Tallaght University Hospital | Ospidéal Ollscoile Thamhlachta

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Weaning and Decannulation of a Patient with Tracheostomy Tube- Tallaght University Adult Services Procedure

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Table of Contents

1.0 Purpose

1.1 The aim of this Procedure is to provide clear instruction and guidance, to Healthcare professionals in the care of patients undergoing weaning and/or decannulation of a tracheostomy tube in the Adult services in TUH.

2.0 Review History

Date	Review No.	Change	Ref. Section	Consulted with:
November 2020	1	New	Changed to this procedure with overarching Policy and associated procedures from Guideline (PPC-GUI-16)	All Stakeholders
Nov 2020	2	Inclusion of QIL in Appendix 1	Appendix 1	NPD
March 2023	3	Full review by all stakeholders Amendments and additional appendices added for clarity	Full Document	Tracheostomy MDT governance group All stakeholders

3.0 Persons Affected

3.1 Registered Nurses and student nurses

3.2 Anaesthetists and ENT Specialists

3.3 Medical Doctors- NCHDs Non Consultant Hospital Doctors

3.4 **Critical Care Outreach (CCO) Nurse - Registered ANP, candidate ANP, CNMs 3, Clinical Nurse Managers CNMs, CNMs in Critical Care (ICU/HDU/PACU)**

3.5 Speech and Language Therapists (SLT)

3.6 Physiotherapists

3.7 Patients with tracheostomy

3.8 Patients with a laryngectomy **are not candidates** for this procedure.

4.0 Procedure Statement

4.1 To provide clear and systematic instructions to all staff involved in the care of a patient undergoing the procedure of weaning and decannulation of a tracheostomy tube.

4.2 Some patients may need individualised approach given the complexity of the patient population. The presence of respiratory muscle weakness, slow recovery from chronic critical illness with multi-organ dysfunction, anxiety from prolonged ventilator dependence, or cardiac dysfunction may necessitate a more gradual weaning strategy.

4.3 The process of weaning from tracheostomy to maintenance of spontaneous respiration and or airway protection is termed 'decannulation.'

4.4 Decannulation is an important step in the recovery process following critical illness.

4.5 This procedure is linked to the Nursing Management of a Patient with Tracheostomy in the Adult Services TUH Policy PPC-POL-151 and associated procedures.

4.6 Special precautions should be taken in Aerosol Generating Procedures (AGP) in patients with tracheostomy with suspected or confirmed infectious respiratory viruses.

4.6.1 Staff must follow Use of Personal Protective Equipment (PPE) in the Management of Infection Prevention and Control Guideline ENV-GUI-13, Infection Prevention and Control Guidelines on the Use of Standard Precautions ENV-GUI-18, Transmission Based Precautions Guidelines ENV-GUI-34 and Infection Control Guideline for the Management of Healthcare Waste ENV-GUI-21.

5.0 Definitions

5.1 **Tracheostomy:** The opening or stoma made by this incision.

5.2 **Tracheostomy Tube:** Artificial airway inserted into the trachea during tracheotomy.

5.3 **One-way Passy Muir Valve:** One-way (PMV) valve that is placed on the end of a tracheostomy tube with a fully deflated cuff or cuffless tracheostomy tube to facilitate restoration of subglottic air pressures, in turn positively affecting cough, sensation, voice and swallow. The one-way PMV valve remains open during inhalation, allowing air to enter the lungs. Upon exhalation the valve closes.

5.4 **Capping:** Tracheostomy button or decannulation cap- used to occlude the tracheostomy tube opening during both inspiration and expiration in some exceptional/specific cases used prior to decannulation.

5.5 **Decannulation:** The removal of the tracheostomy tube. It is the ability of the patient to maintain their own airway without the tracheostomy tube in situ.

5.6 **Weaning:** Is to liberate the patient from their artificial airway and to ensure that respiratory difficulties will not occur after airway decannulation.

5.7 **CAM:** The Confusion Assessment Method for Intensive Care Unit (CAM-ICU) is a tool to screen patients for the presence of delirium in critically ill patients (Ely 2016).Ely EW. Confusion Assessment method for the ICU (CAM-ICU). The Complete Training Manual Revised. Nashville: Vanderbilt University 2016: 1-32**.**

5.8 **Tracheostomy Multi-Disciplinary Team (MDT):** A multidisciplinary team is a group of health care workers who are members of different disciplines e.g. ENT Doctors, ICU Consultants/NCHDs, Critical Care Outreach Nurses, Speech and language Therapists, Physiotherapists, Nursing staff etc.), each providing specific services to the tracheostomy patient. The activities of the

team are brought together through care planning, collaborating and working towards a specific set of goals.

5.9 **Governance group:** an MDT group that oversee, support and drive the high quality, safety standards and satisfaction of hospital tracheostomy patients in the care they deliver.

6.0 Responsibilities

6.1 Registered Nurse

It is the responsibility of the Registered Nurse to:

6.1.1 Have knowledge of tracheostomy and be familiar with and adhere to the procedure and all associated procedures, policies and guidelines.

6.1.2 Develop and maintain competency in the nursing management of patient care with tracheostomy.

6.1.3 Liaise with tracheostomy MDT and Critical Care Outreach Nurse regarding potential plan for weaning and decannulation of tracheostomy.

6.1.4 Document and record nursing care in the tracheostomy care documents, including patient's tolerance of cuff deflation and one-way PMV trials as recommended by SLT as part of weaning and frequency of tracheal suction.

6.1.5 Care and cleaning of one-way PMV according to manufacturer guidelines

6.2 Anaesthetist and ENT Specialists

It is the responsibility of the Anaesthetist and ENT Specialists to:

6.2.1 Be familiar with and adhere to the procedure and all associated procedures, policies and guidelines.

6.2.2 Have experience in performing tracheostomies and be competent to undertake the procedure.

6.2.3 Follow difficult airway guidelines when dealing with tracheostomy emergencies.

6.3 Medical Doctors

It is the responsibility of the Medical Doctor to:

6.3.1 Be familiar with and adhere to the procedure and all associated procedures, policies and guidelines.

6.3.2 Liaise with MDT and Critical Care Outreach Nurse regarding potential plan for weaning and decannulation of tracheostomy.

6.3.3 Communicate and document plan of care in patient's healthcare record.

6.4 Critical Care Outreach Nurse

It is the responsibility of the Critical Care Outreach Nurse to:

6.4.1 Review and assess Tracheostomy patient daily, when notified by receiving ward/area or requested by ward.

6.4.2 Ensure emergency tracheostomy equipment, humidification needs, documentation of tracheostomy care are present at bedside.

6.4.3 Liaise with Tracheostomy MDT re aspects of tracheostomy care; SLT, Physiotherapist, ENT and Anaesthetics.

6.4.4 Organise/liaise in regard to tracheostomy downsizing, capping, decannulation and stoma closure.

6.5 Speech and Language Therapists

It is the responsibility of the Speech and Language Therapist (SLT) to:

6.5.1 Be familiar with and adhere to this procedure and all associated procedures, policies and guidelines.

6.5.2 Assess patient's readiness and suitability for cuff deflation and one-way PMV trials and provide recommendations on these as part of the weaning process.

6.5.3 Be aware of and take into account recommended VFB trial for the patient.

6.5.4 Organise/liaise in regard to tracheostomy downsizing, decannulation and capping screening with relevant tracheostomy MDT members.

6.6 Physiotherapist

It is the responsibility of the Physiotherapist to:

6.6.1 Be familiar with and adhere to this procedure and all associated procedures, policies and guidelines.

6.6.2 Liaise with multidisciplinary team and Critical Care Outreach Nurse regarding potential plan for weaning and decannulation of tracheostomy.

7.0 Procedure

7.1 Weaning can **only** commence once all the following have been addressed.

7.1.1 Decisive factors for Weaning

7.1.1.1 Please refer to Appendix 2,3,4,5 (Ventilator Free Breathing Weaning Plan, SLT PMV in-line MDT Ventilator Guidelines, TUH Multidisciplinary Adult Critical Care Decannulation Checklist, TUH Multidisciplinary Adult Critical Care Capping Checklist)

7.1.1.2 Consider medicine reconciliation for patients on opioids, benzodiazepine, psychiatric medication, etc.

7.1.1.3 Consider if patient is CAM negative or CAM positive with controlled agitation.

7.2 Weaning Guide

7.2.1 There are a minimum 4 stages to the weaning process (but **not all patients** will go through each stage of process or in this order)

7.2.1.1 **Stage 1:** Ventilator Free Breathing Weaning Plan

7.2.1.2 **Stage 2:** Patient tolerance for Cuff deflation

7.2.1.3 **Stage 3:** Patient tolerance in the use of One-way PMV.

7.2.1.4 **Stage 4:** Patient passing Tallaght University Hospital Multidisciplinary Adult Critical Care Tracheostomy Decannulation Checklist screening

7.2.2 Some patients may be screened for a capping trial as an additional stage of weaning in certain exceptional complex patient cases, for example (as per TUH Multidisciplinary Adult Inpatient Tracheostomy Decannulation Algorithm- Appendix 10)

7.2.2.1 Severe swallow dysfunction

7.2.2.2 Neuromuscular disorder (not CC myopathy)

7.2.2.3 Severe ABI (Stroke/TBI)

7.2.2.4 *Head and neck patient- ENT team discretion*’

7.2.3 **+/- Stage 5**: Downsizing the Tracheostomy tube.

7.2.4 **+/- Stage 6**: Patient passing Multidisciplinary Adult Critical Care Tracheostomy Capping Checklist screening and patient tolerance of a Decannulation cap.

7.2.5 **Stage 7: Decannulation (Removal of the Tracheostomy Tube)**

7.2.6 **Best practice recommends that the patient should undergo Tracheostomy change to uncuffed Tracheostomy tube before transfer to ward environment.**

7.2.7 In special circumstances patients with cuffed Tracheostomy tolerating **cuff deflated** may be transferred to the ward only and when approval is given by MDT.

7.3 Stage 1 of Weaning - Ventilator Free Breathing (VFB) Weaning Plan

See Appendix 2 for Stages and Duration of VFB trial

Ensure a referral to SLT has been sent at point of tracheostomy insertion.

Additional Notes on Ventilator-Free-Breathing Component of Weaning Plan:

1. Each stage of the weaning process should be maintained for a minimum of 1 day and a maximum of 3 days.
2. VFB can be delivered using external CPAP (Draeger) or high flow O2 or tracheostomy mask but must be provided via a “wet circuit” (humidified).
3. Decisions to skip any stage will be at the discretion of the ICU team
4. Return to ventilator if >2 of the Following;

- Respiratory Rate >35 breaths
- HR >140
- SBP >180 or <100
- SpO2 < 90%
- Confused, Agitated, Restless, Diaphoretic

7.4 Stage 2 of Weaning - Patient tolerance for Cuff deflation

Stages 2a of Weaning	Nursing/MDT Considerations and Management
Cuff Deflation in Ventilated Tracheostomy Patients: • See SLT Passy Muir One-way PMV (PMV) in Line MDT Ventilator Guidelines for • specific patient selection criteria/ indications, • patient exclusion criteria/ contraindications and precautions • assessment protocol	• For initial assessment, SLT will assess for cuff deflation tolerance with medical team consent. Tracheostomy MDT competent practitioners will monitor tolerance of recommendations thereafter. • The time a patient spends with the cuff deflated can be increased intermittently as tolerated. The aim is to build up cuff deflation for >24 hours when suitable. • SLT will provide recommendations on ICCA for duration of subsequent cuff deflation trials including written guidelines kept at bedside (see appendix 6 '**MDT & SLT Ventilated Tracheostomy Weaning Plan'**) • NS will document patient's tolerance of cuff deflation recommendations on ICCA/the medical records. • SLT will document progress on the ICCA flowsheet and handover. • The cuff should be re-inflated sooner if the patient is requesting or reports difficulty breathing, they are not managing their secretions or any signs of respiratory distress. Please see SLT bedside guidelines for further instructions.

Stages 2b of Weaning	Nursing/MDT Considerations and Management
Cuff Deflation in Non-Ventilated Tracheostomy Patients: **Cuff Deflation**: usually carried out 24 - 48 hours after tube insertion unless otherwise indicated. Initial cuff deflation assessment is carried out by SLT. **Why?** Assesses if patient can manage their own airway and manage their own oral secretions despite alteration in tracheal air flow. • **For inflated cuffed tracheostomy tubes:** start here at Stage 2. • If there is an **uncuffed Tracheostomy tube insitu:** please move directly on to Stage 3.	• For initial assessment, SLT will assess for cuff deflation tolerance. Tracheostomy MDT competent practitioners will monitor tolerance of recommendations thereafter and feed this back to the SLT. • Full explanation of all procedures and reassurance must be given to the patient. • Ideally, the patient should be in maximum view of the nursing station, with the call bell within easy reach. • Patient must be sitting in an upright position if feasible and tolerated. • Patient must be attached to the Sp02 monitor • All secretions in the oropharynx are cleared using suction catheter, patient is asked to cough. Patient should be suctioned via subglottic port pre-cuff deflation if present. • With a sterile suction catheter simultaneously suction whilst gradually deflating the tracheostomy tube cuff with a 10 mL syringe. • Remain with the patient, observe and monitor for respiratory distress. • The time a patient spends with the cuff deflated is increased intermittently as tolerated. The aim is to build up cuff deflation for >24 hours when suitable. • SLT will provide recommendations for duration of subsequent cuff deflation trials including written guidelines kept at bedside (see appendix 6A '**Speech and Language Therapy MDT & SLT Tracheostomy Weaning Plan**') • NS will document patient's tolerance of cuff deflation on ICCA or in medical records.

	• SLT will document progress on the ICCA flowsheet and handover or in the patient's medical records • The cuff should be re-inflated sooner if the patient is requesting or reports difficulty breathing, they are not managing their secretions or any signs of respiratory distress. Please see SLT bedside guidelines for further instructions.

7.4 Stage 3 of Weaning - Patient tolerance in the use of One-way PMV

Stages 3a of Weaning	SLT & Nursing Considerations and Management
One-way PMV in Ventilated Patients – Refer to Appendix 3: SLT Passy Muir One-way PMV (PMV) in-line MDT Ventilator Guideline for • specific patient selection criteria/ indications, • patient exclusion criteria/ contraindications and precautions and Passy Muir Valve (PMV) In-Line Ventilator Bedside Guidelines – see Appendix 9 **Rationale:** This is a one way valve which covers the opening of the tracheostomy, allowing air in through the valve on inspiration, but closing on expiration, thus diverting the air past the vocal	• The SLT determines if a patient is suitable for a one-way PMV. They will assess the patient and provide a one-way PMV where appropriate • Refer to Appendix: SLT Passy Muir One-way PMV (PMV) in-line MDT Ventilator Guideline for assessment protocol and troubleshooting section. • SLT will provide recommendations for duration of subsequent PMV trials including written guidelines kept at bedside (see Appendix 6 '**MDT & SLT Tracheostomy Weaning Plan')** Additional notes: • **Cuff must be deflated prior to using/applying the one-way PMV.** If the cuff is not deflated it may cause asphyxiation, respiratory arrest and/ or potential death. • The SLT will advise you on the placement of the one-way PMV e.g. duration and number of times/ day. (see Appendix 6 '**MDT & SLT Tracheostomy Weaning Plan').** The aim is to increase to all day as tolerated. • The patient may require an AAC device (e.g. iPad/ communication book/ whiteboard & marker, communication book or eye-gaze device) as a

cords and out through the nose and mouth of the patient.	communication aid if unable to achieve voicing with one-way PMV or if unable to tolerate one-way PMV. • Due to changes in ventilation during sleep, **do not leave the one-way PMV on overnight.** (There may be some exceptional circumstances to this that would require a thorough risk-benefit balanced decision and full MDT clearance). • **Do not throw away the one-way PMV if integrity is intact. These are not disposable but single patient use only.** • One-way PMV should be changed every two months as per manufacturer guidelines or sooner if damage to valve. • 'Clean one-way PMV daily according to manufacturer's guidelines: 1. Swish: • Pour a few drops of mild liquid dishwashing soap (soap with no lotion or fragrance) into a cup. • Add lukewarm (not hot) water. • Swish the PMV in the water for about 10 seconds. 2. Rinse: Rinse the PMV thoroughly in lukewarm (not hot) running water. 3. Dry: Allow the PMV to air dry on its side. NOTE: • Do not place in the storage container to dry. • Do not use a blow dryer to heat or dry. 4. Store: After drying, place the PMV in the storage container and close the lid for storing overnight.'

Stages 3b of Weaning	SLT & Nursing Considerations and Management
One-way PMV in Non-Ventilated Patients – patient must be at least 24-48 hours post tracheostomy, prior to initial placement of one-way PMV unless otherwise indicated and agreed with medical team **Rationale:** This is a one way valve which covers the opening of the tracheostomy, allowing air in through the valve on inspiration, but closing on expiration, thus diverting the air past the vocal cords and out through the nose and mouth of the patient. **Patient should be sitting in an upright position if tolerated.** • Ensure Cuff is deflated prior to applying/ using the one-way PMV. • Do not leave the one-way PMV on overnight unless specifically ordered. (Avoids risk of disc blocking with sputum and preventing patient breathing while sleeping).	• The SLT determines if a patient is suitable for a one-way PMV. They will assess the patient and provide a one-way PMV where appropriate • **Cuff must be deflated prior to using/applying the one-way PMV.** If the cuff is not deflated it may cause asphyxiation, respiratory arrest and/ or potential death. • Perform suction of the oropharynx and subglottic port if present pre-cuff deflation. Perform a tracheal suction if clinically indicated. • SLT trial of gloved finger occlusion to assess if patient is suitable for one-way PMV trial. • Place the one-way PMV on the outer rim of the tracheostomy tube. • Continuously monitor the patient's oxygen saturation and other vital signs. • SLT to encourage patient to vocalise to assess vocal quality. • Stay with the patient during the first wearing (15-30 mins or until the patient is confident wearing the valve). • Remain with the patient reassure, observe and monitor for respiratory distress. • **Any signs of distress remove the one-way PMV** (signs of resp. distress, increased secretions, desaturation etc.). • If the patient is not achieving voice with one-way PMV, SLT will advise if potentially changing the tube to a smaller tracheostomy tube +/- fenestrated tube may help or whether there is a suspected intubation trauma

	or other factors warranting instrumental assessment +/- ENT review. • Each patient will tolerate the one-way PMV for different durations. Some patients may require a rest period following one-way PMV placement. • The SLT will advise you on the placement of the one-way PMV e.g. duration and number of times/ day. (See appendix 6 '**MDT & SLT Tracheostomy Weaning Plan').** The aim is to increase to all day as tolerated. • Nursing staff to document progress in the nursing record or ICCA. • The patient may require an AAC device (e.g. iPad/ communication book/ whiteboard & marker, communication book, iPad or eye-gaze device) as a communication aid if unable to achieve voicing with one-way PMV or if unable to tolerate one-way PMV • Due to changes in ventilation during sleep, **do not leave the one-way PMV on overnight.** (There may be some exceptional circumstances to this that would require a thorough risk-benefit balanced decision and full MDT clearance). • One-way PMVs should be removed prior to delivery of a medicated nebuliser or metered dose inhaler. If the Valve is inadvertently used during a medicated treatment, it should be removed immediately and washed according to the cleaning instructions. Aerosolized (or nebulised) medication can leave a residue that may adversely affect the function of the valve.' • **Do not throw away the one-way PMV if integrity is intact. These are not disposable but single patient use only.**

	• One-way PMV should be changed every two months as per manufacturer guidelines or sooner if damage to valve. • ‘Clean one-way PMV daily according to manufacturer’s guidelines: 1. Swish: • Pour a few drops of mild liquid dishwashing soap (soap with no lotion or fragrance) into a cup. • Add lukewarm (not hot) water. • Swish the PMV in the water for about 10 seconds. 2. Rinse: Rinse the PMV thoroughly in lukewarm (not hot) running water. 3. Dry: Allow the PMV to air dry on its side. NOTE: • Do not place in the storage container to dry. • Do not use a blow dryer to heat or dry. 4. Store: After drying, place the PMV in the storage container and close the lid for storing overnight.’

7.5 Stage 4 of Weaning- Decannulation Screening

Refer to Tallaght University Hospital Multidisciplinary Adult Inpatient Tracheostomy Decannulation Algorithm (see Appendix 10) to guide decision making i.e. decannulation or capping screening suitability.

If suitable, screen using Tallaght University Hospital Multidisciplinary Adult Critical Care Tracheostomy Decannulation Checklist (see Appendix 4) and follow listed instruction for procedure and documentation.

- Note minimum of x2 Tracheostomy MDT member (Consultant, Critical Care Outreach Nurse (CCO), ICU CNM, SLT or PT) to perform 'TUH Multidisciplinary Adult Critical Care Tracheostomy Decannulation Checklist' with verbal handover of result to ICU Consultant.

7.6 Stage 5 of Weaning: Downsizing (additional stage if clinically indicated)

7.6.1 The first change of the surgical tracheostomy tubes whether it involves downsizing or a regular change must be performed by the ENT team**.**

7.6.2 **No routine changes of a tracheostomy patient can occur in ICU without prior approval given by the ICU Consultant, ICU CNM and Tracheostomy MDT .**

Stages 5 of Weaning	Nursing Considerations and Management
If Downsizing the Tracheostomy Tube: usually carried out 7 days after the original tube insertion or as the patients condition dictates. **Rationale:** • Airflow is increased either around or through the tracheostomy tube and may reduce the work of breathing for the patient. • The smaller size tube allows the stoma site to shrink in size to accommodate the smaller sized tube. • Facilitate weaning/ speech production purposes (i.e. cuffless/ fenestrated tubes) • Facilitate a capping trial when needed. • To increase patient comfort.	**Following successful patient tolerance for cuff deflation:** • If downsizing to facilitate capping trial in exceptional patient circumstances, the tracheostomy tube must be Portex #7/ Tracoe #5/ Shiley #6 (or smaller) CUFFLESS tracheostomy tube. As per TUH Multidisciplinary Adult Critical Care Tracheostomy Capping Checklist *'Capping of deflated, cuffed tracheostomy tubes should only be done in special circumstances and requires additional considerations.'* • Check with Multidisciplinary Team as to whether a fenestrated tube would be beneficial for insertion at this time. Ensure the emergency tracheostomy tray with all equipment required is present at patient's bedside. • Leakage of air +/- secretions around the new tracheostomy tube may be noticed after smaller tube has been inserted. • This is expected and will settle once the stoma reduces in size around the new tube. • Monitor, reassure and observe patient. • Sometimes a second downsizing may be necessary before proceeding to Stage 6, this will be patient specific.

Stage 6 of Weaning: Capping Screen and Trial (additional stage if clinically indicated)

As per TUH Multidisciplinary Adult Inpatient Tracheostomy Decannulation Algorithm

Consider capping trial as 1st step for complex patient status e.g.

- Severe swallow dysfunction
- Neuromuscular disorder (not critical illness neuromyopathy)
- Severe ABI (Stroke/TBI)
- *Head and neck patient- ENT team discretion*

- If suitable, screen using Tallaght University Hospital Multidisciplinary Adult Critical Care Tracheostomy Capping Checklist (see Appendix 5) and follow listed instruction for procedure and documentation.
- Note minimum of x2 Tracheostomy MDT member (Consultant, Critical Care Outreach Nurse (CCO), ICU CNM, SLT or PT) to perform 'TUH Multidisciplinary Adult Critical Care Tracheostomy Capping Checklist' with verbal handover of result to ICU Consultant.
- Please refer to Appendix 8 'How to Cap' Instruction sheet, of note inner cannula to remain in situ for period of capping trial to maintain patency of tube.
- Ensure 'Tracheostomy Capping in Progress' – see Appendix 11, sign is visible at the bedside and/or door.

7.7 Stage 7: Decannulation (Removal of the Tracheostomy Tube)

7.7.1 See Appendix 4 - Essential criteria listed in TUH Multidisciplinary Adult Critical Care Tracheostomy Decannulation Checklist

Equipment required for decannulation:

7.7.1.1 Functional suction and oxygen apparatus.

7.7.1.2 Clean working area with dressing pack.

7.7.1.3 Dressing–triple layer: small square Kaldostat directly over the stoma, small square gauze and small Mepore (5 x 7 cm0 x 3-5 dressings). Use micropore tape to secure, **Do Not Use Sleek Tape**.

7.7.1.4 Normal Saline–for cleaning area.

7.7.1.5 Disposable gloves and apron.

7.7.1.6 Scissors (if ET tape used).

7.7.1.7 10 mL syringe (for cuffed tube).

7.7.1.8 Oxygen nasal prongs.

7.7.1.9 Torch or bright light.

7.7.2 Decannulation Procedure

7.7.2.1 The tracheostomy tube is removed only with the agreement of the multidisciplinary team caring for the patient. ICU Consultant is agreeable the patient is clinically suitable for decannulation.

7.7.2.2 CNM informed r.e. decannulation ICU

7.7.2.3 Appropriately trained tracheostomy MDT member to decanulate.

7.7.2.4 Ensure the patient is fully informed of the procedure.

7.7.2.5 Decannulation is optimal as early as possible in the morning to allow for monitoring, preferably early in the week if a ward based patient.

7.7.2.6 Ensure NGT feeding is turned off 2 hours before procedure.

7.7.2.7 All staff on duty should be made aware of the intended decannulation.

7.7.2.8 To ensure and optimise patient safety the patient needs to be in maximum view of the nursing station, with their call bell within easy reach.

7.7.2.9 Patient must be sitting in an upright position if tolerated and feasible.

7.7.2.10 Patient must be continuously monitored, recording respiratory rate, rhythm and depth and oxygen saturations.

7.7.2.11 All secretions in the oropharynx and trachea are cleared using suction catheter, and patient is asked to cough.

7.7.2.12 Adherence to universal precautions essential, protective clothing should be worn.

7.7.2.13 Loosen tracheostomy ties.

7.7.2.14 Gently but firmly withdraw the tube in an outward and downward movement.

7.7.2.15 Temporarily apply gauze to stoma to seal the airflow. Using saline to clean the area, ensure the area is clean and dry.

7.7.2.16 Apply triple layer dressing as follows: a small square Kaldostat directly over the stoma, followed by a small square of gauze and then secured with a small

Mepore dressing (5 x 7 cm0 x 3-5 dressings). It may require 3-4 small Mepore to secure. Finally use micropore tape to secure, **Do Not Use Sleek Tape.**

7.7.2.17 This dressing should remain undisturbed for x 72 hours initially to maximise closure

7.7.2.18 Review dressing and stoma site PRN.

7.7.2.19 Monitor the patient for signs of respiratory distress.

7.7.2.20 Encourage deep breathing exercises, coughing and reassure the patient.

7.7.2.21 Keep emergency tracheostomy tray by the patient's bedside until the patient is at least 24 hours post decannulation.

7.7.2.22 After decannulation patient should stay in hospital for at least 2 days and/or a plan in place for review and redressing of stoma.

7.7.2.23 Observe for continuing/cessation air leak and narrowing of stoma indicating healing. Repeat dressing as above if air leak persists reducing the layers of dressing as healing progresses.

7.7.2.24 The patient should be instructed to apply gentle pressure with their fingers over the site when coughing. Applying an ECG dot to the centre of the dressing allows the patient to easily locate the point to apply gentle pressure with fingers. This will allow better airflow upwards to vocal cords assisting vocalisation and coughing.

8.0 Implementation and Education Plan

8.1 This procedure will be disseminated using existing communication structures within the organisation.

8.2 All relevant staff members must sign a signature sheet to confirm that they have read, understand and agree to adhere to the procedure.

8.3 The document will be available electronically on the hospital Q-pulse.

9.0 Evaluation

9.1 This procedure will be reviewed three years from the date of publication on Q-Pulse.

9.2 Revision of this document will be considered if an audit, serious incident, organisational structural change, scope of practice change, advances in technology or significant changes in international best practice or legislation identifies the need to update the procedure.

9.3 The weaning and decannulation practice will be monitored on an ongoing basis through the Tracheostomy MDT and Governance group.

9.4 Audits will be carried out and reviewed to ensure opportunities for continuous improvement are identified.

Document Statement

This document has been developed by Tallaght University Hospital*(TUH) to support and improve the care and services provided by the hospital. It has been issued in conjunction with existing hospital policies, procedures, protocols, guidelines, education and training programmes. TUH reserves the rights that no part of this publication may be externally reproduced, stored in a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise) without the prior written permission of a member of TUH's Executive Management Team. Authorised reproduction of material must include acknowledgement of the source of the material and must be included in all references. TUH reserves the right to revoke such authorisation at any time, and any such use must be discontinued immediately upon notice.

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Appendices

Appendix 1 – List of Stakeholders

Consultant Anaesthetist (s) in ICU

Director of ICU

Consultant ENT

Clinical Surgical Director

Clinical Medical Director

Speech and Language Therapy

Directorate Nurse Manager – Peri-operative Services

Nurse Practice Development Department

Critical Care Outreach Team

Physiotherapy

Clinical Nurse Managers ICU

Senior Policy Officer – Q Pulse

Appendix 2 – Ventilator Free Breathing Weaning Plan

Tallaght University Hospital

Ventilator Free Breathing (VFB) Weaning Plan

Critical Care Unit

Adult Services (PILOT)

Date:

Surname:
Forename:
Address: Addressograph

Healthcare Record Number:
Date of Birth

Summary of previous 24hrs	Daily Plan	Projected Plan

PLEASE DOCUMENT- FOR DAILY REVIEW					
HF/Airvo Settings		Time On	Time off	Duration	Notes
Current	Target in 24hrs				
Flow_____ FiO_2_____	Flow_____ FiO_2_____				
PS/PEEP(CPAP) Settings		Time on	Time off	Duration	
Current	Target in 24hrs				
PS_____ PEEP_____ FiO_2_____	PS_____ PEEP_____ FiO_2_____				
Tracheostomy		Time Up/On	Time Down/off	Duration	
SALT Referral					
Insertion Size	Fen/Non Fen				
Current Size	Fen/Non Fen				
Speaking Valve		On-	Off-		
Expected Downsize Date	:				
Physiotherapy		Time	Time	Duration	
Bedrest					
Cardiac Chair Position in bed					
Sat on side of bed					
Stood with assistance of _____					
Sat out in chair					

Tallaght University Hospital

Ventilator Free Breathing (VFB) Weaning Plan
Tracheostomy Weaning Plan

Critical Care Unit

Adult Services (PILOT)

Date:

Surname:
Forename:
Address: Addressograph
Healthcare Record Number:
Date of Birth

Stage	Duration of VFB Trial	Total
1	10 minutes TDS	30 minutes
2	20 minutes TDS	60 minutes
3	30 minutes TDS	90 minutes
4	40 minutes TDS	120 Minutes
5	1 hour TDS	180 Minutes
6	2 hours TDS	360 Minutes
7	4 hours BD	480 Minutes
8	5 hours BD	600 Minutes
9	12 hours daily	720 Minutes
10	15 hours daily	900 Minutes
11	18 hours daily	1080 Minutes
12	24 hours daily	1440 Minutes

Notes on Ventilator-Free-Breathing Component of Weaning Plan

1. Each stage of the weaning process should be maintained for a minimum of 1 day and a maximum of 3 days.

2. VFB can be delivered using external CPAP (Draeger) or high flow O2 or tracheostomy mask but must be provided via a "wet circuit" (humidified).

3. Decisions to skip any stage will be at the discretion of the ICU team

4. Return to ventilator if >2 of the Following;

- Respiratory Rate >35 breaths
- HR >140
- SBP >180 or <100
- SpO2 < 90%
- Confused, Agitated, Restless, Diaphoretic

Appendix 3 -.SLT PMV in-line MDT Ventilator Guidelines

i) Patient selection criteria/ indications:

1. Patent upper airway.
2. Generally stable medical status and vital signs (HR, RR, BP, SpO2).
3. Alert and responsive (in somnolent patients, the speaking valve can be used to improve alertness but close monitoring is necessary).
4. Minimum 48 hours post tracheostomy placement **case by case digression and agreement with Critical Care Consultant if for sooner assessment*
5. Ideally, patient can tolerate non-invasive ventilation *(*NIV)/assist control (A/C) ventilator support for the trial. **On case-by-case basis it may be trialled in volume control or pressure control modes.*
6. Ideally the patient should be on PS ≤ 15 cmH_2O, PEEP ≤ 10 cm H_2O, $Fi0_2$ ≤ 60% (clinical MDT discretion on case-by-case basis).
7. Patient is able to tolerate cuff deflation.

ii) Patient exclusion criteria/ contraindications:

- Unconscious and/or comatosed patients (RASS score -2 → to -5)
- Medical instability (notably respiratory/cardiac status) or unstable vital signs.
- Airway obstruction.
- History of tracheal stenosis, obstructing lesions or anatomical abnormalities, which may impact upon upper airway patency. These patients require ENT consult prior to trial.
- Vocal cord paralysis in the adducted position.
- Foam-filled cuff (Bivona Tracheostomy).
- Unable to tolerate full cuff deflation.
- Laryngectomy.

iii) Precautions:

- Thick, excessive or otherwise unmanageable secretions at risk of aspiration.
- End stage respiratory disease (e.g. COPD with gas trapping).
- Severe neurological disease.
- Severe anxiety/cognitive dysfunction.

iv) Assessment Protocol:	
Action	**Rationale**
SLT to obtain Critical Care consultant consent prior to commencing initial assessment.	Patient needs to be medically stable and weaning from mechanical ventilation, in order to ensure that patient is safe to tolerate cuff deflation and ventilator adjustments.
Explain the procedure and its steps to the patient and/or family.	To reduce patient anxiety to help facilitate optimum trial performance.
Check ventilator settings pre-assessment including: • mode, • exhaled/expiratory tidal volume (VTe), • respiratory rate (RR), • pressure support (PS) • positive end-expiratory pressure (PEEP), • peak inspiratory pressure (Ppeak/PIP), • fraction of inspired oxygen ($Fi0_2$) Be aware of the patient's current ventilator weaning plan.	To ensure minimum ventilator support is required. Ideally the patient should be on PS ≤ 15 cmH_2O, PEEP ≤ 10 cmH_2O, $Fi0_2$ 60 *clinical MDT discretion on case-by-case basis.
Check the suction record for the amount, consistency and colour of secretions.	To out rule thick, excessive or otherwise unmanageable secretions at risk of aspiration that may contraindicate the trial. Treat with humidity or mucolytics if necessary first.

Position patient comfortably as upright as possible, if lying in bed ensure the head of bed is greater than 30 degrees unless medically contraindicated. Make sure vent circuit and tracheostomy tube are in proper position.	To reduce risk of aspiration and ensure adequate ventilation.
Check RR/HR/SpO_2/BP.	To ensure within normal limits for the patient.
Prepare the PMV 007 Aqua Colour, 10cc syringe, suction equipment and a cuff manometer.	
Determine potential changes to ventilation modes and O_2 therapy with support of CNM/CF/PT/Senior physician.	To allow for adequate air leak within the ventilator system and to facilitate sufficient tidal volumes during the trial.

Action	**Rationale**
Suction orally, via tracheostomy tube and via subglottic port if one in situ prior to cuff deflation.	To ensure minimum residual secretions during procedure to reduce aspiration risk.
Initially reduce the PEEP by 3cm H2O before deflating the cuff.	This will reduce the excessive flow and auto-cycling created by the vent trying to maintain the PEEP level with the cuff leak.
Cuff deflation procedure SLT + one other trained person slowly deflates the cuff fully with a 10ml syringe while another person	To ensure that cuff deflation is tolerated. Stop if: • Increased coughing • Increased respiratory rate/effort

carries out synchronous suction via tracheostomy. Monitor vital signs. Repeat suction if necessary.	• Need for suction increases • SpO_2 levels decrease Re-inflate cuff and do not proceed any further with PMV trial without further reassessment.
Have the patient inhale when the cuff is fully deflated, assess for signs of airway patency: • loss of exhaled tidal volume (VTe), • +/- decreased Ppeak/PIP (will not drop if on pressure control mode), and • oral air coming out through mouth/nose.	There should be a minimum 40%-50% loss of VTe and significant drop in the Ppeak/PIP after cuff deflation. This suggests a patent airway. If not, consider the size of the tracheostomy tube for downsizing first or an ENT consult to out rule laryngeal/tracheal pathology if still not successful. Note: on the TUH 'Servo Maquet' ventilators, '***' flashing symbol means value not within range (100ml-4,000ml for adults) suggestive of VTe <100ml post cuff deflation.
Where clinically indicated, adjust the ventilator settings (e.g.: turn off peep, increase the pressure support, increase tidal volume, adjust sensitivity, adjust alarms). SLT must ensure a Senior Physician/CNM/CF or PT is present on initial assessment to manage the ventilator alarms, assist in ventilator adjustment problem solving and monitor ventilation accordingly.	To ensure patient comfort, to ensure adequate alveolar ventilation and to ensure safe and effective ventilator alarms: • Reduce PEEP alarm. • Set the end expiratory pressure alarm to lower than adjusted PEEP. • Reduce minute ventilation alarm accordingly. • Trial further reducing PEEP by 2cm H2O when cuff deflated and trialling PMV.

	Consider turning off the PEEP (to 0 or 1cm H_2O depending on lowest ventilator setting allowed) on subsequent trials when clinically indicated. This will reduce or eliminate the excessive flow and auto-cycling created by the vent trying to maintain the PEEP level with the cuff leak. • Boost Fi02 by 10% if ARDS patient until patients baseline SaO2 are achieved and maintained (note total limit of 60% Fi02 must not be exceeded). • If the patient is on continuous positive airway pressure (CPAP) or synchronized intermittent mandatory ventilation (SIMV) mode, PS may need to be adjusted to maintain adequate spontaneous tidal volume or patient comfort. Observe the patient closely for an increased WOB or negative pressure during inspiration. • Peak flow may need to be increased in conjunction with tidal volume adjustments, increase PS by x2cm H_2O to help with this. <u>*If patient on SIMV mode:</u> • Adjust sensitivity setting to avoid auto-cycling/auto-triggering where the ventilator triggers in the absence of patient effort

	• Adjust Spontaneous Inspiratory Time (Ti) if applicable to avoid prolonged inhalation time (not available with A/C). • *During volume-oriented ventilation, such as Volume Control modes eg SIMV, if the Ppeak/PIP drops adjust set VTi (inspiratory tidal volume) to compensate for volume lost if needed. This is done by increasing the VTi incrementally (50 ml at a time) to near pre-cuff deflation Ppeak/PIP, patient has good voice, chest rise adequate and RR stable (not necessary with PC or PS ventilation). It is not recommended to add more than 400cc of VTi. In pressure modes of ventilation, such as Pressure Control or Pressure Support, there will be no need to increase the VT or set pressure. Since inspiratory pressure remains an accurate indicator after cuff deflation and valve placement, the ventilator will deliver appropriately the set pressure regardless of the leak.
Once the patient is tolerating cuff deflation, SLT to insert the Passy Muir in-line aqua valve with connector into the ventilator circuit as close to the tracheostomy as possible (e.g. between omniflex (CSS *closed suction system) and ventilator circuit). See diagram below for example.	Benefits of the PMV include: 1. restoration of physiological PEEP 2. restoration of voice 3. improved sense of smell and taste 4. improved swallowing 5. improved secretion management 6. improved quality of life

	
SLT to assess patients ability to phonate	To ensure supraglottic airflow.
If the patient's voice sounds "wet" or "gurgly" ask them to cough and clear secretions.	Any secretions present may adversely affect voice clarity.
Continue to monitor patient for "Stop" criteria.	"Stop" criteria indicating removal of PMV required: • HR change by 20bpm • RR greater than 35 • SpO2 less than 90% or specified acceptable parameters • FiO2 ≥60% • Pt reports difficulty breathing • Accessory muscle use • Inspiratory/ expiratory stridor • Violent, persistent coughing • Fatigue • Patient experiences distress / discomfort • The patient requests PMV removal *This is on a case-by-case basis.

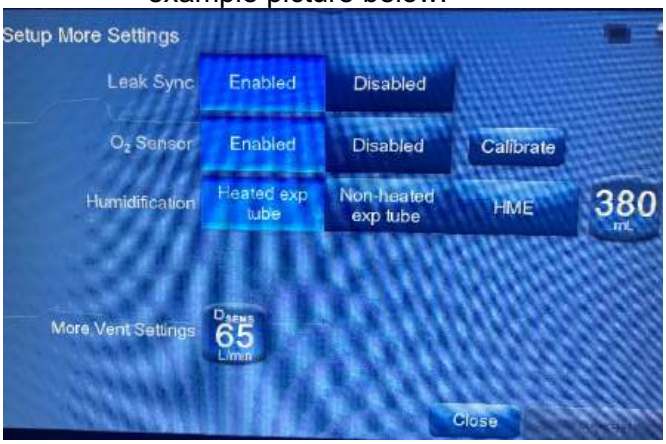
Remove the speaking valve at the end of the trial period, re-adjust to pre-ventilator settings, re-inflate the tracheostomy tube cuff and then check the cuff pressure with a manometer.	To limit respiratory fatigue.
SLT to determine if the trial was successful or not with support of assisting PT/CNM/CF/senior medical team member.	Appropriate Outcomes: 1. Patient able to tolerate the PMV without breathing compromise. 2. Patient able to use verbal output for functional communication.
Clean and dry the speaking valve daily according to manufacturer's guidelines and store in the box provided by manufacturer with the patients name and date opened on it. Note PMV should not be worn during nebulisation or while sleeping.	To ensure valve safe for use.
If the initial trial is successful and it is agreed to continue with its use place the warning sticker provided in the speaking valve pack onto the tracheostomy pilot balloon line which states that when this valve is used the cuff must be deflated first.	To warn of potential asphyxiation if PMV placed when tracheostomy cuff is inflated.
SLT to document all actions and parameters monitored on ICCA including; • Secretions: Amount, Consistency and colour.	To ensure effective communication amongst the multidisciplinary team.

• Vent Settings: mode, tidal volume, RR, pressure support, PEEP, $Fi0_2$, any changes to vent settings during the trial. • Baseline Vital Signs pre & post PMV including HR, RR, Sp02 and BP. • Air flow/cuff leak: tidal volume changes when cuff is fully deflated. • Patient voice quality and ability to cough/clear secretions. • Length and tolerance/outcome of trial. • Patient/Family education and training	
If the patient tolerates the initial trial, SLT to develop PMV schedule documented on ICCA and on 'SLT cuff deflation & speaking valve regime' bedside guidelines for length & frequency of PMV trials. Passy Muir in-Line Speaking Valve on Ventilator Bedside Guidelines to be stuck up at bedside (Appendix __). If patient does not tolerate initial trial, SLT to document next steps and timeframe for repeat attempt on ICCA as agreed with Critical Care Consultant.	To ensure effective communication amongst the multidisciplinary team. Some patients may only tolerate short periods of time initially and tolerance may vary from one day to the next. MDT members (Physicians, Nursing Staff & Physio colleagues) jointly contribute to the monitoring and feedback of cuff deflation & PMV tolerance with SLT. SLT will take MDT feedback into their clinical decision making and recommendations for appropriate length/fq of trials until weaned. It is important that appropriately trained staff are present to manage the ventilator alarms, assist in ventilator adjustment problem solving and monitor

ventilation accordingly on daily cuff deflation & PMV trials recommended.

(Note after initial ax is passed, to stop the alarms bleeping every 2 minutes to account for the cuff deflation/PMV leak on subsequent trials:

- <u>On Puritan Bennett ventilators</u>:
  1. go into setup -> more settings -> enable the leak sync setting option as per example picture below:



  2. Adjust alarms by lowering the $V_{E\ TOT}$ and $V_{TE\ SPONT}$ as per picture below

- <u>On the Servo Marquet ventilator:</u>
  1. Switch the ventilator into NIV mode once the pt is settled & vitally stable.

	2. Re-adjust vent and alarm settings accordingly when you switch to this NIV mode during the period of the recommended cuff deflation & PMV trial. 3. Reduce minute ventilation alarm @least 2cm below observed mve (l/min). 4. Once patient finished cuff deflation & PMV trial, re-set the vent settings to invasive mode as per previous settings.

v) Troubleshooting

Problem	Cause	Solution
On cuff deflation, no or poor airflow past tracheostomy into mouth/ nose as indicated by insufficient VTe drop and insufficient change in Ppeak/PIP.	Reduced space around the tracheostomy as tube too large or airway obstruction (e.g. stenosis, oedema, granulation tissue)	Consider changing the tube to a smaller tracheostomy tube +/- fenestrated tube Consider referral to ENT to out rule out airway obstruction or an anatomical anomaly.
An increase in work of breathing when PMV	Cuff remains inflated. Reduced space around tracheostomy tube as too large or airway obstruction present. Note this problem may be also indicated by back pressure resulting from air trapping (swoosh of air out of tracheostomy when PMV removed) or an increased	Remove PMV and ensure cuff fully deflated with syringe. Consider changing the tube to a smaller tracheostomy tube +/- fenestrated tube. Consider bronchoscopy or referral to ENT to rule out airway obstruction or an anatomical anomaly.

	Ppeak/PIP post PMV placement.	
	Poor respiratory reserves.	Liaise with PT, build up time gradually, monitoring work of breathing.
	Excessive secretions and/or difficulty swallowing	Encourage patient to cough and clear into mouth or swallow. Remove speaking valve and suction if necessary.
	Anxiety	Reassure and explain procedure fully to patient. Re-trial when patient comfortable to do so.
	End-stage pulmonary disease e.g. COPD	May be physiological due to loss of lung compliance.

Appendix 4 –TUH Multidisciplinary Critical Care Decannulation Checklist

Patient Sticker
Name:
MRN: DOB:

Tallaght University Hospital Multidisciplinary Adult Critical Care Tracheostomy Decannulation Checklist

The purpose of the Tracheostomy Decannulation Checklist is to ensure coordination of care to optimise patient safety and to assure adequate oxygenation. A minimum of 2 MDT tracheostomy team members must agree that the following criteria are met. Any questions regarding the ability of the patient to tolerate decannulation should be directed to the attending medical team responsible for the management of the tracheostomy to evaluate whether decannulation should be delayed. Decisions to employ an alternative weaning strategy are at the discretion of the ICU team.
*This checklist is adapted from The John Hopkins Hospital MDT Capping Checklist

PART 1: Assessment	Consultant		Critical Care Outreach Nurse/ ICU CNM		SLT		PT	
Does the patient meet the following criteria? (tick the appropriate boxes)	Yes	No	Yes	No	Yes	No	Yes	No
ESSENTIAL CRITERIA:								
1. Has the initial reason for the tracheostomy placement resolved?								
2. Does the patient have a **difficult airway?** **If so, ensure relevant TUH tracheostomy bedside signage highlighting difficult airway is in place. Consult ENT prior to proceeding.*								
3. Is the patient conscious?								
4. Is the patient free from mechanical ventilation for 24 consecutive hours?								
5. If the patient has a **speaking valve**, has he/she been able to clinically tolerate a speaking valve continuously during daytime hours?								
6. Is the patient being **suctioned** via tracheostomy no more than 1 every 4 hours during a 24-hour period? **6 suctions total* *If no, consider delay of decannulation until resolved.*								
7. Does the patient have a sufficiently **strong cough** to mobilise secretions from their trachea to the oropharynx?								
8. Does the patient's current **baseline respiratory status** support decannulation? O_2 sats _____% RR _____ O2 support _____ *(circle one)* room air trache mask Fisher Paykel airvo **(can switch to nasal prongs when deconnulated)*								
9. Is the patient able to **breathe comfortably** with continuous finger occlusion (cuff deflated) for **5** minutes without trapping air with stable HR, RR and sats?**ensure if cuffed tracheostomy same is deflated*								
10. Has the patient's key medical team (if different from the team managing the tracheostomy) been notified that decannulation is to take place and are agreeable to same? *Team Name*: _____								
11. Are there any other **contraindications** to decannulation? *(E.g. pending off unit testing, anticipated surgery/procedure requiring general anaesthetic imminently following planned decannulation).*								
DECISION MAKING:								
12. If the patient passed the above item(s), do you think that the patient is eligible for consideration of straight decannulation? *If yes, contact the team to feedback findings. Proceed to 'Decannulation' section below.* *If no, refer to item 13 below.*								
13. If the patient failed any item(s) between 1 and 11 and the issues are significant and cannot be addressed, then **DO NOT DECANNULATE.** *If you do not feel the patient is eligible for straight decannulation, please consider allowing time before re-assessment on this checklist or consider suitability for the TUH MDT Adult Inpatient Capping Checklist.*								

Name _____ Signature _____ Bleep _____ Date _____ Time _____

PART TWO: Decannulation				
Person decannulating will ensure the following criteria are met: (Please INITIAL the appropriate boxes)	Consultant		Critical Care Outreach Nurse	
	Yes	No	Yes	No
ICU Consultant is agreeable the patient is clinically suitable for decannulation.				
CNM informed r.e. decannulation				
ICU Consultant or CCO present to perform or supervise the decannulation.				
Relevant supplies are at the bedside and bedside nurse is present.				
Patient is educated on stoma occlusion when speaking and coughing.				

Appendix 5 - TUH Multidisciplinary Adult Critical Care Capping Checklist

Patient Sticker
Name:
MRN: → → DOB:

Tallaght University Hospital Multidisciplinary Adult Critical Care Tracheostomy Capping Checklist

The purpose of the Tracheostomy Capping Checklist is to ensure coordination of care to optimise patient safety and to assure adequate oxygenation where straight decannulation may not be clinically indicated. Any questions regarding the ability of the patient to tolerate capping should be directed to the attending medical team responsible for the management of the tracheostomy to evaluate whether the capping should be delayed or the patient moved to a higher level of care for additional monitoring. A minimum of 2 MDT tracheostomy team members must agree that the below criteria are met on the day of capping. Decisions to employ an alternative weaning strategy are at the discretion of the ICU team. *This checklist is adapted from The John Hopkins Hospital MDT Capping Checklist

Assessment:	Consultant		Critical Care Outreach Nurse/ ICU CNM		SLT		PT	
Does the patient meet the following criteria? (tick the appropriate boxes)	Yes	No	Yes	No	Yes	No	Yes	No
ESSENTIAL CRITERIA:								
1. → Has the initial reason for the tracheostomy placement resolved?								
2. → Does the patient have a **difficult airway?** *If so, ensure relevant TUH tracheostomy bedside signage highlighting difficult airway is in place. Consult ENT prior to proceeding.								
3. → Does the patient currently have a Portex #7/ Shiley #6 (or smaller) CUFFLESS tracheostomy tube? *Capping of deflated, cuffed tracheostomy tubes should only be done in special circumstances and requires additional considerations.								
4. → Is the patient free from mechanical ventilation for 24 consecutive hours?								
5. → If the patient has a **speaking valve**, has he/she been able to clinically tolerate a speaking valve continuously during daytime?								
6. → Is the patient being **suctioned** via tracheostomy no more than once every 4 hours during a 12 hour period? *3 suction total If no, consider delay of capping until resolved.								
7. → Does the patient have a sufficiently **strong cough** to mobilise secretions from their trachea to the oropharynx?								
8. → Does the patient's current **baseline respiratory status** support capping? Pre capping 0_2 sats ____% RR ____ O_2 support ____ (circle one) room air trache mask Fisher Paykel airvo *(can switch to nasal prongs when capped)								
9. → Is the patient able to **breathe comfortably** with continuous finger occlusion (cuff deflated) for 1 minute without trapping air with stable HR, RR and sats?								
10. → Has the patient's key medical team (if different from the team managing the tracheostomy) been notified that capping is to take place and are agreeable to same? *Team Name:* ____								
11. → Are there any other **contraindications** to capping? (E.g. pending off unit testing, anticipated surgery/procedure requiring general anaesthetic during the capping trial period).								
DESIRABLE CRITERIA:								
12. → Is the patient able to notify the nurse using the **call bell?** (E.g. is the patient neurologically or physically impaired?) If not able to use the call bell, evaluate the need for capping to take place in a monitored setting or with a HCA at the bedside.								
13. → Can the patient remove the cap by return demonstration within 30 seconds?								
DECISION MAKING:								
14. → (A): Do you think that the patient is eligible for a full straight 4hr (continuous) capping trial with a view to same day decannulation? If yes proceed to 4hr continuous capping trial. If no, proceed to 14 (B).								
14. (B): Do you think that the patient is eligible for a straight 12hr (daytime only) capping trial and then decannulation the next morning? If yes, then proceed to capping for a straight 12hr (daytime only) period, ***if successfully tolerated** then uncap patient overnight with a view to decannulate the next day. If no, proceed to 15.								
15. → If the patient failed any item(s) between 1 and 13 and the issues are significant and cannot be addressed, then **DO NOT CAP.** Notify the attending medical team as stated above until consensus is obtained among tracheostomy MDT members.								

Name: _____ Signature: _____ Bleep: _____ Date: _____ → Time: _____

Capping procedure: If capping criteria have a been met (Only cap before 10am to facilitate decannulation by 2pm, this is to allow post decannulation observations +/- interventions should they become necessary)	
Person capping will ensure the following criteria are performed:	**Day 1** ___(date)
1. A written copy of the capping checklist is placed in the medical record.	
2. The patient has been suctioned immediately prior to capping.	
3. All team members including CNM & bedside NS are aware that capping is taking place and are available and ready to monitor the patient.	
4. Verify 0_2 sats monitor and all other equipment is at the bedside prior to capping as per tracheostomy policy PPC-POL-151 Nursing Management of a Patient with a Tracheostomy in Adult Services TUH Policy.	
5. Call bell is within reach.	
6. 0_2 support, if ordered, is on the patient	
7. 'Tracheostomy capping in progress' sign is posted on the patient door and/or bedside	
8. Monitor and document vital signs per unit protocol after initial continuous monitoring for 30 minutes: • 0_2 sats _____% RR _____ HR _____ • Signs and symptoms of hypoxia (confusion, agitation, shortness of breath)	
Immediate Post Capping Patient Monitoring	
9. Continuous observation for the first 30 minutes by authorised tracheostomy MDT member (critical care outreach/SLT/PT/ICU CNM). Patient's ward nurse to be notified when observation complete. *Monitoring may be handed over to a qualified team member during the initial post capping period.*	
Capping Goals:	
Day 1: *(tick & circle one)* ☐ Continuous 4 hrs. (daytime only) *before 10am* **OR** ☐ Continuous for 12 hrs. (daytime only) **OR** ☐ *Other specified timeframe: _____ on case by case basis if clinically indicated.* *After trial: remove tracheostomy cap, ensure inner cannula patent, re-apply speaking valve/HME and pre-oxygen via tracheostomy if on same. Complete this sooner if clinically indicated, see below-indictors for failed capping trials).*	**Documentation of total hours tolerated:** **(Day 1: _____)** (*Day 2: _____ if clinically indicated in exceptional circumstances)
Failed Capping Trial:	
The capping trial has failed and decannulation cap removed if the patient meets any of the following criteria: (check all that apply) ☐ inability to maintain 0_2 sats within ordered parameters or less than 92% $Sp0_2$ ☐ tracheal suctioning required due to inability to cough up secretions ☐ suspected aspiration of gastric or upper-airway secretions ☐ shortness of breath ☐ signs of hypoxia ☐ other signs of acute respiratory distress If the patient fails the capping trial: 1. notify the team managing the tracheostomy, 2. remove, clean and save cap at bedside, 3. replace inner cannula and speaking valve/HME 4. Replace patient's pre-capping 0_2 support unless ordered otherwise. Remove tracheostomy cap and reapply pre-capping 0_2 support for	

- Any off-unit testing or treatments
- Any procedures and/or sedation

If you remove tracheostomy cap for any off-unit testing or treatments/ procedures and/or sedation, notify the relevant tracheostomy MDT member so they can restart the capping trial the next day. If the procedure does not require lying flat and is of short duration, then the patient must be transported by a nurse while the cap is on.

PART TWO: Decannulation				
Person decannulating will ensure the following criteria are met: (Please INITIAL the appropriate boxes)	Consultant		Critical Care Outreach Nurse	
	Yes	No	Yes	No
ICU Consultant is agreeable the patient is clinically suitable for decannulation.				
CNM informed r.e. decannulation				
ICU Consultant or CCO present to perform or supervise the decannulation.				
Relevant supplies are at the bedside and bedside nurse is present.				
Patient is educated on stoma occlusion when speaking and coughing.				

Appendix 6 - MDT & SLT Ventilated Tracheostomy Weaning Plan

Name:
MRN:
Date:

MDT & Speech and Language Therapy
Ventilated Tracheostomy Weaning Plan

Tallaght University Hospital

VFB Weaning Plan

Date	Stage	Duration	Total
	1 ☐	10 min TDS	30 mins
	2 ☐	20 min TDS	60 mins
	3 ☐	30 min TDS	90 mins
	4 ☐	40 min TDS	120 mins
	5 ☐	1 hour TDS	180 mins
	6 ☐	2 hours TDS	360 mins
	7 ☐	4 hours BD	480 mins
	8 ☐	5 hours BD	600 mins
	9 ☐	12 hours daily	720 mins
	10 ☐	15 hours daily	900 mins
	11 ☐	18 hours daily	1080 mins
	12 ☐	24 hours daily	1440 mins

MDT member:

Cuff Deflation Regime

☐ Portex

☐ Shiley

☐ Subglottic port
☐ XLT
☐ Cuffed
☐ Uncuffed
☐ Fenestrated
☐ Non- fenestrated

Size _____

Time	Frequency
_____mins/hours	____ times/day

Note _____

- Please monitor for ↓SpO_2, ↑RR, ↑Secretions → re-inflate cuff

SLT:

One-Way Passy Muir Valve (PMV)

☐ PMV 007
☐ See PMV In-Line Ventilator Bedside Guidelines

☐ PMV 2001

Time	Frequency
_____mins/hours	____ times/day

Note _____

- Please monitor for ↓SpO_2, ↑RR, ↑Secretions → remove PMV.
- **DO NOT** wear if cuff is inflated, on nebuliser or when sleeping
- Clean the PMV daily according to manufacturer guidelines.

SLT:

Appendix 6a- Speech and Language Therapy Non-Ventilated Tracheostomy Weaning Plan

Name:
MRN:
Date:

Speech and Language Therapy
Non-Ventilated Tracheostomy Weaning Plan

Tallaght University Hospital

Cuff Deflation Regime

☐ Portex

☐ Shiley

Size _____

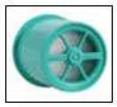
☐ Subglottic port
☐ XLT
☐ Cuffed
☐ Uncuffed
☐ Fenestrated
☐ Non- fenestrated

Time	Frequency
_____mins/hours	____ times/day

Note _____

- Please monitor for ↓SpO_2, ↑RR, ↑Secretions → re-inflate cuff

One-Way Passy Muir Valve (PMV)



☐ PMV 007

☐ PMV 2001

☐ PMV 2000

Time	Frequency
_____mins/hours	____ times/day

Note _____

- Please monitor for ↓SpO_2, ↑RR, ↑Secretions → remove PMV.
- **DO NOT** wear if cuff is inflated, on nebuliser or when sleeping.
- Clean the PMV daily according to manufacturer guidelines.

SLT: **Date:** **Bleep:**

Appendix 7 - Guidance for the Use of Above Cuff Vocalisation (ACV)

What is Above Cuff Vocalisation (ACV)?

ACV is a method to enable a tracheostomised patient to vocalise with the cuff inflated. It utilises the subglottic suction line of the tracheostomy tube to deliver retrograde airflow to the larynx and vocal cords without interruption to mechanical ventilation. Oxygen insufflated via the subglottic suction line, exits above the cuff restoring laryngeal airflow for vocalization and also mimics the effect of cuff deflation.

Potential Benefits of ACV:

- Restores laryngeal airflow.
- Improve QOL for patient (through voicing earlier; reduce distress/ anxiety).
- Promote earlier swallow rehabilitation (stimulating sensation; reducing aspiration risk).
- Enabling voice facilitates patient participation in treatment decisions and assessment of mental capacity e.g. assists with delirium diagnosis.
- Highlights patient communication and MDT working.

Who can perform ACV?

Nurses, medical staff, Speech and Language Therapists (SLTs) and Physiotherapists can perform ACV if they are trained in the use of subglottic suction tubes, ACV technique and follow correct procedure and precautions

SLT should always be involved in initial trial of ACV to assess laryngeal function and safety. The use of **nasendoscopy** to exclude laryngeal pathology in patients unable to vocalize with ACV is recommended.

Indications:

NB: Always rule out cuff deflation trials prior to proceeding with ACV. Where possible progress cuff deflation trials.

- Subglottic suction port tracheostomy tube in-situ (Portex Blue Line Ultra Suctionaid ‘BLUS’ or Tracoe Twist- see image 1 and 2 below).
- Alert.
- Attempting to communicate.
- Cuff inflated.
- An established stoma: 48hours-72 hours post tracheostomy insertion when stoma is adequately healed.

Contraindications:

- Upper airway obstruction or patency concern.
- New tracheostomy < 48 hours due to risk of subcutaneous emphysema.
- Problematic stoma e.g. bleeding, infection or tissue breakdown.
- Continuous subglottic suctioning is required.
- Altered upper airway e.g. head & neck surgery, laryngectomy, laryngeal oedema.
- Tracheostomy tube displace or position suboptimal.
- Other tracheostomy tube in situ e.g. adjustable flange.
- A patient that is too drowsy to cooperate and coordinate vocalisation efforts

Appropriate patients who may meet the criteria for ACV trial should be referred to SLT for assessment and training. Please contact SLT department or SLT in ICU for procedural document on how to complete ACV.

Image 1: Portex Blue Line Ultra Suctionaid 'BLUS' Tracheostomy Tube

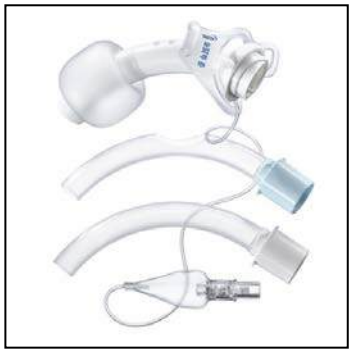


Image 2: Tracoe Twist

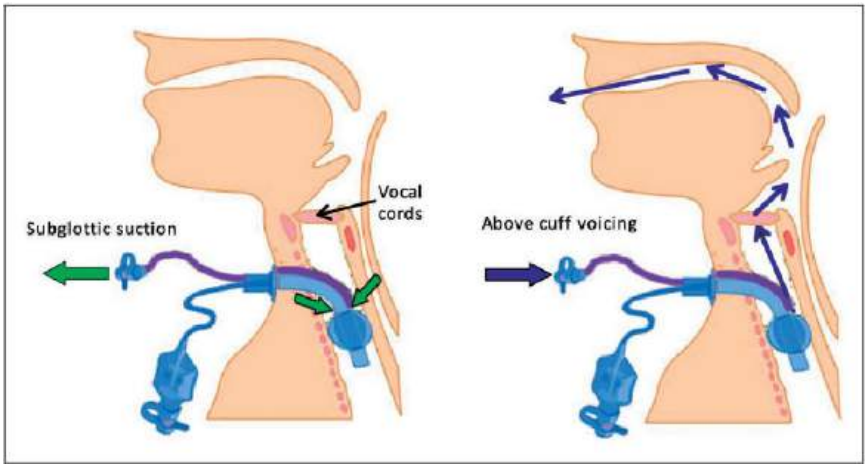


Figure 1: (Mc Grath et al., 2015) Direction of airflow with above cuff vocalization

Appendix 8 - Capping Instructions

1. Digital occlusion trial x1 minute, if no change in O2 sats, RR & HR:
2. Suction patient via tracheostomy immediately prior to capping.
3. Ensure inner cannula patent (change if needed), keep in situ for capping trial
4. Place cap
5. Ensure 0_2 support, if advised, is on the patient (switch to nasal prongs)
6. Monitor and document vital signs per unit protocol after initial continuous monitoring for 30 minutes:
    a. O2 sats _____% RR _____ HR _____
    b. Signs and symptoms of hypoxia (confusion, agitation, shortness of breath)
7. Ensure call bell is within reach.
8. Ensure 'Tracheostomy capping in progress' sign is posted on the patient door and/or bedside
9. Continuous observation for the first 30 minutes by authorised tracheostomy MDT member (critical care outreach/SLT/PT).
10. Patient's ward nurse to be notified when observation complete

Appendix 9 - Passy Muir One-way PMV In-Line Ventilator Bedside Guidelines

Tallaght University Hospital
Ospidéal Ollscoile Thamhlachta
An Academic Partner of Trinity College Dublin

Passy Muir Valve (PMV) In-Line Ventilator Bedside Guidelines

Prior to starting a PMV trial please ensure the following:

- The patient's respiratory status is stable
- PS ≤ 15 cmH_2O, PEEP ≤10 cmH_2O
- 60% FiO_2 *clinical MDT discretion on case-by-case basis.

Ask the patient if they would like a Passy Muir Valve trial (PMV) → Yes/No (head nod/shake).

If yes, this is a **two** person procedure (one to deflate the cuff while the other slowly suctioning via tracheostomy tube).

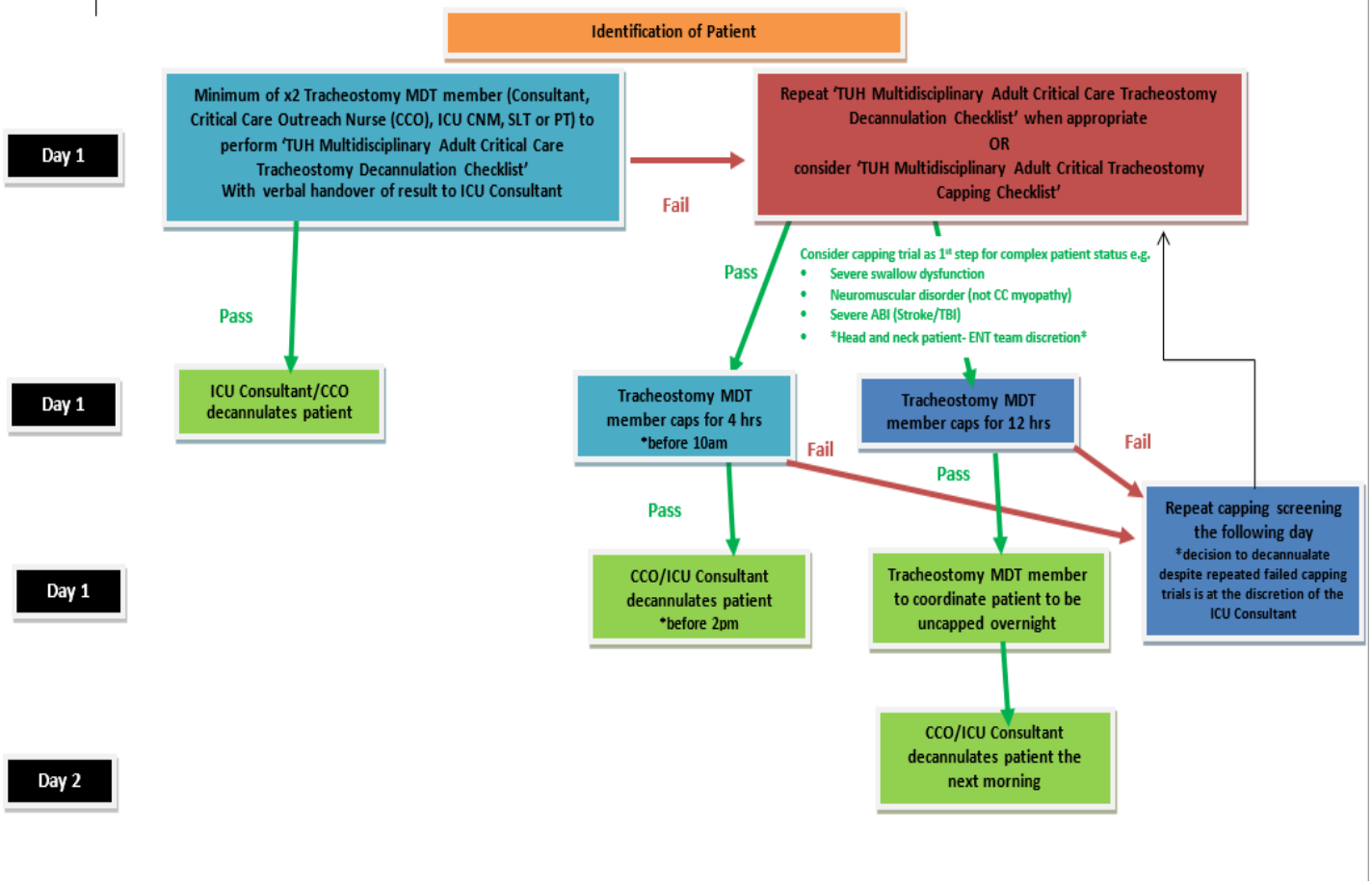
1. Explain process to the patient.
2. Optimise the patient's position as upright as possible.
3. Oral and above cuff suction is subglottic port if present prior to cuff deflation.
4. **Reduce PEEP down by 3cm H20.**
5. Tracheal suction simultaneously as cuff is **slowly** deflated.
6. Make recommended ventilator setting adjustments → **adjust alarms, further reduce PEEP by 2cm H20, if clinically indicated increase Fi02 by 10% during the trial or increase PS by 2 cm cmH_2O for comfort.**
7. If the patient is comfortable, fit the aqua PMSV and ventilator connector as per picture below.
8. Monitor the patient's physiological and clinical response to the use of the PMV. Discontinue trial earlier if:
   - HR change by 20bpm
   - RR greater than 35
   - SpO2 less than 90%
   - FiO2 greater than or equal to 60%
   - Pt reports difficulty breathing/ distress / discomfort/ requests PMSV removal
   - Accessory muscle use
   - Inspiratory/ expiratory stridor
   - Violent, persistent coughing
   - Fatigue
9. See SLT cuff deflation & PMV regime guidelines for length & frequency of PMV trials.

When finishing the trial

1. **remove the PMV first**
2. **re-adjust to pre-ventilator settings**
3. **If re-inflate cuff** do this **last due to risk of asphyxiation**

Speech and Language Therapist _____ Bleep _____ Date _____

Appendix 10- Tallaght University Hospital Multidisciplinary Adult Inpatient Tracheostomy Decannulation Algorithm



Appendix 11- "Tracheostomy Capping In Progress"

Patient:

MRN:

Aim for continuous capping between _____ - _____time-period.

REMOVE the cap pictured above if:

- desaturation less than 92% Sp02 or specified parameters
- tracheal suctioning required due to inability to cough up secretions
- suspected aspiration of gastric or upper-airway secretions
- shortness of breath
- signs of hypoxia
- any other signs of acute respiratory distress

Ensure patent inner cannula, replace HME/speaking valve and pre-capping oxygen support via the tracheostomy if required.

_____ _____ _____

Team Member Name Bleep number Date