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Speech-language
Therapists' Association

Te Kāhui Kaiwhakatikatika
Reo Kōrero o Aotearoa

Above Cuff Vocalisation Practice Standards for Speech-language Therapists in Aotearoa

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Contents

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DISCLAIMER

This document outlines the best current evidence to guide practice within a limited evidence base. The ACV procedure outlined in this document was developed from existing literature and international clinical guidelines as of June 2025. Where variability in practice and literature exists, consensus has been made based on the most frequently used or most recent recommendations.

The recommended guidance below may be updated periodically as research, policy, and practice evolve. If you have any questions or require clarification regarding its application, please consult the NZSTA.

By using this document, you acknowledge that you have read and understood this disclaimer and agree to exercise your professional judgement in its application.

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Purpose

Above cuff vocalisation (ACV) is a technique that uses the subglottic suction port of a specialised tracheostomy tube to achieve vocalisation. ACV is particularly useful for patients who require a cuffed tracheostomy tube and cannot tolerate cuff deflation for vocalisation. It provides a verbal communication option for patients who would otherwise need to rely on low or high-technology multimodal communication. ACV may also positively impact oropharyngeal and laryngeal sensation and secretion management with potential benefits for reintroducing oral intake (Mills et al., 2022).

ACV is used internationally and is becoming more recognised in critical care settings across the motu. However, there is currently no clinical guidance in Aotearoa to support speech-language therapists (SLTs) in practising ACV. Despite being first described in the 1960s, the international guidance for ACV is in its infancy due to a limited but increasing evidence base to support best practice procedure development.

Aim

To provide best practice guidance for SLTs using above cuff vocalisation, upskilling, training others, and/or advocating for practice change in this area in Aotearoa.

As health professionals working in Aotearoa and members of the NZSTA, we are committed to fulfilling Te Tiriti o Waitangi (NZSTA, 2020). Māori continue to experience significant healthcare inequity compared to non-Māori (Kupu Taurangi Hauora o Aotearoa/Health Quality & Safety Commission New Zealand, 2019). We all have a role in supporting Māori-led solutions, Māori wellbeing and models of care (Manatū Hauora/Ministry of Health, 2020). Clinicians utilising this resource should consider how practice in this area may impact equitable health outcomes, particularly for Māori.

Associated Documents

NZSTA Tracheostomy Competency Framework

NZSTA Tracheostomy Practice Guideline

NZSTA Tracheostomy Register

NZSTA Best Clinical Principles in Laryngology

NZSTA FEES Practice Standards

NZSTA FEES Competency Framework

NZSTA Towards Equity for Māori

Austin Health Above Cuff Voicing Guideline

CPR for Neck Breathers

Pre-requisites for SLTs using ACV

Above cuff vocalisation guidance in this document does not reflect a formal competency. Formal competency packages, such as those required for flexible endoscopic evaluation of swallowing (FEES) and videofluoroscopic swallowing study (VFSS), focus largely on practical skill and analysis. Although also a clinical practice, ACV does not require specific advanced practical skills to perform the procedure. Rather, it requires a high level of understanding of the anatomy and physiology of tracheostomy and the upper airway; the uses and benefits of ACV; and a strong understanding of contraindications and clinical risks to safely determine when it is indicated and when it needs to be discontinued.

Essential

- Current NZSTA registered membership.
- Level 3 tracheostomy competence with access to supervision by a Level 4 tracheostomy-trained SLT
- Understanding of the indications and contraindications for ACV use, as listed in the *Risks and Safety Considerations* section below
- Understanding of the clinical risks of ACV and how to mitigate these
- Awareness of signs that a patient is not tolerating ACV, including but not limited to respiratory distress, and the appropriate action to take in response
- Current CPR training as per SLT local policy, including knowledge of CPR for neck breathers (see link under *Associated Documents*)

Recommended

- Level 4 tracheostomy competence
- FEES competence or access to nasendoscopy (SLT or ORL)
- Completion of Austin Health Tracheostomy Emergency Management E-learning

Local policy may apply specific prerequisites for using ACV that are relevant to their workplace. When learning ACV as a new clinical skill, the SLT must ensure they upskill appropriately in the knowledge and skills involved in this clinical area. SLTs practising ACV are

expected to engage in continuing professional development to ensure that new research is integrated into practice as it becomes available.

Background

Some patients require a cuffed tracheostomy but cannot tolerate cuff deflation for vocalisation. This is often because high-pressure ventilation is needed or there is a high risk of aspirating oral secretions or gastric contents into the airway. Above cuff vocalisation (ACV) is a technique that delivers a low flow of air through the subglottic suction port of a tracheostomy tube. This air flow travels upwards through the trachea, passes through the vocal cords, and into the upper airway to enable verbal communication. Loss of voice has been reported to be distressing to patients and negatively impact quality of life (Freeman-Sanderson et al., 2025). Although SLTs can support non-verbal communication options, verbal communication is the preferred method for patients and staff. Therefore, safe restoration of verbal communication should be prioritised where possible to support participation in care needs and psychosocial wellbeing (McGrath, 2019). A scoping review indicated that vocalisation may be achieved in 88% of patients who trial ACV (Petosic, 2020).

In Aotearoa, support for taha hinengaro/emotional wellbeing and taha whānau/family wellbeing, as well as engagement in communication and decision-making, have been identified as themes that impact the experience of care in the rehabilitation journey for Māori and whānau (Kupu Taurangi Hauora o Aotearoa/Health Quality & Safety Commission New Zealand, 2022). Māori report finding it difficult to advocate for themselves at times when they feel most vulnerable (Kupu Taurangi Hauora o Aotearoa/Health Quality & Safety Commission New Zealand, 2022). Restoring voice may further support Māori to communicate with whānau and staff and engage in their health care decisions.

ACV requires a tracheostomy with a subglottic suction port, sometimes called a ‘talking tracheostomy’ or ‘external subglottic airflow’. ACV has been shown to re-establish vocalisation and oropharyngeal and laryngeal sensation with potential benefits for quality of life, communication, and swallowing (Panadian et al., 2021). Improvements in swallowing function include: increased frequency of spontaneous swallowing and coughing, and reduced aspiration ratings identified on FEES (McGrath et al, 2019). The subglottic suction

port allows access to accumulated secretions above the tracheostomy cuff. Routine removal of secretions through the subglottic suction port has been shown to reduce the risk of ventilator-associated pneumonia and mortality (Pawlik et al., 2022; Tomaszek et al., 2021).

The international guidance for ACV is in its infancy due to a limited but increasing evidence base to support the development of best practice advice. ACV practice varies globally, and there is a need for more consistent guidance and training alongside further research to identify the optimum delivery of ACV (Mills, C. et al., 2021).

Suction-aid tracheostomy tubes

The use of subglottic secretion ports with cuffed tracheostomy and endotracheal tubes is recognised as part of management aiming to reduce ventilator-associated pneumonia (Pozuelo-Carascosa et al, 2020). The subglottic suction line comprises a small tube attached superiorly to the shaft of the tracheostomy tube (See *Figure 1*). The suction line has one internal opening in the subglottic space above the tracheostomy cuff and one external opening from which a syringe can be attached to clear secretions.

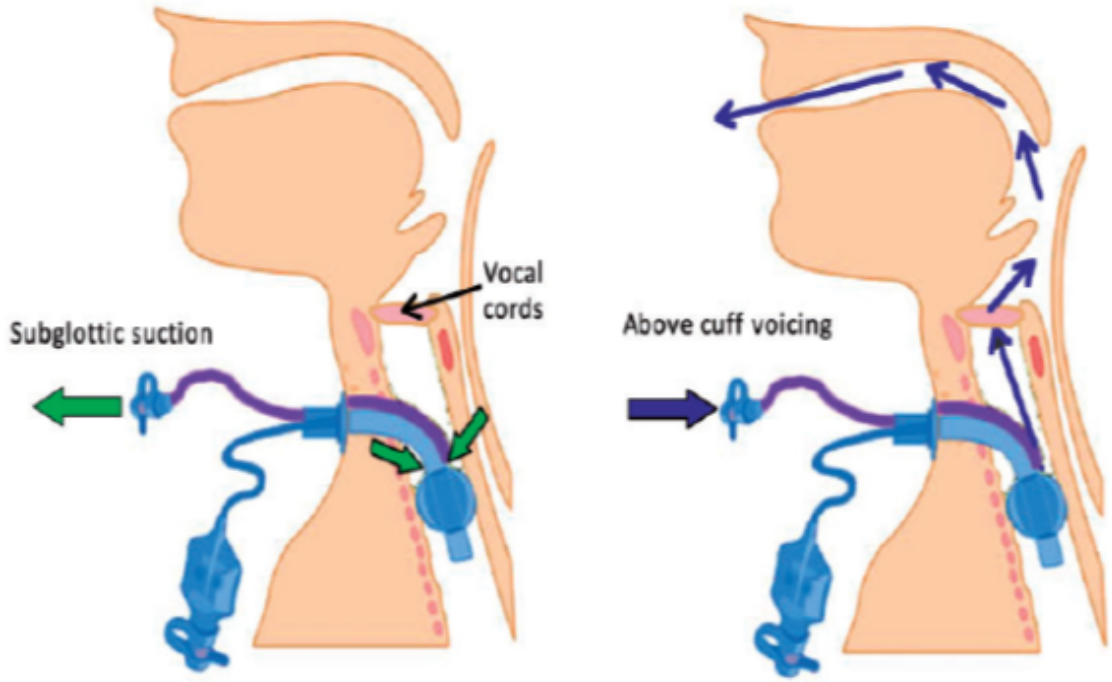

Figure 1: Diagram from McGrath et al., 2019

Some intensive care units use suction-aid tracheostomy tubes as standard practice, while others insert them to support secretion management and/or use the ACV technique (Pandian et al., 2020). Many different brands and types of tracheostomy tubes may have a subglottic suction port.

Role of the SLT in ACV

The speech-language therapist's (SLT) role is to evaluate the potential for restoring verbal communication in tracheostomised patients, both those who are spontaneously breathing and those who are mechanically ventilated, through various techniques, including ACV (ICS, 2024). SLTs can also use FEES to visualise how tracheostomy manipulation impacts laryngeal function, the upper airway, swallowing, and communication (ICS, 2024).

SLTs are members of the multi-professional team and can contribute to decision-making around tracheostomy tube size and type and advocacy for tracheostomies that enable vocalisation and support the management of secretions and swallowing (ICS, 2024). This may include recommending tracheostomy tubes with subglottic suction ports.

Contribution to the assessment of the patient's airway protection, upper airway patency and voice, and management of their communication and swallowing is typically performed by an SLT for a patient with a tracheostomy (Zaga et al., 2023). This includes observation of laryngeal function to detect injury requiring laryngologist review, the effect of tracheostomy manipulation and ACV on secretion clearance, swallowing and voice function. These observations allow SLTs to determine ACV's appropriateness, safety and effectiveness.

If an ACV trial is unsuccessful in achieving voice or is not tolerated, the SLT can problem-solve around the cause of an unsuccessful trial and whether it is safe and/or appropriate to continue ACV use. Therefore, SLTs should be involved in all initial assessments for ACV to establish specific and safe parameters for its use, monitor the safety and effectiveness of ongoing trials to optimise vocalisation, and mitigate the risk of vocal maladaptation (Mills et al., 2025). They also have a role in upskilling other members of the MDT to ensure safe implementation of the procedure.

Practice areas

The role of the SLT may include:

- Identifying patients who could benefit from ACV
- Identifying any contraindications/risk factors to using ACV
- Educating the MDT on the benefits of using ACV for a patient
- Carrying out an initial ACV trial with/without FEES
- Documenting the trial's outcome and specific recommendations for use (duration, air flow rates, etc.)
- Therapeutic intervention to optimise communication, such as the use of clear speech strategies and techniques to maintain healthy voicing patterns
- Upskilling members of the MDT to enable safe implementation of the procedure
- Creation of appropriate local documentation to support the use of ACV
- Advocating for the appropriate equipment to be available
- Keeping up to date with the most recent evidence base around the use of ACV

Risks and safety considerations

Appropriate Patient Population

- Medical team clearance for the procedure
- Haemodynamic stability
- Patients who can provide informed consent, *or,* where the patient does not have capacity for this specific decision, informed consent is provided by EPOA or the medical team with whānau consultation
- Require tracheostomy but cannot tolerate or are not appropriate for cuff deflation
- Patients who are alert and attempting to communicate are optimal candidates for ACV. However, it can also be considered as part of a therapeutic intervention for:
    - Patients who are not yet trying to communicate but may have the potential to
    - Patients who have motor speech or expressive language impairments, but with therapeutic intervention, have the potential to achieve functional verbal communication.

    - Patients who may benefit from re-sensitisation of the larynx/pharynx to aid dysphagia management and tracheostomy weaning (Kothari et al., 2017)
- Have sufficient hand function to use the thumb port, *or* have a communication partner or trained staff member who can assist
- Have a known or suspected patent upper airway
- Intact laryngeal function (viewed by endoscopy if required, e.g. FEES or ENT/ORL)
- Have an established tracheal stoma (more than 72 hours following new tracheostomy insertion, dependent on stoma healing; National Tracheostomy Safety Project, TRAMS)
- Minimal or no stoma leak around the tracheostomy tube and no current issues with the stoma site.

Contraindications

- Newly inserted tracheostomy (within the last 72 hours; National Tracheostomy Safety Project, 2025)
- High secretion load requiring continuous subglottic suction or excessively thick secretions, as they can interfere with vocal quality and cause blocking of the subglottic suction line (National Tracheostomy Safety Project, 2025)
- Medically unstable
- Reduced GCS (National Tracheostomy Safety Project, 2025)
- No medical clearance
- Known or suspected altered upper airway anatomy or concerns regarding upper airway patency (National Tracheostomy Safety Project, 2025; McGrath, 2016)
- Stoma infection, bleeding or tissue breakdown (National Tracheostomy Safety Project, 2025)
- Tracheostomy tube that is in a suboptimal position (National Tracheostomy Safety Project, 2025)
- Known blockage of the subglottic port on the tracheostomy tube with unsuccessful clearance

Risks of ACV procedure

- Laryngeal drying or hyperadduction of vocal folds in response to high airflow and increased subglottic pressure (McGrath et al., 2016; Pandian et al., 2014)
- Aerophagia and abdominal distension (McGrath et al., 2016; Mills et al., 2021)
- Subcutaneous emphysema (Calamai et al., 2018; McGrath et al., 2016)
- Tracheal distension
    - → due to the misconnection of continuous air flow to the cuff pilot tube instead of the suction port, resulting in tracheostomy cuff rupture (Petosic 2021). Potential solutions for this include labelling the pilot balloon and subglottic suction port and/or providing pictorial guidelines/signage for staff (Pandian et al., 2020; Mills et al., 2024)*, or,*
    - → due to air trapping from an upper airway obstruction (McGrath et al., 2016; Mills et al., 2021; Pandian et al., 2014).
- Granulation and pressure necrosis at the stoma site (Mills et al., 2021; Ladar, 1989)
- Patient discomfort, including excessive oral secretions, gagging, nausea, and dry upper airway (McGrath et al., 2019; Mills et al., 2021; Pandian et al., 2014)

Serious adverse events as a result of ACV appear to be uncommon. However, the literature reports two cases of subcutaneous emphysema of the neck and face and one case of tracheal dilation (Mills et al., 2021). It is recommended that clinicians carefully consider the contraindications of ACV before commencing the procedure with patients. Should signs of adverse reaction be present, clinicians should discontinue and seek appropriate medical support.

ACV can be carried out with either a continuous or intermittent technique. Continuous technique involves a constant flow of air through the subglottic suction port. In contrast, an intermittent technique controls the timing of airflow delivery by turning it on and off to mimic natural airflow for speech. Intermittent airflow is normally achieved using a thumb port or cutting a hole in the tubing so that air is only delivered when the thumb port/hole is occluded. Whilst both continuous and intermittent air delivery methods can be used, an intermittent technique may reduce the risk of pressure building up if the subglottic suction line is occluded and is recommended (Mills et al., 2024; National tracheostomy safety project, 2025; Pandian et al., 2020; Whitlock, 1967).

ACV Procedure

Equipment	• Tracheostomy with subglottic suction port • Oxygen tubing and thumb port for intermittent airflow technique • Syringe for aspiration of the subglottic suction port • Room air/oxygen supply
Consent	• Obtain medical consent • Explain the procedure to the patient/whānau and gain consent, or consider carrying out in the best interests if the patient is unable to consent and has no EPOA
Set up	• Prepare the patient for possible changes in upper airway sensation. They may experience blowing of secretions into the mouth initially or a change in taste/smell • Check patient observations • Optimise positioning- as upright as possible in bed or chair • Support with oral hygiene as needed • Use the syringe to aspirate secretions from the subglottic suction line • **Do not deflate the tracheostomy cuff**. • Connect the oxygen tubing to the room air or the oxygen supply • Connect the opposite end of the oxygen tubing to the clear thumb port. If the thumb port is not available, a small hole can be cut in the oxygen tubing to achieve a similar function • Connect the thumb port to the subglottic suction port on the tracheostomy • **Take care to connect to the subglottic port, <u>not</u> the cuff pilot balloon.**
Go	• Start at 1L / minute and increase as needed to facilitate voicing up to a maximum of 5L / minute (McGrath, 2016; Mills et al., 2025). Maintain the lowest flow rate that achieves voicing. • Occlude the thumb port to achieve intermittent airflow through the larynx • Encourage the patient to phonate while the thumb port is occluded. • Open the thumb port when the patient is not speaking to prevent continuous airflow • Monitor for signs of discomfort, nausea or belching from swallowed air. This may suggest the flow rate is too high • Perform additional oral suctioning as required. Encourage the patient to swallow • Limit ACV time to a maximum of 15 minutes (NTSP, 2025) • The patient must not be left unattended during ACV • Turn off the air supply and remove the thumb port and oxygen tubing. • Document the time, parameters and outcome of each trial • Note, it may take time and repeat sessions for patients to tolerate changes in sensation and achieve functional communication
Stop	• Air leak around the stoma alongside the tracheostomy tube • Pain or discomfort reported by the patient • No air passing via the upper airways or an absent voice • Swelling or surgical emphysema around the tracheostomy site • Patient fatigue • Change in observation parameters from baseline • Alert the medical team in case of any concerns or adverse reactions.

Troubleshooting Support

Determining tolerance for ACV requires clinical judgement. If there is perceived risk or a significant clinical concern, the clinician should respond accordingly and seek support where needed. The table below outlines troubleshooting considerations for minor issues common during ACV, where the risk is perceived to be negligible and the clinician deems it safe to continue.

Issue	Considerations
No air flow identified through the upper airway	● Check the thumb port is fully occluded ● Clear the suction line by one of the following methods: o Rapidly pushing air (max of 5ml) through the line with a syringe o Flushing the line with 1-5ml of saline, followed by immediate aspiration of the saline (Mills et al., 2025) o Apply 1-2ml of 10% acetylcysteine via the subglottic suction port once or twice per day to reduce the viscosity of secretions (Shinnick & Freedman, 1981) ● Ensure airway patency ● Consider placement of the tracheostomy tube and subglottic port, e.g. try re-positioning the patient in case the suction port is pressed against mucosa
Voicing is quiet or absent	● Try increasing the airflow rate as needed up to the maximum of 5L / minute ● Check vocal fold function ● Success rates of audible voicing with ACV vary in the literature. ACV aims to achieve functional verbal communication; vocal quality may vary (Mills et al., 2021; Pandian et al., 2014; Petosic et al., 2020)
Voicing/breathing is wet in quality	● Consider suctioning further secretions from the port and/or oral yankeur suctioning
Patient discomfort	● Consider reducing the flow rate if able, while still achieving voicing ● If using continuous airflow, change to intermittent airflow by switching the air stream off or releasing the thumb port when the patient is not voicing. Intermittent airflow may feel more natural and may also reduce the drying effect ● If able, consider teaching the patient to use the thumb port themselves, to allow them more control over the airflow

	• Use humidified medical air whenever possible, as oxygen can be drying and cause discomfort (Mills et al., 2024; Whitlock, 1967) • Consider completing mouth care prior, if the patient reports experiencing an unpleasant taste during ACV

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