

Converting to a new tracheostomy platform with a multidisciplinary team approach

Today, tracheotomy is routinely performed in hospitals around the world for various indications, such as ventilator dependence, trauma, and airway obstruction. Despite its widespread use, little is published on the challenges and complications of tracheotomy procedures.

There is also a major opportunity for hospitals to standardize on best practices to manage cost variability when it comes to tracheostomy care. When led by a multidisciplinary tracheostomy team, these best practices can notably improve patient experiences and outcomes.

Background

Within the intensive care unit (ICU) population, the purpose and duration of intubation can vary dramatically, with the benefits of early versus late tracheostomy debated extensively. In the critically ill, an important practical consideration is that once an endotracheal tube is placed, replacing it may increase the risk to the patient. There is a clear association between the size of the or tracheal tube and long-term debilitating complications, such as subglottic stenosis.¹

Sizing and positioning matters

The dimensions of tracheostomy tubes are given by their inner diameter, outer diameter, length, and curvature of the outer cannula. Although dimension differences in tubes with the same inner diameter from different manufacturers are not commonly appreciated, they may have important clinical implications. It is important for clinicians to understand the nuances of various tracheostomy tube designs and select a tube that appropriately fits the patients.²



If inner diameter is too small, it increases the resistance through the tube making airway clearance more difficult. The result is increased work of breathing for the patient. If the outer diameter is too large, the leak with cuff deflated will decrease.² All tracheostomy tubes are angled and curved, a feature that can improve the fit of the tube in the trachea. The shape of the tube should conform as closely as possible to the anatomy of the patient's airway.

Differences in tracheostomy tube length can also have important clinical implications. Extra proximal length facilitates tracheostomy tube placement in patients with a large neck (e.g., obesity, bodybuilders) or in patients with tracheomalacia or tracheal anomalies.² Because tracheostomy tube malposition is a potentially serious issue,² it's important to avoid inappropriate use of these tubes because they may induce distal obstruction of the tube.

Schmidt et al. found the most common malposition resulted in the posterior tracheal wall occluding the distal tip of the tube. Malposition tracheostomy tubes were changed to a better fitting tube in 80% of cases.³

Many configurations are available

Tracheostomy tubes can be dual cannula or single cannula; fenestrated or non-fenestrated; and cuffed or uncuffed. Uncuffed tubes allow airway clearance but provide no protection from aspiration. Cuffed tubes allow secretion clearance, offer some protection from aspiration, and are also used for patients who require mechanical ventilation.

Tracheostomy tubes can come with risks. Subglottic tracheal stenosis and tracheal stenosis are major late complications following tracheostomy and tracheal intubation. Practicing vigilant stoma care can prevent infection and skin breakdown surrounding the stoma. Yet some degree of stenosis develops in about 20% to 30% of patients with tracheostomy, and 2% to 7% of patients develop symptoms that warrant invasive interventions.⁴

Much of our current understanding of tracheotomy technique and management is based on studies performed decades ago. But since then, there have been many improvements in tracheotomy tube designs and approaches.

Converting to a new tracheostomy platform: a multidisciplinary team approach

In 2017, United Regional Health Care System in Wichita Falls, Texas switched from the legacy Shiley™ tracheostomy tubes to the newly designed Shiley™ flexible tracheostomy tubes. The transition, like any product change, took time and patience.



The importance of obtaining clinical buy-in – as well as buy-in from the whole tracheostomy team – was critical to their success, according to Darrin French, Director of Respiratory Services at United Regional Health Care System.

“The team had to commit to the change and strive to resolve any confusion the new products would introduce,” said French. “A new product is hard to adjust to, and old habits are hard to break.”

Once the decision was made to switch tracheostomy portfolios, they went all in with the new products. To help break old habits, they only stocked the new tracheostomy tubes by working with the team to ensure they ordered the correct products.

Working through challenges: understanding sizing

Determining what product to order was the most challenging part of the process for the team. Since the new tracheostomy tubes had different sizing numbers, they worked around it by creating an ordering chart using the inter-diameter sizes with their own ordering numbers. They linked it into their internal product ordering system to decrease the incidence of ordering mistakes.

Working through challenges: staff education and training

Because the new portfolio included cuffed and uncuffed tracheostomy options as well as specialty tracheostomy solutions, a major key to success depended on educating the RTs and RNs on the full line of products. French dedicated time during staff meetings to train the RTs, then developed a train-the-trainer approach to ensure everyone was competent on tracheostomy procedures and care using the new product portfolio.

At times, ICU patients are transferred to the general care floor with a tracheostomy, so the RTs, as well as the RNs, needed training since they have less experience with tracheostomy as a whole. Even though RTs perform tracheostomy care every 8 hours, it was equally important for RNs to feel comfortable with tracheostomy patients to ensure they could care for them competently.

Tracheostomy care, performed every 8 to 12 hours on all patients, includes cleaning the stoma site and changing any dressing. The RTs assess the site for redness, signs of skin breakdown, and general tracheostomy placement, and document the information in the patient's chart.

From here, the train-the-trainer approach became especially critical to successfully train RNs on an individual, as-needed basis. To ensure the whole staff had full competency, the tracheostomy team provided educational resources by either creating their own materials, using product inserts and posters, taking CECs, or attending conferences. The tracheostomy team stayed engaged every step of the way fostering open communication to ensure the clinical staff felt comfortable caring for tracheostomy patients. With turnovers and new team members lacking tracheostomy experience, it was crucial for the tracheostomy team to re-engage with the clinical staff frequently, especially with new hires.

Working through challenges: anticipating clinical staff needs

Leading a team through this change required the tracheostomy team to foresee the needs of its clinical staff. When it comes to choosing the right tracheostomy product and the right size, the clinical staff starts by using the same size endotracheal tube as standard practice. If the patient is of average size, they pull size 8 (8CN85H).

Another way they anticipate staff needs is by having a tracheostomy cart ready with a full portfolio of sizes and tracheostomy tube options, in case of an emergent need, such as a trach tube replacement. This cart is stocked at the end of each shift and always available.

Improving patient outcomes and experiences

Seeing the benefits patients stand to gain by switching to a new product portfolio as the standard of care can often make the adoption process an easier one.

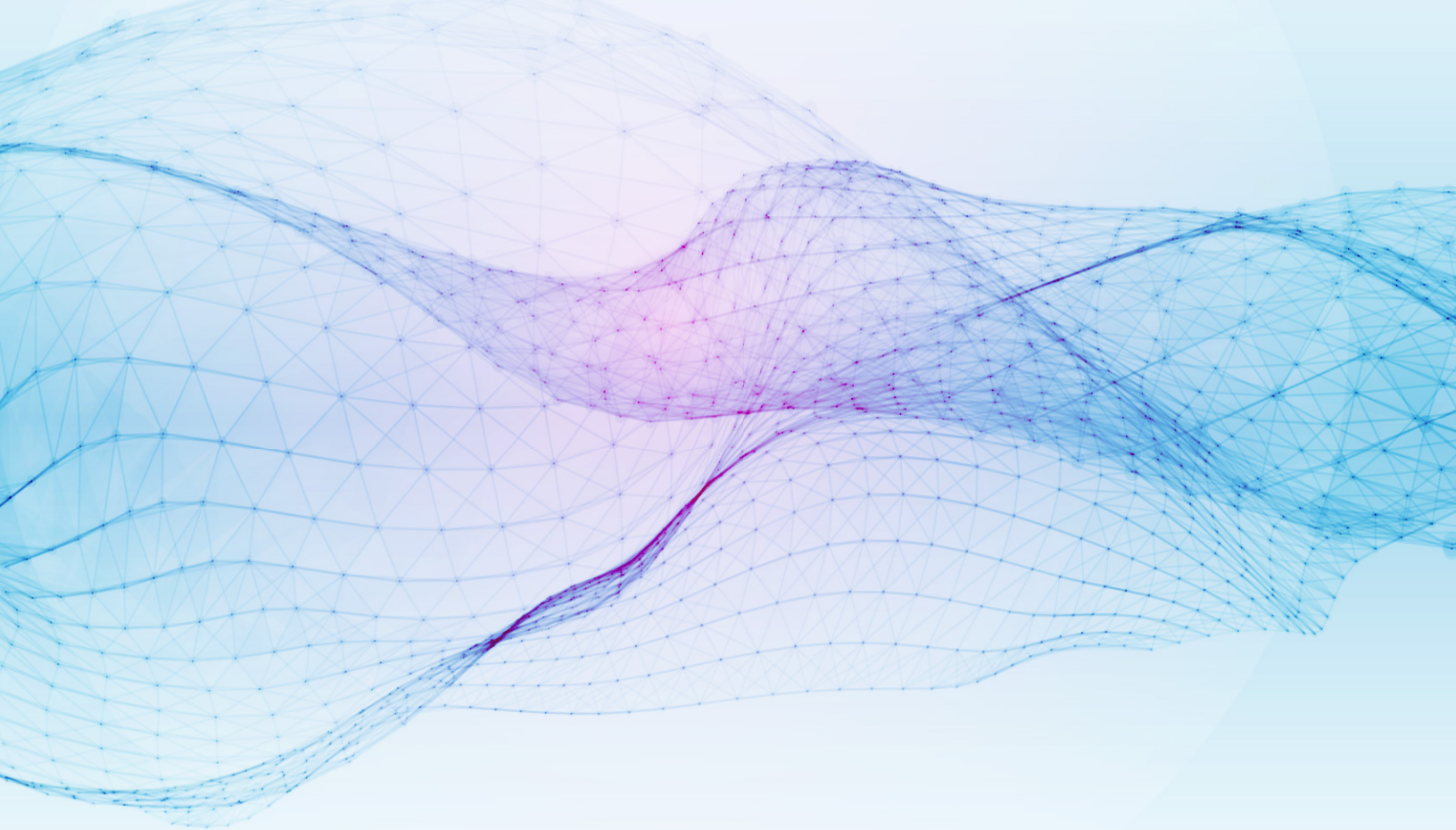
"The enhancements of the new product outweighed the challenges of converting to a new portfolio," said French.

The newly designed Shiley™ flexible tracheostomy product offers many clear improvements over the previous product. The clear flange allows clinicians to see the stoma clearly to prevent irritation and skin breakdown. The tapered cuff with less bulky material makes insertion easier with less trauma to the stoma area. The suture holes make it more accessible to keep a new tracheostomy in place.

While it takes time to gain confidence and comfort with a new product, the tracheostomy team made the transition smoother by removing key obstacles through the following steps:

- Garnering clinical buy-in
- Anticipating the right size tracheostomy tube based on clinical experience
- Only stocking new product portfolio
- Solving ordering challenges by developing an internal ordering chart that linked to their internal ordering system
- Providing continuous education of new products to the team





Caution: U.S. federal law restricts this device for sale by or on the order of a physician.

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2. Hess DR, Altobelli NP. Tracheostomy tubes. *Respir Care*. 2014;59(6):956-973.
3. Schmidt U, Hess D, Kwo J, et al. Tracheostomy tube malposition in patients admitted to a respiratory acute care unit following prolonged ventilation. *Chest*. 2008;134(2):288-294.
4. Kim SS, Khalpey Z, Hsu C, Little AG. Changes in tracheostomy- and intubation-related tracheal stenosis: implications for surgery. *Ann Thorac Surg*. 2017;104:964-70.

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