



This month's top papers: June 2026

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.

You can sign up to our community to keep informed of our work here: <https://ntsp-ltd.myklpages.com/l/XTFSzY>

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 cover

1. Watson LJ, Wadey W, Babb M, et al.

Co-designing laryngectomy accessible information to support the development of an education and training package for community healthcare professionals: experiences and reflections from multiple stakeholders.

Research Involvement and Engagement. 2026;12:81.

2. Larson J, Lavin J, Rowland M, Hazkani I.

Tracheitis after pediatric tracheostomy: A NSQIP analysis.

International Journal of Pediatric Otorhinolaryngology. 2026;206:112853.

3. Moran M, Goryanny A, Haron A, et al.

Staff experiences of percutaneous tracheostomy in intensive care: challenges, complications and potential solutions.

Anaesthesia Reports. 2026;14:e70039.

4. Rára A, Soták M, Hynek M, et al.

Percutaneous dilatational tracheostomy and thyroid isthmus penetration (PETRIS).

Anaesthesia Critical Care & Pain Medicine. 2026;45:101863.

Paper 1

Co-designing laryngectomy accessible information to support the development of an education and training package for community healthcare professionals

Watson LJ, Wadey W, Babb M, et al.

Research Involvement and Engagement. 2026;12:81.

Lay Summary

Having a total laryngectomy means completely removing the voice box, usually as part of treatment for advanced laryngeal cancer. The operation permanently changes how someone breathes and communicates and can also affect swallowing and appearance.

After leaving hospital, people living with a laryngectomy may need help from healthcare professionals who do not regularly care for patients with this type of airway. Previous work has suggested that educational resources for these professionals can be difficult to navigate and inconsistent, with limited involvement from people who have actually experienced laryngectomy.

Watson and colleagues therefore brought together people living with a laryngectomy, family members, healthcare professionals, a designer and a creative agency to develop a simple “back to basics” animation and infographic.

Importantly, people living with a laryngectomy helped decide what information should be prioritised. Six core areas were developed: anatomy, communication, airway, eating and drinking, treating everyone as an individual, and key messages. People with lived experience particularly wanted **airway and communication changes** to be emphasised. They also wanted healthcare professionals to recognise the importance of giving people sufficient time and space to communicate and treating each person as an individual.

The resulting animation and infographic were positively received by those involved in their development. They are intended to become an entry point into a larger education and training package for community healthcare professionals.

This work does not yet tell us whether the resources improve knowledge, confidence or patient outcomes. Instead, it demonstrates how involving people with lived experience can change both the content and priorities of healthcare education.

Summary for Healthcare Professionals

This paper describes an early stage of the **CREATOR study**, which aims to co-design a laryngectomy education and training package for community healthcare professionals.

The rationale is compelling. Specialist head and neck services are often centralised, whereas people with laryngectomies live and receive care across much wider geographical areas. Community teams may therefore encounter a relatively unfamiliar airway without ready access to specialist expertise. Previous work by the group identified inconsistency in existing laryngectomy education and limited patient and public involvement in its development.

Rather than starting with a conventional clinician-designed training package, the researchers worked with people with laryngectomies, family members and healthcare professionals. Initial discussions involved seven members of a PPI group and five healthcare professionals. Further development involved several groups, including the local laryngectomy support group, National Association of Laryngectomy Clubs contributors, the CREATOR PPI group and healthcare professional advisers.

One of the most interesting findings is not technological at all: **co-design changed what was considered important.**

A clinician-led resource might naturally give relatively equal attention to anatomical and physiological consequences of laryngectomy. People living with laryngectomy instead prioritised airway and communication and wanted a stronger message around individuality, listening and allowing time to communicate.

That has practical implications. Knowing that a person with a laryngectomy breathes exclusively through their neck is essential, particularly in an emergency. But good care also means understanding how that individual communicates, avoiding assumptions and ensuring that communication difficulty does not inadvertently exclude them from decisions about their own care.

Strengths

A major strength is the meaningful involvement of people living with laryngectomy throughout development rather than simply asking for feedback once a clinician-designed product was complete. Multiple stakeholder groups contributed, including patients, family members, nurses, speech and language therapists and surgeons.

The project also paid attention to communication accessibility during the co-design process itself. For example, technology settings and meeting formats were adapted so that alternative communication methods did not prevent participation.

Limitations

This is primarily a development and reflection paper rather than an effectiveness study.

Participants with lived experience were generally highly engaged and had sufficient digital access and literacy to participate. People with lower literacy, less technological access or different support needs may therefore be under-represented. Feedback was also predominantly positive and came largely from people involved in developing the resource. All authors were UK-based, which may limit international transferability.

Most importantly, the study does **not yet demonstrate that the animation improves clinical practice or patient outcomes**.

Clinical relevance

For NTSP teams, the paper reinforces an important principle: education about laryngectomy should be developed **with**, rather than simply **for**, people living with laryngectomy.

There is also a useful distinction between emergency education and wider long-term care. Recognising a laryngectomy airway in an emergency is vital, but community professionals also need practical confidence around communication, rehabilitation and the everyday consequences of living with a permanent neck stoma.

What next?

The animation and infographic will be used within further CREATOR co-design workshops to develop a broader training package for non-specialist community healthcare professionals. Future evaluation needs to establish whether this translates into measurable improvements in knowledge, confidence, behaviour and, ultimately, the experiences and outcomes of people living with laryngectomy.

Paper 2

Tracheitis after pediatric tracheostomy: A NSQIP analysis

Larson J, Lavin J, Rowland M, Hazkani I.

International Journal of Pediatric Otorhinolaryngology. 2026;206:112853.

Lay Summary

Children who require a tracheostomy often have complex medical needs. Infection of the airway, sometimes described as tracheitis, is a common concern, but deciding whether a child has a genuine infection can be difficult because bacteria frequently live in tracheostomy tubes and airway secretions without necessarily causing illness.

Larson and colleagues used a large US surgical database to examine **5,784 children** who underwent tracheostomy between 2019 and 2023.

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Within 30 days of surgery, **652 children – 11.3% – were recorded as developing tracheitis**, occurring on average around 11 days after tracheostomy.

Children recorded as having tracheitis were also more likely to experience pneumonia or sepsis and had longer hospital stays. Some factors, including receiving corticosteroids before surgery, needing nutritional support and having cardiac conditions, were associated with an increased risk of tracheitis even after additional statistical analyses intended to account for differences in how unwell the children were.

However, these findings need careful interpretation. A positive tracheal culture does not necessarily mean that a child has an infection because long-term tracheostomy is commonly associated with bacterial colonisation. The database definition also relied on culture results and antibiotic treatment and could not provide the detailed bedside clinical information needed to distinguish infection reliably from colonisation or other respiratory illnesses.

The study therefore identifies an important period of vulnerability after paediatric tracheostomy, but it cannot tell us exactly which preventive treatments should be used.

Summary for Healthcare Professionals

This multicentre retrospective cohort study analysed the American College of Surgeons National Surgical Quality Improvement Program–Pediatric database from 2019–2023.

Only cases in which tracheostomy was the primary surgical procedure were included. The investigators identified **5,784 paediatric tracheostomies**, with a median age of approximately six months; nearly three-quarters of procedures occurred in children younger than two years.

Postoperative tracheitis was identified in **652 patients (11.3%)**, at a mean of 11.4 days after surgery.

The investigators used modified Poisson regression with robust variance, supplemented by analyses stratified according to ASA classification and exposure-specific propensity score weighting.

Preoperative corticosteroid use, nutritional support and cardiac comorbidity were associated with increased risk. Unplanned postoperative intubation was also associated with tracheitis in the principal analysis. Age, gestational age, ASA classification and chronic lung disease were not independently associated.

The clinical associations are striking. Children classified as having tracheitis had pneumonia more frequently than those without tracheitis — **11.5% versus 4.6%** — and sepsis was recorded in **20.7% versus 4.3%**. Hospital stay was also longer.

However, association is not causation. Tracheitis may contribute to deterioration, but it may also be a marker of a medically complex child with greater exposure to invasive treatment, cultures and antibiotics.

Strengths

The major strength is scale. Almost 5,800 paediatric tracheostomies provide substantially greater statistical power than most single-centre paediatric tracheostomy studies.

The investigators also made meaningful attempts to address confounding. ASA-stratified analyses and propensity score weighting explored whether apparent risk factors were simply markers of greater baseline illness severity.

Restricting the analysis to cases where tracheostomy was the primary procedure also attempted to reduce misclassification of infections associated with other operations.

Limitations

The key limitation is the definition of **tracheitis itself**.

NSQIP-P relies on positive tracheal culture alongside antibiotic treatment. In a tracheostomised child, however, bacterial colonisation is common. The database cannot provide detailed clinical adjudication to reliably distinguish colonisation from genuine lower respiratory tract infection, nor can it completely separate tracheitis from bronchitis, pneumonia or systemic infection.

The database also lacks important granular information including tube characteristics, ventilator settings and postoperative airway-care practices. Participation in NSQIP-P is voluntary, so participating centres may not represent all hospitals undertaking paediatric tracheostomy.

The retrospective observational design also means that residual confounding remains possible despite sophisticated statistical adjustment.

Clinical relevance

The paper should **not** be interpreted as demonstrating that every positive culture in the first fortnight after paediatric tracheostomy requires antibiotics.

Rather, it highlights the early postoperative period as a potentially important surveillance and quality-improvement window.

For clinicians, the distinction between **colonisation and infection remains fundamental**. Culture results should be interpreted alongside the child's clinical condition, secretion changes, respiratory requirements and other evidence of infection.

The identified risk factors may ultimately help identify groups requiring closer surveillance, but the authors specifically caution that the study was not designed to recommend particular preventive interventions.

What next?

A major research priority is a **standardised, clinically meaningful definition of tracheostomy-associated respiratory infection in children**.

Prospective studies incorporating clinical features, microbiology, airway-care practices and longitudinal outcomes would help determine which children are genuinely developing infection and

whether targeted preventive strategies can reduce clinically important complications without promoting unnecessary antibiotic use.

Paper 3

Staff experiences of percutaneous tracheostomy in intensive care: challenges, complications and potential solutions

Moran M, Goryanny A, Haron A, et al.

Anaesthesia Reports. 2026;14:e70039.

Lay Summary

Percutaneous dilatational tracheostomy, or PDT, is commonly performed at the bedside in intensive care. Although it is a well-established procedure, putting the initial needle into exactly the right place can be challenging, particularly when patients have obesity, neck swelling or difficult anatomy.

Moran and colleagues asked **32 members of staff from three different ICUs** about their experiences of performing and supporting tracheostomy procedures.

Participants included consultants, resident doctors, nurses, advanced critical care practitioners and other staff. The researchers used interviews and focus groups to explore training, teamwork, complications and how a future device designed to help guide the tracheostomy needle might fit into clinical practice.

Six main themes emerged. These included learning and maintaining tracheostomy skills; how staff, equipment and the ICU environment interact; recognising and preventing complications; differences in how clinicians plan and perform tracheostomy; what information a guidance device should provide; and the potential benefits and problems of introducing new technology.

One consistent message was that safety is about more than the person holding the needle. Teamwork, leadership, equipment, preparation, supervision and the physical environment all matter.

Staff were interested in technology that might make needle placement more accurate, but they also emphasised that any new device would need to be simple, accessible, affordable and easy to incorporate into an already crowded ICU environment.

Summary for Healthcare Professionals

This UK qualitative study is particularly interesting because it asks a different question from most PDT research.

Rather than comparing complication rates between techniques, the investigators asked the people actually undertaking and supporting PDT **what makes the procedure difficult and what might make it safer**.

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Thirty-two participants across three different ICUs took part in 26 interviews and two focus groups. Participants represented multiple professional groups and levels of experience. Semi-structured interviews were analysed using inductive thematic analysis.

Six themes were identified:

Gaining skills and keeping them — PDT was viewed as a skilled, high-risk procedure that is best learned through supervised practice. Exposure during training is variable, and maintaining procedural confidence can be difficult for clinicians who undertake tracheostomy infrequently.

How people, equipment and the environment interact to keep patients safe — leadership, teamwork, ergonomics and MDT working were central to safe performance.

The dangers of tracheostomy insertion and how to prevent them — participants discussed bleeding, injury to structures, airway problems, instability and the importance of governance and safety processes.

Variations in how to plan and do a tracheostomy — practice differed between clinicians and centres, including how risk factors influenced the choice between percutaneous and surgical approaches.

What assistive devices tell us and how — clinicians described uncertainty around exact needle position and considered what useful guidance technology should display.

The benefits and pitfalls of introducing new technologies — participants recognised that useful technologies need to integrate into established workflows rather than simply adding complexity.

Needle placement emerged as a particularly important concern. Difficult anatomy, including obesity and short or swollen necks, increased uncertainty. Participants were generally receptive to guidance technology that could help identify a safe insertion point and trajectory.

Strengths

The multidisciplinary design is an important strength. PDT is inherently a team procedure, and the inclusion of doctors, nurses, ACCPs and ancillary staff provides a broader understanding than interviewing proceduralists alone.

The three participating ICUs were also clinically different, including a general acute ICU, a cardiothoracic/ECMO service and a district general hospital ICU. This exposed genuine variation in attitudes towards risk and practice.

The work also illustrates a sensible approach to medical-device development: **understand the clinical problem and end-user requirements before designing the solution.**

Limitations

Qualitative research provides depth rather than prevalence. We cannot infer from these interviews how commonly each view occurs across UK intensive care.

The interviewers themselves had ICU experience and some had worked with participants previously. This could have influenced what participants felt comfortable saying, particularly where professional

hierarchies existed. The researchers used reflexive approaches and team discussion to mitigate this, but interpretation inevitably remains influenced by the research team.

There is also an important potential conflict to acknowledge: several authors are involved in the NIHR-funded project developing the proposed guidance technology. This does not invalidate the findings, but it is relevant context when interpreting enthusiasm for such a device.

Clinical relevance

Perhaps the most useful message is that **PDT safety is a systems problem as much as a technical problem.**

Good patient selection, preparation, equipment, communication, leadership, supervision, checklists and the ability to recognise when conditions are becoming unsafe may be at least as important as the choice of dilator or imaging modality.

The paper also highlights an important tension in training. Trainees need supervised procedural exposure to develop competence, but PDT occurs in critically ill patients in whom prolonged procedures may themselves create risk.

What next?

The findings are intended to inform development of a needle-guidance system. Future work therefore needs to establish not simply whether such technology can identify needle position, but whether it improves meaningful outcomes without creating additional workload, distraction, cost or training requirements.

Human-factors evaluation should occur alongside technical validation.

The broader lesson for medical technology is straightforward: **a device that works technically but does not work within the clinical system is unlikely to improve care.**

Paper 4

Percutaneous dilatational tracheostomy and thyroid isthmus penetration (PETRIS)

Rára A, Soták M, Hynek M, et al.

Anaesthesia Critical Care & Pain Medicine. 2026;45:101863.

Lay Summary

The thyroid gland sits at the front of the neck, and the bridge of thyroid tissue joining its two sides — called the **thyroid isthmus** — often lies close to the usual site used for tracheostomy.

Clinicians have traditionally been concerned that passing a percutaneous tracheostomy through this tissue might increase bleeding or other complications.

Rára and colleagues studied this question prospectively.

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Of 180 tracheostomies performed during the study period, **100 percutaneous procedures** were included in the main analysis. Fifty-one were performed using the standard landmark approach and 49 used ultrasound during the procedure. All patients considered for percutaneous tracheostomy had ultrasound assessment beforehand to identify potentially high-risk anatomy.

Perhaps surprisingly, **68% of the percutaneous tracheostomy trajectories passed through the thyroid isthmus.**

Early complications occurred in 4.4% of trans-isthmic procedures compared with 3.1% where the isthmus was avoided. This difference was not statistically significant.

Similarly, using ultrasound during the procedure did not produce a statistically significant reduction in early complications.

However, this does **not** prove that the techniques are equally safe. There were very few complications and the study was far too small to reliably detect modest differences between the groups.

The study therefore suggests that passing through a normal thyroid isthmus may be more common — and perhaps less problematic — than traditionally assumed, but larger studies are needed before changing practice.

Summary for Healthcare Professionals

PETRIS is a single-centre prospective interventional study examining two related questions: how frequently PDT traverses the thyroid isthmus, and whether ultrasound adds useful information to procedural planning and guidance.

A particularly important feature of the design is that **all potential PDT patients underwent pre-procedural ultrasound assessment**. Patients with extensive vascular structures or other high-risk anatomical features could instead be directed towards surgical tracheostomy. The subsequent PDT population was therefore deliberately preselected as anatomically suitable.

One hundred PDT procedures were analysed: 51 using a standard landmark technique and 49 using intra-procedural ultrasound guidance.

Ultrasound was also performed after guidewire placement for study purposes, while bronchoscopic verification was undertaken in all cases.

The trajectory passed through the thyroid isthmus in **68 of 100 cases**.

Three early complications occurred among the 68 trans-isthmic procedures, compared with one among the 32 procedures avoiding the isthmus: **4.4% versus 3.1%, $p=1.00$** .

There was similarly no statistically significant difference between standard and ultrasound-guided PDT: **2.0% versus 6.1%, $p=0.342$** .

Interestingly, bronchoscopy led to guidewire repositioning in **five patients** — three because of off-centre positioning and two because the guidewire entered at an inappropriate tracheal ring level.

Strengths

The prospective design and systematic imaging are important strengths.

The study also separates two functions of ultrasound which are sometimes conflated:

1. **Pre-procedural ultrasound for anatomical assessment and patient selection.**
2. **Intra-procedural ultrasound for real-time guidance.**

That distinction is clinically useful. The study provides support for ultrasound as an anatomical mapping tool, particularly for identifying vessels or other features that might make PDT unsuitable.

Limitations

The biggest limitation is statistical power.

Only four early complications occurred in the 100 PDT procedures. The authors calculate that the study had only approximately **20% power** for the ultrasound versus standard PDT comparison and **less than 5% power** for comparing trans-isthmus with non-trans-isthmus PDT.

Therefore, **“no statistically significant difference” must not be interpreted as “the techniques are equivalent”**.

The confidence intervals were wide, and clinically relevant differences cannot be excluded.

The study was also single-centre and included a preselected PDT population following ultrasound screening. The results should therefore not be extrapolated to patients with abnormal thyroid anatomy or significant anterior-neck vascularity.

Follow-up focused on early complications over approximately 10 days, so longer-term outcomes such as tracheal stenosis or tracheomalacia were not assessed.

The reported comparison with surgical tracheostomy also needs particular caution. Complications occurred in 4.0% of PDT procedures compared with 23.9% of surgical procedures, but these were **not comparable populations**. Patients selected for surgery had important baseline differences and the comparison was unadjusted. It should therefore be considered descriptive rather than evidence that PDT is intrinsically safer.

Clinical relevance

The most interesting finding may be just how frequently the thyroid isthmus was traversed.

The study challenges the assumption that encountering the isthmus automatically makes PDT unsafe. In appropriately selected patients with normal anatomy, the authors suggest that achieving a well-positioned tracheostomy may be more important than deliberately trying to avoid normal thyroid tissue.

However, the data are **not strong enough to justify deliberately targeting the thyroid isthmus**, nor should they diminish the importance of identifying vessels and abnormal anatomy before puncture.

Pre-procedural ultrasound may therefore be the more important application: **map the neck, understand the anatomy and select the appropriate procedure.**

What next?

Larger multicentre prospective studies are required, with sufficient numbers to detect clinically meaningful differences in bleeding and other uncommon complications.

Future research should also examine longer-term outcomes and clarify which patients benefit most from real-time ultrasound, bronchoscopy, both techniques, or neither.

The authors appropriately describe their findings as exploratory rather than definitive.

Putting the four papers together

Although these papers address very different parts of tracheostomy and laryngectomy care, there is a common theme running through all four: **safe airway care depends on understanding the context around the intervention.**

Watson and colleagues show that even well-intentioned education may miss what matters most if patients are not involved in deciding what should be taught. People living with laryngectomy shifted the emphasis towards communication, airway changes and being treated as an individual.

Larson and colleagues remind us that large datasets can identify important patterns, but definitions matter. A positive tracheal culture in a child with a tracheostomy is not synonymous with infection, and sophisticated statistical analysis cannot completely overcome limitations in the underlying clinical data.

Moran and colleagues move the focus to the ICU procedure itself. Their qualitative findings remind us that technical skill exists within a wider system of teamwork, supervision, equipment, ergonomics and human factors.

Finally, PETRIS asks us to reconsider assumptions about anatomy and imaging during PDT. Passing through the thyroid isthmus appears common in this selected cohort, but the small number of complications means that the absence of statistical significance should not be mistaken for proof of safety or equivalence.

Across all four papers, the direction for future work is therefore similar: move beyond simply describing what happens and determine whether interventions produce **meaningful improvements for patients.**

For laryngectomy education, that means evaluating whether co-designed training changes professional behaviour and patient experience. For paediatric tracheitis, it means developing better diagnostic definitions and prospective surveillance. For PDT, it means combining technical innovation with human-factors research and adequately powered clinical evaluation.

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That is perhaps the main message from this month's papers: safer tracheostomy and laryngectomy care comes not from any single technology, test or protocol, but from bringing together **patients, people, systems, anatomy and evidence**.

Disclaimer

These summaries are intended for education and professional discussion and should not replace local policies, clinical guidelines or individualised clinical decision-making. Interpretation and commentary reflect the educational aims of the National Tracheostomy Safety Project.