

	Policies and Procedures Title: ENDOTRACHEAL TUBES (ADULT, PEDIATRIC) – EXTUBATION RNSP: RN Procedure Number: 1162
Authorization: [x] SHR Nursing Practice Committee	Source: Nursing / Respiratory Therapy Date Revised: October 2017 Date Approved: February 2004 Date Effective: March 2004 Scope: SHR Acute Care

Any PRINTED version of this document is only accurate up to the date of printing 20-Nov-17. Saskatoon Health Region (SHR) cannot guarantee the currency or accuracy of any printed policy. Always refer to the Policies and Procedures site for the most current versions of documents in effect. SHR accepts no responsibility for use of this material by any person or organization not associated with SHR. No part of this document may be reproduced in any form for publication without permission of SHR.

DEFINITION:

Extubation: is the removal of an endotracheal tube (ETT)

ROLES

Registered Respiratory Therapists (RRT): RRT and student RT under direct supervisor of RRT

Registered Nurses (RN) - RNs identified by their manager in targeted practice settings will be certified in RN Specialty Practice (RN Procedure) Endotracheal Tubes (ETT) – Extubation

Nurse practitioners (RN (NP)) - certified in Extubation

Advance Care Paramedics - as outlines in the job description

1. PURPOSE

1.1 To safely remove oral or nasal ETTs.

2. POLICY

2.1 Who may extubate

2.1.1 Registered Respiratory Therapists (RRT) or student RT under direct supervision of RRT will extubate. If RRT coverage is not available (such as an unplanned extubation or in Urban Acute Care PACU), the extubation can be performed by a:

- 2.1.1.1 RN or RN (NP) certified in extubation
- 2.1.1.2 Physician
- 2.1.1.3 Advance Care Paramedic

2.2 RN certified in this RNSP will have first completed the following learning modules/activities prior to performing extubation

- 2.2.1 Complete the required learning module and quiz (teaching and learning methods may vary e.g. classroom and /or self-study using paper module or on-line)
 - 2.2.2 Complete a skills checklist with certified RN during simulation or during first extubation to ensure safety checks are followed appropriately
 - 2.2.3 Provide documentation of learning module quiz and skills checklist to educator/supervisor.
- 2.3 A Physician / RN (NP) order is required.

NOTE: *if patient is receiving enteral nutrition, an order is required to temporarily stop the nutrition if necessary.*

2.4 Special considerations

- 2.4.1 A HCP skilled in intubation must be immediately available for re-intubation if necessary.
- 2.4.2 Adults: NPO status as ordered.
- 2.4.3 Pediatrics: NPO status as ordered. Gastric feeds: 2 - 4 hours prior to extubation or aspirate gastric contents just prior to extubation. Jejeunal feeds, stop immediately prior to extubation.

3. PROCEDURE

3.1 Gather supplies

- Suction setup – oral and tracheal
- Personal protective equipment mask with attached visor and sterile/non-sterile gloves as required by the situation (based on a point-of-care risk assessment, the use of other appropriate PPE such as a gown may be considered).
- Bag-valve-mask (BVM) device with oxygen source and appropriately sized mask
- Scissors (for cutting adhesive tapes or twill tapes)
- Adhesive remover
- Supplemental oxygen delivery device or non-invasive ventilation per physician / RE (NP) order for post-extubation support
- 12 ml syringe
- Absorbent pad
- Patent vascular access
- Readily available: intubation supplies, code blue cart
- Direct ECG rhythm (if available) and SpO₂ monitoring

3.2 If appropriate, assess readiness for extubation (see Appendices)

3.3 Check physician's / RN(NP) order

3.4 Verify patient identification (see SHR [Regional Policy Verification of Identification 7311-60-017](#))

3.5 Ensure appropriate monitoring in place (ECG, SpO₂)

3.6 Ensure the necessary equipment is in place for urgent reintubation

- 3.7 Explain the procedure to the patient / family and importance of deep breathing and coughing following extubation.
- 3.8 Perform hand hygiene. Position patient with head of bed elevated, if not contraindicated. Pediatrics: 45 degrees unless contraindicated.
- 3.9 Perform hand hygiene. Using point-of-care risk assessment, don the appropriate PPE.
- 3.10 Suction the ETT, if necessary.
- 3.11 Suction oropharynx if necessary. In small infants, suction nares to ensure patency
- 3.12 Hyperoxygenate patient if condition warrants.

NOTE: hyperoxygenation with 100% oxygen not recommended for children with certain congenital heart defects.

- 3.13 If a cuffed ETT is in situ, deflate the cuff by connecting a 12mL syringe into one way valve of pilot balloon and aspirate all of the air from the cuff. If there is any concern regarding presence of laryngeal edema, ensure patient can breathe around the ETT by auscultating over the trachea. If there is no air leak, **DO NOT PROCEED**. Notify MRP / RN (NP) STAT for reassessment of patient readiness for extubation.
- 3.14 While maintaining a firm grip on ETT, unfasten or cut ETT securing device.
- 3.15 If patient can cooperate, ask patient to take in a deep breath then quickly and gently remove ETT at peak inspiration. Pediatrics: may apply positive pressure with BVM and remove tube during peak inspiration NOTE: If the ETT does not come out easily, do not attempt removal and notify MRP / RN (NP) STAT.
- 3.16 Encourage deep breathing and coughing. Suction oral and nasopharyngeal secretions prn.
- 3.17 Remove PPE and perform hand hygiene.
- 3.18 Physician / RE (NP) may order chest x-ray and / or blood gas as required for post extubation assessment.
- 3.19 Patient to remain NPO post-extubation until Physician / RE (NP) order resumption of oral intake / enteral feeds.
- 3.20 Apply oxygen and humidity as required.
- 3.21 Assess patient's respiratory status (i.e. rate, rhythm, breath sounds, presence of secretions, SpO₂).
- 3.22 If an unplanned extubation (patient self-extubation or blocked ETT removed):
 - 3.22.1 Apply oxygen adjunct to maintain SpO₂ as ordered. For patients with insufficient respiratory effort / rate, provide BVM ventilation with 100% oxygen
 - 3.22.2 Call qualified physician, RN-NP, or RRT stat for possible reintubation.

3.22.3 Consider aspiration of gastric feeds to prevent vomiting / aspiration.

3.23 Documentation on appropriate record

3.23.1 Patient's tolerance of procedure

3.23.2 Oxygen therapy / non-invasive ventilation settings

3.23.3 Problems encountered during procedure and interventions done, including use of any medications (on appropriate medication record)

3.23.4 Patient's respiratory status (i.e. rate, breath sounds, rhythm, presence of secretions, SpO₂)

3.23.5 Chest x-ray and / or blood gases, as ordered.

4. REFERENCES:

Da Silva, P.S., Fonseca, M.C. (2012). Unplanned endotracheal extubations in the intensive care unit: systematic review, critical appraisal, and evidence-based recommendations. *Anesth Analg.* 114(5):1003-14.

<http://ovidsp.ovid.com/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=ovft&AN=00000539-201205000-00015&PDF=y>

Grzeskowiak, M. (2015). Protecting the Airway, Protecting the Patient. *RT: The Journal Forfor Respiratory Care Practitioners.* 28(3):16-20

<http://ezproxy.saskatoonhealthregion.lib.sk.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=rzh&AN=107780764&site=ehost-live>

Haas, C., Eakin, R., Konkle, M., Blank, R. (2014). Endotracheal Tubes: Old and New. *Respiratory Care.* 59(6):933-955

Jarachovic, M., Mason, M., Kerber, K., McNett, M. (2011). The role of standardized protocols in unplanned extubations in a medical intensive care unit. *American Journal of Critical Care.* 20(4):304-12.

<http://ezproxy.saskatoonhealthregion.lib.sk.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=rzh&AN=104655011&site=ehost-live>

Koser, L. (2017). Extubation / decannulation (assist) in AACN Procedure Manual for High Acuity, Progressive, and Critical Care – E-Book 7th ed. Seventh edition. Saunders: St. Louis Pg. 44-48

Muu-Dan, L., Guei-Ling, F. (2015). Reducing the Unplanned Removal Rate of Endotracheal Tubes in the Pediatric Intensive Care Unit. *Journal of Nursing.* 62:39-48

Peñuelas, Ó., Frutos-Vivar, F., Esteban, A. (2011). Unplanned extubation in the ICU: a marker of quality assurance of mechanical ventilation. *Critical Care.* 15(2):1-2.

Perry, A. G., Potter, P.A., Ostendorf, W. R. (2014). Extubation in *Clinical Nursing Skills and Techniques.* 8th ed. St. Louis: Elsevier. Pg. 629 – 630.

Removal of the endotracheal tube. AARC clinical practice guideline. Downloaded 02 / 02/ 2012

Shimizu, T., Mizutani, T., Yamashita, S., Hagiya, K., Tanaka, M. (2011). Endotracheal tube extubation force: adhesive tape versus endotracheal tube holder. *Respiratory Care*. 56(11):1825-9.

Urden, L. D., Stacy, K. M., Lough, M. E. (2014). *Endotracheal Tubes in Critical Care Nursing; Diagnosis and Management*. 7th ed. St. Louis: Elsevier. pg. 563.

Appendix A

Adult

Extubation Guidelines

These are guidelines only. The decision to extubate is not dependant on the patient meeting **all** of the following criteria.

- Patient is weaned to minimal ventilatory support and able to maintain the following parameters:
 - Acceptable PaCO₂ with a spontaneous respiratory rate 10-30 breaths/min
 - SpO₂ greater than / equal to 92% or PaO₂ greater than / equal to 60 mmHg with FiO₂ less than / equal to 0.40 and CPAP less than / equal to 8 cmH₂O
- Return of gag reflex
- Able to effectively remove secretions from airway - capable of generating an effective cough
- Adequate air leak past deflated ETT cuff – see Respiratory Therapy Policy: Assessment of Endotracheal Tube Cuff Leak - Adults
- Awake and can follow commands
- Able to hold head or leg lift for a sustained period of time
- Stable vital signs

Post Extubation

- Patient to remain NPO until ordered otherwise by physician

Appendix B

Pediatric

Extubation Guidelines

These are guidelines only. The decision to extubate a pediatric patient is not dependant on the patient meeting all of the following:.

- Intact airway protective reflexes (gag and cough and swallow).
- Spontaneous respiratory rate within age appropriate norms.
- Sedation / analgesia at level that does not affect respiration
- Muscular strength present to sustain work of breathing
- NPO prior to extubation dependent on if gastric or jejunal feeds or gastric contents emptied
- Acceptable blood gases or SpO₂ , and/or ET CO₂ while on minimal ventilatory support ventilation with FiO₂ less than / equal to .40 and CPAP less than / equal to 8 cmH₂O.
- Cardiovascular and metabolic stability