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Search details

In relation to Tracheostomies I am updating the ULHT protocol for tracheostomy care so the areas it covers are: Suctioning / Humidification, Resuscitation in the event of cardio-respiratory arrest, Swallow assessments, Cuff deflation, Phonation, Recognition of tube occlusion, Weaning and Decannulation of the tracheostomy tube. I don’t need the procedure for insertion/outcome/benefits bit.

Resources searched

National Library for Health, Nursing Reference Center, MEDLINE, Google Scholar, Google Advanced Scholar

Database search terms: TRACHEOTOMY; TRACHEOSTOMY; tracheotom*; tracheostom*; TRACHEA; SUCTION; suction*; humidificat*; RESUSCITATION; resuscitat*; ("swallow* assess*" OR "assess* of swallow*" OR "swallow* test assess*" OR "swallow* test") ; "cuff deflation"; PHONATION; phonation; "tube occlu*"; VENTILATOR WEANING; decannulat*

Google search string: (tracheotomy or tracheostomy) and (suction or resuscitation or swallow or cuff or phonation or occlusion or weaning or decannulation) 2005..2010

Summary

This was a very broad search involving all aspects of managing and caring for a patient with a tracheostomy, Nicky didn’t want the search to focus on the outcomes or the benefits of the procedure and instead wanted information on the steps involved whilst the procedure was ongoing. Broad guidelines were obtainable as was published research on weaning the patient, decannulation, humidification, cuff deflation, and swallow assessments. Some information was found on tube occlusion and resuscitation but little was available on suction and phonation.

Guidelines

Tracheostomy tubes: change of. Nursing Practice and Skill, 2009
Standards for the care of adult patients with a temporary tracheostomy, Intensive Care Society, 2008


Patient Safety Information: protecting patients who are neck breathers, National Patient Safety Agency, 2005

Evidence-based reviews

Multidisciplinary care for tracheostomy patients: a systematic review, Centre for Reviews and Dissemination, 2010

Percutaneous tracheostomy: one center's experience with a new modality, Centre for Reviews and Dissemination, 2006

Systematic review and meta-analysis of studies of the timing of tracheostomy in adult patients undergoing artificial ventilation, Centre for Reviews and Dissemination, 2005

Published research

3. **Tracheostomy care on the medical-surgical unit.**

   **Author(s):** Frace MA

   **Citation:** MEDSURG Nursing, January 2010, vol./is. 19/1(58-61), 1092-0811;1092-0811 (2010 Jan-Feb)

   **Publication Date:** January 2010

   **Source:** MEDLINE

   **Full Text:**

   Available in fulltext at EBSCO Host

   15. **Saline instillation before tracheal suctioning decreases the incidence of ventilator-associated pneumonia.**

   **Author(s):** Caruso P, Denari S, Ruiz SA, Demarzo SE, Deheinzelin D

   **Citation:** Critical Care Medicine, January 2009, vol./is. 37/1(32-8), 0090-3493;1530-0293 (2009 Jan)

   **Publication Date:** January 2009

   **Abstract:** OBJECTIVES: To compare the incidence of ventilator-associated pneumonia (VAP) with or without isotonic saline instillation before tracheal suctioning. As a secondary objective, we compared the incidence of endotracheal tube occlusion and atelectasis. DESIGN: Randomized clinical trial. SETTING AND PATIENTS: The study was conducted in a medical surgical intensive care unit of an oncologic hospital. We selected consecutive patients needing mechanical ventilation for >72 hrs. Patients were allocated into two groups: a saline group that received instillation of 8 mL of saline before tracheal suctioning and a control group which did not. VAP was diagnosed based on clinical suspicion and confirmed by bronchoalveolar lavage quantitative culture. The incidence of atelectasis on daily chest radiography and endotracheal tube occlusions were recorded. The sample size was calculated to a power of 80% and a type I error probability of 5%. MEASUREMENTS AND MAIN RESULTS: One hundred thirty patients were assigned to the saline group and 132 to the control group. The baseline demographic variables were similar between groups. The rate of clinically suspected VAP was similar in both groups. The incidence of microbiological proven
VAP was significantly lower in the saline group (23.5% x 10.8%; p = 0.008) (incidence density/1.000 days of ventilation 21.22 x 9.62; p < 0.01). Using the Kaplan-Meier curve analysis, the proportion of patients remaining without VAP was higher in the saline group (p = 0.02, log-rank test). The relative risk reduction of VAP in the saline instillation group was 54% (95% confidence interval, 18%-74%) and the number needed to treat was eight (95% confidence interval, 5-27). The incidence of atelectases and endotracheal tube occlusion were similar between groups. CONCLUSIONS: Instillation of isotonic saline before tracheal suctioning decreases the incidence of microbiological proven VAP.

Source: MEDLINE

Full Text: Available in fulltext at Ovid

17. Boussignac continuous positive airway pressure for weaning with tracheostomy tubes.

Author(s): Dieperink W, Aarts LP, Rodgers MG, Delwig H, Nijsten MW

Citation: Respiration, 2008, vol./is. 75/4(427-31), 0025-7931;1423-0356 (2008)

Publication Date: 2008

Abstract: BACKGROUND: In patients who are weaned with a tracheostomy tube (TT), continuous positive airway pressure (CPAP) is frequently used. Dedicated CPAP systems or ventilators with bulky tubing are usually applied. However, CPAP can also be effective without a ventilator by the disposable Boussignac CPAP (BCPAP) system that is normally used with face masks. OBJECTIVE: It was the aim of this audit to evaluate the feasibility of low-level BCPAP in patients who were weaned with a TT. METHODS: All patients at our surgical intensive care unit who received a TT for weaning were considered for application of BCPAP. Once patients had received minimal pressure support from the mechanical ventilator, the BCPAP device was connected to the TT three times a day for 30 min with pressure set to 3-5 cm H(2)O, FiO(2) at 0.4 and with humidification. BCPAP was then gradually extended to 24 h/day. Patient acceptance, complications and outcome were recorded. RESULTS: 58 patients received a TT to facilitate weaning. They had a median stay of 52 days in the intensive care unit during which they had an endotracheal tube for 22 days and a TT for 28 days. 50 of these patients (86%) received BCPAP for a median of 16 days. The lightweight BCPAP system was well tolerated without tube obstructions or accidental decannulations and may have contributed to patient mobility. No patient remained on ventilatory support after hospital discharge. In-hospital and 1-year survival were 86 and 71%, respectively. CONCLUSIONS: BCPAP is a feasible and safe method for weaning tracheostomy patients. (c) 2007 S. Karger AG, Basel.

Source: MEDLINE

Full Text: Available in fulltext at EBSCO Host


Author(s): Keck T, Rozsasi A, Leiacker R, Scheithauer MO

Citation: Head & Neck, May 2008, vol./is. 30/5(582-8), 1043-3074;1043-3074 (2008 May)

Publication Date: May 2008
**Abstract:** BACKGROUND: Our aim was to compare inhalation with molecular water (vaporizing humidifier) and particulate water (trachea spray) in spontaneously breathing tracheostomized patients. METHODS: We performed a randomized, 2-way crossover study and a prospective, comparative, nonblinded study. Tracheal humidity and temperature were measured before and after use of a humidifier and spray for 1 week. RESULTS: After both inhalation and spray, the tracheal temperature and total water content increased significantly (study 1). The temperature gradient between ambient and tracheal air was significantly higher after spray, but not after inhalation (study 2). The water gradient increased nonsignificantly after spray and inhalation. The water gradient after inhalation or spray did not differ significantly. CONCLUSIONS: Molecular water is not superior to particulate water because of temperature and humidity increase after both forms of water delivery. Because of its easy use, portability, and moisturizing effect, a trachea spray may offer additional options in postoperative tracheostomy care.

**Source:** MEDLINE

Full Text: Available in fulltext at EBSCO Host

**21.** An evidence-based evaluation of tracheostomy care practices.

**Author(s):** Dennis-Rouse MD, Davidson JE

**Citation:** Critical Care Nursing Quarterly, April 2008, vol./is. 31/2(150-60), 0887-9303;0887-9303 (2008 Apr-Jun)

**Publication Date:** April 2008

**Abstract:** Adverse outcomes related to tracheal occlusion and peritracheal skin breakdown stimulated a review of tracheostomy care. An evidence-based practice approach was taken to evaluate the problem. Organizational tracheostomy care policies were reviewed. Subcategories related to tracheostomy care were queried including securing devices, sutures and their removal, type and choice of dressings, prevention of skin breakdown, frequency of care and role delineation, and suctioning. A literature review was done. National experts were surveyed. A geographical survey was taken and vendors of tracheostomy products were interviewed. Collected evidence was scored along a continuum. Costs of supplies were evaluated. Physicians, staff, and patients were interviewed. Skin maceration on the neck was found on multiple audits. The type of tie was identified as a problem. Nurses and respiratory therapists reported difficulty providing tracheostomy care due to suturing technique and securing methods. The stocked dressing was too large to fit under sutures. Several conflicting policies existed regarding tracheostomy care, none of which identified responsibility for performing care: respiratory versus nursing or time standards for care. New supplies were trialed. A list of practice changes were agreed upon by respiratory, nursing, and medical staff. Primary responsibility for tracheostomy care was shifted to the registered nurse.

**Source:** MEDLINE

**36.** Influence of passive humidification on respiratory heat loss in tracheotomized patients.

**Author(s):** Rozsasi A, Leiacker R, Fischer Y, Keck T

**Citation:** Head & Neck, July 2006, vol./is. 28/7(609-13), 1043-3074;1043-3074 (2006 Jul)

**Publication Date:** July 2006

**Abstract:** BACKGROUND: The aim of this study was to evaluate changes in total
respiratory heat loss during use of a heat and moisture exchanger (HME) in tracheotomized patients. METHODS: Tracheal humidity and temperature were measured before the application and during use of the HME (plastic foam impregnated with CaCl2), and total respiratory heat loss was calculated. RESULTS: No significant difference was found between the convective heat exchange before and after use of the HME for a 10-minute period. When the HME was placed on the tracheal opening, the evaporative heat exchange and the total respiratory heat loss decreased significantly. CONCLUSIONS: The results indicate that passive airway humidification is effective in tracheotomized patients even after a 10-minute period. However, the positive effect on the energy balance of the tracheal mucosa after prolonged use of the HME remains to be proven. Copyright 2006 Wiley Periodicals, Inc.

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39. Development of a tracheostomy scoring system to guide airway management after major head and neck surgery.

Author(s): Cameron M, Corner A, Diba A, Hankins M

Citation: International Journal of Oral & Maxillofacial Surgery, August 2009, vol./is. 38/8(846-9), 0901-5027;1399-0020 (2009 Aug)

Publication Date: August 2009

Abstract: The use of elective tracheostomy in major head and neck surgery is well established, although practice varies between units. There is no published method that reliably predicts the need for tracheostomy. This paper describes the development of a surgical scoring system designed to achieve that aim. The system was devised using data obtained retrospectively from 148 consecutive major head and neck procedures. These procedures were grouped according to the airway management plan in place at the end of the procedure: elective extubation (group E, 52 procedures, 50 patients); elective overnight ventilation via an endotracheal tube (group ETT, 55 procedures, 52 patients); and elective overnight ventilation via a tracheostomy (group T, 41 procedures, 41 patients). 8 patients from group ETT required a late tracheostomy for either medical or surgical indications. Using statistical methods, a threshold score was defined above which the high risk of upper airway obstruction should prompt consideration of an elective tracheostomy.

Source: MEDLINE

47. Balloon dilatational tracheostomy: initial experience with the Ciaglia Blue Dolphin method.

Author(s): Gromann TW, Birkelbach O, Hetzer R

Citation: Anesthesia & Analgesia, June 2009, vol./is. 108/6(1862-6), 0003-2999;1526-7598 (2009 Jun)

Publication Date: June 2009

Abstract: BACKGROUND: Percutaneous dilational tracheostomy has become an established technique for ensuring safe and uncomplicated access to the respiratory systems of patients undergoing prolonged intubation. We studied a new balloon dilation percutaneous dilational tracheostomy technique which primarily uses radial force to widen the tracheostoma, the Ciaglia Blue Dolphin system. METHODS: We report our initial clinical experience with this method in 20 patients from a cardiosurgical intensive care unit. We analyzed the results with regard to the practical feasibility of balloon dilation as well as possible complications. RESULTS:
Tracheostomy surgery time averaged 3.3 +/- 1.9 min. The new technique caused neither bleeding requiring treatment nor injuries of the posterior tracheal wall. Routine bronchoscopic checks revealed one fracture of a single tracheal cartilage ring (5%). One patient developed subcutaneous emphysema during the balloon dilation, but this regressed spontaneously without treatment. No wound infections or prolonged wound healing of the tracheostoma were observed in any patient. There were no differences in terms of practical feasibility or bleeding complications when skin incisions of different lengths were analyzed. CONCLUSIONS: The balloon dilational tracheostomy proved to be a feasible, easy, and successful technique. Its use of mainly radial force may reduce typical complications such as fractures of tracheal cartilage rings or injuries of the posterior tracheal wall.

Source: MEDLINE

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66. A rapid bail-out technique for reinsertion of a displaced tracheostomy tube in difficult situations.

Author(s): Balacumaraswami L, Fernando S, Van Tornout F

Citation: Interactive Cardiovascular & Thoracic Surgery, December 2008, vol./is. 7/6(1170-1), 1569-9285;1569-9285 (2008 Dec)

Publication Date: December 2008

Abstract: Safe and rapid repositioning of a displaced tracheostomy tube is vital to protect the airway and to avoid a potentially life threatening situation. This article describes a simple bail-out technique to avert prolonged airway compromise. This is particularly useful in patients with obesity, large goitre or maxillofacial injuries.

Source: MEDLINE

Full Text:

Available in fulltext at Highwire Press

81. Tracheostomy tube malposition in patients admitted to a respiratory acute care unit following prolonged ventilation.


Citation: Chest, August 2008, vol./is. 134/2(288-94), 0012-3692;0012-3692 (2008 Aug)

Publication Date: August 2008

Abstract: BACKGROUND: Tracheostomy tube malposition is a barrier to weaning from mechanical ventilation. We determined the incidence of tracheostomy tube malposition, identified the associated risk factors, and examined the effect of malposition on clinical outcomes. METHODS: We performed a retrospective study on 403 consecutive patients with a tracheostomy who had been admitted to an acute care unit specializing in weaning from mechanical ventilation between July 1, 2002, and December 31, 2005. Bronchoscopy reports were reviewed for evidence of tracheostomy tube malposition (ie, > 50% occlusion of lumen by tissue). The main outcome parameters were the incidence of tracheostomy tube malposition; demographic, clinical, and tracheostomy-related factors associated with malposition; clinical response to correct the malposition; the duration of mechanical ventilation; the length of hospital stay; and mortality. RESULTS: Malpositioned
tracheostomy tubes were identified in 40 of 403 patients (10%). The subspecialty of the surgical service physicians who performed the tracheostomy was most strongly associated with malposition. Thoracic and general surgeons were equally likely to have their patients associated with a malpositioned tracheostomy tube, while other subspecialty surgeons were more likely (odds ratio, 6.42; 95% confidence interval, 1.82 to 22.68; p = 0.004). Malpositioned tracheostomy tubes were changed in 80% of cases. Malposition was associated with prolonged mechanical ventilation posttracheostomy (median duration, 25 vs 15 d; p = 0.009), but not with increased hospital length of stay or mortality. CONCLUSION: Tracheostomy tube malposition appears to be a common and important complication in patients who are being weaned from mechanical ventilation. Surgical expertise may be an important factor that impacts this complication.

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Available in fulltext at Grantham Hospital Staff Library; Note: Username: ULHTKIS/Password: Library

Available in fulltext at EBSCO Host

90. **Endotracheal tube cuff pressure alteration after changes in position in patients under mechanical ventilation.**

**Author(s):** Godoy AC, Vieira RJ, Capitani EM

**Citation:** Jornal Brasileiro De Pneumologia: Publicacao Oficial Da Sociedade Brasileira De Pneumologia E Tisologia, May 2008, vol./is. 34/5(294-7), 1806-3756 (2008 May)

**Publication Date:** May 2008

**Abstract:** OBJECTIVE: The purpose of this study was to investigate endotracheal tube cuff pressure (Pcuff) alteration in patients under mechanical ventilation after changes in position. METHODS: All selected patients were initially placed in the 35 degrees semi-Fowler position, with Pcuff adjusted to 20 mmHg, and randomly divided into two groups. Group A, in which patients were moved to the lateral decubitus position, facing away from the ventilator (measurement designated Pcuff A1), returned to the initial position (measurement designated Pcuff A2), moved to a lateral decubitus position, facing the ventilator (measurement designated Pcuff A3) and then returned to the initial position (measurement designated Pcuff A4); and Group B, in which patients were moved to the lateral decubitus position, facing the ventilator (measurement designated Pcuff B1), returned to the initial position (measurement designated Pcuff B2), moved to the lateral decubitus position; facing away from the ventilator (measurement designated Pcuff B3) and then returned to the initial position (measurement designated Pcuff B4). RESULTS: The study comprised 70 patients, 31 allocated to group A and 39 allocated to group B. Values >22 mmHg were observed in 142(50.7%) of the 280 Pcuff measurements taken, and values <18 mmHg were observed in 14 (5%). When moved from the 35 degrees semi-Fowler position to the lateral decubitus position, facing away from the ventilator, 58 (82.2%) of the patients presented mean Pcuff values in the higher range (>22 mmHg). CONCLUSIONS: Changes in body position can cause significant Pcuff variations in patients under mechanical ventilation.

Source: MEDLINE

100. **Successful cardiopulmonary resuscitation in a morbidly obese patient with airway obstruction 10 days after tracheostomy.**
Author(s): Huang ST, Kuo CP, Chen JC, Wu CT, Hsieh CM, Wong CS, Yeh CC

Citation: Acta Anaesthesiologica Taiwanica: Official Journal of the Taiwan Society of Anesthesiologists, March 2008, vol./is. 46/1(30-3), 1875-4597 (2008 Mar)

Publication Date: March 2008

Abstract: Tracheostomy is often performed in patients requiring prolonged ventilatory support. Tracheostomy tube obstruction caused either by blood clots, mucous plugs, tube malposition and tissue granulation can lead to life-threatening complications. The risk of such complications is markedly increased in morbidly obese individuals. Here we report an incident in an 81-year-old, morbidly obese, male patient who sustained airway obstruction which resulted in cardiac arrest 10 days after tracheostomy. A 17-cm 10-ng blood clot in a tracheobronchial configuration was found to cause the obstruction. It was removed and the patient recovered after resuscitation. The etiology of the obstruction, specific management, and recommendations are discussed.

Source: MEDLINE

124. Intubating laryngeal mask as a ventilatory device during percutaneous dilatational tracheostomy: a descriptive study.

Author(s): Linstedt U, Moller F, Grote N, Zenz M, Prengel A

Citation: British Journal of Anaesthesia, December 2007, vol./is. 99/6(912-5), 0007-0912;1471-6771 (2007 Dec)

Publication Date: December 2007

Abstract: BACKGROUND: We use an intubating laryngeal mask (ILM) in preference to an endotracheal tube (ETT) as the ventilatory device during percutaneous dilatational tracheostomy (PDT) to overcome potential problems such as difficult ventilation, accidental extubation, damage of the ETT or of the bronchoscope, and need for additional assistant to secure the airway. We report our experience with this method. METHODS: In this prospective observational study, PDT was performed using the ILM in 86 patients. The insertion of the ILM, the quality of ventilation, and the view of the tracheal puncture site were rated as: 'very good', 'good', 'difficult', and 'not possible with ILM'. RESULTS: The bronchoscope was not damaged during any case, and all PDTs were performed by two physicians, without the need for an additional assistant. PDTs with ILM were successful in 95% of the patients (n=82). The ratings were 'very good' or 'good' in 80% of cases with regards to ventilation, in 90% for identification of relevant structures and tracheal puncture site, and in 85% for the view inside the trachea during PDT. Tracheal re-intubation was required for inadequate ventilation with ILM in four patients. CONCLUSIONS: The advantages of this procedure were lack of damage to the bronchoscope, the need for two instead of three persons to perform the PDT, and the excellent view inside the trachea. We recommend the ILM as a standard device for ventilation during bronchoscope-guided PDT.

Source: MEDLINE

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136. Tracheotomy: clinical review and guidelines.

Abstract: Tracheotomy is a commonly performed procedure. The Belgian Society of Pneumology (BVP-SBP) and the Belgian Association for Cardiothoracic Surgery (BACTS) developed guidelines on tracheotomy for mechanical ventilation in adults. The levels of evidence as developed by the American College of Chest Physicians (ACCP) were used. The members of the guideline committee reviewed peer-reviewed publications on this subject. After discussion, a proposal of guidelines was placed on the website for remarks and suggestions of the members. Remarks and suggestions were discussed and used to adapt the guidelines when judged necessary. The different techniques of tracheotomy are described. The potential advantages and disadvantages of surgical and percutaneous tracheotomy versus endotracheal intubation are discussed. An overview of early and late complications is given. Low-pressure, high-volume cuffs should be used. The cuff pressure should be monitored with calibrated devices and recorded at least once every nursing shift and after manipulation of the tracheotomy tubes. Inspired gas should be humidified and heated. Regarding the timing of tracheotomy there are not enough well-designed studies to establish clear guidelines. Therefore, the timing of tracheotomy should be individualised. In critically ill adult patients requiring prolonged mechanical ventilation, tracheotomy performed at an early stage (within the first week) may shorten the duration of artificial ventilation and length of stay in intensive care. Percutaneous dilatational tracheotomy (PDT) appears to be at least as safe as surgical tracheotomy (ST) as measured in terms of peri-procedural complications. With PDT, less wound infection is observed. When PDT is compared to ST performed in the operating room, PDT is less expensive, reduces the time between the decision and the performance of tracheotomy and has a lower mortality rate. Different techniques of PDT are discussed. We recommend performing PDT under bronchoscopic guidance. Because of its technical simplicity and short procedure time, the modified Ciaglia Blue Rhino technique is advocated as technique of choice. PDT should be considered the procedure of choice in elective non-urgent tracheotomy. There are some relative contraindications for PDT, but with growing experience, they become less frequent.

Source: MEDLINE

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145. Expandable metal stents as an alternative treatment of cuff-related tracheal stenosis in tracheostomy-dependent ventilated patients: a prospective study of nine cases and description of the complications.

Author(s): Cheng YJ, Kao EL

Citation: Langenbecks Archives of Surgery, July 2007, vol./is. 392/4(479-83), 1435-2443;1435-2443 (2007 Jul)

Publication Date: July 2007

Abstract: BACKGROUND AND AIMS: In long-term intubated patients, cuff-related tracheal injury is occasionally complicated by tracheal stricture. To keep the airway patent, bougienage and deployment of stents are adopted in patients unfit for surgery. MATERIALS AND METHODS: Prospectively, nine episodes of cuff-related tracheal stricture in nine tracheostomy-dependent ventilated patients were treated with pre-stenting bougienage, followed by implantation of expandable metal stents (EMS). The primary endpoint of this study was the successful discharge of the patients back to the chronic care unit. The other endpoint was the re-treatment rate. RESULTS: The mean age of the nine patients was 61.7 years. The follow-up period was 18.6 months. The first two patients received a bare stent, and the other
seven patients received membrane-coated stents. They all recovered well with successful discharge back to the chronic care unit. There were two episodes of granulation formation in one bare-stent patient and in one coated-stent patient, respectively. In another coated-stent patient, complications arose from a broken stent. CONCLUSION: EMS appears to have a role to play in tracheostomy-dependent ventilated patients with benign tracheal stenoses in whom there are no other reasonable options.

Source: MEDLINE

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Author(s): McGowan SL, Gleeson M, Smith M, Hirsch N, Shuldham CM

Citation: Neurocritical Care, 2007, vol./is. 6/2(90-3), 1541-6933;1541-6933 (2007)

Publication Date: 2007

Abstract: INTRODUCTION: Patients on neurological intensive care units (NICU) who require ventilatory support often suffer from co-existing bulbar dysfunction, either because of their underlying disease or because of their decreased level of consciousness. For this reason, most patients are ventilated through a cuffed tracheostomy tube, which allows a degree of protection from tracheal aspiration of saliva and gastric contents. Patients who are awake often complain of thirst, but traditionally are only offered oral fluids when the cuff of the tracheostomy tube has been deflated. Given that many patients in NICU cannot tolerate cuff deflation, a reliable technique is needed to assess the adequacy of the patient's swallow and therefore the risk of aspiration when the tracheostomy cuff is inflated. METHODS: The aim of this feasibility study was to examine the viability of Fibreoptic Endoscopic Evaluation of Swallowing (FEES) as a diagnostic tool to assess the effectiveness of swallowing in four NICU patients with cuffed tracheostomies. RESULTS: The technique was successful in all of the four patients. One patient was found to have a normal swallow. Two patients were seen to have laryngeal penetration of fluids and one patient aspirated the fluid challenge. CONCLUSION: This pilot study has demonstrated the feasibility of using the FEES technique for assessment of swallowing in patients with cuffed tracheostomy tubes; it therefore presents the prospect of allowing earlier drinking in such patients whilst helping confirm the safety of such a strategy.

Source: MEDLINE

1. 149. Automatic control of tracheal tube cuff pressure in ventilated patients in semirecumbent position: a randomized trial.

Author(s): Valencia M, Ferrer M, Farre R, Navajas D, Badia JR, Nicolas JM, Torres A

Citation: Critical Care Medicine, June 2007, vol./is. 35/6(1543-9), 0090-3493;0090-3493 (2007 Jun)

Publication Date: June 2007

Abstract: OBJECTIVE: The aspiration of subglottic secretions colonized by bacteria pooled around the tracheal tube cuff due to inadvertent deflation (<20 cm H2O) of the cuff plays a relevant role in the pathogenesis of ventilator-associated pneumonia. We assessed the efficacy of an automatic, validated device for the continuous regulation of tracheal tube cuff pressure in preventing ventilator-associated pneumonia. DESIGN: Prospective randomized controlled trial. SETTING: Respiratory intensive care unit and general medical intensive care unit.
PATIENTS: One hundred and forty-two mechanically ventilated patients (age, 64 +/- 17 yrs; Acute Physiology and Chronic Health Evaluation II score, 18 +/- 6) without pneumonia or aspiration at admission. INTERVENTIONS: Within 24 hrs of intubation, patients were randomly allocated to undergo continuous regulation of the cuff pressure with the automatic device (n = 73) or routine care of the cuff pressure (control group, n = 69). Patients remained in a semirecumbent position in bed. MEASUREMENTS AND MAIN RESULTS: The primary end point variable was the incidence of ventilator-associated pneumonia. Main causes for intubation were decreased consciousness (43, 30%) and exacerbation of chronic respiratory diseases (38, 27%). Cuff pressure <20 cm H2O was more frequently observed in the control than the automatic group (45.3 vs. 0.7% determinations, p < .001). However, the rate of ventilator-associated pneumonia with clinical criteria (16, 22% vs. 20, 29%) and microbiological confirmation (11, 15% vs. 10, 15%), the distribution of early and late onset, the causative microorganisms, and intensive care unit (20, 27% vs. 16, 23%) and hospital mortality (30, 41% vs. 23, 33%) were similar for the automatic and control groups, respectively. CONCLUSIONS: Cuff pressure is better controlled with the automatic device. However, it did not result in additional benefits to the semirecumbent position in preventing ventilator-associated pneumonia.

Source: MEDLINE

Full Text:

Available in fulltext at Ovid

154. Mouth-to-tracheostomy tube ventilation in an emergency situation.

Author(s): Kowalik MM

Citation: Resuscitation, May 2007, vol./is. 73/2(322-3), 0300-9572:0300-9572 (2007 May)

Publication Date: May 2007

Source: MEDLINE

183. Stenting allows weaning and extubation in ventilator- or tracheostomy dependency secondary to benign airway disease.

Author(s): Noppen M, Stratakos G, Amjadi K, De Weerdt S, D'Haese J, Meysman M, Vincken W

Citation: Respiratory Medicine, January 2007, vol./is. 101/1(139-45), 0954-6111;0954-6111 (2007 Jan)

Publication Date: January 2007

Abstract: Central airway obstruction can cause severe respiratory insufficiency leading to mechanical ventilation (MV) or artificial airway (AA) dependency. Interventional bronchoscopic procedures have been reported to be of help in weaning patients with malignant airway stenoses from mechanical ventilation, whereas their use in benign disease is only anecdotal. The objectives of this study are to evaluate early, intermediate and long-term outcome of interventional bronchoscopy and stent placement in the treatment of MV/AA dependency due to benign airway obstruction. In a retrospective cohort analysis for the period 1999-2004, we evaluated 15 consecutive ICU patients with documented benign central airway obstruction, who were referred for bronchoscopic management of their condition after multiple failed attempts at weaning from MV or decannulation of the AA. Indications for bronchoscopic treatment were surgery refusal, medical or surgical inoperability, or absence of alternative treatment options. Malacia, post-intubation stenosis and goiter were the main causes of airway obstruction and MV/AA dependency. All patients were treated by means of rigid bronchoscopy, dilatation procedures and stent insertion. All but one patient (93.3%) were
successfully and permanently extubated/decanulated immediately after the bronchoscopy. Minor complications occurred in 6 patients (40%) leading to a second intervention. All complications could be managed endoscopically and long-term follow up was uneventful. Interventional bronchoscopy with stent insertion can allow successful withdrawal from MV/AA and can offer longstanding airway patency in selected ventilator- or tracheostomy-dependant individuals with benign airway stenoses, when surgery in not feasible or contra-indicated.

Source: MEDLINE

193. Intrapulmonary percussive ventilation in tracheostomized patients: a randomized controlled trial.

Author(s): Clini EM, Antoni FD, Vitacca M, Crisafulli E, Paneroni M, Chezzi-Silva S, Moretti M, Trianni L, Fabbri LM

Citation: Intensive Care Medicine, December 2006, vol./is. 32/12(1994-2001), 0342-4642;0342-4642 (2006 Dec)

Publication Date: December 2006

Abstract: OBJECTIVE: To investigate whether the addition of intrapulmonary percussive ventilation to the usual chest physiotherapy improves gas exchange and lung mechanics in tracheostomized patients. DESIGN AND SETTING: Randomized multicenter trial in two weaning centers in northern Italy. PATIENTS AND PARTICIPANTS: 46 tracheostomized patients (age 70 +/- 7 years, 28 men, arterial blood pH 7.436 +/- 0.06, PaO(2)/FIO(2) 238 +/- 46) weaned from mechanical ventilation. INTERVENTIONS: Patients were assigned to two treatment groups performing chest physiotherapy (control), or percussive ventilation (IMP2 Breas, Sweden) 10 min twice/day in addition to chest physiotherapy (intervention). MEASUREMENTS AND RESULTS: Arterial blood gases, PaO(2)/FIO(2) ratio, and maximal expiratory pressure were assessed every 5th day for 15 day. Treatment complications that showed up in 1 month of follow-up were recorded. At 15 days the intervention group had a significantly better PaO(2)/FIO(2) ratio and higher maximal expiratory pressure; after follow-up this group also had a lower incidence of pneumonia. CONCLUSIONS: The addition of percussive ventilation to the usual chest physiotherapy regimen in tracheostomized patients improves gas exchange and expiratory muscle performance and reduces the incidence of pneumonia.

Source: MEDLINE

Full Text:
Available in fulltext at EBSCO Host
Available in print at Lincoln County Hospital Professional Library

198. Comparison of 2 models for managing tracheotomized patients in a subacute medical intensive care unit.

Author(s): Hoffman LA, Miller TH, Zullo TG, Donahoe MP

Citation: Respiratory Care, November 2006, vol./is. 51/11(1230-6), 0020-1324;0020-1324 (2006 Nov)

Publication Date: November 2006

Abstract: OBJECTIVE: To compare 2 models for managing patients admitted to a subacute medical intensive care unit (MICU) who required prolonged mechanical ventilation (> or = 7 d). METHODS: The subjects were 192 consecutive patients (mean +/- SD age 61.5 +/- 16.1 y, 52% male, 86% white) managed during alternating 7-month blocks of time by an attending physician in collaboration with
an acute care nurse practitioner (ACNP) (n = 98 patients) or by an attending physician in collaboration with critical care/pulmonary fellows (n = 94 patients). The total observation time was 28 months (14 mo per team). RESULTS: At unit entry, there were no significant differences in age, sex, race, comorbidity, Acute Physiology and Chronic Health Evaluation III score, or time of tracheostomy between the patients managed by the 2 teams. Patients managed by the ACNP team were more likely to have required mechanical ventilation due to an acute pulmonary problem (p = 0.005). At subacute MICU discharge, the groups were not significantly different in regard to subacute MICU length of stay, days on mechanical ventilation, or discharge weaning status (p > 0.05). The number of readmissions to the MICU was similar for the ACNP team (n = 7) and fellows team (n = 8), as were readmissions to the subacute MICU < or = 72 h after discharge (ACNP = 2, fellows = 1). Each team had 2 deaths without treatment limitation. CONCLUSION: As hypothesized, management of patients who required prolonged mechanical ventilation with tracheostomy had equivalent outcomes with the ACNP team or the fellows team.

Source: MEDLINE

-- 205. Tracheotomy does not affect reducing sedation requirements of patients in intensive care—a retrospective study.

Author(s): Veelo DP, Dongelmans DA, Binnekade JM, Korevaar JC, Vroom MB, Schultz MJ

Citation: Critical Care (London, England), 2006, vol./is. 10/4(R99), 1364-8535;1466-609X (2006)

Publication Date: 2006

Abstract: INTRODUCTION: Tracheotomized patients often need sedation to treat anxiety, agitation and/or pain. Current opinion is that tracheotomy reduces sedation requirements. We determined sedation needs before and after tracheotomy of intubated and mechanically ventilated patients. METHODS: We performed a retrospective analysis of the use of morphine, midazolam and propofol in patients before and after tracheotomy. RESULTS: Of 1,788 patients admitted to our intensive care unit during the study period, 129 (7%) were tracheotomized. After the exclusion of patients who received a tracheotomy before or at the day of admittance, 117 patients were left for analysis. The daily dose (DD; the amount of sedatives for each day) divided by the mean daily dose (MDD; the mean amount of sedatives per day for the study period) in the week before and the week after tracheotomy was 1.07 +/- 0.93 DD/MDD versus 0.30 +/- 0.65 for morphine, 0.84 +/- 1.03 versus 0.11 +/- 0.46 for midazolam, and 0.62 +/- 1.05 versus 0.15 +/- 0.45 for propofol (p < 0.01). However, when we focused on a shorter time interval (two days before and after tracheotomy), there were no differences in prescribed doses of morphine and midazolam. Studying the course in DD/MDD from seven days before the placement of tracheotomy, we found a significant decline in dosage. From day -7 to day -1, morphine dosage (DD/MDD) declined by 3.34 (95% confidence interval -1.61 to -6.24), midazolam dosage by 2.95 (-1.49 to -5.29) and propofol dosage by 1.05 (-0.41 to -2.01). After tracheotomy, no further decrease in DD/MDD was observed and the dosage remained stable for all sedatives. Patients in the non-surgical and acute surgical groups received higher dosages of midazolam than patients in the elective surgical group. Time until tracheotomy did not influence sedation requirements. In addition, there was no significant difference in sedation between different patient groups. CONCLUSION: In our intensive care unit, sedation requirements were not further reduced after tracheotomy. Sedation requirements were already sharply declining before tracheotomy was performed.

Source: MEDLINE

Full Text:
218. Cardiopulmonary collapse associated with malpositioning of an adjustable flange tracheostomy tube.

**Author(s):** Perkins GD, Freeman JW, Walia S

**Citation:** Resuscitation, June 2006, vol./is. 69/3(357-8), 0300-9572;0300-9572 (2006 Jun)

**Publication Date:** June 2006

**Source:** MEDLINE

228. A low-volume, low-pressure tracheal tube cuff reduces pulmonary aspiration.

**Author(s):** Young PJ, Pakeerathan S, Blunt MC, Subramanya S

**Citation:** Critical Care Medicine, March 2006, vol./is. 34/3(632-9), 0090-3493;0090-3493 (2006 Mar)

**Publication Date:** March 2006

**Abstract:** OBJECTIVE: Leakage of fluid from the subglottic space to the lungs occurs along the longitudinal folds within the wall of an inflated high-volume, low-pressure (HVLP) cuff. The low-volume, low-pressure (LVLP) cuff does not have these folds yet allows for convenient and reliable control of tracheal wall pressure. Pulmonary aspiration during anesthesia has been linked with postoperative pneumonia and during critical illness causes ventilator-associated pneumonia.

**DESIGN:** Prospective, blinded, randomized controlled trial; prospective observational study; and benchtop models. **SETTING:** Department of Anaesthesia and Critical Care, Queen Elizabeth Hospital. **PATIENTS:** Anesthetized patients (n=38) and critically ill patients with either an LVLP or HVLP cuffed tracheostomy tube following swallow assessments (n=67). **INTERVENTIONS:** The LVLP cuff was compared with HVLP cuffs for leakage of dye placed in the subglottic space to the tracheobronchial tree in a rigid tracheal model and a benchtop pig trachea model (before and after a standardized cuff movement). **MEASUREMENTS AND MAIN RESULTS:** In the rigid tracheal model, the incidence of leakage was 0% in the LVLP group and 100% in the HVLP group (p<.01). Dye leakage in the pig tracheal model with HVLP cuffs was 44% before tube movement, increasing to 79% afterward. The LVLP cuff did not leak in the pig tracheal model. Dye leakage in anesthetized patients was 0% before movement and 5% after in the LVLP group and in the HVLP group 22% increasing to 67% after movement (p<.001). Forty-nine percent of swallow assessments were scored as failed in the critical care patients with HVLP tracheostomy tube cuffs, and there were no episodes of aspiration following swallow assessment in the LVLP group (p<.05).

**CONCLUSIONS:** The LVLP cuffed tracheal and tracheostomy tubes reduced pulmonary aspiration in the benchtop models and in anesthetized and critically ill patients. The single failure of the LVLP cuff in the anesthesia group was probably associated with accidental endobronchial intubation following tube movement.

**Source:** MEDLINE

**Full Text:**

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237. The cuff-leak test is a simple tool to verify severe laryngeal edema in patients undergoing long-term mechanical ventilation.

Author(s): Chung YH, Chao TY, Chiu CT, Lin MC

Citation: Critical Care Medicine, February 2006, vol./is. 34/2(409-14), 0090-3493;0090-3493 (2006 Feb)

Publication Date: February 2006

Abstract: OBJECTIVE: The cuff-leak test has been proposed as a simple tool to clinically predict stridor or respiratory distress secondary to laryngeal edema following extubation. However, the true incidence of laryngeal edema in patients on long-term mechanical ventilation is uncertain. The relationship between upper airway obstruction (detected by video bronchoscopy) and the cuff-leak test value for patients with prolonged translaryngeal intubation during percutaneous dilatational tracheostomy (PDT) was investigated. DESIGN: Prospective, clinical investigation. SETTING: Intensive care unit of a university hospital. PATIENTS: Ninety-five patients with prolonged translaryngeal intubation requiring PDT were enrolled during a 12-month period. INTERVENTIONS: Cuff-leak test, PDT, video bronchoscopy. MEASUREMENTS AND MAIN RESULTS: The average duration of translaryngeal intubation was 28.1 +/- 17.6 days. The incidence of severe laryngeal edema was 36.8% (35/95). We chose 140 mL as the threshold cuff-leak volume below which edema is indicated. The rate of cuff-leak test positivity was 38.9% (37/95). The sensitivity and the specificity of the test were 88.6% and 90.0%, respectively. The positive and negative predictive values were 83.8% and 93.1%, respectively. Patients who developed severe laryngeal edema had a smaller leak volume than those who did not, expressed in absolute values (53.9 +/- 56.2 vs. 287.9 +/- 120.0 mL; p < .001) or in relative values (10.1 +/- 10.2 vs. 55.3 +/- 22.7%, p < .001). The occurrence of severe laryngeal edema was not associated with age, gender, body weight, respiratory failure due to pneumonia, duration of translaryngeal intubation, endotracheal tube diameter, Acute Physiology and Chronic Health Evaluation II score, or history of self-extubation. CONCLUSIONS: A reduced cuff-leak volume measured before PDT may signal the presence of severe laryngeal edema in patients on long-term mechanical ventilation.

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256. Impact of tracheotomy on sedative administration, sedation level, and comfort of mechanically ventilated intensive care unit patients.

Author(s): Nieszkowska A, Combes A, Luyt CE, Ksibi H, Trouillet JL, Gibert C, Chastre J

Citation: Critical Care Medicine, November 2005, vol./is. 33/11(2527-33), 0090-3493;0090-3493 (2005 Nov)

Publication Date: November 2005

Abstract: OBJECTIVE: To assess the impact of tracheotomy on sedative administration, sedation level, and autonomy of mechanically-ventilated intensive care unit (ICU) patients. DESIGN, SETTING, AND PATIENTS: In this observational study, the charts of all consecutive patients undergoing mechanical ventilation requiring tracheotomy over a 14-month period in our 18-bed tertiary care ICU were reviewed retrospectively. Patients' sedation levels (according to the Riker's 7-level...
sedation-agitation score) and intravenous (fentanyl and midazolam) and oral (clorazepate and haloperidol) sedative administration were measured daily during the 7 days before and after tracheotomy. We also recorded patients for whom chair positioning and oral alimentation became possible in the days following tracheotomy. INTERVENTIONS: None. MEASUREMENTS AND MAIN RESULTS: Tracheotomy was performed on 72 (23.1%) of the 312 patients undergoing mechanical ventilation for $> 0$ or $= 48$ hrs. After tracheotomy, median (25th, 75th percentiles) fentanyl and midazolam administration decreased from 866 (191, 1672) to 71 (3, 426) microg/(patient.day) and from 44 (16, 128) to 7 (1, 42) mg/(patient.day) ($p < .001$), respectively. Concomitant median time spent heavily sedated decreased from 7 (3, 17) to 1 (0, 6) hrs/day ($p < .001$), with no increase in agitation time. During the 7 days following tracheotomy, partial oral alimentation became possible for 35 patients (48.6%) and out-of-bed positioning became possible for 16 patients (22.2%). CONCLUSION: On the basis of these observations, we conclude that tracheotomized mechanically ventilated ICU patients required less intravenous sedative administration, spent less time heavily sedated, and achieved more autonomy earlier.

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Available in print at Grantham Hospital Staff Library

273. Timing of tracheostomy in adult patients: potential ramifications are alarming.

Author(s): Philpott C, Bennett A, Tassone P

Citation: BMJ, August 2005, vol./is. 331/7513(404; author reply 404-5), 0959-535X;1468-5833 (2005 Aug 13)

Publication Date: August 2005

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286. Clinical evaluation of the “T-Dagger”: a new bedside percutaneous dilational tracheostomy device.

Author(s): Ambesh SP, Tripathi M, Pandey CK, Pant KC, Singh PK

Citation: Anaesthesia, July 2005, vol./is. 60/7(708-11), 0003-2409;0003-2409 (2005 Jul)

Publication Date: July 2005

Abstract: A number of percutaneous dilational tracheostomy devices are now available for clinical use. Recently, a new percutaneous dilational tracheostomy device, the “T-Dagger” (Criticure Invasives, India), has been introduced for rapid bedside percutaneous tracheostomy. In a prospective preliminary study, we have performed percutaneous dilational tracheostomy (PDT) using the T-Dagger in 20 adult ventilated patients in order to evaluate the safety and efficacy of the new device. The T-Dagger facilitated bedside PDT in about 3 min with no untoward incidents. There was no significant bleeding, pneumothorax, pneumomediastinum,
tracheal wall injuries or difficulty in ventilation in any of the patients. We conclude that the T-Dagger shows early promise in bedside percutaneous dilational tracheostomy. However, controlled studies are required in a larger patient population before it can be recommended for routine use.

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304. Physiological effects of meals in difficult-to-wean tracheostomised patients with chronic obstructive pulmonary disease.

**Author(s):** Vitacca M, Callegari G, Sarva M, Bianchi L, Barbano L, Balbi B, Ambrosino N

**Citation:** Intensive Care Medicine, February 2005, vol./is. 31/2(236-42), 0342-4642;0342-4642 (2005 Feb)

**Publication Date:** February 2005

**Abstract:** OBJECTIVES: To evaluate effects of meals in difficult-to-wean tracheostomised patients with chronic obstructive pulmonary diseases during spontaneous breathing or Inspiratory Pressure Support. DESIGN: Prospective, crossover, randomised, and physiological study. SETTING: Weaning centre. PATIENTS: Sixteen COPD undergoing either decreasing levels of pressure support or increasing periods of spontaneous breathing. MEASUREMENTS: Each patient underwent monitoring during a 30-min procedure, during and after meals either under pressure support or spontaneous breathing on two consecutive days. Inductance plethysmography was used to monitor respiratory rate and tidal volume. Tidal volume by a flow transducer, arterial oxygen saturation, pulse rate, end-tidal CO2(,) and dyspnoea by a visual analogue scale were also assessed. RESULTS: ANOVA analysis showed a significant increase under spontaneous breathing for respiratory rate (P<0.001) and for end tidal CO(2) (P<0.03) induced by the meals. Inspiratory pressure support was associated to significantly greater tidal volume (P<0.001), lower respiratory rate (P<0.032), lower respiratory rate/tidal volume (P<0.001), and lower pulse rate (P<0.047) than spontaneous breathing. Under spontaneous breathing but not under pressure support a statistically worsening in meal-induced dispnoea (P<0.001) was found. CONCLUSIONS: In tracheostomised difficult-to-wean COPD patients: 1) under unassisted breathing, meals may induce an increase in respiratory rate, end-tidal CO(2), and dyspnoea; 2) Inspiratory pressure support ventilation prevents dyspnoea from worsening during meals.

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**Author(s):** Hsu CL, Chen KY, Chang CH, Jerng JS, Yu CJ, Yang PC

**Citation:** Critical Care (London, England), February 2005, vol./is. 9/1(R46-52), 1364-8535;1466-609X (2005 Feb)
**Publication Date:** February 2005

**Abstract:** INTRODUCTION: Tracheostomy is frequently performed in critically ill patients for prolonged intubation. However, the optimal timing of tracheostomy, and its impact on weaning from mechanical ventilation and outcomes in critically ill patients who require mechanical ventilation remain controversial. METHODS: The medical records of patients who underwent tracheostomy in the medical intensive care unit (ICU) of a tertiary medical centre from July 1998 to June 2001 were reviewed. Clinical characteristics, length of stay in the ICU, rates of post-tracheostomy pneumonia, weaning from mechanical ventilation and mortality rates were analyzed. RESULTS: A total of 163 patients (93 men and 70 women) were included; their mean age was 70 years. Patients were classified into two groups: successful weaning (n = 78) and failure to wean (n = 85). Shorter intubation periods (P = 0.02), length of ICU stay (P = 0.001) and post-tracheostomy ICU stay (P = 0.005) were noted in patients in the successful weaning group. Patients who underwent tracheostomy more than 3 weeks after intubation had higher ICU mortality rates and rates of weaning failure. The length of intubation correlated with the length of ICU stay in the successful weaning group (r = 0.70; P < 0.001). Multivariate analysis revealed that tracheostomy after 3 weeks of intubation, poor oxygenation before tracheostomy (arterial oxygen tension/fractional inspired oxygen ratio <250) and occurrence of nosocomial pneumonia after tracheostomy were independent predictors of weaning failure. CONCLUSION: The study suggests that tracheostomy after 21 days of intubation is associated with a higher rate of failure to wean from mechanical ventilation, longer ICU stay and higher ICU mortality.

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Available in fulltext at National Library of Medicine
Available in fulltext at Ovid
Available in fulltext at EBSCO Host

310. **An unusual complication of a Bivona Hyperflex tracheostomy tube.**

**Author(s):** Natarajan A, Simpson DA, Sanders GM

**Citation:** Anaesthesia, February 2005, vol./is. 60/2(208; discussion 208), 0003-2409:0003-2409 (2005 Feb)

**Publication Date:** February 2005

**Source:** MEDLINE

**Full Text:**
Available in fulltext at EBSCO Host
Available in print at Lincoln County Hospital Professional Library
Available in print at Pilgrim Hospital Staff Library

1. **The added value of fibreoptic endoscopic evaluation of swallowing in tracheostomy weaning.**

**Author(s):** Hales PA, Drinnan MJ, Wilson JA
OBJECTIVE: To determine if fibreoptic endoscopic evaluation of swallowing adds information to the clinical assessment of swallowing in tracheostomised patients. DESIGN: A prospective, observational study. SETTING: Addenbrooke's Hospital, Cambridge, UK. PARTICIPANTS: Twenty-five consecutive, adult, tracheostomised patients were recruited over a 3-month period. They were referred to speech and language therapy for a swallowing assessment and were ready to trial cuff deflation. MAIN OUTCOME MEASURES: In current practice the clinical assessment is invariably a precursor to fibreoptic endoscopic evaluation of swallowing and a test would be considered positive when penetration or aspiration are detected. We considered the value of fibreoptic endoscopic evaluation of swallowing following both positive and negative outcomes of the clinical assessment. RESULTS: The positive predictive value of aspiration or penetration was 91% i.e. when a clinical assessment is failed, there is a very high probability the patient would also be failed on fibreoptic endoscopic evaluation of swallowing. However, the negative predictive value was only 64% i.e. over one-third of patients who pass a clinical assessment would later fail a fibreoptic endoscopic evaluation of swallowing. CONCLUSIONS: Despite a small cohort, our data suggest that the assessment of swallowing to aid weaning in tracheostomised patients is currently performed incorrectly; we estimate that over a third of all tracheostomised patients that 'pass' the clinical assessment of swallowing are, in reality, at risk from penetration, aspiration or failed decannulation. This finding supports the use of fibreoptic endoscopic evaluation of swallowing and a change in clinical practice.

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Author(s): McGowan SL, Gleeson M, Smith M, Hirsch N, Shuldham CM

Citation: Neurocritical Care, 2007, vol./is. 6/2(90-3), 1541-6933;1541-6933 (2007)

Abstract: INTRODUCTION: Patients on neurological intensive care units (NICU) who require ventilatory support often suffer from co-existing bulbar dysfunction, either because of their underlying disease or because of their decreased level of consciousness. For this reason, most patients are ventilated through a cuffed tracheostomy tube, which allows a degree of protection from tracheal aspiration of saliva and gastric contents. Patients who are awake often complain of thirst, but traditionally are only offered oral fluids when the cuff of the tracheostomy tube has been deflated. Given that many patients in NICU cannot tolerate cuff deflation, a reliable technique is needed to assess the adequacy of the patient's swallow and therefore the risk of aspiration when the tracheostomy cuff is inflated. METHODS: The aim of this feasibility study was to examine the viability of Fibreoptic Endoscopic Evaluation of Swallowing (FEES) as a diagnostic tool to assess the effectiveness of swallowing in four NICU patients with cuffed tracheostomies. RESULTS: The technique was successful in all of the four patients. One patient was found to have a normal swallow. Two patients were seen to have laryngeal penetration of fluids and one patient aspirated the fluid challenge. CONCLUSION: This pilot study has demonstrated the feasibility of using the FEES technique for assessment of swallowing in patients with cuffed tracheostomy tubes; it therefore presents the prospect of allowing earlier drinking in such patients whilst helping
confirm the safety of such a strategy.

**Source:** MEDLINE

5. **Prospective randomized trial comparing the effect of early suturing of tracheostomy sites on postoperative patient swallowing and rehabilitation.**

**Author(s):** Brookes JT, Seikaly H, Diamond C, Mechor B, Harris JR

**Citation:** Journal of Otolaryngology, April 2006, vol./is. 35/2(77-82), 0381-6605;0381-6605 (2006 Apr)

**Publication Date:** April 2006

**Abstract:** PURPOSE: This study was designed to evaluate the effect of tracheostomy site suturing after decannulation on swallowing rehabilitation, the incidence of postoperative complications, the length of hospital stay, and overall cost saving in patients undergoing major head and neck cancer resections. DESIGN: Prospective, randomized, blinded, controlled clinical trial. METHODS: Seventy-five patients undergoing major head and neck cancer resections were block randomized to have their tracheostomy site sutured or not sutured at the time of decannulation. Two blinded speech-language pathologists conducted bedside swallowing assessments immediately after decannulation. Patients resumed oral feedings if they passed; otherwise, the assessment was repeated daily until they were able to resume oral feedings or required a G-tube. OUTCOME MEASURES: We monitored (1) time intervals during the admission from surgery to discharge, (2) the rate of aspiration, (3) complications, and (4) cost savings. RESULTS: Significant differences were seen in the mean time from decannulation and commencement of swallowing (suture arm, 0.58 days; nonsuture arm, 2.7 days; p = .013). There was also a significant difference seen for the time interval from decannulation to discharge from hospital (suture arm, 5.5 days; nonsuture arm, 8.3 days; p = .045) and for overall duration of hospital stay (suture arm, 14.6 days; nonsuture arm, 19.3 days; p = .025). The cost saving per patient in the suture group averaged $11 609, which translates to a yearly saving of 742 976 dollars. CONCLUSION: The suturing of the tracheostomy site in head and neck cancer patients after decannulation is a safe, effective, cost-saving manoeuvre that speeds the return of the patient's normal swallowing, promoting earlier discharge from the hospital.

**Source:** MEDLINE

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6. **A low-volume, low-pressure tracheal tube cuff reduces pulmonary aspiration.**

**Author(s):** Young PJ, Pakeerathan S, Blunt MC, Subramanya S

**Citation:** Critical Care Medicine, March 2006, vol./is. 34/3(632-9), 0090-3493;0090-3493 (2006 Mar)

**Publication Date:** March 2006

**Abstract:** OBJECTIVE: Leakage of fluid from the subglottic space to the lungs occurs along the longitudinal folds within the wall of an inflated high-volume, low-pressure (HVLP) cuff. The low-volume, low-pressure (LVLP) cuff does not have these folds yet allows for convenient and reliable control of tracheal wall pressure. Pulmonary aspiration during anesthesia has been linked with postoperative pneumonia and during critical illness causes ventilator-associated pneumonia. DESIGN: Prospective, blinded, randomized controlled trial; prospective observational study; and benchtop models. SETTING: Department of Anaesthesia and Critical Care, Queen Elizabeth Hospital. PATIENTS: Anesthetized patients
(n=38) and critically ill patients with either an LVLP or HVLP cuffed tracheostomy tube following swallow assessments (n=67). **INTERVENTIONS:** The LVLP cuff was compared with HVLP cuffs for leakage of dye placed in the subglottic space to the tracheobronchial tree in a rigid tracheal model and a benchtop pig trachea model (before and after a standardized cuff movement). **MEASUREMENTS AND MAIN RESULTS:** In the rigid tracheal model, the incidence of leakage was 0% in the LVLP group and 100% in the HVLP group (p<.01). Dye leakage in the pig tracheal model with HVLP cuffs was 44% before tube movement, increasing to 79% afterward. The LVLP cuff did not leak in the pig tracheal model. Dye leakage in anesthetized patients was 0% before movement and 5% after in the LVLP group and in the HVLP group 22% increasing to 67% after movement (p<.001). Forty-nine percent of swallow assessments were scored as failed in the critical care patients with HVLP tracheostomy tube cuffs, and there were no episodes of aspiration following swallow assessment in the LVLP group (p<.05). **CONCLUSIONS:** The LVLP cuffed tracheal and tracheostomy tubes reduced pulmonary aspiration in the benchtop models and in anesthetized and critically ill patients. The single failure of the LVLP cuff in the anesthesia group was probably associated with accidental endobronchial intubation following tube movement.

**Source:** MEDLINE

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8. **Swallow physiology in patients with trach cuff inflated or deflated: a retrospective study.**

**Author(s):** Ding R, Logemann JA

**Citation:** Head & Neck, September 2005, vol./is. 27/9(809-13), 1043-3074;1043-3074 (2005 Sep)

**Publication Date:** September 2005

**Abstract:** BACKGROUND: Past research has suggested that medical diagnosis and trach cuff conditions may contribute to swallow physiology changes in patients with tracheostomy. This study attempts to investigate the differences in swallow physiology between patients with trach cuff-inflated and trach cuff-deflated conditions with respect to four medical diagnostic categories: neuromuscular disorder, head and neck cancer, respiratory diseases, and general medical diagnosis. METHODS: Retrospective database analysis of videofluoroscopic study results in 623 patients with tracheostomies with trach cuff-inflated or cuff-deflated conditions. Swallow disorders were examined for each patient. RESULTS: The frequencies of reduced laryngeal elevation and silent aspiration were found to be significantly higher in the cuff-inflated condition than the cuff-deflated condition. Significant swallow physiology changes were also found to be significantly different among various medical diagnostic categories. CONCLUSIONS: It is important to evaluate changes in swallow physiology under both the trach cuff-inflated and cuff-deflated conditions to fully assess swallow function. (c) 2005 Wiley Periodicals, Inc.

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25. **Characteristics of tracheostomy phonation valves.**

**Author(s):** Prigent H, Orlikowski D, Blumen MB, Leroux K, Legrand L, Lejaille M, Falaize L, Ruquet M, Raphael JC, Lofaso F

**Citation:** European Respiratory Journal, May 2006, vol./is. 27/5(992-6), 0903-
Phonation valves are commonly used devices that allow the restoration of speech in tracheostomised patients. However, their use should not compromise the physiological benefit of tracheostomy. Six commercialised phonation valves were studied in a dynamic set-up simulating a respiratory frequency of 20 breaths.min⁻¹, a tidal volume of 0.5 L and a peak flow rate of 0.5 L.s⁻¹. Resistance and additional work of breathing (WOB) were calculated. In 10 tracheostomised patients, evaluations using no phonation valve (baseline), and the most and one of the least resistive valves were carried out. Respiratory patterns and gas exchanges were recorded. Inspiratory difficulty was evaluated using the modified Borg scale. Valves displayed a wide array of resistance ranging 1.3-5.9 cmH₂O.L⁻¹.s⁻¹. Additional WOB varied with a ratio of 4.4 between the best and the worst valve. While the different clinical conditions did not modify respiratory patterns and gas exchanges, a significant effect on the Borg scale rating was observed using ANOVA and post hoc analysis of baseline versus worst valve and one of the best valves versus worst valve. In conclusion, the variety of aerodynamic characteristics of phonation valves should be considered when choosing the device, according to the underlying condition of the patients benefiting from their use.

Source: MEDLINE

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3. **Bivona Hyperflex tracheostomy tube occlusion causing spurious tachypnoea and tracheal ulceration.**

**Author(s):** Papadimos TJ, Flores AS, Schmidt MS, Borst MJ

**Citation:** European Journal of Anaesthesiology, May 2007, vol./is. 24/5(472-3), 0265-0215;0265-0215 (2007 May)

**Publication Date:** May 2007

**Source:** MEDLINE

**Full Text:**

Available in fulltext at EBSCO Host

4. **Secretions, occlusion status, and swallowing in patients with a tracheotomy tube: a descriptive study.**

**Author(s):** Donzelli J, Brady S, Wesling M, Theisen M

**Citation:** Ear, Nose, & Throat Journal, December 2006, vol./is. 85/12(831-4), 0145-5613;0145-5613 (2006 Dec)

**Publication Date:** December 2006

**Abstract:** We conducted a prospective, descriptive study of 400 tracheotomized patients to investigate the relationships between (1) levels of accumulated oropharyngeal secretions and laryngeal penetration/aspiration status, (2) secretion levels and tube-occlusion status, and (3) tube-occlusion status and aspiration status. Assessments of secretion status were quantified with the use of a 5-point rating scale. All evaluations were made by fiberoptic endoscopic evaluation of swallowing. We found that patients with higher secretion levels were more likely to
Aspirate than were patients with lower secretion levels. Also, patients who tolerated placement of a tube cap had the lowest mean secretion level, and those who tolerated only light finger occlusion had the highest; likewise, most patients with normal secretion levels tolerated a capped tube, and a plurality of patients with profound secretion levels tolerated only light finger occlusion. Finally, no significant differences were observed with respect to occlusion status and aspiration rates.

Source: MEDLINE

23. An evaluation of the impact of a tracheostomy weaning protocol on extubation time.

Author(s): Spencer A, Clifford C

Citation: Nursing in Critical Care, May 2009, vol./is. 14/3(131-8), 1362-1017;1478-5153 (2009 May-Jun)

Publication Date: May 2009

Abstract: BACKGROUND: To avoid the possible complications of prolonged intubation, it is necessary and advisable to attempt weaning from the tracheostomy tube at the earliest opportunity. However, while weaning protocols have proven successful in reducing ventilation time of critical care patients, there is little evidence of their use and impact on tracheostomy tube weaning time. AIMS: This pilot study sought to determine if the introduction of a new tracheostomy weaning protocol would reduce the time to extubation of the tracheostomy. METHOD: A quasi-experimental design used two groups of patients. A retrospective control group of patients (n = 20) who had been weaned using standard practice were identified by a search of medical records. A prospective experimental group (n = 20) had care planned using a new tracheostomy weaning protocol. Data relating to time to extubation were collected on both groups who were all patients in an eight-bedded Critical Care Unit of a District General Hospital. The same inclusion and exclusion criteria were applied to both groups. RESULTS: The results revealed a reduction of 1.35 days from commencement of weaning to extubation in the prospective (experimental) group. This was not statistically significant (P = 0.181) CONCLUSION: Although the findings from the study were not statistically significant, they can be seen as clinically significant in terms of patient comfort and reduced dependency in care by a reduction of time with a tracheostomy. It is recommended that a larger scale study be carried out to determine if a tracheostomy weaning protocol does make an impact on length of time to extubation in wider care settings.

Source: MEDLINE

Full Text: Available in fulltext at EBSCO Host

27. Tracheostomy decannulation failure rate following critical illness: a prospective descriptive study.

Author(s): Choate K, Barbetti J, Currey J

Citation: Australian Critical Care, February 2009, vol./is. 22/1(8-15), 1036-7314;1036-7314 (2009 Feb)

Publication Date: February 2009

Abstract: BACKGROUND: Tracheostomy is a well established and practical approach to airway management for patients requiring extended periods of mechanical ventilation or airway protection. Little evidence is available to guide the process of weaning and optimal timing of tracheostomy tube removal. Thus, decannulation decisions are based on clinical judgement. The aim of this study was to describe decannulation practice and failure rates in patients with tracheostomy
following critical illness. METHODS: A prospective descriptive study was conducted of consecutive patients who received a tracheostomy at a tertiary metropolitan public hospital intensive care unit (ICU) between March 2002 and December 2006. Data were analysed using descriptive and inferential tests.

RESULTS: Of the 823 decannulation decisions, there were 40 episodes of failed decannulation, a failure rate of 4.8%. These 40 episodes occurred in 35 patients: 31 patients failed once, 3 patients failed twice and 1 patient failed three times. There was no associated mortality. Simple stoma recannulation was required in 25 episodes, with none of these patients readmitted to ICU. Translaryngeal intubation and readmission to ICU took place for the remaining 15 episodes. The primary reason for decannulation failure was sputum retention. Twenty-four patients (60%) failed decannulation within 24h, with 14 of these occurring within 4h.

CONCLUSIONS: Clinical assessments coupled with professional judgement to decide the optimal time to remove tracheostomy tubes in patients following critical illness resulted in a failure rate comparable with published data. Although reintubation and readmission to ICU was required in just over one third of failed decannulation episodes, there was no associated mortality or other significant adverse events. Our data suggest nurses need to exercise high levels of clinical vigilance during the first 24h following decannulation, particularly the first 4h to detect early signs of respiratory compromise to avoid adverse outcomes.

Source: MEDLINE

29. Driving standards in tracheostomy care: a preliminary communication of the St Mary’s ENT-led multi disciplinary team approach.

Author(s): Arora A, Hettige R, Ifeacho S, Narula A

Citation: Clinical Otolaryngology, December 2008, vol./is. 33/6(596-9), 1749-4486 (2008 Dec)

Publication Date: December 2008

Abstract: OBJECTIVES: To assess tracheostomy care and improve standards following the introduction of an ENT-led multidisciplinary tracheostomy ward round service. DESIGN: Prospective third cycle audit. SETTING: Tertiary academic London hospital serving an inner city population of multi-ethnic background (St Mary's Hospital, Paddington, London). PARTICIPANTS: Patients with a tracheostomy discharged from ITU to general wards. IMPLEMENTED ACTIONS: Establishment of an ENT-led Tracheostomy Multidisciplinary Team (TMDT). Weekly TMDT ward round to manage patients with a tracheostomy. ENT-led educational and training sessions for allied healthcare professionals. MAIN OUTCOME MEASURES: Compliance with local tracheostomy care guidelines (St Mary's tracheostomy care bundle) and time to tracheostomy tube decannulation. RESULTS: Preliminary results of 10 patients show improved compliance with tracheostomy care guidelines, established in 2004, rising to 94%. Average time to decannulation was significantly reduced from 21 to 5 days (P-value = 0.0005, Mann Whitney Wilcoxon Test). The mean total tracheostomy time was reduced from 34 to 24 days although this was not statistically significant (P-value = 0.13, Mann Whitney Wilcoxon Test). CONCLUSIONS: The introduction of regular ENT-led multidisciplinary input for patients with a tracheostomy significantly improved compliance with nursing care standards. There was also a reduction in the total length of time tracheostomy tubes remain in situ, with time to decannulation significantly reduced.

Source: MEDLINE

Full Text:

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32. Safety and complications of percutaneous tracheostomy in a cohort of 800 mixed ICU patients.
Author(s): Diaz-Reganon G, Minambres E, Ruiz A, Gonzalez-Herrera S, Holanda-Pena M, Lopez-Espadas F

Citation: Anaesthesia, November 2008, vol./is. 63/11(1198-203), 0003-2409;1365-2044 (2008 Nov)

Publication Date: November 2008

Abstract: Percutaneous tracheostomy is used primarily to assist weaning from mechanical ventilation in the intensive care unit. We report our experiences of 800 such procedures performed in the intensive care unit by a collaborative team (critical care and ENT specialists). Most procedures (85.6%) were performed by residents supervised by the intensive care unit staff. Complications occurred in 32 patients (4%). Intraprocedural complications occurred in 17 patients (2.1%), early postprocedural complications in six (0.75%), and late postprocedural complications in nine (1.1%). No deaths were directly related to percutaneous tracheostomy. The incidence of complications was greater in percutaneous tracheostomy performed by the residents during their initial five attempts compared to their later attempts (9.2% vs 2.6%, p < 0.05). The low incidence of complications indicates that bedside percutaneous tracheostomy can be performed safely as a routine procedure in daily care of intensive care unit patients.

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Available in print at Pilgrim Hospital Staff Library
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36. The evaluation of physiologic decannulation readiness according to upper airway resistance measurement.

Author(s): Gao C, Zhou L, Wei C, Hoffman MR, Li C, Jiang JJ

Citation: Otolaryngology - Head & Neck Surgery, October 2008, vol./is. 139/4(535-40), 0194-5998;0194-5998 (2008 Oct)

Publication Date: October 2008

Abstract: OBJECTIVE: To measure the upper-airway resistance in patients with tracheostomies and determine the value representing decannulation readiness. SUBJECTS AND METHODS: Fifty-six patients with tracheostomies resultant to laryngeal disease participated in this study. Forty patients met clinical criteria for decannulation; 16 did not. Subglottal pressure was measured with a tube connected to the tracheostomy tube, and airflow was monitored simultaneously using a facemask. Upper-airway resistance measurements were recorded during shallow and deep breathing. RESULTS: During both shallow and deep breathing, the inspiratory and expiratory resistances were significantly higher for the group unsuitable for decannulation (P < .0001). The areas under the receiver operating characteristic curves were 0.938 or greater for the four curves, indicating a high sensitivity and specificity of resistance measures for diagnosis. CONCLUSIONS: Objective measurement of upper-airway resistance during shallow and deep breathing may be a useful parameter in determining decannulation readiness of tracheostomized patients.

Source: MEDLINE

49. An intensivist-led tracheostomy review team is associated with
shorter decannulation time and length of stay: a prospective cohort study.

Author(s): Tobin AE, Santamaria JD

Citation: Critical Care (London, England), 2008, vol./is. 12/2(R48), 1364-8535;1466-609X (2008)

Publication Date: 2008

Abstract: INTRODUCTION: Without specific strategies to address tracheostomy care on the wards, patients discharged from the intensive care unit (ICU) with a tracheostomy may receive suboptimal care. We formed an intensivist-led multidisciplinary team to oversee ward management of such patients. To evaluate the service, we compared outcomes for the first 3 years of the service with those in the year preceding the service. METHODS: Data were prospectively collected over the course of 3 years on ICU patients not under the care of the ear, nose, and throat unit who were discharged to the ward with a tracheostomy and compared with outcomes in the year preceding the introduction of the service. Principal outcomes were decannulation time, length of stay after ICU discharge, and stay of less than 43 days (upper trim point for the disease-related group [DRG] for tracheostomy). Analysis included trend by year and multivariable analysis using a Cox proportional hazards model. P values of less than 0.05 were assumed to indicate statistical significance. As this was a quality assurance project, ethics approval was not required. RESULTS: Two hundred eighty patients were discharged with a tracheostomy over the course of a 4-year period: 41 in 2003, 60 in 2004, 95 in 2005, and 84 in 2006. Mean age was 61.8 (13.1) years, 176 (62.9%) were male, and mean APACHE (Acute Physiology and Chronic Health Evaluation) II score was 20.4 (6.4). Length of stay after ICU decreased over time (30 [13 to 52] versus 19 [10 to 34] days; P < 0.05 for trend), and a higher proportion of decannulated patients were discharged under the upper DRG trim point of 43 days (48% versus 66%; P < 0.05). Time to decannulation after ICU discharge decreased (14 [7 to 31] versus 7 [3 to 17] days; P < 0.01 for trend). Multivariate analysis showed that the hazard for decannulation increased by 24% (3% to 49%) per year. CONCLUSION: An intensivist-led tracheostomy team is associated with shorter decannulation time and length of stay which may result in financial savings for institutions.

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50. Tracheostomy decannulation: marathons and finish lines.

Author(s): Heffner JE

Citation: Critical Care (London, England), 2008, vol./is. 12/2(128), 1364-8535;1466-609X (2008)

Publication Date: 2008

Abstract: Critically ill patients with a tracheostomy who are recovering from respiratory failure eventually require evaluation for airway decannulation. Although expert recommendations guide decisions for managing decannulation, few if any investigative data exist to inform evidence-based care. Consequently, practice variation limits the effectiveness of weaning from tracheostomy. In an investigation reported in this issue of Critical Care, the authors surveyed experienced physicians and respiratory therapists to assess their opinions on managing airway
decannulation and identified several clinical factors that they recommend for selecting patients for tracheostomy tube removal. The authors propose that these factors can assist with designing clinical trials of tracheostomy decannulation. Pending completion of such studies, this report underscores the problem of practice variation in managing tracheotomized patients after critical illness. An important implication of the study is that care providers should recognize our knowledge deficit and develop systematic protocols for improving patient care using quality improvement techniques. Such models exist in the literature for adult patients and for children with tracheostomies who are managed by expert teams with requisite knowledge and skills.

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52. Surface functional electrical stimulation of the abdominal muscles to enhance cough and assist tracheostomy decannulation after high-level spinal cord injury.

Author(s): Lee BB, Boswell-Ruys C, Butler JE, Gandevia SC

Citation: Journal of Spinal Cord Medicine, 2008, vol./is. 31/1(78-82), 1079-0268;1079-0268 (2008)

Publication Date: 2008

Abstract: OBJECTIVE: Evaluation of noninvasive stimulation modalities to augment cough and assist tracheostomy decannulation in high-level tetraplegia. STUDY DESIGN: Single case study. METHODS: A 65-year-old man with C4 ASIA C tetraplegia had delayed rehabilitation due to a tracheostomy and recurrent pneumonia primarily resulting from ineffective cough. Anterior surface electrical stimulation (SES) of the abdominal musculature was conducted to train an effective cough and enable decannulation. Training occurred daily for 4 weeks. The patient was tested 1 year later with posterolateral SES to determine the relative clinical effect of this delivery method. RESULTS: At baseline, the addition of anterior SES increased maximal expiratory pressure (80%), maximal expiratory cough pressure (67%), and peak expiratory flow rate (11%). Three weeks after training began, the patient was decannulated following a program of SES and assisted and voluntary coughing. Upon testing 1 year later, SES with posterolaterally placed electrodes also produced an enhancement of voluntary cough attempts. CONCLUSIONS: Noninvasive SES can potentially assist decannulation of tracheostomies.

Source: MEDLINE

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Available in fulltext at National Library of Medicine

53. Tracheostomy protocol: experience with development and potential utility.

Author(s): Freeman BD, Kennedy C, Robertson TE, Coopersmith CM, Schallom M, Sona C, Cracchiolo L, Schuerer DJ, Boyle WA, Buchman TG

Citation: Critical Care Medicine, June 2008, vol./is. 36/6(1742-8), 0090-3493;1530-0293 (2008 Jun)
Abstract: OBJECTIVES: To examine the feasibility and potential utility of a tracheostomy protocol based on a standardized approach to ventilator weaning.
DESIGN: Prospective, observational data collection. SETTING: Academic medical center. PATIENTS: Surgical intensive care unit patients requiring mechanical ventilatory support. INTERVENTIONS: None. MEASUREMENTS AND MAIN RESULTS: Tracheostomy practice in 200 patients was analyzed in relation to spontaneous breathing trial (SBT) weaning. Decision for, and performance of, tracheostomy occurred (median [interquartile range]) 5.0 (3.75-8.0) and 7.0 (5.0-10.0) days following initiation of mechanical ventilation, respectively. Duration of mechanical ventilation was greater in tracheostomy compared with nontracheostomy patients (15.0 [11.0-19.0] vs. 6.0 [4.0-8.0], p < .001). For patients requiring ventilatory support for > or = 20 days, 100% of patients were maintained via tracheostomy. A protocol based on weaning performance, which included technical considerations, was developed. Individuals who failed preliminary weaning assessment or SBT for 3 successive days following 5 days (nonreintubated patients) or 3 days (reintubated patients) of ventilatory support met tracheostomy criteria. The protocol was implemented on a pilot basis in 125 individuals. Of the 55 (44.0%) patients undergoing tracheostomy, 25 (45.5%) did so consistent with criteria. Eighteen patients (32.7%) underwent tracheostomy before the time interval of data collection targeting weaning protocol performance, and 12 patients (21.8%) passed SBT on one or more occasions, were not extubated, and proceeded to tracheostomy. CONCLUSIONS: A standardized approach in which the decision for tracheostomy is based on objective measures of weaning performance may be a means of using this procedure more consistently and effectively.

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1. 55. Boussignac continuous positive airway pressure for weaning with tracheostomy tubes.

Author(s): Dieperink W, Aarts LP, Rodgers MG, Delwig H, Nijsten MW

Citation: Respiration, 2008, vol./is. 75/4(427-31), 0025-7931;1423-0356 (2008)

Publication Date: 2008

Abstract: BACKGROUND: In patients who are weaned with a tracheostomy tube (TT), continuous positive airway pressure (CPAP) is frequently used. Dedicated CPAP systems or ventilators with bulky tubing are usually applied. However, CPAP can also be effective without a ventilator by the disposable Boussignac CPAP (BCPAP) system that is normally used with face masks. OBJECTIVE: It was the aim of this audit to evaluate the feasibility of low-level BCPAP in patients who were weaned with a TT. METHODS: All patients at our surgical intensive care unit who received a TT to facilitate weaning were considered for application of BCPAP. Once patients had received minimal pressure support from the mechanical ventilator, the BCPAP device was connected to the TT three times a day for 30 min with pressure set to 3-5 cm H(2)O, FiO(2) at 0.4 and with humidification. BCPAP was then gradually extended to 24 h/day. Patient acceptance, complications and outcome were recorded. RESULTS: 58 patients received a TT to facilitate weaning. They had a median stay of 52 days in the intensive care unit during which they had an endotracheal tube for 22 days and a TT for 28 days. 50 of these patients (86%) received BCPAP for a median of 16 days. The lightweight BCPAP system was well tolerated without tube obstructions or accidental decannulations and may have contributed to patient mobility. No patient remained on ventilatory support after hospital discharge. In-hospital and 1-year survival were 86 and 71%, respectively. CONCLUSIONS: BCPAP is a feasible and safe method for weaning tracheostomy
Determinants of tracheostomy decannulation: an international survey.

Author(s): Stelfox HT, Crimi C, Berra L, Noto A, Schmidt U, Bigatello LM, Hess D

Citation: Critical Care (London, England), 2008, vol./is. 12/1(R26), 1364-8535;1466-609X (2008)

Publication Date: 2008

Abstract: BACKGROUND: Although tracheostomy is probably the most common surgical procedure performed on critically ill patients, it is unknown when a tracheostomy tube can be safely removed. METHODS: We performed a cross-sectional survey of physicians and respiratory therapists with expertise in the management of tracheostomized patients at 118 medical centers to characterize contemporary opinions about tracheostomy decannulation practice and to define factors that influence these practices. RESULTS: We surveyed 309 clinicians, of whom 225 responded (73%). Clinicians rated patient level of consciousness, ability to tolerate tracheostomy tube capping, cough effectiveness, and secretions as the most important factors in the decision to decannulate a patient. Decannulation failure was defined as the need to reinsert an artificial airway within 48 hours (45% of respondents) to 96 hours (20% of respondents) of tracheostomy removal, and 2% to 5% was the most frequent recommendation for an acceptable recannulation rate (44% of respondents). In clinical scenarios, clinicians who worked in chronic care facilities (30%) were less likely to recommend decannulation than clinicians who worked in weaning (47%), rehabilitation (53%), or acute care (55%) facilities (p = 0.015). Patients were most likely to be recommended for decannulation if they were alert and interactive (odds ratio [OR] 4.76, 95% confidence interval [CI] 3.27 to 6.90; p < 0.001), had a strong cough (OR 3.84, 95% CI 2.66 to 5.54; p < 0.001), had scant thin secretions (OR 2.23, 95% CI 1.56 to 3.19; p < 0.001), and required minimal supplemental oxygen (OR 2.04, 95% CI 1.45 to 2.86; p < 0.001). CONCLUSION: Patient level of consciousness, cough effectiveness, secretions, and oxygenation are important determinants of clinicians' tracheostomy decannulation opinions. Most surveyed clinicians defined decannulation failure as the need to reinsert an artificial airway within 48 to 96 hours of planned tracheostomy removal.

2. Tracheostomy decannulation: implication on respiratory mechanics.

Author(s): Dellweg D, Barchfeld T, Haidl P, Appelhans P, Kohler D

Citation: Head & Neck, December 2007, vol./is. 29/12(1121-7), 1043-3074;1043-3074 (2007 Dec)
**Abstract:** BACKGROUND: Tracheostomy decreases airway resistance and work of breathing. No comprehensive data are available on respiratory mechanics after tracheostomy decannulation. We evaluated respiratory mechanics after decannulation. METHODS: Twenty-five patients with tracheostomy were included. Measurement of arterial blood gases, air-flow, and esophageal pressure during spontaneous breathing were evaluated. RESULTS: Overall arterial blood gas parameters as well as flow and pressure measurements including work of breathing and airway resistance were not affected by the intervention. Inspiratory time fraction increased from 40.0 + or - 0.04 to 43% + or - 0.05% (p = .007). We observed marked individual differences. Postdecannulation change in work of breathing is best predicted by change in airway resistance (R = 0.869, R(2) = 0.755, p < .0001) CONCLUSION: Inspiratory time increased after decannulation, and arterial blood gas levels and respiratory mechanics did not change for the whole cohort. Individual changes in work of breathing are considerable and correlate closely to changes in airway resistance.

**Source:** MEDLINE

**Full Text:**
Available in fulltext at EBSCO Host

68. **What about the trach? Tracheotomy removal as a palliative care maneuver.**

**Author(s):** Newman AJ 3rd, Kvale EA, Williams BR, Bailey FA

**Citation:** American Journal of Hospice & Palliative Medicine, October 2007, vol./is. 24/5(371-5), 1049-9091;1049-9091 (2007 Oct-Nov)

**Publication Date:** October 2007

**Abstract:** Tracheotomy is performed on patients with airway obstruction or prolonged mechanical ventilation. Tracheotomy patients are increasingly being referred to hospice and palliative care. This case series describes a process for evaluating the ongoing need for tracheotomy and the impact of tracheotomy removal. A retrospective cohort design was used in which charts were reviewed of all tracheotomy patients referred to the palliative care unit between November 1, 1998, and July 31, 2001. Tracheotomy was present in 13 of 791 palliative care unit admissions. Persistent airway obstruction contraindicated tracheotomy removal in 5 patients. The remaining patients had a successful "button" trial with subsequent tracheotomy removal. They incurred no complications and exhibited improved functional status and decreased symptom burden. Tracheotomy removal is safe and beneficial in this patient subset and should be considered an alternative to prolonged tracheotomy.

**Source:** MEDLINE

3. **Dysphagic patients with tracheotomies: a multidisciplinary approach to treatment and decannulation management.**

**Author(s):** Frank U, Mader M, Sticher H

**Citation:** Dysphagia, January 2007, vol./is. 22/1(20-9), 0179-051X;0179-051X (2007 Jan)

**Publication Date:** January 2007

**Abstract:** In 2000 a multidisciplinary protocol for weaning dysphagic patients from the tracheotomy tube and a decannulation decision chart created according to principles of the F.O.T.T.((R)) Concept (Face and Oral Tract Therapy) were
introduced in the Swiss Neurological Rehabilitation Centre REHAB in Basel. In the present study we introduce these guidelines and present an evaluation of the treatment and decannulation procedure. We retrospectively compared data from patients before and after introduction of the multidisciplinary procedure with regard to mean cannulation times and success of decannulation. Furthermore, we analyzed the rehabilitation progress of the group who underwent multidisciplinary treatment as well as the participation of the speech language therapist. The results show that the treatment introduced to improve swallowing functions and wean patients from the tracheotomy tube led to a fast and safe decannulation of our patients. The mean length of cannulation time was reduced significantly. After decannulation the patients showed clear functional improvements. Interdisciplinary treatment using the approach discussed in this study can be considered efficient and an important basis for further functional progress in the rehabilitation process.

Source: MEDLINE

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92. Stenting allows weaning and extubation in ventilator- or tracheostomy dependency secondary to benign airway disease.

Author(s): Noppen M, Stratakos G, Amjadi K, De Weerdt S, D'Haese J, Meysman M, Vincken W

Citation: Respiratory Medicine, January 2007, vol./is. 101/1(139-45), 0954-6111;0954-6111 (2007 Jan)

Publication Date: January 2007

Abstract: Central airway obstruction can cause severe respiratory insufficiency leading to mechanical ventilation (MV) or artificial airway (AA) dependency. Interventional bronchoscopic procedures have been reported to be of help in weaning patients with malignant airway stenoses from mechanical ventilation, whereas their use in benign disease is only anecdotal. The objectives of this study are to evaluate early, intermediate and long-term outcome of interventional bronchoscopy and stent placement in the treatment of MV/AA dependency due to benign airway obstruction. In a retrospective cohort analysis for the period 1999-2004, we evaluated 15 consecutive ICU patients with documented benign central airway obstruction, who were referred for bronchoscopic management of their condition after multiple failed attempts at weaning from MV or decannulation of the AA. Indications for bronchoscopic treatment were surgery refusal, medical or surgical inoperability, or absence of alternative treatment options. Malacia, post-intubation stenosis and goiter were the main causes of airway obstruction and MV/AA dependency. All patients were treated by means of rigid bronchoscopy, dilatation procedures and stent insertion. All but one patient (93.3%) were successfully and permanently extubated/decanulated immediately after the bronchoscopy. Minor complications occurred in 6 patients (40%) leading to a second intervention. All complications could be managed endoscopically and long-term follow up was uneventful. Interventional bronchoscopy with stent insertion can allow successful withdrawal from MV/AA and can offer longstanding airway patency in selected ventilator- or tracheostomy-dependant individuals with benign airway stenoses, when surgery in not feasible or contra-indicated.

Source: MEDLINE

96. Locally developed guidelines reduce immediate complications from percutaneous dilatational tracheostomy using the Ciaglia Blue Rhino technique: a report on 200 procedures.

Ciaglia Blue Rhino percutaneous dilatational tracheostomy is used as an aid to ventilatory weaning. It carries an immediate complication rate previously reported in 100 consecutive patients by Fikkers et al at 6% for "major" complications and 30% for "minor" complications. Mortality has been associated with the procedure. Our institution has performed dilatational percutaneous tracheostomy since 1998 and used the Blue Rhino technique since 2002. Consensus guidelines were developed following initial experiences. They focus on preoperative risk assessment including levels of ventilatory support and anatomical considerations, seniority of staff use of bronchoscopy and capnography and correction of coagulopathies. Following introduction of the guidelines we conducted an audit of the first 200 Ciaglia Blue Rhino tracheostomies performed. There was an immediate major complication rate of 3% and minor complication rate of 18%. No deaths occurred within 24 hours of the procedure. We conclude that applying our consensus guidelines produced an immediate complication rate for Ciaglia Blue Rhino percutaneous dilatational tracheostomy below published audits.

OBJECTIVE: To determine the time to wean from mechanical ventilation and time spent off the ventilator per day after tracheotomy in critically ill patients in a 28-bed mixed medical and surgical intensive care unit (ICU) in Amsterdam, Netherlands. METHODS: We conducted a retrospective analysis of consecutive patients during the 14-month period from November 1, 2003, through January 1, 2005. Included were translaryngeally intubated mechanically ventilated patients who received a tracheotomy during their ICU stay. RESULTS: Of all the patients admitted to the ICU, 129 (7%) received a tracheotomy. Significantly more tracheotomies were performed in neurosurgery/neurology patients and in those admitted for acute conditions (16% and 12%, respectively). Tracheotomy was performed a median 8 days (interquartile range 4-13 d) after ICU admission. For all the patients, the median time to wean after tracheotomy was 5 days (interquartile range 2-11 d). Neurosurgery/neurology patients and patients in the cardiology subgroup needed significantly less time to wean from mechanical ventilation than did patients in other subgroups (3 d, interquartile range 2-7 d, and 3 d, interquartile range 2-5 d, respectively, p < 0.05). There was a significant association between admission group and neurological status at the time of tracheotomy. A low Glasgow coma scale score was associated with shorter time to wean. Within 1 week after tracheotomy, the probability of the patient having breathed spontaneously, without ventilator assistance, for > 4 h/d was 89%, 78% for > 8 h/d, and 72% for > 12 h/d. By day 28, the probability of the patient having breathed spontaneously for > 4 h/d was 98%, 97% for > 8 h/d, and 94% for > 12 h/d. CONCLUSION: Time to wean from after tracheotomy differed among the subgroups in our ICU. After tracheotomy, the majority of patients were quickly able
to breathe spontaneously without assistance of the mechanical ventilator for several hours per day. Patients who require tracheotomy only for airway protection wean sooner than other patients.

Source: MEDLINE

4. 98. **Intrapulmonary percussive ventilation in tracheostomized patients: a randomized controlled trial.**

**Author(s):** Clini EM, Antoni FD, Vitacca M, Crisafulli E, Paneroni M, Chezzi-Silva S, Moretti M, Trianni L, Fabbri LM

**Citation:** Intensive Care Medicine, December 2006, vol./is. 32/12(1994-2001), 0342-4642;0342-4642 (2006 Dec)

**Publication Date:** December 2006

**Abstract:** OBJECTIVE: To investigate whether the addition of intrapulmonary percussive ventilation to the usual chest physiotherapy improves gas exchange and lung mechanics in tracheostomized patients. DESIGN AND SETTING: Randomized multicenter trial in two weaning centers in northern Italy. PATIENTS AND PARTICIPANTS: 46 tracheostomized patients (age 70 +/- 7 years, 28 men, arterial blood pH 7.436 +/- 0.06, PaO(2)/FIO(2) 238 +/- 46) weaned from mechanical ventilation. INTERVENTIONS: Patients were assigned to two treatment groups performing chest physiotherapy (control), or percussive ventilation (IMP2 Breas, Sweden) 10 min twice/day in addition to chest physiotherapy (intervention). MEASUREMENTS AND RESULTS: Arterial blood gases, PaO(2)/FIO(2) ratio, and maximal expiratory pressure were assessed every 5th day for 15 day. Treatment complications that showed up in 1 month of follow-up were recorded. At 15 days the intervention group had a significantly better PaO(2)/FIO(2) ratio and higher maximal expiratory pressure; after follow-up this group also had a lower incidence of pneumonia. CONCLUSIONS: The addition of percussive ventilation to the usual chest physiotherapy regimen in tracheostomized patients improves gas exchange and expiratory muscle performance and reduces the incidence of pneumonia.

Source: MEDLINE

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Available in print at Lincoln County Hospital Professional Library

102. **Repositioning a displaced tracheostomy tube with an Aintree intubation catheter mounted on a fibre-optic bronchoscope.**

**Author(s):** Rajendram R, McGuire N

**Citation:** British Journal of Anaesthesia, October 2006, vol./is. 97/4(576-9), 0007-0912;0007-0912 (2006 Oct)

**Publication Date:** October 2006

**Abstract:** Although tracheostomy tube displacement is uncommon, the management is often difficult and the associated mortality is high. It is important to ensure that the airway is secure and then either replace or reposition the tracheostomy tube. This case report describes the use of an Aintree intubation catheter (C-CAE-19.0-56-AIC, William Cook Europe, Denmark) mounted on an intubating fibre-optic bronchoscope (11302BD1, Karl Storz Endoskope, Germany) to reposition a partially displaced tracheostomy tube.

Source: MEDLINE

Full Text:
105. A double-blind placebo-controlled randomised pilot study of nocturnal melatonin in tracheostomised patients.

Author(s): Ibrahim MG, Bellomo R, Hart GK, Norman TR, Goldsmith D, Bates S, Egi M

Citation: Critical Care & Resuscitation, September 2006, vol./is. 8/3(187-91), 1441-2772;1441-2772 (2006 Sep)

Publication Date: September 2006

Abstract: BACKGROUND AND AIM: Patients in the intensive care unit often suffer from lack of sleep at night. We hypothesised that nocturnal melatonin may increase observed nocturnal sleep in tracheostomised patients. DESIGN: Double-blind, randomised, placebo-controlled pilot study. SETTING: ICU of a tertiary hospital. PARTICIPANTS: Thirty-two ICU patients with tracheostomy who were not receiving continuous sedation. METHODS: We administered either oral melatonin (3mg) or placebo at 20:00. We collected pre- and post-dosage blood samples on Days 1 and 3 to confirm drug delivery. Primary outcome measure was number of hours of observed sleep at night, assessed by the bedside nurse. Secondary outcome measures included comparison of the incidence of agitation, assessed by score on the Riker Sedation-Agitation Scale, and requirement for sedatives or haloperidol to settle agitation. RESULTS: Pre-treatment melatonin levels in the two groups were similarly low: 4.8 pg/mL (95% CI, 2.4-7.5) for melatonin versus 2.4 (95% CI, 1.6-3.2) for placebo (P=0.13). Post-treatment, melatonin levels increased significantly in the melatonin group compared with the placebo group (3543 pg/mL versus 3 pg/mL; P<0.0001). However, subsequent observed nocturnal sleep was similar in the two groups: 240 minutes (range, 75-331.3) for melatonin v 243.4 minutes (range, 0-344.1) for placebo (P=0.98). Observed diurnal sleep was also similar: 138.7 minutes (range, 50-230) with melatonin v 104 minutes (range, 0-485) for placebo (P=0.42). The incidence of agitation was non-significantly higher in the melatonin group (31% v 7%; P=0.11), while the requirement for extra sedation or use of haloperidol was slightly higher in the placebo group (57% versus 46%; P=0.56). CONCLUSION: Melatonin is well absorbed, and a standard dose increases blood levels approximately 1000-fold. However, in this pilot assessment, these high levels failed to increase observed nocturnal sleep or induce other observable benefits in tracheostomised ICU patients.

Source: MEDLINE

106. Physiological responses during a T-piece weaning trial with a deflated tube.

Author(s): Ceriana P, Carlucci A, Navalesi P, Prinianakis G, Fanfulla F, Delmastro M, Nava S

Citation: Intensive Care Medicine, September 2006, vol./is. 32/9(1399-403), 0342-4642;0342-4642 (2006 Sep)

Publication Date: September 2006

Abstract: RATIONALE: T-piece trials and spontaneous breathing trials through the tracheostomy tube are often used as weaning techniques. They are usually performed with the cuff inflated, which may increase the inspiratory load and/or influence the tidal volume generated by the patient. We assessed diaphragmatic effort during T-piece trials with or without cuff inflation. SETTINGS: Respiratory intensive care unit METHODS: We measured breathing pattern, transdiaphragmatic pressure (Pdi), the pressure-time product of the diaphragm, per minute (PTPdi/min) and per breath (PTPdi/b), and lung mechanics (lung
compliance and resistance) in 13 tracheotomized patients ready for a weaning trial. V(T) was recorded with respiratory inductive plethysmography (RIP-V(T)) or pneumotachography PT-V(T)). Patients completed two T-piece trials of 30[Symbol: see text]min each with or without the cuff inflated. RESULTS: RIP-V(T) and PT-V(T) values were similar with the cuff inflated, but PT-V(T) significantly underestimated RIP-V(T) when the cuff was deflated, and therefore the RIP-V(T) was chosen as the reference method. The RIP-V(T) was significantly greater and the Pdi and PTPdi/min significantly lower when the cuff was deflated than when it was inflated. The efficiency of the diaphragm, calculated by the ratio of PTPdi/b over RIP-V(T), was also improved, while no changes were observed in lung mechanics. CONCLUSIONS: Diaphragmatic effort is significantly lower during a T-piece trial with a deflated cuff than when the cuff is inflated, while RIP-V(T) is higher, so that the diaphragm’s efficiency in generating tidal volume is also improved.

Source: MEDLINE

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112. Ventilator weaning using a fenestrated tracheostomy tube with a speaking valve.

Author(s): Fukumoto M, Ota H, Arima H

Citation: Critical Care & Resuscitation, June 2006, vol./is. 8/2(117-9), 1441-2772;1441-2772 (2006 Jun)

Publication Date: June 2006

Abstract: We describe two patients with tracheostomies who showed difficulty in weaning from mechanical ventilation, but were eventually weaned after use of a fenestrated tracheostomy tube with a speaking valve. The first patient underwent mechanical ventilation after pulmonary bleeding, while the second needed ventilator support because of tracheomalacia. Both patients needed only slight ventilator support but developed respiratory distress when it was discontinued. When the standard tracheostomy tube was replaced by a fenestrated tracheostomy tube with a speaking valve, each patient was easily weaned from mechanical ventilation. With a valved tube, vocal cords can exert part of their original function during expiration. The valved tube allowed the first patient to control breath-holding, and the second to avoid tracheal collapse. Regaining vocal cord function improved their pulmonary mechanics, which was demonstrated by dramatic improvement of findings on chest x-ray and computed tomography. A fenestrated tracheostomy tube is usually used to improve daily activities of patients with tracheostomies, but might be worth trying for difficult ventilator weaning.

Source: MEDLINE


Author(s): Chiu CT, Chung YH, Lu HI, Lin MC

Citation: Chang Gung Medical Journal, December 2005, vol./is. 28/12(829-36), 2072-0939;2072-0939 (2005 Dec)

Publication Date: December 2005

Abstract: BACKGROUND: This is a prospective study of peri-procedure and post-procedure complications and successful weaning of long-term mechanically-ventilated patients following video bronchoscopy-guided percutaneous dilatational
tracheostomy (PDT). METHODS: Video bronchoscopy guided PDT was performed for long-term mechanically-ventilated patients in a medical intensive care unit (ICU). Peri-procedure and post-procedure complications were prospectively observed and evaluated. The success of weaning and the factors affecting the outcomes of these patients after PDT were also investigated. RESULTS: A total of 107 patients with mechanical ventilation were enrolled. The average duration of translaryngeal intubation was 27.8 +/- 18.4 days which was longer than reported in previous studies. There were 70 men and 37 women, all of whom underwent bedside PDT at a medical ICU. The complication rates during and post-procedure were 8.4% and 14%, respectively. The most common complications were desaturation during the procedure and bleeding during the follow-up period. Only one death was procedure related (0.9%). After PDT, 50 patients (46.7%) were successfully weaned from mechanical ventilation. The rate of successful weaning (p = 0.02) increased while the days to achievement (p < 0.001) decreased with decreasing duration of translaryngeal intubation. Gender, age, body weight, Acute Physiology and Chronic Health Evaluation II (APACHE II) score, duration of procedure, endotracheal tube diameter and position, and history of self-extubation were not related to successful weaning. CONCLUSIONS: PDT is a bedside procedure with relatively low complication and mortality rates when performed for patients on long-term mechanical ventilation in a medical ICU. The previous duration of translaryngeal intubation was an important determinant for successful weaning after PDT.

Source: MEDLINE
All patients for whom decannulation is considered should ..... patients can achieve voice (phonation) unless the structures involved in ... deflating the cuff, the effect of the tracheostomy on swallowing may be reduced. ..... Ill patients using a trach care closed suction system versus an open-suction system: ...
www.nhshealthquality.org/files/TRACHEOREV_BPS_MAR07.pdf - Similar

THE NURSING CARE AND MANAGEMENT OF ADULTS WITH TRACHEOSTOMIES

6.1 Before a patient with a tracheostomy is admitted to the ward or as soon ..... 16.3 All phonation valves require the tracheostomy cuff to be deflated. ... 17.11 The stoma will shrink rapidly following decannulation and usually closes off ... resuscitation is usually useless. Nose and mouth should be occluded to ...
www.ruh.nhs.uk/about/.../Blue_736_Trachetomies_in_Adults.pdf - Similar

CARE OF A PATIENT WITH A TRACHEOSTOMY

The only indication for an emergency tracheostomy is an obvious .... 3. a bed capable of tipping and suitable for resuscitation .... tube may aid both phonation and weaning (by facilitating the flow of air both ... Most patients can wean to decannulation by simply deflating the existing cuff (even though the ...
www.ics.ac.uk/.../care_of_the_adult_patient_with_a_temporary_tracheostomy_2008

MedCastle - Tracheostomy

The traditional semantic difference between tracheostomy and tracheotomy is ... Old Testament: Elijah performed mouth-to-mouth resuscitation on a child ..... In patients of average habitus, a #6 Shiley cuffed tracheostomy tube ... Plugging: In preparation for decannulation, the tracheostomy tube may be plugged. ...
www.medcastle.com/?p=5187 - Cached

10 D TRACHEOSTOMY MANAGEMENT

The size of the replacement tracheostomy tubes will be determined on arrival of the ... If a tracheostomy tube is in situ expired air resuscitation is delivered ... Mallinckrodt TracheSoft Evac: A tube with a suction port above the cuff ..... Decannulation is the term used to refer to the weaning process adopted ...

Tracheostomy

INDICATIONS FOR TRACHEOTOMY Current indications for tracheotomy are: ... the larynx when the external end of the tracheostomy tube is occluded transiently. ... Patients can be evaluated for decannulation after they demonstrate ..... Deflating the tracheostomy cuff and capping the tube. WEANING FROM TRACHEOTOMY ...
www.slideshare.net/shabeelpn/tracheostomy-3612075 - United States - Cached

Decannulation in children after long-term tracheostomy. ... 2008). It is important to realize that inflation of the cuff does not prevent aspiration. ... 76 Tracheostomies Portex Blue Line Trach Talk Structure: Cuffed. .... if the patient's tracheostomy is occluded during and immediately after the swallow. Downs. ...
www.scribd.com/doc/33540221/Tracheostomies - Cached
... of an exercise program with newly tracheostomized patients, and awareness during resuscitation from cardiac ... for his bronchoscopic images of a percutaneous dilatational tracheotomy (in chapter 2) ... When not actively swallowing (eg, the unconscious patient), the larynx rests ...

Respiration and Pulmonary Rehabilitation

... of the epiglottis, located at the entrance to the larynx, protects the airway from aspiration during swallowing and allows ... Health Patterns: Systems Functions taught to use these muscles to increase vital capacity and assist with phonation (Frownfelter & Dean, 2006). ...