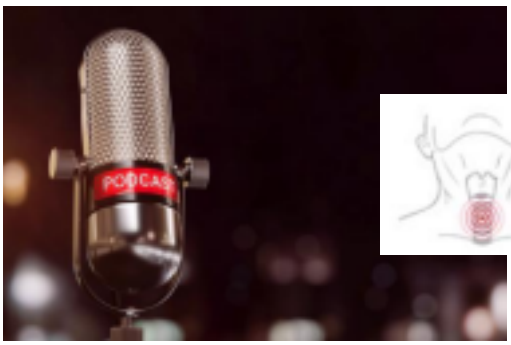
NTSP Podcast series



National Tracheostomy Safety Project

This month's top papers: June 2022

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

Please note that the comments below and on the podcasts represent the individual authors' opinions and do not reflect the opinions of any of the organisations that the authors work for. Please leave any comments in the chat function or via X.

This month's top papers

- Pediatric Chronic Tracheostomy Care: An Evaluation of an Innovative Competency-Based Education Program for Community Health Care Providers
- Coronary artery bypass grafting via manubrium-sparing sternotomy in a patient with total laryngectomy and a permanent tracheostoma
- Primary Total Laryngectomy versus Organ Preservation for Locally Advanced T3/T4a Laryngeal Cancer
- Virtual Deliberate Practice Module for Tracheostomy Change Training: An Application of Educational Design Research

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Pediatric Chronic Tracheostomy Care: An Evaluation of an Innovative Competency-Based Education Program for Community Health Care Providers

Lay Summary:

This study looked at a new training program for homecare nurses who take care of children with a tracheostomy, which is a breathing tube in the neck. The main goal was to see if a standardized, hands-on training course could make these nurses more confident and knowledgeable about their job, both immediately and over the long term.

The researchers conducted a randomized controlled trial with 44 nurses. They divided the nurses into two groups: one group took the tracheostomy course, and the other took a different course. They then measured the nurses' knowledge and confidence levels at several points over a year. The results showed that the nurses who took the tracheostomy course felt significantly more confident in their skills, especially when it came to managing emergencies like a blocked or dislodged tube. This increased confidence lasted for at least six months. While their knowledge scores also improved, the difference was not as strong, and the authors noted that some knowledge gaps remained, particularly regarding stoma care.

The study concludes that a structured, hands-on training program is very effective at boosting a homecare nurse's confidence and knowledge. This is crucial for keeping medically complex children safe at home and for improving the quality of their care.

Summary for Healthcare Professionals:

This pragmatic randomized controlled trial evaluated the effectiveness of a standardized, competency-based tracheostomy education course for homecare nurses caring for children with chronic tracheostomies. The study's primary objective was to assess the immediate and sustained knowledge retention and self-efficacy of the nurses following the course.

The trial included 44 homecare nurses randomized into an intervention group that received the tracheostomy course and a control group that received a different course. The curriculum, developed by an interprofessional team, included didactic instruction, hands-on simulation-based learning, and formal assessments. Knowledge retention and self-efficacy were measured at baseline, 6 weeks, 3 months, 6 months, and 12 months post-course.

The results demonstrated a significant improvement in self-efficacy for the intervention group compared to the control group at 6 weeks ($p=0.04$) and 3 months ($p=0.007$). The change in mean self-efficacy scores was significantly higher in the intervention group at 6 weeks (18.6 vs. 6.6) and 3 months (19.6 vs. 5.2). While knowledge scores trended higher in the intervention group, the change from baseline was not statistically significant. Qualitative analysis revealed that the intervention group felt more confident in managing emergencies, such as a blocked or dislodged tube. The study concludes that the standardized course effectively enhances the self-efficacy and knowledge of homecare nurses, which is critical for ensuring safe, high-quality homecare for this vulnerable patient population.

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Coronary artery bypass grafting via manubrium-sparing sternotomy in a patient with total laryngectomy and a permanent tracheostoma

Lay Summary:

This study looked at a new surgical technique called manubrium-sparing sternotomy (MSS) for a patient who had previously undergone a total laryngectomy, which is the surgical removal of the voice box. Patients with a total laryngectomy have a permanent breathing hole in their neck, and because of this, a regular sternotomy, or chest incision, can be very risky due to the high chance of infection and other complications.

The paper describes the case of a 69-year-old man who needed a coronary artery bypass graft (CABG) due to severe heart disease. Instead of a full chest incision, the surgeons performed an MSS, which is an alternative that avoids cutting the upper part of the breastbone. This approach allowed them to perform the complex heart surgery while keeping the incision away from the patient's breathing hole. The patient recovered well, with no signs of infection or other complications, and was discharged from the hospital in 12 days.

The authors conclude that MSS is a safe and effective surgical approach for patients with a total laryngectomy who require this type of heart surgery.

Summary for Healthcare Professionals:

This case report describes the successful use of a manubrium-sparing sternotomy (MSS) for conventional coronary artery bypass grafting (CABG) in a patient with a prior total laryngectomy and a permanent tracheostoma. A median full sternotomy is considered a high-risk approach in these patients due to the increased risk of sternal wound infection and mediastinitis.

The case involved a 69-year-old man with severe triple-vessel coronary artery disease who was an unsuitable candidate for percutaneous coronary interventions. To mitigate the risk, a manubrium-sparing sternotomy was performed, involving a longitudinal skin incision that spared the manubrium and a transverse cut at the level of the second intercostal space. The procedure allowed for the harvesting of bilateral internal thoracic arteries and the completion of a five-vessel CABG without the manubrium interfering with the surgical field.

The patient had an uneventful postoperative course with no evidence of wound infection or mediastinitis and was discharged on postoperative day 12. The authors conclude that MSS is a safe and effective alternative for patients with a permanent tracheostoma who require conventional CABG. They also note that the use of bilateral internal thoracic arteries is their preferred method to improve survival in multivessel coronary artery disease.

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Primary Total Laryngectomy versus Organ Preservation for Locally Advanced T3/T4a Laryngeal Cancer

Lay Summary:

This study compares two different ways of treating advanced laryngeal (voice box) cancer:

1. Primary total laryngectomy (TL): This involves surgically removing the voice box.
2. Organ preservation (OP): This involves using radiation and/or chemotherapy to treat the cancer while trying to save the voice box.

The researchers looked back at the records of 237 patients and found that for patients with very large, advanced T4 cancers, both treatments resulted in similar overall survival. However, for patients with less advanced T3 cancers, the organ preservation approach was less effective, with a much higher rate of the cancer returning in the same area. This was because a significant number of these patients (28.9%) experienced a local recurrence, compared to a much lower rate in the surgery group (7.1%).

Another important finding was that even though the surgery group had their voice box removed, their ability to swallow and speak was comparable to the organ preservation group. The study also found that about 40% of patients whose cancer returned after the organ preservation approach were not eligible for a second, or "salvage," surgery. The authors conclude that while organ preservation can be a good option for some, total laryngectomy may offer better long-term control for T3 patients without compromising their ability to eat and speak.

Summary for Healthcare Professionals:

This retrospective cohort study compared oncologic and functional outcomes of primary total laryngectomy (TL) versus organ preservation (OP) for patients with locally advanced T3/T4a laryngeal cancer. The study reviewed 237 patients treated at a single tertiary care institution between 2000 and 2018.

The study found that overall survival was similar between both treatment groups for all patients and specifically for T4 patients. However, when stratified by T stage, disease-free survival (DFS) was significantly worse for T3 patients receiving OP compared to TL ($p=0.014$). This was attributed to a higher local recurrence (LR) rate in the OP group (28.9%) versus the TL group (7.1%) for T3 patients ($p<0.01$).

A crucial finding was that approximately 40% of OP patients who experienced LR were not eligible for salvage laryngectomy. While the overall survival of OP patients who underwent salvage surgery was similar to that of patients who received primary TL, the survival of the entire group of OP patients with LR trended toward being inferior.

The study also compared functional outcomes. Despite most TL patients receiving adjuvant radiation or chemoradiation, they achieved comparable swallowing and speech outcomes to the OP group. For instance, 75.4% of TL patients achieved a normal diet status, compared to 53.8% of OP patients ($p<0.001$). The authors conclude that while strict patient selection may lead to similar survival in T4 patients, the poor DFS and high LR rate in T3 patients receiving OP suggest that upfront TL may offer better long-term disease control without a significant compromise in functional outcomes.

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Virtual Deliberate Practice Module for Tracheostomy Change Training: An Application of Educational Design Research

Lay Summary:

This study looked at a new training program for homecare nurses who take care of children with a tracheostomy, which is a breathing tube in the neck. The main goal was to see if a standardized, hands-on training course could make these nurses more confident and knowledgeable about their job, both immediately and over the long term.

The researchers conducted a randomized controlled trial with 44 nurses. They divided the nurses into two groups: one group took the tracheostomy course, and the other took a different course. They then measured the nurses' knowledge and confidence levels at several points over a year. The results showed that the nurses who took the tracheostomy course felt significantly more confident in their skills, especially when it came to managing emergencies like a blocked or dislodged tube. This increased confidence lasted for at least six months. While their knowledge scores also improved, the difference was not as strong, and the authors noted that some knowledge gaps remained, particularly regarding stoma care.

The study concludes that a structured, hands-on training program is very effective at boosting a homecare nurse's confidence and knowledge. This is crucial for keeping medically complex children safe at home and for improving the quality of their care.

Summary for Healthcare Professionals:

This pragmatic randomized controlled trial evaluated the effectiveness of a standardized, competency-based tracheostomy education course for homecare nurses caring for children with chronic tracheostomies. The study's primary objective was to assess the immediate and sustained knowledge retention and self-efficacy of the nurses following the course.

The trial included 44 homecare nurses randomized into an intervention group that received the tracheostomy course and a control group that received a different course. The curriculum, developed by an interprofessional team, included didactic instruction, hands-on simulation-based learning, and formal assessments. Knowledge retention and self-efficacy were measured at baseline, 6 weeks, 3 months, 6 months, and 12 months post-course.

The results demonstrated a significant improvement in self-efficacy for the intervention group compared to the control group at 6 weeks ($p=0.04$) and 3 months ($p=0.007$). The change in mean self-efficacy scores was significantly higher in the intervention group at 6 weeks (18.6 vs. 6.6) and 3 months (19.6 vs. 5.2). While knowledge scores trended higher in the intervention group, the change from baseline was not statistically significant. Qualitative analysis revealed that the intervention group felt more confident in managing emergencies, such as a blocked or dislodged tube. The study concludes that the standardized course effectively enhances the self-efficacy and knowledge of homecare nurses, which is critical for ensuring safe, high-quality homecare for this vulnerable patient population.

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Scientific abstracts and references

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Front Pediatr. 2022 May 31;10:885405. doi: 10.3389/fped.2022.885405. eCollection 2022.

Pediatric Chronic Tracheostomy Care: An Evaluation of an Innovative Competency-Based Education Program for Community Health Care Providers.

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OBJECTIVE: To evaluate the immediate and sustained knowledge retention and sense of self-efficacy of homecare nurses following completion of a standardized competency-based tracheostomy education course. Safe discharge of children requiring tracheostomy with or without ventilation relies on the competence of homecare nurses. STUDY DESIGN: Pragmatic, randomized controlled trial of 44 homecare nurses. Participants were randomized into the intervention group (n = 21), which received the tracheostomy course, or the control group (n = 23), which received an enterostomy and vascular access course. Multiple-choice question (MCQ) knowledge assessments and self-efficacy questionnaires were administered to both groups pre-course and post-course at 6 week, 3 month, 6 month, and 12 month follow-ups. RESULTS: Twenty participants in the intervention group and 19 in the control group were included. Four withdrew from the study and two crossed over from the control into the intervention arm. The change in mean self-efficacy scores (total score = 100) was significantly higher in the intervention group than in the control group at 6 weeks (intervention (mean ± SD): 18.6 ± 14.5; control: 6.6 ± 20.4; p = 0.04) and 3 months (intervention: 19.6 ± 14.2; control: 5.2 ± 17.0; p = 0.007), and trended higher at 6 months (intervention: 18.0 ± 14.5; control: 6.9 ± 24.1; p = 0.1). The change in mean MCQ assessment scores (total score = 20) trended higher in the intervention group than in the control group at 6 weeks (intervention (mean ± SD): 1.8 ± 2.2; control: 1.6, ± 2.9; p = 0.8). CONCLUSIONS: Homecare nurses who attended the tracheostomy course demonstrated a higher sense of self-efficacy at long-term follow-up. CLINICAL TRIAL REGISTRATION: www.ClinicalTrials.gov, identifier: NCT04559932.

DOI: 10.3389/fped.2022.885405 PMCID: PMC9220937 PMID: 35757113

Conflict of interest statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Indian J Thorac Cardiovasc Surg. 2022 Jul;38(4):398-402. doi: 10.1007/s12055-021-01309-8. Epub 2022 Jan 14.

Coronary artery bypass grafting via manubrium-sparing sternotomy in a patient with total laryngectomy and a permanent tracheostoma.

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Author information: (1)Department of Cardiovascular Surgery, Clinical Research Institute, National Hospital Organization Kyushu Medical Center, Fukuoka, Japan. (2)Department of Cardiovascular Surgery, Faculty of Medicine, Kyushu University Graduate School of Medicine, Fukuoka, Japan.

For patients who have previously undergone total laryngectomy and a permanent tracheostomy, median full sternotomy is not the ideal surgical approach because of the substantially increased risk of sternal wound complications and tracheal injuries. We present a case in which conventional coronary artery bypass grafting using bilateral internal thoracic arteries was performed safely via a manubrium-sparing sternotomy in a patient who had undergone total laryngectomy and a permanent tracheostoma. We also discuss the appropriate surgical approach for patients with total laryngectomy and a permanent tracheostoma. SUPPLEMENTARY INFORMATION: The online version contains supplementary material available at 10.1007/s12055-021-01309-8.

DOI: 10.1007/s12055-021-01309-8 PMCID: PMC9218033 PMID: 35756556

Conflict of interest statement: Conflict of interestThe authors declare no competing interests.

Laryngoscope. 2022 Jun 26. doi: 10.1002/lary.30254. Online ahead of print.

Primary Total Laryngectomy versus Organ Preservation for Locally Advanced T3/T4a Laryngeal Cancer.

Lee MY(1), Belfiglio M(1), Zeng J(1), Fleming CW(2), Koyfman S(2), Joshi NP(3), Lamarre E(4), Prendes B(4), Scharpf J(4), Lorenz RR(4), Woody NM(2), Adelstein DJ(5), Geiger JL(5), Chute DJ(6), Ku JA(4).

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OBJECTIVE: Organ preservation (OP) treatment for advanced laryngeal cancer has increased compared to primary total laryngectomy. Our study compares oncologic and functional outcomes between these approaches. STUDY DESIGN: Retrospective cohort study. SETTING: Single tertiary care institution. METHODS: Retrospective review of patients receiving primary total laryngectomy or OP for laryngeal cancer between 1/1/2000 and 12/31/2018. RESULTS: A total of 118 patients received primary total laryngectomy and 119 received OP. Overall survival was similar between total laryngectomy and OP. When stratified by T stage, disease-free survival was worse among T3 patients receiving OP versus total laryngectomy. In T3 patients, 28 OP patients experienced local recurrence (28.9%) compared to 3 total laryngectomy patients (7.1%; $p < 0.01$). In total, 20 OP patients with local recurrence received salvage surgery. These patients had similar overall survival to patients who underwent initial total laryngectomy (TL). About 14 OP patients with local recurrence did not receive salvage surgery. About 89 (75.4%) TL patients achieved normal diet as compared to 64 (53.8%) OP patients ($p < 0.001$). In TL patients, 106 (89.8%) received primary or secondary tracheoesophageal-prosthesis, 82 (77.4%) of whom achieved completely understandable speech. CONCLUSIONS: There was no difference in survival by treatment in T4 patients, possibly because of strict patient selection. However, disease-free survival was worse in T3 patients receiving OP, likely due to a high local recurrence rate. Approximately 40% of patients with local recurrence were not eligible for salvage laryngectomy. TL patients had comparable swallowing and speech outcomes with OP patients. LEVEL OF EVIDENCE: 3 Laryngoscope, 2022.

DOI: 10.1002/lary.30254 PMID: 35754153

ATS Sch. 2022 Mar 11;3(1):135-143. doi: 10.34197/ats-scholar.2021-0110OC. eCollection 2022 Mar.

Virtual Deliberate Practice Module for Tracheostomy Change Training: An Application of Educational Design Research.

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BACKGROUND: The pandemic poses challenges for in-person procedural skills training. We developed a virtual module for teaching hands-on tracheostomy skills. OBJECTIVE: To develop and evaluate a virtual module prototype grounded in deliberate practice using tracheostomy change as an example. METHODS: After identifying desirable features of a virtual module by surveying stakeholders, we designed a prototype using VoiceThread, a multimedia-based collaborative learning platform. We created an asynchronous module accessible to learners for repeated skill practice and for video upload of individual performance on a tracheostomy task trainer using personal devices. This virtual module provided a four-step coaching (demonstration, deconstruction, formulation, and performance) to practice tracheostomy change. Two instructors reviewed the learners' performance videos, providing timely feedback for further refinement of skills. RESULTS: Sixty-four residents completed the module, System Usability Scale, and self-efficacy survey. All residents rated the module, with a mean System Usability Scale score of 68.6 ± 18.4 (maximum score of 100). Two independent instructors rated performance videos using a 12-item checklist with mean interobserver agreement of 88.1% (standard deviation, 9.7) and mean performance checklist score (n = 40) of 10.1 (standard deviation, 1.2) out of 12. After training, residents reported high confidence in their ability to list and perform procedural steps, with improvement in median (interquartile range) comfort levels from 1 (1-2) to 4 (3-4) out of 5 ($P < 0.0001$). CONCLUSION: We developed an asynchronous deliberate practice module on a virtual platform using tracheostomy change as an example. Residents evaluated the module favorably using system usability and learner self-efficacy surveys with improvement of skills.

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