in safety, efficiency, and quality across the acute care continuum. However, the paper identifies persistent clinical deficits that impede optimal outcomes. These gaps include substantial variability in workforce training, insufficient competency in new providers, inadequate patient and family education post-discharge, and resource disparities.

The recommended strategy is the strategic adoption of data-driven innovation to address these shortfalls. Specific interventions should include leveraging innovative technologies such as Virtual Reality and AI for scalable, remote CBE delivery; implementing routine multidisciplinary case reviews; and continuously updating curricula to ensure alignment with the latest evidence. The conclusion emphasizes that a successful, high-value model requires a continuous, reinforcing cycle of EBP, CBE, and QI to systematically bridge knowledge gaps and mitigate adverse events across the entire healthcare system.

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Evaluation and Treatment of Acute Laryngeal Injury at Time of Tracheostomy for Prolonged Intubation.

Lay Summary:

This study investigated how often patients suffer injury to their voice box (larynx) after having a breathing tube in their throat for a long time. Since this laryngeal injury can make it difficult to remove the final tracheostomy tube, researchers used a camera during the tracheostomy surgery to examine and grade the damage.

The main finding was that laryngeal injury is extremely common, affecting nearly 79% of the 28 patients studied. While most injuries were minor, 25% were moderate, and 3.6% were severe. Patients with severe injury were much less likely to have their tracheostomy tube removed successfully.

However, the study provided a clear solution: treating patients with simple medications like steroids and proton-pump inhibitors (PPIs) immediately after the injury was diagnosed was associated with a higher success rate in removing the breathing tube for those with moderate injuries. The authors conclude that these common injuries are preventable and should be routinely treated with medication to improve a patient's chances of breathing normally again.

Summary for Healthcare Professionals:

This single-institution cohort study assessed the incidence and severity of Acute Laryngeal Injury (ALgI) following prolonged endotracheal intubation at the time of tracheostomy placement. The secondary objective was to determine the influence of ALgI and subsequent acute medical management on decannulation rates. In the cohort of 28 patients, ALgI was present in 78.6%, with severity classified as mild (50%), moderate (25%), and severe (3.6%) based on intraoperative endoscopic findings of mucosal ulceration and/or granulation tissue.

The study found a strong association between injury severity and outcome. Patients with severe ALgI had a significantly lower decannulation rate. Crucially, acute medical therapy consisting of a steroid and proton-pump inhibitor (PPI) was associated with a higher decannulation rate in the moderate ALgI group. The overall decannulation rate was 53.6%. The authors conclude that ALgI is highly prevalent, and acute medical management with steroid and PPI therapy is effective in mitigating injury and improving decannulation outcomes, warranting consideration for routine application in patients diagnosed with moderate ALgI at the time of tracheostomy.

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Assessing the Comprehensibility and Trustworthiness of Online Tracheostomy Care Resources.

Lay Summary:

This study looked at how reliable and easy-to-understand online information about tracheostomy care is for patients and their families. Since patients often use the internet to learn how to clean and care for their breathing tube, the quality of these resources is critical for preventing infections and ensuring safety. Researchers analyzed 50 websites providing tracheostomy care information, assessing them using standardized scoring systems for readability (how easy they are to read) and reliability (how trustworthy they are).

The findings showed that the websites generally provided information with moderate overall readability. For instance, the Flesch-Kincaid Grade Level averaged 6.2, suggesting the content is written at an acceptable reading level for the public. However, the scores for reliability were only average. The DISCERN score, which measures the quality of health information, and the JAMA benchmark score, which measures scientific credibility, were both average. This indicates that while the information is easy to read, its trustworthiness and scientific backing could be significantly better. The authors conclude that there is immense scope for improvement in the quality and reliability of these online resources. They urge medical professionals to actively work on improving the quality of online resources to ensure patients receive reliable, high-quality information for safe home care.

Summary for Healthcare Professionals:

This study conducted a cross-sectional analysis to assess the readability and reliability of 50 publicly available websites providing patient education on tracheostomy tube care. The objective was to characterize the quality of information accessed by patients for self-management guidance. The websites were rigorously evaluated using three readability tools (FKGL, FRES, and GF score) and two reliability metrics (DISCERN score and JAMA benchmark criteria). The results indicated a moderate level of overall readability, with mean scores of FKGL 6.2, FRES 61.9, and GF 7.2. Although comprehensibility was generally adequate, the reliability metrics were suboptimal. The mean DISCERN score of 3.2 and JAMA score of 1.8 were only average, indicating a potential lack of high scientific rigor and limited disclosure of sources. The authors conclude that while the content's readability is acceptable, there is immense scope for improvement in the trustworthiness and scientific validity of online tracheostomy care resources. This necessitates an urgent focus on quality improvement initiatives for digital patient education to ensure that self-management guidance is reliably evidence-based, mitigating risks associated with inconsistent patient knowledge.

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Scientific abstracts and references

Otolaryngol Head Neck Surg. 2024 Nov 4. doi: 10.1002/ohn.1044. Online ahead of print.

Trends in Medicare Utilization and Reimbursement of Tracheostomy From 2000 to 2022.

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OBJECTIVE: To analyze the utilization and reimbursement for tracheostomy. STUDY DESIGN: Retrospective Cross-Sectional Study. SETTING: Centers for Medicare & Medicaid Services (CMS) Medicare Provider Utilization and Payment Data (2013 and 2021) and Part B Medicare Fee-For-Service National Summary Data (2000-2022). METHODS: Utilization, payment, and specialty breakdown were analyzed for planned tracheostomy (Current Procedural Terminology [CPT] codes 31600, 31601, 31610) and emergency tracheostomy (CPT codes 31603, 31605). RESULTS: From 2000 to 2022, there was a 48.9% decrease (40,754-20,812) in number of planned tracheostomies and a 75.3% decrease (3277-811) in number of emergency tracheostomies, leading to an overall decrease of 51%. Similarly, there was a 59.3% inflation-adjusted decrease ($13.4-$5.5 million) in total reimbursement for planned tracheostomies and an 82.1% inflation-adjusted decrease ($1.1 million-$205 thousand) in total reimbursement for emergency tracheostomies. There was a 20.3% inflation-adjusted decrease ($329-$262) in reimbursement per planned tracheostomy and a 27.7% inflation-adjusted decrease ($349-$252) in reimbursement per emergency tracheostomy. In our sample of 280 high-volume tracheostomy providers in 2021 (28.2% otolaryngology, 28.2% general surgery, 14.6% thoracic surgery, 14.3% pulmonary disease, 6.4% critical care), the average provider performed 15.8 tracheostomies and was reimbursed $5362. CONCLUSION: Despite significant declines in tracheostomy utilization and reimbursement, understanding trends for these lifesaving procedures are critical for otolaryngologists and other providers in delivering high-quality care, and can be used by surgeons, hospital systems, and policymakers to guide future health care legislation.

DOI: 10.1002/ohn.1044 PMID: 39497452

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Respir Care. 2024 Nov 12:respcare.12080. doi: 10.4187/respcare.12080. Online ahead of print.

Improving Outcomes for Patients With Tracheostomy Through Implementation of AARC Clinical Practice Guidelines.

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BACKGROUND: The COVID-19 global pandemic dramatically increased our institution's tracheostomy census. Comparing our existing protocols with American Association for Respiratory Care (AARC) January 2021 clinical practice guideline (CPG) relevant to caring for adult patients with tracheostomy in the acute care setting revealed numerous opportunities for improving our care of those patients. We assembled an interdisciplinary tracheostomy team to implement AARC CPG recommendations and manage all patients with tracheostomy in our hospital. METHODS: We examined the effect our interdisciplinary team approach and implementation of AARC CPG recommendations had on the following metrics: average patient length of stay (LOS); ICU LOS; percentage of ventilator days; percentage of tracheostomy mask days; tracheostomy tube changes; decannulations; average time to decannulation; mortality; 30-d readmissions; and consultations for speech-language pathology (SLP), one-way speaking valves, physical therapy, and occupational therapy.RESULTS: A total of 203 subjects with tracheostomy were followed in a quality improvement study from June 2019-June 2023 (94 in the pre-intervention group, 109 in the post group). There were significant increases between before and after intervention groups in percentage of decannulations in acutely patients with tracheostomy/not present on admission, non-COVID subjects who survived hospitalization (11.8% vs 33.3%, P = .043), percentage of SLP consults (53.2% vs 89.0%, P < .001), and percentage of one-way speaking valve consults (17.0% vs 32.1%, P = .02). CONCLUSIONS: Establishment of an interdisciplinary tracheostomy team and implementation of AARC CPG recommendations for care of adult patients with tracheostomy in the acute care setting resulted in positive, statistically significant outcomes.

DOI: 10.4187/respcare.12080 PMID: 39532496

Ann Otol Rhinol Laryngol. 2024 Nov 19:34894241300807. doi: 10.1177/00034894241300807. Online ahead of print.

Evaluation and Treatment of Acute Laryngeal Injury at Time of Tracheostomy for Prolonged Intubation.

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OBJECTIVES: The primary objective was to assess incidence and severity of acute laryngeal injury (ALgI) following intubation at time of tracheostomy using a proposed grading scale. The secondary objective was to evaluate what factors influence the rate of decannulation.METHODS: Single institution cohort study with review of prospectively maintained database including patients from October 2021 to October 2022 who underwent tracheostomy for prolonged intubation/critical illness. Severity of ALgI was graded as mild, moderate, or severe based on intraoperative endoscopic findings (laryngeal mucosal ulceration and/or granulation tissue). Rates of tracheostomy decannulation were collected as the secondary outcome measure. RESULTS: Twenty-eight patients met criteria for inclusion. About 60.7% (n = 17) patients were female. Average age was 59.0 ± 13.2 years old. Average body mass index was 32.3 ± 14.0 kg/m2. The most common endotracheal tube size was 7.5 (range = 6.0-8.0) inner diameter (ID) for men and 7.0 (range = 5.5-8.0) ID for women. Average Charlson Comorbidity Index (CCI) was 4.8 ± 2.4. Length of intubation was 15.7 ± 6.5 days (range = 5-30). Direct laryngoscopy at the time of tracheostomy demonstrated ALgI in 92.8% (n = 26) of patients. This was graded as mild (25.0%, n = 7), moderate (42.9%, n = 12), or severe (25.0%, n = 7). Severe ALgI was correlated with a reduced rate of tracheostomy decannulation compared to no/mild/moderate ALgI (28.5% vs 81.2%, P = .04). CONCLUSIONS: ALgI is highly prevalent in patients undergoing tracheostomy for prolonged intubation. Severe injury is associated with reduced rates of decannulation. Direct laryngoscopy at time of tracheostomy is warranted to diagnose ALgI and guide interventions. Determining the extent of laryngeal injury is prognostic and could help tailor follow-up and management strategies. LEVEL OF EVIDENCE: 4.

DOI: 10.1177/00034894241300807 PMID: 39563005

Conflict of interest statement: Declaration of Conflicting InterestsThe author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Indian J Otolaryngol Head Neck Surg. 2024 Dec;76(6):5793-5798. doi: 10.1007/s12070-024-05098-5. Epub 2024 Sep 21.

Assessing the Comprehensibility and Trustworthiness of Online Tracheostomy Care Resources.

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Tracheostomy is a surgical procedure to create an opening in the neck to insert a tube into the trachea to help a person breathe. Proper cleaning and care of the tracheostomy tube is vital to prevent infections. Patients frequently use the internet to learn about tracheostomy tube care before and after the procedure. To assess the readability and reliability of 50 websites providing patient information on tracheostomy tube care. The websites were evaluated using the Flesch-Kincaid Grade Level (FKGL), Flesch Reading Ease Score (FRES), Gunning Fog score (GF), DISCERN score, and JAMA benchmark criteria. The mean FKGL was 6.2, FRES was 61.9 and GF score was 7.2, indicating moderate overall readability. The reliability scores were average, too, with mean DISCERN and JAMA scores being 3.2 and 1.8, respectively. There is immense scope for improvement in the readability and reliability of online resources on tracheostomy tube care for patients to comprehend the information quickly.

DOI: 10.1007/s12070-024-05098-5 PMCID: PMC11569040 PMID: 39559005

Conflict of interest statement: Competing InterestsThe authors declare that they have no competing interests.