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### Literature search results

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### Search details

Tracheostomy management in acute care (adults) 2012-2014

### Resources searched

NHS Evidence; TRIP Database; Cochrane Library; CINAHL; MEDLINE

**Database search terms:** (tracheostom* OR tracheotom*)

**Evidence search string(s):** tracheostomy OR tracheotomy

### Guidelines and Policy

**Intensive Care Society**

Standards for capnography in critical care, 2013

**NICE**

IPG462 Translaryngeal tracheostomy: guidance, 2013

MTG14 Ambu aScope2 for use in unexpected difficult airways: guidance, 2013

### Evidence-based reviews

**Cochrane Database of Systematic Reviews**

Automated weaning and spontaneous breathing trial systems versus non-automated weaning strategies for discontinuation time in invasively ventilated postoperative adults, 2014

Noninvasive positive-pressure ventilation as a weaning strategy for intubated adults with respiratory failure, 2013

Early versus late tracheostomy for critically ill patients, 2012
Published research – Databases

The UK National Tracheostomy Safety Project and the role of speech and language therapists.

**Author(s)** McGrath BA, Wallace S

**Citation:** Current Opinion in Otolaryngology & Head & Neck Surgery, June 2014, vol./is. 22/3(181-7), 1068-9508;1531-6998 (2014 Jun)

**Publication Date:** June 2014

**Abstract:** PURPOSE OF REVIEW: Tracheostomy care is evolving, with the majority of procedures now performed percutaneously to facilitate weaning from mechanical ventilation in the critically ill. Traditional surgical indications remain, but surgical tracheostomies are increasingly performed in more complex patients and procedures. This brings unique challenges for the multidisciplinary professional team in which speech and language therapists (SLTs) have a key role.RECENT FINDINGS: Reviews of tracheostomy-related critical incidents have identified recurrent themes associated with adverse outcomes for this high-risk population. Recent research has highlighted the impact of tracheostomy on communication and swallowing, along with the contribution of SLTs to the multidisciplinary professional team, prompting new guidance for SLTs. The UK National Tracheostomy Safety Project has developed educational and practical resources that have been shown to improve care. Similar approaches from around the world led to the newly formed Global Tracheostomy Collaborative.SUMMARY: Patients with tracheostomies can benefit from a coordinated, truly multidisciplinary approach to care. SLT-specific expertise in assessing and managing communication and swallowing needs is a vital part of this process.

Source: Medline

Predictors of clinical outcome after tracheotomy in critically ill obese patients.

**Author(s)** Byrd JK, Ranasinghe VJ, Day KE, Wolf BJ, Lentsch EJ

**Citation:** Laryngoscope, May 2014, vol./is. 124/5(1118-22), 0023-852X;1531-4995 (2014 May)

**Publication Date:** May 2014

**Abstract:** OBJECTIVES/HYPOTHESIS: To identify patient factors associated with outcomes in critically ill obese patients requiring tracheotomy.STUDY DESIGN: Single-institution, retrospective cohort study.METHODS: Charts were reviewed for inpatients admitted to an intensive care unit from 2007 to 2010 with International Classification of Diseases, 9th Revision codes of obesity or morbid obesity and tracheotomy. Variables collected in the dataset include subject age, ethnicity, gender, body mass index, tracheotomy type, patient outcome, chief diagnosis, and medical comorbid conditions. The primary outcomes of interest were tracheotomy type and patient outcome at the time of hospital discharge. Logistic regression models were developed for the probability of each patient outcome using univariate and multivariate models.RESULTS: One hundred two patients met inclusion criteria. The most common outcome was tracheostomy dependence (49%). Increased mortality was independently significantly associated with pulmonary hypertension (P=.019) and African American ethnicity (P=.045). Increased tracheostomy dependence was significantly associated with obstructive sleep apnea (P=.030). Increased decannulation was significantly associated with percutaneous tracheotomy (P=.016) and Caucasian ethnicity (P<.001).CONCLUSIONS: Obese patients in the intensive care unit who undergo tracheotomy have a high likelihood of remaining tracheostomy dependent at the time of discharge from the hospital. The factors most commonly found to be significantly associated with poor outcomes were open tracheotomy, African American ethnicity, obstructive sleep apnea, and pulmonary hypertension.LEVEL OF EVIDENCE: 4 Laryngoscope, 124:1118-1122, 2014. 2014 The American Laryngological, Rhinological and Otological Society, Inc.

Source: Medline

A frailty index identifies patients at high risk of mortality after tracheostomy.

**Author(s)** Johnson MS, Bailey TL, Schmid KK, Lydiatt WM, Johanning JM

**Citation:** Otolaryngology - Head & Neck Surgery, April 2014, vol./is. 150/4(568-73), 0194-5998;1097-6817 (2014 Apr)

**Publication Date:** April 2014

**Abstract:** OBJECTIVE: To evaluate the utility of a modified frailty index as an indicator of postoperative mortality in patients undergoing tracheostomy.STUDY DESIGN: Case series
with chart review. SETTING: Tertiary care veterans hospital. SUBJECTS AND METHODS: A chart review was conducted of consecutive tracheostomies performed between April 2007 and September 2012. A modified frailty index consisting of 11 items based on the Revised Minimum Data Set Mortality Rating Index (MMRI-R) was retrospectively applied using the patient's status immediately prior to tracheostomy. The resultant 6-month calculated mortality risk was compared with both the Veterans Health Administration Surgical Quality Improvement Program's (VASQIP) 30-day calculated mortality and actual mortality. RESULTS: One hundred consecutive tracheostomies were analyzed. No patients were excluded. Sixty-nine patients died within the study period, with 1-, 6-, and 12-month mortality rates of 25%, 43%, and 59%, respectively. The average calculated 6-month mortality risk using the modified frailty index was 40.5% for nonsurvivors compared with 25.4% for survivors (P = .001). Both the VASQIP calculator and modified frailty index differentiated mortality risks between patients without head and neck cancer who survived less than 6 months versus those who survived longer than 6 months (P = .006 and .01). However, neither the VASQIP nor the modified frailty index differentiated mortality risks for head and neck cancer patients who survived less than 6 months versus greater than 6 months (P = .94 and .26). CONCLUSION: A modified frailty index identifies patients without head and neck cancer at high risk of postoperative mortality after tracheostomy.

Source: Medline

Essential principles: tracheostomy care in the adult patient.

Author(s) Dawson D
Citation: Nursing in Critical Care, March 2014, vol./is. 19/2(63-72), 1362-1017;1478-5153 (2014 Mar)
Publication Date: March 2014
Abstract: AIM: This article aims to guide the nurse caring for a tracheostomy patient, following the main principles of nursing care. BACKGROUND: Tracheostomy is a surgical procedure to create an opening in the anterior wall of the trachea. Owing to improvement in technological support, the number of adult patients receiving a tracheostomy has increased. This requires the critical care nurse to have an understanding of the essential principles of care for a patient with a tracheostomy tube in situ. DESIGN AND METHOD: Literature search was conducted in Medline and CinaHL using the search terms tracheostomy OR tracheotomy AND procedure/nursing care/experience limited to English language and adult. Owing to the lack of empirical research on the care of patients with tracheostomy, evidence is limited and therefore expert consensus is utilized in much of the article. RESULTS: This article considers the indications for a tracheostomy, identifies the component parts of a tracheostomy tube, discusses 12 essential principles of care for a patient with a tracheostomy tube in situ, and finally briefly describes the nurse's role in an emergency and when discharging a patient with a tracheostomy tube to a ward. CONCLUSION: Performing a tracheostomy has an enormous impact on patients and their care. RELEVANCE TO CLINICAL PRACTICE: Nurses caring for patients with tracheostomy require an appreciation of the breadth of knowledge needed to provide individual and safe care. It is also important to appreciate the lack of empirical evidence on which to base that care. 2014 British Association of Critical Care Nurses.
Source: Medline

Percutaneous tracheostomy at the bedside: 13 tips for improving safety and success.

Author(s) Maxwell BG, Ganaway T, Lighthall GK
Citation: Journal of Intensive Care Medicine, March 2014, vol./is. 29/2(110-5), 0885-0666;1525-1489 (2014 Mar-Apr)
Publication Date: March 2014
Abstract: We have developed a set of routines and practices in the course of performing a large series (n = 70) of percutaneous dilational tracheostomy (PDT). The 13 tips discussed in this review fall into 4 categories. System factors that facilitate training, patient safety, and avoidance of crises including the use of appropriate personnel, importance of timing, use of premedication, and the utility and content of a preprocedure briefing. Suggestions to prevent loss of the airway include tips on airway assessment, preparation of airway equipment, and use of exchange catheter techniques. Strategies to avoid and manage both microvascular and large-vessel bleeding are discussed. We also discuss the management of common postprocedure problems including tracheostomy tube obstruction, malposition requiring tube exchange or replacement, and air leak. The practical considerations for successful execution of PDT involve common sense, thorough planning, and structured approaches to prevent adverse effects if the procedure does not go as smoothly as
expected. These strategies will aid anesthesiologists and intensivists in improving their comfort level, safety, and competence in performing this beside procedure.

Source: Medline

The importance of tracheostomy progression in the intensive care unit.

Author(s) Morris LL, McIntosh E, Whitmer A
Citation: Critical Care Nurse, February 2014, vol./is. 34/1(40-8; quiz 50), 0279-5442;1940-8250 (2014 Feb)
Publication Date: February 2014
Abstract: A plan to progress a tracheostomy toward decannulation should be initiated unless the tracheostomy has been placed for irreversible conditions. In most cases, tracheostomy progression can begin once a patient is free from ventilator dependence. Progression often begins with cuff deflation, which frequently results in the patient's ability to phonate. A systematic approach to tracheostomy progression involves assessing (1) hemodynamic stability, (2) whether the patient has been free from ventilator support for at least 24 hours, (3) swallowing, cough strength, and aspiration risk, (4) management of secretions, and (5) toleration of cuff deflation, followed by (6) changing to a cuffless tube, (7) capping trials, (8) functional decannulation trials, (9) measuring cough strength, and (10) decannulation. Critical care nurses can facilitate the process and avoid unnecessary delays and complications.

Source: Medline
Available in fulltext from Critical Care Nurse at EBSCOhost

Bedside Percutaneous Tracheostomy versus Open Surgical Tracheostomy in Non-ICU Patients.

Citation: Critical Care Research & Practice, 2014, vol./is. 2014/(156814), 2090-1305;2090-1305 (2014)
Publication Date: 2014
Abstract: Percutaneous bedside tracheostomy (PBT) is one of the common and safe procedures in intensive care units through the world. In the present paper we published our clinical experience with a performance of PBTs in the regular ward by intensive care physicians' team. We found it safe and similar outcome in comparison to open surgical tracheostomy method in operation room by ENT team. The performance of PBT in the regular ward showed potential economic advantages in saving medical staff and operating room resources.

Source: Medline
Available in fulltext from Critical Care Research and Practice at Directory of Open Access Journals
Available in fulltext from Critical Care Research and Practice at National Library of Medicine

UK survey of clinical consistency in tracheostomy management.

Author(s) McGowan SL, Ward EC, Wall LR, Shellshear LR, Spurgin AL
Citation: International Journal of Language & Communication Disorders, January 2014, vol./is. 49/1(127-38), 1368-2822;1460-6984 (2014 Jan-Feb)
Publication Date: January 2014
Abstract: BACKGROUND: Many speech and language therapists (SLTs) work with patients who have a tracheostomy. There is limited information about their working practices and the extent to which recent publications and research have influenced the speech and language therapy management of the tracheostomized patient. AIMS: This study reviews the current patterns of clinical practice for SLTs in the management of adult tracheostomized patients in the UK. METHODS & PROCEDURES: An online questionnaire was completed by 106 SLTs with prior experience in tracheostomy management. The information from this was explored to determine patterns of practice across various areas of speech and language therapy tracheostomy management including clinical roles and responsibilities, management of communication disorders, and assessment and management of dysphagia and decannulation. These clinical patterns were then examined with respect to the current literature, emerging patterns in evidence-based practice and national practice guidelines. OUTCOMES & RESULTS: The results indicate a moderate to high level of clinical consistency in the majority of areas evaluated across the scope of tracheostomy management in speech and language therapy. Consistency in practice areas
such as increased utilization of instrumental assessments and conservative use of the Modified Evans Blue Dye Test indicate clinical application in line with current research. Limited clinical consensus or inconsistencies in evidence-based services were identified in aspects of practice that are supported by conflicting or emerging research evidence. Such areas include involvement in cuff deflation regimes, adoption of specific decannulation procedures and participation in multidisciplinary team management. CONCLUSIONS & IMPLICATIONS: SLTs in the UK provide a moderate to high level of consistent practice in tracheostomy management. This study identifies areas of tracheostomy management that require further research in order to establish clinical practice guidelines and to address discrepancies between research evidence and clinical implementation. 2013 Royal College of Speech and Language Therapists.

Source: Medline

Relative contraindications for percutaneous tracheostomy: from the surgeons’ perspective.
Author(s) Huang CS, Chen PT, Cheng SH, Chen CK, Hsu PK, Hsieh CC, Shih CC, Hsu WH
Citation: Surgery Today, January 2014, vol./is. 44/1(107-14), 0941-1291;1436-2813 (2014 Jan)
Publication Date: January 2014
Abstract: PURPOSE: Percutaneous tracheostomy (PT) has gained worldwide acceptance as a bedside procedure by intensivists, but its popularity has declined based on reports of some relative contraindications. The aim of this study was to ascertain the perioperative comorbidities of PT when it is performed by surgeons with experience performing standard tracheostomy. METHODS: Prospective data were collected and analyzed for consecutive PTs performed in intensive care units. RESULTS: No procedure-related mortality occurred in the present study. No significant differences in perioperative comorbidities, such as transient hemodynamic instability and postoperative wound infection, were noted between the relative contraindication (RC) and normal condition (NC) groups. Otherwise, instrument failure (5 cases, p = 0.052) and procedure failure (2 cases, p = 0.222) occurred in the RC group, but not in the NC group. Two patients in the NC group and one patient in the RC group needed to undergo a reoperation to check for bleeding. In a subgroup analysis, more bleeding events were noted for the patients with coagulopathy (p = 0.057), and premature extubation of the endotracheal tube/instrument failure (p = 0.073) was more common in the patients with neck anatomical difficulty in the RC group. CONCLUSIONS: For patients with relative contraindications, the potential of using PT should be determined on an individual basis. Special attention should be paid to the possibility of instrument failure and bleeding events for the patients with relative contraindications for PT.
Source: Medline

Effect of tracheostomy timing on clinical outcome in neurosurgical patients: early versus late tracheostomy.
Author(s) Jeon YT, Hwang JW, Lim YJ, Lee SY, Woo KI, Park HP
Citation: Journal of Neurosurgical Anesthesiology, January 2014, vol./is. 26/1(22-6), 0898-4921;1537-1921 (2014 Jan)
Publication Date: January 2014
Abstract: BACKGROUND: The optimal timing of tracheostomy in neurosurgical patients is not well established. This retrospective study was conducted to determine the effect of the timing of tracheostomy on clinical outcome in mechanically ventilated neurosurgical patients admitted to the surgical intensive care unit (ICU). METHODS: A total of 125 neurosurgical patients, who underwent tracheostomy and had total mechanical ventilation (MV) duration of >7 days from October 2007 to December 2011, were enrolled. Patients were divided into 2 groups based on the timing of tracheostomy. Tracheostomy was performed within 10 days of MV in the early group (group E, n=39), whereas in the late group, it was performed after 10 days of MV (group L, n=86). The ICU and in-hospital mortality rates, total duration of MV, length of stay (LOS) in the ICU, hospital LOS, and incidence of ventilator-associated pneumonia (VAP) were compared between both the groups. RESULTS: The total MV duration and ICU LOS were significantly longer in group L than E (21.5+15.5 vs. 11.4+5.6 d, P<0.001; 31.1+18.2 vs. 19.9+10.6 d, P<0.001). The incidence of VAP before tracheostomy was higher in group L than group E (44 vs. 23%, P<0.05). No significant difference was found in the ICU and in-hospital mortality rates and hospital LOS between the groups. CONCLUSIONS: Early tracheostomy reduced the MV duration, ICU LOS, and incidence of VAP in critically ill neurosurgical patients. However, early tracheostomy did not reduce either the ICU or hospital mortality.
Tracheostomy in stroke patients.

Author(s) Bosel J

Citation: Current Treatment Options in Neurology, January 2014, vol./is. 16/1(274), 1092-8480;1092-8480 (2014 Jan)

Publication Date: January 2014

Abstract: OPINION STATEMENT: Patients with severe ischemic and hemorrhagic stroke may require tracheostomy in the course of their disease. This may apply to stroke unit patients whose deficits include a severe dysphagia posing such risk of aspiration as it cannot be sufficiently counteracted by tube feeding and swallowing therapy alone. More often, however, tracheostomy is performed in stroke patients so severely afflicted that they require intensive care unit treatment and mechanical ventilation. In these, long-term ventilation and prolonged insufficient airway protection are the main indications for tracheostomy. Accepted advantages are less pharyngeal and laryngeal lesions than with prolonged orotracheal intubation, better oral hygiene and nursing care, and higher patient comfort. Optimal timing of tracheostomy is unclear, in general, as in stroke intensive care unit patients. Potential benefits of early tracheostomy concerning ventilation duration and length of stay, respirator weaning, airway safety, rate of pneumonia, and other complications, outcome and mortality have been suggested in studies on non-neurologic subgroups of critical care patients. Stroke patients have hardly been investigated with regard to these aspects, and mainly retrospectively. A single randomized pilot trial on early tracheostomy in 60 ventilated patients with severe hemorrhagic and ischemic stroke demonstrated feasibility, safety, and less need of sedation. Regarding the technique, bedside percutaneous dilational tracheostomy should be preferred over surgical tracheostomy because of several reported advantages. As the procedural risk is low and early tracheostomy does not seem to worsen the clinical course of the ventilated stroke patient, it is reasonable to assess the need of further ventilation at the end of the first week of intensive care and proceed to tracheostomy if extubation is not feasible. Reliable prediction of prolonged ventilation need and outcome benefits of early tracheostomy, however, await further clarification. Decannulation of stroke patients after discontinued ventilation has to follow reliable confirmation of swallowing ability, as by endoscopy.

Sleep patterns during long-term mechanical ventilation in tracheostomized patients in the ICU: do they matter?

Author(s) Esquinas AM, Papadakos PJ, Schwartz AR

Citation: Critical Care Medicine, January 2014, vol./is. 42/1(e82-3), 0090-3493;1530-0293 (2014 Jan)

Publication Date: January 2014

Source: Medline

Available in fulltext from Critical Care Medicine at the ULHT Library and Knowledge Services’ ejournal collection

Timing of tracheostomy in critically ill patients: a meta-analysis.

Author(s) Huang H, Li Y, Ariani F, Chen X, Lin J

Citation: PLoS ONE [Electronic Resource], 2014, vol./is. 9/3(e92981), 1932-6203;1932-6203 (2014)

Publication Date: 2014

Abstract: OBJECTIVE: To compare important outcomes between early tracheostomy (ET) and late tracheostomy (LT) or prolonged intubation (PI) for critically ill patients receiving long-term ventilation during their treatment.METHOD: We performed computerized searches for relevant articles on PubMed, EMBASE, and the Cochrane register of controlled trials (up to July 2013). We contacted international experts and manufacturers. We included in the study randomized controlled trials (RCTs) that compared ET (performed within 10 days after initiation of laryngeal intubation) and LT (after 10 days of laryngeal intubation) or PI in critically ill adult patients admitted to intensive care units (ICUs). Two investigators evaluated the articles; divergent opinions were resolved by consensus.RESULTS: A meta-analysis was evaluated from nine randomized clinical trials with 2,072 participants. Compared to LT/PI, ET did not significantly reduce short-term mortality [relative risks (RR) = 0.91; 95% confidence intervals (CIs) = 0.81-1.03; p = 0.14] or long-term mortality (RR = 0.90; 95% CI = 0.76-1.08; p = 0.27). Additionally, ET was not associated with a markedly reduced length of ICU stay [weighted mean difference (WMD) =
-4.41 days; 95% CI = -13.44-4.63 days; p = 0.34], ventilator-associated pneumonia (VAP) (RR = 0.88; 95% CI = 0.71-1.10; p = 0.27) or duration of mechanical ventilation (MV) (WMD = - 2.91 days; 95% CI = -7.21-1.40 days; p = 0.19). CONCLUSION: Among the patients requiring prolonged MV, ET showed no significant difference in clinical outcomes compared to that of the LT/PI group. But more rigorously designed and adequately powered RCTs are required to confirm it in future.

Source: Medline
Available in fulltext from PLoS ONE at EBSCOhost
Available in fulltext from PLoS ONE at National Library of Medicine
Available in fulltext at PLoS One; Collection notes: On first login to a ProQuest journal you will need to select 'Athens (OpenAthens Federation)' from Select Region, and then 'NHS England' from Choose your Library.

Clinical consensus statement: tracheostomy care-putting statements into action!
Author(s) Dawson C, Farrington M
Citation: ORL - Head & Neck Nursing, 2014, vol./is. 32/1(14-9), 1064-3842;1064-3842 (2014)
Publication Date: 2014
Abstract: A clinical consensus statement (CCS) on tracheostomy care for adults and children was developed to improve care for this patient population. Statements were identified using a modified Delphi method with the goal to reduce practice variations among tracheostomy patients. Integration of these statements into daily practice in the care setting is the next step for information dissemination. The CCS affected current policies, procedures, protocols, staff education, and patient education. The process of updating practice at a large tertiary care center is described using evidence-based implementation strategies.
Source: Medline

Patients Don't Benefit From Early Tracheostomy.
Citation: AACN Bold Voices, 01 November 2013, vol./is. 5/11(8-8), 19487088
Publication Date: 01 November 2013
Source: CINAHL
Available in fulltext from AACN Bold Voices at EBSCOhost

Benefits of early tracheotomy: a meta-analysis based on 6 observational studies.
Author(s) Shan L, Hao P, Xu F, Chen YG
Citation: Respiratory Care, November 2013, vol./is. 58/11(1856-62), 0020-1324;1943-3654 (2013 Nov)
Publication Date: November 2013
Abstract: BACKGROUND: Whether early tracheotomy can improve the clinical outcomes of critically ill patients remains controversial. The current study aimed to discuss the potential benefits of early tracheotomy compared to late tracheotomy with meta-analysis of observational studies.METHODS: An electronic search (up to February 28, 2013) was conducted by a uniform requirement, and then clinical data satisfying the predefined inclusion criteria were extracted.RESULTS: Data from a total of 2,037 subjects were included from 6 observational retrospective studies. Meta-analysis suggested that early tracheotomy was associated with significant reductions in mortality (odds ratio 0.77, 95% CI 0.62-0.96), duration of mechanical ventilation (mean difference -10.04, 95% CI -15.15 to -4.92), ICU stay (mean difference -8.80 d, 95% CI -9.71 to -7.89 d), and hospital stay (mean difference -12.18 d, 95% CI -18.25 to -6.11 d). However, as compared with late tracheotomy, early tracheotomy did not reduce the incidence of ventilator-associated pneumonia.CONCLUSIONS: Our meta-analysis of retrospective observational studies suggests that early tracheotomy performed between days 3 and 7 after intubation had some advantages, including decreased mortality and reduced ICU stay, hospital stay, and mechanical ventilation duration in ICU patients.
Source: Medline
Available in fulltext from Respiratory Care at Highwire Press

Training for tracheostomy.
Author(s) Taylor C, Barrass L, Drewery H
Citation: British Journal of Anaesthesia, November 2013, vol./is. 111/5(842-3), 0007-0912;1471-6771 (2013 Nov)
Publication Date: November 2013
Tracheostomy care and complications in the intensive care unit.

Author(s): Morris LL, Whitmer A, McIntosh E
Citation: Critical Care Nurse, October 2013, vol./is. 33/5(18-30), 0279-5442;1940-8250 (2013 Oct)
Publication Date: October 2013
Abstract: Tracheotomy is a common procedure in intensive care units, and nurses must provide proper care to tracheostomy patients to prevent complications. One of the most important considerations is effective mobilization of secretions, and a suction catheter is the most important tool for that purpose. Each bedside should be equipped with a functional suctioning system, an oxygen source, a manual resuscitation bag, and a complete tracheostomy kit, which should accompany patients wherever they go in the hospital. Complications include infection, tracheomalacia, skin breakdown, and tracheoesophageal fistula. Tracheostomy emergencies include hemorrhage, tube dislodgement and loss of airway, and tube obstruction; such emergencies are managed more effectively when all necessary supplies are readily available at the bedside. This article describes how to provide proper care in the intensive care unit, strategies for preventing complications, and management of tracheostomy emergencies.

Source: Medline
Available in fulltext from Critical Care Nurse at EBSCOhost

Ventilator-associated pneumonia in trauma patients with open tracheotomy: Predictive factors and prognosis impact.

Author(s): Chaari A, Ksibi H, Zribi W, Medhioub F, Chelly H, Algia NB, Hamida CB, Bahloul M, Bouaziz M
Citation: Journal of Emergencies Trauma & Shock, October 2013, vol./is. 6/4(246-51), 0974-2700;0974-2700 (2013 Oct)
Publication Date: October 2013
Abstract: OBJECTIVE: To assess the predictive factors of ventilator associated pneumonia (VAP) occurrence following open tracheotomy in trauma patients.MATERIALS AND METHODS: We conducted an observational, prospective study over 15 months, between 01/08/2010 and 30/11/2011. All trauma patients (except those with cervical spine trauma), older than 15 years, undergoing open tracheotomy during their ICU stay were included. All episode of VAP following tracheotomy were recorded. Predictive factor of VAP onset were studied.RESULTS: We included 106 patients. Mean age was 37.9 ± 15.5 years. Mean Glasgow coma Scale (GCS) was 8.5 ± 3.7 and mean Injury Severity Score (ISS) was 53.1 ± 23.8. Tracheotomy was performed for 53 patients (50%) because of prolonged ventilation whereas 83 patients (78.3%) had tracheotomy because of projected long mechanical ventilation. Tracheotomy was performed within 8.6 ± 5.3 days. Immediate complications were bleeding events (22.6%) and barotrauma (0.9%). Late complications were stomal infection (28.3%) and VAP (52.8%). In multivariate analysis, independent factors predicting VAP onset were delayed tracheotomy (OR = 0.041; CI95% [1.02-7.87]; P = 0.041) and stomal infection (OR = 3.04; CI95% [1.02-9.93]; P = 0.045). Thirty three patients died in ICU (31.1%) without significant impact of VAP on mortality.CONCLUSION: Late tracheotomy and stomal infection are independent factors predicting VAP onset after open tracheotomy in trauma patients. The occurrence of VAP prolongers mechanical ventilation duration and intensive care unit (ICU) length of stay (LOS) but doesn't increase mortality.

Source: Medline
Available in fulltext from Journal of Emergencies, Trauma, and Shock at National Library of Medicine
Available in fulltext at Journal of Emergencies, Trauma and Shock: Collection notes: On first login to a ProQuest journal you will need to select 'Athens (OpenAthens Federation)' from Select Region, and then 'NHS England' from Choose your Library.
Available in fulltext from Journal of Emergencies, Trauma and Shock at Directory of Open Access Journals
Available in fulltext from Journal of Emergencies, Trauma and Shock at Free Access Content

Benefit, timing, and technique of tracheostomy.
Avoiding tracheostomy complication.

Percutaneous dilational tracheostomy.

Abstract: Tracheostomy is a commonly performed intervention with several benefits in the treatment of patients with chronic respiratory failure. Percutaneous dilational tracheostomy techniques have allowed bedside tracheostomy placement in the modern intensive care unit. Percutaneous dilational tracheostomy can be safely performed by interventional pulmonologists, medical intensive care physicians, and surgical specialists. When performed with the assistance of adjuncts, such as flexible bronchoscopy, the percutaneous dilational method has a favorable complication rate, efficiency, and cost profile compared with surgical tracheostomy. Copyright 2013 Elsevier Inc. All rights reserved.

Humidification Performance of Humidifying Devices for Tracheostomized Patients With Spontaneous Breathing: A Bench Study.

Abstract: BACKGROUND: Heat and moisture exchangers (HMEs) are commonly used for humidifying respiratory gases administered to mechanically ventilated patients. While they are also applied to tracheostomized patients with spontaneous breathing, their performance in this role has not yet been clarified. We carried out a bench study to investigate the effects of spontaneous breathing parameters and oxygen flow on the humidification performance of 11 HMEs. METHODS: We evaluated the humidification provided by 11 HMEs for tracheostomized patients, and also by a system delivering high-flow CPAP, and an oxygen mask with nebulizer heater. Spontaneous breathing was simulated with a mechanical ventilator, lung model, and servo-controlled heated humidifier at tidal volumes of 300, 500, and 700 mL, and breathing frequencies of 10 and 20 breaths/min. Expired gas was warmed to 37°C. The high-flow CPAP system was set to deliver 15, 30, and 45 L/min. With the 8 HMEs that were equipped with ports to deliver oxygen, and with the high-flow CPAP system, measurements were taken when delivering 0 and 3 L/min of dry oxygen. After stabilization we measured the absolute humidity (AH) of inspired gas with a hygrometer. RESULTS: AH differed among HMEs applied to tracheostomized patients with spontaneous breathing. For all the HMEs, as tidal volume increased, AH decreased. At 20 breaths/min, AH was higher than at 10 breaths/min. For all the HMEs, when oxygen was delivered, AH decreased to below 30 mg/L. With an oxygen mask and high-flow CPAP, at all settings, AH exceeded 30 mg/L. CONCLUSIONS: None of the HMEs provided adequate humidification when supplemental oxygen was added. In the ICU, caution is required when applying HME to tracheostomized patients with spontaneous breathing, especially when supplemental oxygen is required.

Effect of timing of tracheotomy on clinical outcomes: an update meta-analysis including 11 trials.

Abstract: We conducted a meta-analysis of 11 randomized controlled trials that examined the clinical outcomes of early and late tracheotomies. The studies were identified by searching five databases and cross-referencing the references of included studies. Both surgery-related and patient-related outcomes were assessed. In all trials, early tracheotomy was defined as being performed within the first week after the onset of ventilatory support. Late tracheotomy was defined as being delayed until after the first week of ventilation. Of the studies, one evaluated surgical outcomes and eight evaluated clinical (i.e., mortality, duration of ventilatory support, and duration of tracheostomy) outcomes. The duration of ventilatory support was a significant predictor of early tracheotomy (p = 0.025). The duration of tracheostomy was a significant predictor of late tracheotomy (p = 0.035). There was no significant difference in duration of ventilation between early and late tracheotomy groups (p = 0.65). Therefore, early tracheotomy may be associated with a shorter duration of ventilatory support, while late tracheotomy may be associated with a shorter duration of tracheostomy.
OBJECTIVE: To estimate the relative effect of early vs. late tracheotomy on clinical end-points in unselected intensive care unit (ICU) patients undergoing mechanical ventilation.

METHODS: We searched electronic databases (up to February 27, 2013) for both randomized control trials and observational studies satisfying the predefined inclusion criteria.

RESULTS: We retrieved 11 reports of studies including a total of 13,705 patients. Early tracheotomy was associated with significant reductions in mortality [33.3% vs. 36.3%; relative risk (RR): 0.92; 95% confidence interval (CI): 0.88, 0.97; I(2): 29%), length of ICU stay (mean difference: -6.55 days; 95% CI: -8.19, -4.90; I(2): 98%) and duration of mechanical ventilation (mean difference: -6.53 days; 95% CI: -11.43, -1.63; I(2): 100%). However, as compared with late tracheotomy, early tracheotomy did not reduce the incidence of hospital pneumonia (21.9% vs. 21.0%, RR: 0.85; 95% CI: 0.68, 1.06; I(2): 67%).

CONCLUSIONS: Early tracheotomy can reduce length of ICU stay, duration of mechanical ventilation and mortality but has no influence on hospital pneumonia when compared with late tracheotomy. Once the decision has been made about tracheotomy, clinical physicians should not hesitate to perform the procedure.

Source: Medline

Does an oral care protocol reduce VAP in patients with a tracheostomy?

Author(s): Conley P, McKinsey D, Graff J, Ramsey AR

Citation: Nursing, July 2013, vol./is. 43/7(18-23), 0360-4039;1538-8689 (2013 Jul)

Abstract: BACKGROUND: Several studies have demonstrated that oral care with chlorhexidine gluconate (CHG) 0.12% solution reduces the incidence of ventilator-associated pneumonia (VAP) in mechanically ventilated patients with endotracheal tubes in the ICU. Minimal evidence shows the effectiveness of any oral care protocols in preventing VAP in mechanically ventilated patients with tracheostomies in a step-down or progressive care unit (PCU).

OBJECTIVE: To determine the effectiveness of an oral care protocol in reducing the VAP rate in mechanically ventilated patients with tracheostomies in the PCU.

METHODS: A 12-month prospective study was conducted on 75 mechanically ventilated patients who had tracheostomies. The oral care protocol consisted of tooth brushing with toothpaste and applying CHG 0.12% solution every 12 hours. At the conclusion of the study, the VAP rate in the study population was compared with the National Health and Safety Network (NHSN) report for 2009 benchmark of 1.5 per 1,000 ventilator days.

RESULTS: After the oral care protocol was implemented in the PCU, the VAP rate was 1.1 per 1,000 ventilator days, compared with the NHSN report for 2009 of 1.5 per 1,000 ventilator days.

CONCLUSIONS: Tooth brushing with toothpaste and applying CHG 0.12% solution may be an effective oral care protocol to reduce the VAP rate in patients in PCUs with tracheostomies who are being mechanically ventilated.

Source: Medline

Standardized endoscopic swallowing evaluation for tracheostomy decannulation in critically ill neurologic patients.

Author(s): Warnecke T, Suntrup S, Teismann IK, Hamacher C, Oelenberg S, Dziewas R

Citation: Critical Care Medicine, July 2013, vol./is. 41/7(1728-32), 0090-3493;1530-0293 (2013 Jul)

Abstract: OBJECTIVES: Decisions regarding tracheostomy tube removal after mechanical ventilation often depend on the physician's individual experience because evidence-based practice guidelines are still scarce, especially for critically ill neurologic patients. In these patients, the prevalence of aspiration is high and regarded as an important contributor to decannulation failure. The presence of severe neurological deficits may, however, give clinicians the subjective impression that a tracheostomy tube is still necessary although decannulation may actually be safe. It is therefore crucial to test swallowing function reliably prior to decannulation in this patient population.

DESIGN: Prospective observational study.

SETTING: University hospital, neurological ICU.

PATIENTS: One hundred tracheostomized patients with acute neurologic disease completely weaned from mechanical ventilation.

INTERVENTIONS: An endoscopic protocol evaluating readiness for decannulation and a conventional clinical swallowing examination were carried out by separate, experienced practitioners blinded to each other's decisions. Patient management always followed the decision made with endoscopy.

MEASUREMENTS AND MAIN
RESULTS: Practitioners' decannulation decisions (yes/no) reached with both assessments were compared. Decannulated patients were monitored throughout their stay for complications related to tube removal. Endoscopy was performed successfully in all subjects without any complications. Following the protocol, the tracheostomy tube was successfully removed in 54 patients, whereas according to the clinical swallowing examination, only 29 patients would have been decannulated at that point. Only one patient needed recannulation due to respiratory problems, resulting in a failure rate of 1.9%. CONCLUSIONS: In neurologic patients, speech-language pathologists' impressions about the patient's state when clinically assessing indirect variables of swallowing function often lead to the unnecessary prolongation of cannulation time. Endoscopic evaluation has the advantage of objectively visualizing the patient's ability to manage secretions directly and allows for faster but, nonetheless, safe decannulation. The endoscopic protocol proposed here is a safe, efficient, and objective bedside tool to guide decannulation decisions.

Source: Medline
Available in fulltext from Critical Care Medicine at the ULHT Library and Knowledge Services' eJournal collection

Comparison of sleep quality with mechanical versus spontaneous ventilation during weaning of critically ill tracheostomized patients.
Author(s) Roche-Campo F, Thille AW, Drouot X, Galia F, Margarit L, Cordoba-Izquierdo A, Mancebo J, d'Ortho MP, Brochard L
Citation: Critical Care Medicine, July 2013, vol./is. 41/7(1637-44), 0090-3493;1530-0293 (2013 Jul)
Publication Date: July 2013
Abstract: BACKGROUND: In mechanically ventilated patients under mechanical ventilation in the ICU, ventilatory mode or settings may influence sleep quality. The aim of this study was to evaluate the direct impact of mechanical ventilation per se on sleep quantity and quality in patients who were able to tolerate separation from mechanical ventilation over prolonged periods. DESIGN AND SETTING: Randomized crossover clinical trial in a medical ICU. PATIENTS: Sixteen conscious patients, free of sedation and tracheostomized because of prolonged weaning from mechanical ventilation, were included in the study when able to tolerate at least 5 hours of spontaneous ventilation. INTERVENTIONS: Patients were randomized to receive either spontaneous ventilation or mechanical ventilation at low levels of pressure support for two crossover periods of 5-hour duration each, from 22:00 to 08:00. Polysomnography was performed throughout the study. MEASUREMENTS AND RESULTS: Total sleep time was higher during mechanical ventilation than during spontaneous ventilation (183 min vs 132 min, p = 0.04). No significant differences between mechanical ventilation and spontaneous ventilation were observed in slow wave sleep time (45 min vs 28 min), rapid eye movement sleep time (11 min vs 3 min), or the fragmentation index (25 vs 23 arousals and awakenings per hr). In four patients, however, our analysis of patient-ventilator interaction suggested that the ventilatory settings were suboptimal and could have been improved to potentially improve sleep. CONCLUSIONS: In difficult-to-wean tracheostomized patients, sleep quality was similar with or without the ventilator. Sleep quantity was higher during mechanical ventilation. Reconnection to the ventilator during the night period may favor sleep efficiency in tracheostomized patients in prolonged weaning.
Source: Medline
Available in fulltext from Critical Care Medicine at the ULHT Library and Knowledge Services' eJournal collection

Evolution of percutaneous dilatational tracheostomy--a review of current techniques and their pitfalls.
Author(s) Cools-Lartigue J, Aboalsaud A, Gill H, Ferri L
Citation: World Journal of Surgery, July 2013, vol./is. 37/7(1633-46), 0364-2313;1432-2323 (2013 Jul)
Publication Date: July 2013
Abstract: Tracheostomy is the most commonly performed surgical procedure in critically ill patients with acute respiratory failure. While few absolute indications exist, this procedure is widely used in patients with upper respiratory obstruction and those requiring long-term mechanical ventilation. The traditional approach to tracheostomy has been an open procedure performed in the operating room. This method is associated with an increased rate of complications and costs. Accordingly, percutaneous bedside tracheostomy
procedures have largely replaced the traditional operative approach at many institutions. Numerous methods for percutaneous tracheostomy have thus emerged. However, the benefits of one technique versus another have not been well demonstrated. In this article, we review the evidence supporting the use of percutaneous tracheostomy procedures over the traditional operative approach. Furthermore, we review the currently available and emerging methods by which percutaneous tracheostomy can be performed. In addition, we highlight the available evidence concerning the safety and complication rates of each technique.

**Source:** Medline

**The effects of increasing effective airway diameter on weaning from mechanical ventilation in tracheostomized patients: a randomized controlled trial.**  
**Citation:** Intensive Care Medicine, June 2013, vol./is. 39/6(1063-70), 0342-4642;1432-1238 (2013 Jun)  
**Publication Date:** June 2013  
**Abstract:** PURPOSE: To determine the effects of deflating the tracheal cuff during disconnections from mechanical ventilation (MV) in tracheostomized patients.METHODS: This was a single-center, randomized trial conducted in a general ICU of a tertiary hospital with regional referral for trauma patients. Patients at high risk of aspiration based on the drink test were excluded. Critically ill tracheostomized patients were randomized to have the tracheal cuff deflated or not during spontaneous breathing trials. Weaning was protocolized on progressive T-tube trials, and patients were considered weaned after 24 consecutive hours disconnected from MV. The primary end point was time to definitive withdrawal of MV; secondary end points were ventilator-associated respiratory infection (pneumonia and/or tracheobronchitis) and swallowing function. Statistical analyses included Cox proportional risk models.RESULTS: We randomized 195 patients and 181 patients completed the study (94 patients with deflated cuff and 87 with inflated cuff). Variables independently related to weaning time in the multivariate analysis were tracheostomy-to-first MV disconnection time (HR 0.5, 95 % CI 0.3-0.8; p < 0.01) and cuff deflation (HR 2.2, 95 % CI 1.5-3; p < 0.01). Respiratory infection was lower in the deflated group (20 vs. 36 %; p = 0.02). Swallowing function improved more in the deflated group (31 vs. 22 %; p = 0.02).CONCLUSION: Under the conditions of our protocol, deflating the tracheal cuff in tracheostomized patients shortens weaning, reduces respiratory infections, and probably improves swallowing.

**Source:** Medline

**Weaning of the patient with tracheostomy. Role of continuous positive airway pressure.**  
**Author(s)** Kopp R, Bickenbach J  
**Citation:** Minerva Anestesiologica, May 2013, vol./is. 79/5(474-6), 0375-9393;1827-1596 (2013 May)  
**Publication Date:** May 2013  
**Source:** Medline  
**Available in fulltext from Minerva Anestesiologica at Free Access Content**

**NCEPOD Tracheostomy Care Study.**  
**Author(s)** Plowright, Catherine  
**Citation:** Nursing in Critical Care, 01 May 2013, vol./is. 18/3(154-155), 13621017  
**Publication Date:** 01 May 2013  
**Source:** CINAHL

**Effect of early vs late tracheostomy placement on survival in patients receiving mechanical ventilation: the TracMan randomized trial.**  
**Author(s)** Young D, Harrison DA, Cuthbertson BH, Rowan K, TracMan Collaborators  
**Citation:** JAMA, May 2013, vol./is. 309/20(2121-9), 0098-7484;1538-3598 (2013 May 22)  
**Publication Date:** May 2013  
**Abstract:** IMPORTANCE: Tracheostomy is a widely used intervention in adult critical care units. There is little evidence to guide clinicians regarding the optimal timing for this procedure.OBJECTIVE: To test whether early vs late tracheostomy would be associated with lower mortality in adult patients requiring mechanical ventilation in critical care units.DESIGN AND SETTING: An open multicentered randomized clinical trial conducted between 2004 and 2011 involving 70 adult general and 2 cardiothoracic critical care units in
PARTICIPANTS: Of 1032 eligible patients, 909 adult patients breathing with the aid of mechanical ventilation for less than 4 days and identified by the treating physician as likely to require at least 7 more days of mechanical ventilation. INTERVENTIONS: Patients were randomized 1:1 to early tracheostomy (within 4 days) or late tracheostomy (after 10 days if still indicated). MAIN OUTCOMES AND MEASURES: The primary outcome measure was 30-day mortality and the analysis was by intention to treat. RESULTS: Of the 455 patients assigned to early tracheostomy, 91.9% (95% CI, 89.0%-94.1%) received a tracheostomy and of 454 assigned to late tracheostomy, 44.9% (95% CI, 40.4%-49.5%) received a tracheostomy. All-cause mortality 30 days after randomization was 30.8% (95% CI, 26.7%-35.2%) in the early and 31.5% (95% CI, 27.3%-35.9%) in the late group (absolute risk reduction for early vs late, 0.7%; 95% CI, -5.4% to 6.7%). Two-year mortality was 51.0% (95% CI, 46.4%-55.6%) in the early and 53.7% (95% CI, 49.1%-58.3%) in the late group (P = .74). Median critical care unit length of stay in survivors was 13.0 days in the early and 13.1 days in the late group (P = .74). Tracheostomy-related complications were reported for 6.3% (95% CI, 4.6%-8.5%) of patients (5.5% in the early group, 7.8% in the late group). CONCLUSIONS AND RELEVANCE: For patients breathing with the aid of mechanical ventilation treated in adult critical care units in the United Kingdom, tracheostomy within 4 days of critical care admission was not associated with an improvement in 30-day mortality or other important secondary outcomes. The ability of clinicians to predict which patients required extended ventilatory support was limited. TRIAL REGISTRATION: isrctn.org Identifier: ISRCTN28588190.

Source: Medline
Available in fulltext from JAMA Journal of the American Medical Association at Free Access Content
Available in fulltext from JAMA: the Journal of the American Medical Association at the ULHT Library and Knowledge Services' eJournal collection

Coagulation disorders do not increase the risk for bleeding during percutaneous dilatational tracheotomy.

Author(s) Deppe AC, Kuhn E, Scherner M, Slottosch I, Liakopoulos O, Langebartels G, Choi YH, Wahlers T
Citation: Thoracic & Cardiovascular Surgeon, April 2013, vol./is. 61/3(234-9), 0171-6425;1439-1902 (2013 Apr)
Publication Date: April 2013
Abstract: BACKGROUND: Percutaneous dilatational tracheotomy (PDT) is a common procedure. Coagulation disorders represent a relative contraindication for PDT and, therefore, normalization of hemostasis parameters is recommended. Especially patients undergoing cardiac surgery after valve replacement and with any kind of assist device need to require an adequate anticoagulation. This study investigated the impact of impaired hemostasis as a risk factor for bleeding complications retrospectively. METHODS: Patients who underwent PDT (November 2007 to November 2010) were stratified into a high-risk (HR) and low-risk (LR) group in regard to bleeding complications. The following determining factors activated partial thromboplastin time (aPTT > 50 seconds, prothrombin time (PT < 50%), international normalized ratio (INR > 1.4), and platelet count (< 50,000/L) were assessed. RESULTS: A total of 213 patients underwent PDT (HR = 5/85; LR = 8/128). There was no difference in demographics or intraoperative data. Patients of both groups showed mild bleeding without the need for surgical intervention or transfusion (p = 0.957). There were no severe bleeding nor other procedure-related complications. CONCLUSION: Percutaneous tracheotomy is a safe and feasible procedure in patients with coagulation disorders. Therefore, discontinuation of anticoagulation treatment or normalization of hemostasis prior to the procedure is not necessary. Georg Thieme Verlag KG Stuttgart New York.

Source: Medline

Predictive factors for patient outcomes following open bedside tracheotomy.

Author(s) Rayess HM, Revenaugh PC, Benninger MS, Knott PD
Citation: Laryngoscope, April 2013, vol./is. 123/4(923-8), 0023-852X;1531-4995 (2013 Apr)
Publication Date: April 2013
Abstract: OBJECTIVES/HYPOTHESIS: Open bedside tracheotomy (OBT) in the intensive care unit (ICU) has been advocated as a safe and more cost-effective alternative to
tracheotomy performed in the operating room. The objective of this study is to determine predictive factors for postoperative outcomes, including decannulation and in-hospital mortality following OBT. STUDY DESIGN: Retrospective chart review. METHODS: The charts of 330 consecutive adult patients who underwent OBT at a tertiary care medical center between January, 2005, and April, 2011, were reviewed. Perioperative variables including demographics, comorbidities, serological markers, and time to tracheotomy were collected and analyzed in relation to the endpoints of in-hospital mortality and decannulation rate. RESULTS: A total of 218 patients were included in the final analysis. The decannulation rate was 26.1% and inpatient mortality was 24.2%. On multivariate analysis, the inpatient mortality rate was significantly increased and the decannulation rate was significantly decreased among patients with concomitant cardiac or respiratory disease, or a coincident diagnosis of malignancy. ICU length of stay was increased by 4.5 days for each unit increase in cardiac comorbidity count. CONCLUSIONS: Admitting diagnosis and serological markers did not predict the rates of decannulation or in-hospital mortality. However, the presence of cardiac disease and/or oncologic comorbidities played a significant role in predicting hospital mortality or eventual decannulation. Several comorbidity combinations resulted in a greater than 60% likelihood of inpatient mortality. In this population, the overall benefit of an OBT may be debatable. Despite very high overall acuity levels, there were no serious procedural complications, indicating that bedside tracheotomy is safe in ill patients. Copyright 2013 The American Laryngological, Rhinological, and Otological Society, Inc.

Source: Medline
Available in fulltext from Laryngoscope at EBSCOhost

Safety of bedside percutaneous tracheostomy in the critically ill: evaluation of more than 3,000 procedures.

Author(s) Dennis BM, Eckert MJ, Gunter OL, Morris JA Jr, May AK
Citation: Journal of the American College of Surgeons, April 2013, vol./is. 216/4(858-65; discussion 865-7), 1072-7515;1879-1190 (2013 Apr)
Publication Date: April 2013
Abstract: BACKGROUND: Bedside percutaneous dilational tracheostomy has been demonstrated to be equivalent to open tracheostomy. At our institution, percutaneous dilational tracheostomy without routine bronchoscopy is our preferred method. My colleagues and I hypothesized that our 10-year percutaneous dilational tracheostomy experience would demonstrate that the technique is safe with low complication rates, even in obese patient populations. STUDY DESIGN: We conducted a retrospective review of all bedside percutaneous dilational tracheostomy performed by the Division of Trauma and Surgical Critical Care faculty from 2001 to 2011, excluding patients younger than 18 years of age. All major airway complications and procedure-related deaths were evaluated during the early (<48 hours postprocedure), intermediate (in hospital), and late (after discharge) periods. Incidence of post-tracheostomy stenosis was also evaluated. RESULTS: There were 3,162 percutaneous dilational tracheostomies performed during the study period. Mean body mass index was 28 (16% with body mass index >35), mean Injury Severity Score was 32, and mean APACHE II score was 19. Major airway complications occurred in 12 (0.38%) patients, accounting for 5 (0.16%) deaths. Early major complications included 3 airway losses and 1 bleeding event requiring formal exploration with procedure-related deaths occurring in 3 patients. Intermediate major complications included 2 tube occlusion/dislodgement events with 2 related deaths. Late complications included 5 (0.16%) cases of tracheal stenosis requiring intervention without associated deaths. CONCLUSIONS: Bedside percutaneous dilational tracheostomy is safe across a broad critically ill patient population. The safety of this technique, even in the obese population, is demonstrated by its low complication rate. Routine bronchoscopic guidance is not necessary. Specially trained procedure nurse and process improvement programs contribute to the safety and efficacy of this procedure. Copyright 2013 American College of Surgeons. All rights reserved.
Source: Medline

Verbal communication for the ventilator-dependent patient requiring an inflated tracheotomy tube cuff: A prospective, multicenter study on the Blom tracheotomy tube with speech inner cannula.

Author(s) Leder SB, Pauloski BR, Rademaker AW, Grammer T, Dikeman K, Kazandjian M, Mendes J, Logemann JA
Citation: Head & Neck, April 2013, vol./is. 35/4(505-10), 1043-3074;1097-0347 (2013 Apr)
Background: The purpose of this study was to present our findings on the impact of the Blom tracheotomy tube with speech inner cannula on voice production abilities and speech intelligibility scores of ventilator-dependent patients requiring a fully inflated tracheotomy tube cuff.

Methods: Prospective single group case-series design permitted consecutive accrual of 23 adult inpatients from acute care and rehabilitation settings. Maximum ambient room noise, voice intensity, phonation duration of vowel /a/, and speech intelligibility scores were determined over 3 sessions.

Results: All participants achieved audible voicing with the Blom tracheotomy tube. Voice intensity was significantly greater than ambient room noise by >10 dB SPL (p = .003). Speech intelligibility scores improved significantly from 80% to 85% (p = .03). Phonation duration averaged from 3.30 to 3.45 seconds. There were no significant changes in oxygen saturation (p > .05), and no significant complications occurred.

Conclusion: The Blom tracheotomy tube with speech inner cannula permitted individuals requiring mechanical ventilation with a fully inflated tracheotomy tube cuff to produce excellent speech intelligibility for verbal communication.

Source: Medline
Available in fulltext from Head & Neck at EBSCOhost

Self-expanding foam-filled tracheostomy tube cuffs and the management of airway emergencies.
Author(s) Rajendram R, Barker G
Citation: Anaesthesia, April 2013, vol./is. 68/4(436-7), 0003-2409:1365-2044 (2013 Apr)
Publication Date: April 2013
Source: Medline
Available in fulltext from Anaesthesia at EBSCOhost
Available in fulltext from Anaesthesia at Wiley

An interprofessional team approach to tracheostomy care: a mixed-method investigation into the mechanisms explaining tracheostomy team effectiveness.
Author(s) Mitchell R, Parker V, Giles M
Citation: International Journal of Nursing Studies, April 2013, vol./is. 50/4(536-42), 0020-7489:1873-491X (2013 Apr)
Publication Date: April 2013
Abstract: BACKGROUND: In an effort to reduce tracheostomy-related complications, many acute care facilities have implemented specialist tracheostomy teams. Some studies, however, generate only mixed support for the connection between tracheostomy teams and patient outcomes. This suggests that the effect of collaborative teamwork in tracheostomy care is still not well understood.OBJECTIVE: The aim of this paper is to investigate the mechanisms through which an interprofessional team approach can improve the management of patients with a tracheostomy.DESIGN: The achievement of this research objective requires the collection of rich empirical data, which indicates the use of a qualitative methodology. A case study approach provided an opportunity to collect a wealth of data on tracheostomy team activities and dynamics.SETTING AND PARTICIPANTS: Data were collected on an interprofessional tracheostomy team in a large tertiary referral hospital in Australia. The team was composed of clinical nurse consultants, a physiotherapist, a speech pathologist, a dietician, a social worker and medical officers.METHODS: Data were collected through a focus group and one-to-one, semi-structured in-depth interviews, and thematic analysis was used to analyse experiences of tracheostomy team members.RESULTS: Qualitative analysis resulted in two main themes: interprofessional protocol development and implementation; and interprofessional decision-making.CONCLUSIONS: Our findings suggest that tracheostomy teams enhance consistency of care through the development and implementation of interprofessional protocol. In addition, such team allow more efficient and effective communication and decision-making consequent to the collocation of diverse professionals. These findings provide new insight into the role of tracheostomy teams in successfully implementing complex protocol and the explanatory mechanisms through which interprofessional teams may generate positive outcomes for tracheostomy patients. Copyright 2012. Published by Elsevier Ltd.
Source: Medline

Tracheostomy teams reduce total tracheostomy time and increase speaking valve use: a
systematic review and meta-analysis.

Author(s) Speed L, Harding KE
Citation: Journal of Critical Care, April 2013, vol./is. 28/2(216.e1-10), 0883-9441;1557-8615 (2013 Apr)
Publication Date: April 2013
Abstract: PURPOSE: Multidisciplinary tracheostomy teams have been implemented in acute hospitals over the past 10 years. This systematic review of the literature and meta-analysis aimed to assess the effect of tracheostomy teams on patient outcomes.MATERIALS AND METHODS: We conducted an electronic search of the literature in the following databases: MEDLINE, CINAHL, EMBASE, and AMED. Inclusion/exclusion criteria were applied, and included articles were assessed against quality criteria. Qualitative synthesis and meta-analysis were completed.RESULTS: Seven studies were included. The studies were all pre-post cohort designs of low-moderate quality. Meta-analysis showed that tracheostomy teams were associated with reductions in total tracheostomy time (4 studies; mean difference, 8 days; 95% confidence interval, 6-11; P < .01; I(2) = 0%) and hospital length of stay (LOS) (3 studies; mean difference, -14 days; 95% confidence interval, -39 to 9; P = .23; I(2) = 50%). Reductions in intensive care unit LOS (3 studies) and increases in speaking valve (3 studies) use were also reported with tracheostomy teams.CONCLUSION: There is low-quality evidence that multidisciplinary tracheostomy care contributes to a reduction in total tracheostomy time and increase speaking valve use for patients leading to improved quality of life. There is insufficient evidence to determine that multidisciplinary tracheostomy teams reduce hospital or intensive care unit LOS. Crown Copyright 2013. Published by Elsevier Inc. All rights reserved.
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Available in fulltext at Journal of Critical Care; Collection notes: On first login to a ProQuest journal you will need to select 'Athens (OpenAthens Federation)' from Select Region, and then 'NHS England' from Choose your Library.

Outcome of tracheotomized patients following reintubation.

Citation: Medicina Intensiva, April 2013, vol./is. 37/3(142-8), 0210-5691;1578-6749 (2013 Apr)
Publication Date: April 2013
Abstract: OBJECTIVE: To evaluate the outcome of tracheotomized patients after reintubation.METHOD: Secondary analysis from a prospective, multicenter and observational study including 36 Intensive Care Units (ICUs) from 8 countries.PATIENTS: A total of 180 patients under mechanical ventilation for more than 48 hours, extubated and reintubated within 48 hours.INTERVENTIONS: None.OUTCOMES: ICU mortality, length of ICU stay, organ failure.RESULTS: Fifty-two patients (29%) underwent tracheotomy after reintubation. The median time from reintubation to tracheotomy was 2.5 days (interquartile range (IQR) 1-8 days). The length of ICU stay was significantly longer in the tracheotomy group compared with the group without tracheotomy (median time 25 days, IQR 17-43 versus 16.5 days (IQR 11-25); p<0.001). ICU mortality in the tracheotomy group was not significantly different (31% versus 27%; p 0.57).CONCLUSIONS: In our cohort of reintubated patients, tracheotomy is a common procedure in the ICU. Patients with tracheotomy had an outcome similar to those without tracheotomy. Copyright 2012 Elsevier Espana, S.L. and SEMICYUC. All rights reserved.
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Available in fulltext from Medicina Intensiva at Directory of Open Access Journals

"Corkscrew stenosis": defining and preventing a complication of percutaneous dilatational tracheostomy.

Author(s) Jacobs JV, Hill DA, Petersen SR, Bremner RM, Sue RD, Smith MA
Citation: Journal of Thoracic & Cardiovascular Surgery, March 2013, vol./is. 145/3(716-20), 0022-5223;1097-685X (2013 Mar)
Publication Date: March 2013
Abstract: OBJECTIVE: The short-term safety of percutaneous dilatational tracheostomy has been widely demonstrated. However, less is known about their long-term complications. Through an illustrative case series, we present and define "corkscrew
stenosis," a type of tracheal stenosis uniquely associated with percutaneous dilatational tracheostomy.

**METHODS:** Patients treated at our institution for tracheal stenosis after percutaneous dilatational tracheostomy were reviewed. Demographic data including gender, age, history of presentation, lesion morphology, imaging, and management was collected and evaluated. The pathology of the stenosis and the strategies for prevention are presented.

**RESULTS:** From January, 2008 through December 2011, 11 patients had tracheal stenosis after percutaneous dilatational tracheostomy. The mean age was 54 + 17 years and 55% were male. The stenotic lesions were characterized by a corkscrew morphology at the stoma site with a mean distance of 2.3 + 0.8 cm from the vocal cords. Images of these lesions demonstrated disruption and fracture of the proximal tracheal cartilages and displacement of the anterior tracheal wall into the tracheal lumen. The majority of our patients required tracheal resection for definitive repair.

**CONCLUSIONS:** We suggest that a unique form of tracheal stenosis can result from percutaneous dilatational tracheostomy. We observed corkscrew stenosis to be located proximally, associated with fractured tracheal rings, and morphologically appearing as interdigitation of these fractured rings. Recognizing corkscrew stenosis, its unique mechanism of formation, and technical means of prevention may be important in advancing the long-term safety of this procedure for critically ill patients who require prolonged ventilatory support. Copyright 2013 The American Association for Thoracic Surgery. Published by Mosby, Inc. All rights reserved.

**Source:** Medline

**Effect of Percutaneous Tracheostomy on Gas Exchange in Hypoxemic and Non-hypoxemic Mechanically Ventilated Patients.**

**Author(s)** Bellani, Giacomo, Aziz El Sayed Deab, Salua Abd El, Pradella, Andrea, Mauri, Tommaso, Citerio, Giuseppe, Foti, Giuseppe, Pesenti, Antonio

**Citation:** Respiratory Care, 01 March 2013, vol./is. 58/3(482-486), 00201324

**Publication Date:** 01 March 2013

**Abstract:** BACKGROUND: The influence of percutaneous tracheostomy on ventilator-dependence and clinical outcomes has been investigated in a number of studies. However, except for the variations during the procedure, the impact of tracheostomy on gas exchange has been scarcely explored. We investigated the effect of tracheostomy on respiratory function in a cohort of ICU patients. METHODS: In this retrospective study, clinical records of 107 patients from a general ICU and neurosurgical ICU who underwent percutaneous tracheostomy were reviewed to compare ventilator setting, gas exchange, and hemodynamic parameters on the day before and on the day after the procedure. Further, a pre-established subgroup analysis on hypoxemic patients (PaO$_2$/FIO$_2$ < 300 mm Hg) was performed. RESULTS: Among all patients analyzed, a marginal decrease in PaCO$_2$ (43 ± 9mmHg vs 42 ± 7 mm Hg, before vs after P ± .004) and an increase in pH (7.43 ± 0.04 vs 7.44 ± 0.03, before vs after P ± .03) were observed after tracheostomy. In the subgroup of hypoxemic patients (n = 38), after the tracheostomy an increase in PaO$_2$/FIO$_2$ (222 ± 60 mm Hg vs 256 ± 84 mm Hg, before vs after P ± .001) and a decrease in PaCO$_2$ (46 ± 11 mm Hg vs 43 ± 9 mm Hg, before vs after P = .001) were found. CONCLUSIONS: Percutaneous tracheostomy did not worsen gas exchange in a cohort of ICU patients. In hypoxemic patients, tracheostomy appeared to improve oxygenation and ventilation.

**Source:** CINAHL

Available in fulltext from Respiratory Care at Highwire Press

**Percutaneous versus open tracheostomy: comparison of procedures and surgical site infections.**

**Author(s)** Park H, Kent J, Joshi M, Zhu S, Bochicchio GV, Henry S, Scalea T

**Citation:** Surgical Infections, February 2013, vol./is. 14/1(21-3), 1096-2964;1557-8674 (2013 Feb)

**Publication Date:** February 2013

**Abstract:** BACKGROUND: Tracheostomy is one of the most common procedures performed in trauma patients in the intensive care unit (ICU). Few studies have evaluated the incidence of surgical site infections (SSIs) specifically in a trauma population. Our objective was to compare the incidence of SSI after open versus percutaneous tracheostomy and to discern whether there were any differences in outcome. METHODS: A prospective single-institution study was conducted on 640 patients admitted to the ICU over eight years who underwent tracheostomy. Age, gender, race, admission Injury Severity Score (ISS) and Acute Physiology and Chronic Health Evaluation (APACHE) II score, and
mechanism of injury were obtained. The majority of patients were male (56.1%) and white (62.5%) with a mean age of 43.2 ± 20.2 years, ISS of 30.7 ± 13.2 points, and APACHE score of 13.3 ± 6.3 points. The majority of patients were admitted for blunt trauma (85.1%). The outcome was measured by hospital (HLOS) and ICU (ILOS) lengths of stay, duration of mechanical ventilation, infection rate, and mortality rate.

RESULTS: A total of 330 open and 310 percutaneous tracheostomies were performed. A total of 36 SSIs (5.3%) were found. Patients who underwent percutaneous tracheostomy had a statistically significantly lower rate of SSI (3.4%) than the open surgery group (7%) (p=0.04). There was no difference in HLOS, ILOS, ventilator days, or mortality rate.

CONCLUSION: To our knowledge, this is the largest study of the benefit of percutaneous tracheostomy in a critically injured trauma population. The risk of SSI is significantly lower after percutaneous than open tracheostomy.

Source: Medline

Algorithm for management of tracheostomy emergencies on intensive care.
Author(s) Kelly FE, Hommers C, Jackson R, Cook TM
Citation: Anaesthesia, February 2013, vol./is. 68/2(217-9), 0003-2409;1365-2044 (2013 Feb)
Publication Date: February 2013
Source: Medline
Available in fulltext from Anaesthesia at EBSCOhost
Available in fulltext from Anaesthesia at Wiley

Tracheostomy tube change before day 7 is associated with earlier use of speaking valve and earlier oral intake.
Author(s) Fisher DF, Kondili D, Williams J, Hess DR, Bittner EA, Schmidt UH
Citation: Respiratory Care, February 2013, vol./is. 58/2(257-63), 0020-1324;1943-3654 (2013 Feb)
Publication Date: February 2013
Abstract: BACKGROUND: Presence of a tracheostomy tube often decreases the patient's ability to communicate and to tolerate oral intake. The initial tracheostomy tube change is often recommended between day 7 and 14 post insertion. Local guidelines permit tracheostomy tube change 5 days after insertion.OBJECTIVE: We hypothesized that changing tracheostomy tubes before day 7 is associated with earlier use of a speaking valve as well as earlier oral intake, compared to changing tracheostomy tubes after 7 days.METHODS: We prospectively enrolled 130 admitted subjects, after tracheostomy placement to a respiratory care unit between July 2008 and May 2010. Subject data were recorded from the electronic medical record. The primary end point was the time from tracheostomy tube placement to tolerating speaking valve. The secondary end point was the time from tracheostomy tube placement to tolerating oral intake. Complications of tracheostomy tube change were recorded.RESULTS: Thirty-eight subjects had the first tracheostomy tube change before 7 days (early group), and 92 subjects had the first tracheostomy tube change after 7 days (late group). The early group tolerated a speaking valve significantly sooner than the late group (7 d vs 12 d, P = .001). The early group also tolerated oral intake significantly sooner (10 d vs 20 d, P = .04). After change of the tracheostomy tube, the time to tolerating oral feeding was 5.5 days in both groups. There was no significant difference in time to decannulation between the groups. The early group had a shorter respiratory care unit stay (11 d vs 17 d, P = .001) and a shorter hospital stay (P = .05) than the late group. There was no difference in survival. There were no complications associated with tracheostomy tube change.CONCLUSIONS: Tracheostomy tube change before day 7 is associated with earlier ability to tolerate speaking valve and oral intake. In this series, early tracheostomy tube change was not associated with an increased rate of complications. 2013 Daedalus Enterprises.
Source: Medline
Available in fulltext from Respiratory Care at Highwire Press

Effect of pressure support vs unassisted breathing through a tracheostomy collar on weaning duration in patients requiring prolonged mechanical ventilation: a randomized trial.
Citation: JAMA: Journal of the American Medical Association, 20 February 2013, vol./is. 309/7(671-677), 00987484
Publication Date: 20 February 2013
Should a percutaneous dilational tracheostomy be guided with a bronchoscope?

**Author(s)** Abdulla S, Conrad A, Vielhaber S, Eckhardt R, Abdulla W

**Citation:** B-ENT, 2013, vol./is. 9/3(227-34), 1781-782X;1781-782X (2013)

**Publication Date:** 2013

**Abstract:** OBJECTIVE: The aim was to evaluate the complications and practicability of percutaneous dilational tracheostomy (PDT) with and without video endoscopic guidance in critically ill patients. METHODS: In a retrospective review of patients admitted to a multidisciplinary ICU, PDT was performed under bronchoscopic control in 74 patients and without bronchoscopic control in 113 patients. Both groups were evaluated in similar technical conditions. RESULTS: Complications in both groups were mostly minor. Bleeding or difficult tracheal cannulation occurred in 8 patients in each group. In patients without bronchoscopy, one major bleeding necessitated a switch to open revision, the Murphy eye was punctured (n = 2) and there was one pneumothorax. Furthermore, similar levels of cuff leaks, loss of airway and minor stoma infections were noted in both groups. All tracheostomies were performed bedside with similar manpower. Operation times were shorter in patients without bronchoscopy. CONCLUSION: Our data about PDT in critically ill patients do not indicate any clear-cut difference in complication rates or practicability in the absence of bronchoscopic guidance when adequate skills and experience have been acquired and simple but effective precautions at each step are adopted. However, randomisation and long-term laryngotracheal followup should be considered in future studies.

**Source:** Medline

**Novel modification of tracheostomy tube to allow speech and manage tracheal stenosis.**

**Author(s)** de la Cruz M, Islam S, Cloyes R

**Citation:** BMJ Case Reports, 2013, vol./is. 2013/, 1757-790X (2013)

**Publication Date:** 2013

**Abstract:** Mid-tracheal, postintubation stenosis can be managed with an extended length tracheostomy tube to bypass the stenotic area. However these extra-long tracheostomy tubes are not fenestrated, and when the stenotic tracheal lumen sits against the tracheostomy tube, phonation is not possible as there is no translaryngeal airflow. A 59-year-old man developed distal tracheal stenosis following a prolonged intubation and tracheostomy after a motorcycle accident. He eventually required an extra-long tracheostomy tube to bypass the stenotic region. We modified a silicone tracheostomy tube by creating a fenestration on its posterior wall. This relieved the obstruction while still allowing phonation and speech.

**Source:** Medline

**BAL for pneumonia prevention in tracheostomy patients: A clinical trial study.**

**Author(s)** K Vejdan A, Khosravi M

**Citation:** Pakistan Journal of Medical Sciences, January 2013, vol./is. 29/1(148-51), 1682-024X;1681-715X (2013 Jan)

**Publication Date:** January 2013

**Abstract:** Objective: To evaluate the role of flexible bronchoscopy (FB) and bronchoalveolar lavage (BAL) on pneumonia prevention of tracheostomy patients in intensive care unit. Methodology: This clinical trial was conducted on 67 head-injury patients who needed tracheostomy. The eligible patients were divided into two groups of different methods for removing the airway secretions. In intervention group, FB and BAL was added to routine conventional methods for airway clearance. Patients were followed for signs and symptoms of pneumonia. Results: The risk of nosocomial pneumonia decreased from 35% to 14% in intervention group. The days of hospital stay were significantly reduced with bronchoscopic method. Conclusions: Flexible Bronchoscopy is recommended to all ICU admitted patients that have tracheostomy tube and high volume of secretion in their airways. It can not only prevent the pneumonia formation decrease the morbidity and mortality rate but it can even shorten the ICU stay time and consequently reduce the costs of treatment.

**Source:** Medline
OBJECTIVES: We evaluated the effect of tracheotomy tubes that enable suction immediately above the cuff on the development of ventilator-associated pneumonia (VAP). METHODS: Patients without preexisting pneumonia who required tracheotomy were randomly assigned to receive a tracheotomy tube with or without above-the-cuff suction. The suction tube provided 10 mm Hg of continuous wall suction while the tracheotomy tube cuff was inflated. Data regarding the development of VAP, time on the ventilator, and length of stay in the intensive care unit (ICU) were recorded and compared between groups. RESULTS: Eighteen patients were randomized and prospectively evaluated. Nine patients received standard tracheotomy tubes, and 9 received suction-above-the-cuff tracheotomy tubes. The prevalences of VAP were 56% in the control group and 11% in the suction tracheotomy group (p = 0.02). The mean times on the ventilator were 18 +/- 14 days in the control group and 11 +/- 11 days in the suction group (p = 0.12). The mean lengths of ICU stay were 26 +/- 15 days in the control group and 18 +/- 15 days in the suction group (p = 0.14). CONCLUSIONS: Use of suction-above-the-cuff tracheotomy tubes significantly decreases the incidence of VAP in ICU patients. There were trends toward decreased time on the ventilator and decreased length of stay in the ICU.

Source: Medline

Available in fulltext from Annals of Otology, Rhinology & Laryngology at EBSCOhost
Available in fulltext at Annals of Otology, Rhinology and Laryngology, The; Collection notes: On first login to a ProQuest journal you will need to select 'Athens (OpenAthens Federation)' from Select Region, and then 'NHS England' from Choose your Library.

Tracheotomy tubes with suction above the cuff reduce the rate of ventilator-associated pneumonia in intensive care unit patients.

Author(s) Ledgerwood LG, Salgado MD, Black H, Yoneda K, Sievers A, Belafsky PC
Citation: Annals of Otology, Rhinology & Laryngology, January 2013, vol./is. 122/1(3-8), 0003-4894;0003-4894 (2013 Jan)
Publication Date: January 2013
Abstract: OBJECTIVES: We evaluated the effect of tracheotomy tubes that enable suction immediately above the cuff on the development of ventilator-associated pneumonia (VAP). METHODS: Patients without preexisting pneumonia who required tracheotomy were randomly assigned to receive a tracheotomy tube with or without above-the-cuff suction. The suction tube provided 10 mm Hg of continuous wall suction while the tracheotomy tube cuff was inflated. Data regarding the development of VAP, time on the ventilator, and length of stay in the intensive care unit (ICU) were recorded and compared between groups. RESULTS: Eighteen patients were randomized and prospectively evaluated. Nine patients received standard tracheotomy tubes, and 9 received suction-above-the-cuff tracheotomy tubes. The prevalences of VAP were 56% in the control group and 11% in the suction tracheotomy group (p = 0.02). The mean times on the ventilator were 18 +/- 14 days in the control group and 11 +/- 11 days in the suction group (p = 0.12). The mean lengths of ICU stay were 26 +/- 15 days in the control group and 18 +/- 15 days in the suction group (p = 0.14). CONCLUSIONS: Use of suction-above-the-cuff tracheotomy tubes significantly decreases the incidence of VAP in ICU patients. There were trends toward decreased time on the ventilator and decreased length of stay in the ICU.

Source: Medline

Available in fulltext from Annals of Otology, Rhinology & Laryngology at EBSCOhost
Available in fulltext at Annals of Otology, Rhinology and Laryngology, The; Collection notes: On first login to a ProQuest journal you will need to select 'Athens (OpenAthens Federation)' from Select Region, and then 'NHS England' from Choose your Library.

Clinical consensus statement: tracheostomy care.

Author(s) Mitchell RB, Hussey HM, Setzen G, Jacobs IN, Nussenbaum B, Dawson C, Brown CA 3rd, Brandt C, Deakins K, Hartnick C, Merati A
Citation: Otolaryngology - Head & Neck Surgery, January 2013, vol./is. 148/1(6-20), 0194-5998;1097-6817 (2013 Jan)
Publication Date: January 2013
Abstract: OBJECTIVE: This clinical consensus statement (CCS) aims to improve care for pediatric and adult patients with a tracheostomy tube. Approaches to tracheostomy care are currently inconsistent among clinicians and between different institutions. The goal is to reduce variations in practice when managing patients with a tracheostomy to minimize complications. METHODS: A formal literature search was conducted to identify evidence gaps and refine the scope of this consensus statement. The modified Delphi method was used to refine expert opinion and facilitate a consensus position. Panel members were asked to complete 2 scale-based surveys addressing different aspects of pediatric and adult tracheostomy care. Each survey was followed by a conference call during which results were presented and statements discussed. RESULTS: The panel achieved consensus on 77 statements; another 39 were dropped because of lack of consensus. Consensus was reached on statements that address initial tracheostomy tube change, management of emergencies and complications, prerequisites for decannulation, management of tube cuffs and communication devices, and specific patient and caregiver education needs. CONCLUSION: The consensus panel agreed on statements that address the continuum of care, from initial tube management to complications in children and adults with a tracheostomy. The panel also highlighted areas where consensus could not be reached and where more research is needed. This consensus statement should be used by physicians, nurses, and other stakeholders caring for patients with a tracheostomy.

Source: Medline
The threshold moment: ethical tensions surrounding decision making on tracheostomy for patients in the intensive care unit.

Author(s) Venkat A

Citation: Journal of Clinical Ethics, 2013, vol./is. 24/2(135-43), 1046-7890;1046-7890 (2013)

Publication Date: 2013

Abstract: With the aging of the general population and the ability of intensivists to support patients using ventilator support, tracheostomy has become a vital tool in the medical management of critically ill patients. While much of the medical literature on tracheostomy has focused on the optimal timing of and indications for performing this procedure, little is written on the ethical tensions that can revolve around decisions by patients, surrogates, and physicians on its use. This article will elucidate the ethical dilemmas that can arise surrounding the use of tracheostomy in critically ill patients and how ethics consultants and committees can approach these cases to allow resolution.

Source: Medline

Does removal of tracheostomy affect dysphagia? A kinematic analysis.

Author(s) Kang JY, Choi KH, Yun GJ, Kim MY, Ryu JS

Citation: Dysphagia, December 2012, vol./is. 27/4(498-503), 0179-051X;1432-0460 (2012 Dec)

Publication Date: December 2012

Abstract: Tracheostomy tubes are thought to increase the incidence of aspiration and several mechanisms that might cause this have been suggested. Some studies reported alterations in laryngeal elevation during swallowing, which they attributed to an anchoring effect of the tracheostomy tube resulting in dysphagia. The purpose of the present study was to kinematically investigate the effect of tracheostomy on the swallowing process in dysphagic patients. Thirteen patients (7 males, 6 females; mean age = 61.4 years) were prospectively enrolled between August 2008 and December 2009. The inclusion criteria for a patient who had undergone tracheostomy were an ability to tolerate tube plugging for 48 h and the capacity to expectorate without assistance. All patients underwent two videofluoroscopic swallow studies (VFSS), before and after decannulation. We measured 21 time interval variables during swallowing in the pharyngeal phase and the extent of laryngeal elevation. No patient exhibited any change in swallowing function status [Penetration - Aspiration Scale (PAS) (median value = 1)] in the interval between the two VFSS tests. Upon kinematic analysis, no significant difference in any variable pertaining to laryngeal elevation or pharyngeal constriction was found when pre- and post-decannulation VFSS test data were compared (p > 0.05). The present study thus showed that removal of a tracheostomy tube does not affect the kinematics of swallowing. Our results support previous findings that indicated no relationship between tracheostomy tube placement and dysphagia.

Source: Medline

Different tracheotomy tube diameters influence diaphragmatic effort and indices of weanability in difficult to wean patients.

Author(s) Valentini I, Tonveronachi E, Gregoretti C, Mega C, Fasano L, Pisani L, Nava S

Citation: Respiratory Care, December 2012, vol./is. 57/12(2012-8), 0020-1324;0020-1324 (2012 Dec)

Publication Date: December 2012

Abstract: OBJECTIVE: To determine the effects of different tracheotomy tube sizes on diaphragm effort and weanability indices.METHODS: Ten tracheotomized and difficult to wean subjects were randomized to 2 T-piece trials, with different tracheotomy tube diameters: inner diameters 8 mm and 6.5 mm. Diaphragm pressure-time product per min. (PTP(di/min)), lung compliance and resistance (C(L) and R(L)), breathing pattern, tension-time index of the diaphragm (TT(di)), and the ratio of breathing frequency to tidal volume (f/V(T)) were recorded. In an in vitro model, the flow-pressure relationship was measured using the 2 tracheotomy tubes and 2 endotracheal tubes of the same diameter. RESULTS: The use of a smaller diameter resulted in an increase of PTP(di) (337.63 + 194.35 cm H(2)O s/min vs 263.28 + 156.23 cm H(2)O s/min for 6.5 mm and 8 mm, respectively, P =
Both weanability indices were also significantly higher using the smaller tube: f/V(T) 93.32 ± 20.91 vs 77.06 ± 19.26 for 6.5 mm and 8 mm, respectively, P < .02; TT(di) 0.09 ± 0.052 vs 0.08 ± 0.04, respectively, P < .02. In vitro measurements confirmed that the resistances were higher with the smaller diameter and similar between the tracheotomy tubes and the endotracheal tubes of the same diameters.

CONCLUSIONS: In tracheotomized difficult to wean subjects the decrease of the tracheotomy tube size was associated with an increased PTP(di), f/V(T), and TT(di), that were otherwise normal, using a higher diameter. The in vitro study showed that the resistances increased similarly for tracheotomy tube and endotracheal tube, decreasing the diameter and increasing the flows.

Source: Medline
Available in fulltext from Respiratory Care at Highwire Press

Safety and efficacy of ultrasonography before and during percutaneous dilatational tracheostomy in adult patients: a systematic review.

Author(s) Rudas M, Seppelt I
Citation: Critical Care & Resuscitation, December 2012, vol./is. 14/4(297-301), 1441-2772;1441-2772 (2012 Dec)
Publication Date: December 2012
Abstract: OBJECTIVE: A systematic review to examine the safety and efficacy of ultrasound before and/or during percutaneous dilatational tracheostomy (PDT).METHODS: Systematic searches of MEDLINE, PubMed, EMBASE, and the Cochrane Central Register of Controlled Trials were undertaken to identify trials reporting on safety and efficacy of using ultrasound guidance before and/or during PDT.RESULTS: Ultrasound before PDT: no controlled trials; two observational studies suggested a possible benefit in avoiding serious complications by identifying vulnerable vascular structures. Real-time ultrasound during PDT: one controlled study, which retrospectively compared real-time ultrasound guidance with the landmark-guided technique and found it to be superior in avoiding cranial misplacement; it appeared to be safe and effective in two observational studies.CONCLUSIONS: There are currently no randomised controlled trials to establish the safety or efficacy of preprocedure and/or real-time intraprocedural ultrasound guidance during PDT compared with the current standard of care. One study supports the use of real-time ultrasound guidance during PDT in preventing cranial tracheostomy tube misplacement. Observational data suggest that preprocedure ultrasound may help prevent vascular complications and that real-time ultrasound guidance during PDT is likely safe, with a high success rate. A prospective randomised controlled trial evaluating its safety and efficacy compared with the traditional landmark-guided technique is required to establish its role in clinical practice.

Source: Medline
Available in fulltext from Critical Care & Resuscitation at EBSCOhost

Tracheotomy-related morbidity and mortality: what else can we do to reduce them?.

Author(s) Mantovani M, Rinaldi V, Torretta S, Pignataro L
Citation: International Journal of Oral & Maxillofacial Surgery, December 2012, vol./is. 41/12(1589-90), 0901-5027;1399-0020 (2012 Dec)
Publication Date: December 2012
Source: Medline

Surgical location of open tracheostomies: in the operating room or at the bedside?.

Author(s) Hong SJ, Park MR, Lee JY
Citation: Journal of Oral & Maxillofacial Surgery, December 2012, vol./is. 70/12(2729; author reply 2729-30), 0278-2391;1531-5053 (2012 Dec)
Publication Date: December 2012
Source: Medline
Available in print at Lincoln County Hospital Professional Library

Is obesity truly a risk factor for mortality after tracheotomy?.

Author(s) Meacham R, Vieira F
Citation: Annals of Otology, Rhinology & Laryngology, November 2012, vol./is. 121/11(733-7), 0003-4894;0003-4894 (2012 Nov)
Publication Date: November 2012
Abstract: OBJECTIVES: We sought to determine the short-term and long-term overall
mortality rates in obese and non-obese patients after tracheotomy and to evaluate which factors, including the Charlson Comorbidity Index (CCI), predict mortality rates among obese patients.

METHODS: We performed a retrospective chart review of patients who underwent open tracheotomy in the operating room at a single hospital from 2005 to 2010. RESULTS: Of 200 patients reviewed, 146 were non-obese and 54 were obese. The rate of mortality was higher at 30 days ($p = 0.02$) and at 1 year ($p = 0.04$) in obese patients (35.1% and 59.2%, respectively) than in non-obese patients (19.2% and 42.5%, respectively). The need for tracheotomy due to ventilator-dependent respiratory failure (VDRF) was much higher ($p < 0.001$) in obese patients (83.3%) than in non-obese patients (56.8%), and the rate of mortality was significantly higher ($p < 0.001$) in those who required tracheotomy for VDRF (32.8% at 30 days and 57% at 1 year) than in those who required tracheotomy for all other indications (4.2% at 30 days and 25% at 1 year). The mortality risk increased with higher CCI scores at both 30 days ($p = 0.08$) and 1 year ($p = 0.009$). CONCLUSIONS: The overall mortality rate is higher in obese patients after tracheotomy than in non-obese control subjects in the short and long terms. This increased rate of mortality is due to the heightened incidence of tracheotomy for VDRF among obese patients. The mortality rates after tracheotomy correlate well with the CCI.

Source: Medline
Available in fulltext at Annals of Otology, Rhinology and Laryngology, The; Collection notes: On first login to a ProQuest journal you will need to select 'Athens (OpenAthens Federation)' from Select Region, and then 'NHS England' from Choose your Library. Available in fulltext from Annals of Otology, Rhinology & Laryngology at EBSCOhost

The indication of tracheostomy conditions the predictors of time to decannulation in critical patients.

Citation: Medicina Intensiva, November 2012, vol./is. 36/8(531-9), 0210-5691;1578-6749 (2012 Nov)
Publication Date: November 2012
Abstract: OBJECTIVE: Variables predicting optimal timing for tracheostomy decannulation remain unknown. We aimed to determine whether classifying patients into two groups according to their indications for tracheostomy could identify variables associated with time to decannulation. DESIGN: A prospective, observational cohort study was carried out. LOCATION: Two medical-surgical ICUs. PATIENTS: We included all patients tracheostomized during ICU stay, excluding patients with do-not-resuscitate orders, tracheostomies for long-term airway control, neuromuscular disease, or neurological damage. Patients were classified into two groups: patients tracheostomized due to prolonged weaning and/or prolonged mechanical ventilation (Group 1), and patients tracheostomized due to low level of consciousness or inability to manage secretions (Group 2). INTERVENTIONS: Patients were weaned and decannulated according to established protocols. MAIN VARIABLES: We recorded the following variables: time to tracheostomy, forced vital capacity, peak flow, suctioning requirements, Glasgow Coma Score (GCS), characteristics of respiratory secretions, and swallowing function. Statistical analyses included Cox-proportional multivariate analysis with time to decannulation as the dependent variable. RESULTS: A total of 227 patients were tracheostomized in the ICUs; of these, 151 were finally included in the study. In the multivariate analysis, time to decannulation in Group 1 was associated with the male gender (HR 1.74 (1.04-2.89), $p=0.03$), age>60 years (HR 0.58 (0.36-0.91), $p=0.02$), high suctioning frequency (HR 0.81 (0.67-0.97), $p=0.02$), low forced vital capacity (HR 0.48 (0.28-0.82), $p<0.01$), and low peak flow (HR 0.25 (0.14-0.46), $p<0.01$). In Group 2 time to decannulation was associated to GCS >13 (HR 2.73 (1.51-4.91), $p<0.01$), high suctioning frequency (HR 0.7 (0.54-0.91), $p<0.01$), and inadequate swallowing (HR 1.97 (1.11-3.52), $p=0.02$). CONCLUSION: Variables associated with longer time to decannulation in ICU-tracheostomized patients differ with the indications for tracheostomy. Copyright 2011 Elsevier Espana, S.L. and SEMICYUC. All rights reserved.

Source: Medline
Available in fulltext from Medicina Intensiva at Free Access Content
Available in fulltext from Medicina Intensiva at Directory of Open Access Journals

The adult tracheostomy: a guide for the hospital at night doctor.

Author(s) Townsley RB, Florea CD, Clark LJ
Citation: British Journal of Hospital Medicine, October 2012, vol./is. 73/10(C152-5), 1750-
The ventilator liberation process: update on technique, timing, and termination of tracheostomy.

Author(s): Bittner EA, Schmidt UH

Citation: Respiratory Care, October 2012, vol./is. 57/10(1626-34), 0020-1324;0020-1324 (2012 Oct)

Abstract: Tracheostomy is one of the most commonly performed procedures in the ICU. Despite the frequency of the procedure, there remains controversy regarding selection of patients who should undergo tracheostomy, the optimal technique, timing of placement and decannulation, as well as impact on outcome associated with the procedure. A growing body of literature demonstrates that percutaneous tracheostomy performed in the ICU is a safe procedure, even in high risk patients. Advances in techniques, together with adjuncts to improve visualization, seem promising and likely to further improve the safety of the technique. Although there was initial enthusiasm in support of early tracheostomy to improve patient outcomes, repeated studies have been unable to produce robust benefits. The question of optimal timing and location of decannulation has not been answered, but there is some reassurance that in aggregate, across a variety of ICUs, patients do not appear to be harmed by transfer to ward with tracheostomy. Future research into techniques, timing, and termination of tracheostomy is warranted.

Source: Medline
Available in fulltext from Respiratory Care at Highwire Press

Tracheostomy practice in adults with acute respiratory failure.

Author(s): Freeman BD, Morris PE

Citation: Critical Care Medicine, October 2012, vol./is. 40/10(2890-6), 0090-3493;1530-0293 (2012 Oct)

Abstract: OBJECTIVE: Tracheostomy remains one of the most commonly performed surgical procedures in adults with acute respiratory failure and identifies a patient cohort which is among the most resource-intensive to provide care. The objective of this concise definitive review is the synthesis of current knowledge regarding tracheostomy practice in this context.DATA SOURCE: Peer-reviewed, English language publications pertaining to tracheostomy indications, timing, technique, and management.RESULTS: Contemporary literature concerning tracheostomy use predominately focuses on two aspects: procedure timing and technical considerations. Three recent, large, randomized controlled trials failed to demonstrate an effect of "early" tracheostomy on mortality, infectious complications, intensive care unit, or hospital length of stay. Relative to continued translaryngeal intubation, tracheostomy was associated with less sedation use and earlier mobility. An accumulating body of literature suggests that, relative to conventional surgical methods, percutaneous dilational techniques are advantageous with respect to cost and complication profile. Literature addressing management following tracheostomy placement consists largely of single institution, nonrandomized reports, limiting the ability to formulate specific recommendations regarding this aspect of care.CONCLUSIONS: In patients who otherwise lack indication for surgical airway, clinicians should defer tracheostomy placement for at least 2 wks following the onset of acute respiratory failure to insure need for ongoing ventilatory support. Subpopulations of patients (e.g., those with acute neurological injury or stroke) may benefit from earlier tracheostomy. Percutaneous dilational tracheostomy should be considered the preferred technique for this intervention in the appropriately selected individual. Future investigations should include efforts to optimize post-tracheostomy management and to quantify tracheostomy effects on patient-centric outcomes.

Source: Medline
Available in fulltext from Critical Care Medicine at the ULHT Library and Knowledge Services' eJournal collection

Influence of the cuff pressure on the swallowing reflex in tracheostomized intensive care unit patients.

Author(s): Amathieu R, Sauvat S, Reynaud P, Slavov V, Luis D, Dinca A, Tual L, Bloc S,
Dhonneur G

**Citation:** British Journal of Anaesthesia, October 2012, vol./is. 109/4(578-83), 0007-0912;1471-6771 (2012 Oct)

**Publication Date:** October 2012

**Abstract:** BACKGROUND: Because recovery of an efficient swallowing reflex is a determining factor for the recovery of airway protective reflexes, we have studied the influence of the tracheostomy tube cuff pressure (CP) on the swallowing reflex in tracheotomized patients.

**METHODS:** Twelve conscious adult intensive care unit (ICU) patients who had been weaned from mechanical ventilation were studied. Simultaneous EMG of the submental muscles with measurement of peak activity (EMGp) and amplitude of laryngeal acceleration (ALA) were performed during reflex swallows elicited by pharyngeal injection of distilled water boluses during end expiration. After cuff deflation, characteristics of the swallowing reflex (latency time: LaT, EMGp, and ALA) were measured at CPs of 5, 10, 15, 20, 25, 30, 40, 50, and 60 cm H(2)O.

**RESULTS:** LaT and CP were linearly related (P<0.01). CP was inversely correlated (P<0.01) to both ALA and EMGp.

**CONCLUSIONS:** We demonstrated that LaT, EMGp, and ALA of the swallowing reflex were influenced by tracheostomy tube CP. The swallowing reflex was progressively more difficult to elicit with increasing CP and when activated, the resulting motor swallowing activity and efficiency at elevating the larynx were depressed.

**Source:** Medline

Available in fulltext from BJA: The British Journal of Anaesthesia at EBSCOhost

Available in print at Lincoln County Hospital Professional Library

Available in fulltext from British Journal of Anaesthesia at Highwire Press

**Multidisciplinary team approach in the management of tracheostomy patients.**

**Author(s)** Pandian V, Miller CR, Mirski MA, Schiavi AJ, Morad AH, Vaswani RS, Kalmar CL, Feller-Kopman DJ, Haut ER, Yarmus LB, Bhatti NI

**Citation:** Otolaryngology-Head & Neck Surgery, 01 October 2012, vol./is. 147/4(684-691), 01945998

**Publication Date:** 01 October 2012

**Source:** CINAHL

**Percutaneous tracheostomy: let's play it safe.**

**Author(s)** Corso RM, Gambale G

**Citation:** The Journal of Trauma and Acute Care Surgery, September 2012, vol./is. 73/3(779-80; author reply 780), 2163-0755;2163-0763 (2012 Sep)

**Publication Date:** September 2012

**Source:** Medline

Available in fulltext from Journal of Trauma and Acute Care Surgery at Ovid

**The impact of tracheostomy timing in patients with severe head injury: an observational cohort study.**

**Author(s)** Wang HK, Lu K, Liliang PC, Wang KW, Chen HJ, Chen TB, Liang CL

**Citation:** Injury, September 2012, vol./is. 43/9(1432-6), 0020-1383;1879-0267 (2012 Sep)

**Publication Date:** September 2012

**Abstract:** STUDY DESIGN: A retrospective analysis of 66 adults with severe head injury admitted to the neurosurgical intensive care unit (ICU) who required tracheostomy.

**OBJECTIVE:** The purpose of this cohort study was to examine the impact of the tracheostomy timing in patients with severe head injury.

**METHODS:** Patients were included in this study if they were admitted to the neurosurgical ICU because of severe head injury and if tracheostomy was performed. The patients were classified into 2 groups: early tracheostomy (ET) and late tracheostomy (LT). The timing of tracheostomy was considered early if it was performed by day 10 of mechanical ventilation and late if it was performed after day 10. We compared the duration of mechanical ventilation, length of stay (LOS) at ICU, hospital LOS, incidence of pneumonia, duration of antibiotics use, and mortality between the ET and LT groups.

**RESULTS:** Of the 2481 patients with severe head injury admitted to the neurosurgical ICU, 66 (2.7%) required tracheostomy; 16 of whom were in the ET group and 50 were in the LT group. The ICU LOS was significantly shorter in the ET group (p<0.001). The incidence of nosocomial pneumonia was lower in the ET group (p=0.04) and the duration of antibiotic use was significantly shorter in the ET group (p<0.001). The patients in the ET group had a lower incidence of pneumonia caused by gram-negative microorganisms (p=0.001).

**CONCLUSIONS:** ET in patients with severe head injury might contribute to a shorter duration of ICU LOS, lower incidence of gram-negative
microorganism-related nosocomial pneumonia, and shorter duration of antibiotic use.

**Source:** Medline
Available in fulltext from Injury - International Journal for the Care of the Injured at the ULHT Library and Knowledge Services' eJournal collection

**Multidisciplinary guidelines for the management of tracheostomy and laryngectomy airway emergencies.**

**Author(s)** McGrath BA, Bates L, Atkinson D, Moore JA, National Tracheostomy Safety Project

**Citation:** Anaesthesia, September 2012, vol./is. 67/9(1025-41), 0003-2409;1365-2044 (2012 Sep)

**Publication Date:** September 2012

**Abstract:** Adult tracheostomy and laryngectomy airway emergencies are uncommon, but do lead to significant morbidity and mortality. The National Tracheostomy Safety Project incorporates key stakeholder groups with multi-disciplinary expertise in airway management, the Intensive Care Society, the Royal College of Anaesthetists, ENT UK, the British Association of Oral and Maxillofacial Surgeons, the College of Emergency Medicine, the Resuscitation Council (UK) the Royal College of Nursing, the Royal College of Speech and Language Therapists, the Association of Chartered Physiotherapists in Respiratory Care and the National Patient Safety Agency. Resources and emergency algorithms were developed by consensus, taking into account existing guidelines, evidence and experiences. The stakeholder groups reviewed draft emergency algorithms and feedback was also received from open peer review. The final algorithms describe a universal approach to managing such emergencies and are designed to be followed by first responders. The project aims to improve the management of tracheostomy and laryngectomy critical incidents. Anaesthesia 2012 The Association of Anaesthetists of Great Britain and Ireland.

**Source:** Medline
Available in fulltext from Anaesthesia at EBSCOhost
Available in fulltext from Anaesthesia at Wiley

**How to decannulate tracheostomised severe head trauma patients: a comparison of gradual vs abrupt technique.**

**Author(s)** Shrestha KK, Mohindra S, Mohindra S

**Citation:** Nepal Medical College Journal: NMCJ, September 2012, vol./is. 14/3(207-11) (2012 Sep)

**Publication Date:** September 2012

**Abstract:** Tracheostomy is a common surgical procedure performed in patients with severe head injury to facilitate prolonged airway and ventilatory support. Decannulation is the procedure of removing the tracheostomy tube either gradually by downsizing the tube or abruptly in a single sitting. This prospective study was done to evaluate gradual vs abrupt techniques for successful decannulation in tracheostomised severe head trauma patients in Post Graduate Institute of Medical Education and Research (PGIMER), a central government tertiary centre in Chandigarh, India. A total of 118 patients, recruited over one and half years duration were arbitrarily divided into 2 groups: Gradual and Abrupt. Particulars were taken. Time since tracheostomy, timing of decannulation, Glasgow Coma Scale, amount of secretions, breath holding time, CXR and STN radiographs and cough reflex were all assessed. Follow up was done at one month to classify those who were re-tracheostomised or re-intubated as decannulation failures. Sixty-eight patients were decannulated gradually and 50 abruptly. Of the various factors assessed, only cough reflex, number of suctioning required per day, X-ray STN and use of antibiotics for more than 7 days were found to be statistically significant. One hundred and fourteen patients, 67 out of 68 in the GD group and 47 out of 50 in the AD group, had successful outcome. The study showed that success or failure of decannulation is independent of mode of decannulation.

**Source:** Medline

**Inadequate follow-up after tracheostomy and intensive care.**

**Author(s)** Mondrup F, Skjelsager K, Madsen KR

**Citation:** Danish Medical Journal, August 2012, vol./is. 59/8(A4481), 2245-1919;2245-1919 (2012 Aug)

**Publication Date:** August 2012

**Abstract:** INTRODUCTION: When patients are transferred from intensive care units (ICUs)
to general wards with a tracheostomy in situ, there is a risk of suboptimal care and increased morbidity. The aim of this study was to elucidate the management of patients with a tracheostomy in situ at discharge from the ICU to the ward.

**MATERIAL AND METHODS:** We performed an electronic questionnaire survey among heads of unit at registered Danish ICUs.

**RESULTS:** A total of 34 out of 43 ICUs responded. 56% of the ICUs do not document individual plans for decannulation in the patient's chart. 91% of the ICUs do not perform daily follow-up of tracheotomised patients on the ward. No guidelines for decannulation on the ward were found, and only 6% have a guideline for accidental decannulation. Furthermore, as little as 47% of the ICUs report any formalized education or training of staff nurses in the management of tracheotomised patients.

**CONCLUSION:** Guidelines relevant to patients discharged from Danish ICUs with a tracheal cannula in situ are scarce; few ICUs employ individualized plans for tracheostomy management and decannulation; there is largely no daily intensivist-led post-ICU follow-up, and formal staff education in tracheostomy management on the ward is scarce. Altogether these factors create a potential for adverse events and increased morbidity in this high-risk, high-cost patient population. Possibly individualized plans for tracheotomised patients as well as intensivist-led follow-up on the ward can improve patient outcome and safety and this should be confirmed in a future study.

**FUNDING:** not relevant.

**TRIAL REGISTRATION:** not relevant.

**Source:** Medline

Available in fulltext from Danish Medical Journal at Directory of Open Access Journals

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**Percutaneous tracheostomy: a new approach to the emergency airway.**

**Author(s)** Davidson SB, Blostein PA, Walsh J, Maltz SB, VandenBerg SL

**Citation:** The Journal of Trauma and Acute Care Surgery, August 2012, vol./is. 73/2 Suppl 1(S83-8), 2163-0755;2163-0763 (2012 Aug)

**Publication Date:** August 2012

**Abstract:** BACKGROUND: Endotracheal intubation is the preferred method of airway control. Current surgical standard of care for the emergent airway when endotracheal intubation cannot be performed is cricothyroidotomy. Percutaneous tracheostomy (PT) is a widely accepted technique for elective long-term airway management in the critical care setting. We describe our experience with successful placement of PT for emergency airway control.

**METHODS:** After institutional review board approval was obtained, patients were identified retrospectively from January 2003 to present that had emergency PT performed as identified by the DRG International Classification of Diseases--9th Rev. procedure code (31.1). Data included demographics, body mass index, admitting service, size of tracheostomy tube, reason for urgent airway access, duration PT was required, unit, and hospital day performed, and complications.

**RESULTS:** Eighteen patients underwent emergency PT; 61% were male, and age range was 21 years to 86 years. Indications for PT included respiratory failure associated with anaphylaxis, supraglottic edema, cardiac arrest, and blood or edema blocking the airway preventing intubation. PT was performed in various departments throughout the hospital. Admitting services included critical care intensivist (44.4%), trauma surgery (27.7%), cardiology (11.1%), medicine (11.1%), and neurology (5.5%). Most of the tracheostomy tube sizes were no. 8 (61.1%), followed by no. 7 (22.2%), no. 6 (5.5%), and no. 9 (5.5%). All PTs were successfully placed, and there were no complications. Ten of our patients had no airway in place at the time of procedure. Six patients had emergency esophageal-tracheal airways in place. Two patients had a cricothyroidotomy that was not functioning adequately. Nine patients had body mass indexes ranging from 30 kg/m2 to 112 kg/m2.

**CONCLUSION:** PT provided a safe, effective emergency airway in adult patients who presented with a variety of indications, in varying locations throughout the hospital. PT performed by appropriately trained personnel may be a potential adjunct for emergent airway control in diverse settings.

**Source:** Medline

Available in fulltext from Journal of Trauma and Acute Care Surgery at Ovid

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**Predictors of short-term mortality in patients undergoing percutaneous dilatational tracheostomy.**

**Author(s)** Pandian V, Gilstrap DL, Mirski MA, Haut ER, Haider AH, Efron DT, Bowman NM, Yarmus LB, Bhatti NI, Stevens KA, Vaswani R, Feller-Kopman D

**Citation:** Journal of Critical Care, August 2012, vol./is. 27/4(420.e9-15), 0883-9441;1557-8615 (2012 Aug)

**Publication Date:** August 2012

**Abstract:** PURPOSE: The purpose of the study was to identify the predictors of short-term
Mortality in patients undergoing percutaneous dilatational tracheostomy (PDT). MATERIALS AND METHODS: Retrospective analysis of data pertaining to adult patients who underwent PDT between July 2005 and June 2008 in an urban, academic, tertiary care medical center was done. Clinical and demographic data were analyzed for 483 patients undergoing PDT via multivariate logistic regression. RESULTS: Mortality data were examined at in-hospital, 14, 30, and 180 days postprocedure. Overall mortality rates were 11% at 14 days, 19% at 30 days, and 40% at 180 days. In-hospital mortality was 30%. CONCLUSIONS: Patients undergoing PDT have significant short-term mortality with 11% dying within 14 days and an in-hospital mortality rate of 30%. We identified an index diagnosis of ventilator-associated pneumonia and trauma to be associated with a higher survival rate, whereas older age, oncological diagnosis, cardiogenic shock, and ventricular-assist devices were associated with higher mortality. There is significant heterogeneity in both underlying diagnosis and patient outcomes, and these factors should be considered when deciding to perform this procedure and discussed with patients/family members to provide a realistic expectation of potential prognosis. Copyright 2012 Elsevier Inc. All rights reserved.

Source: Medline
Available in fulltext at Journal of Critical Care; Collection notes: On first login to a ProQuest journal you will need to select 'Athens (OpenAthens Federation)' from Select Region, and then 'NHS England' from Choose your Library.

Early tracheostomy decreases ventilation time but has no impact on mortality of intensive care patients: a randomized study.

Author(s) Koch T, Hecker B, Hecker A, Brenck F, Preus M, Schmelzer T, Padberg W, Weigand MA, Klasen J

Citation: Langenbecks Archives of Surgery, August 2012, vol./is. 397/6(1001-8), 1435-2443;1435-2451 (2012 Aug)

Publication Date: August 2012

Abstract: BACKGROUND: Long-term ventilation in intensive care units (ICUs) is associated with several problems such as increased mortality, increased rates of ventilator-associated pneumonia (VAP), and prolonged time of hospitalization, and thus leads to enormous healthcare expenditure. While the influence of tracheostomy on VAP incidence, duration of ventilation, and time of hospitalization has already been analyzed in several studies, the timing of the tracheostomy procedure on patient's mortality is still controversial. The aim of our study was to investigate whether early tracheostomy improved outcome in critically ill patients. MATERIALS AND METHODS: Within 2 years, 100 critically ill, predominantly surgical patients entered this prospective randomized study. A percutaneous dilatational tracheostomy was performed either early (<4 days, 2.8 days median) or late (>6 days, 8.1 days median) after intubation. RESULTS: We could demonstrate that mortality was not significantly reduced in the early tracheostomy (ET) group in contrast to the late tracheostomy (LT) group. ET was associated with decreased VAP incidence (ET 38% vs. LT 64%), decreased duration of ventilation (ET 367.5 h vs LT 507.5 h), and shorter time of hospitalization both in hospital (ET 31.5 days vs LT 68 days) and in ICU (ET 21.5 days vs LT 27 days). CONCLUSION: Despite many advantages like reduced time of ventilation and hospitalization, early tracheostomy is not associated with decreased mortality in critically ill patients.

Source: Medline
Available in fulltext from Langenbeck's Archives of Surgery at EBSCOhost

Morbidity and mortality associated with tracheotomy procedure in a university medical centre.

Author(s) Oreadi D, Carlson ER

Citation: International Journal of Oral & Maxillofacial Surgery, August 2012, vol./is. 41/8(974-7), 0901-5027;1399-0020 (2012 Aug)

Publication Date: August 2012

Abstract: This prospective study assessed the morbidity and mortality associated with 192 consecutive tracheotomies. Complications were assessed including intraoperative and/or postoperative bleeding, infection, tracheoinnominate fistulae, tracheoesophageal fistulae, dislodgement of the tracheotomy tube, pneumothorax, wound infection and obstruction of the airway. 16% of the tracheotomy procedures resulted in complications. 22 tracheotomy procedures (11%) resulted in postoperative bleeding, 6 procedures (3%) had intraoperative bleeding which exceeded an estimated blood loss of 5 cc and 2 procedures (1%) developed a tracheoesophageal fistula. One patient (0.5%) experienced airway distress related to obstruction of the airway proximal to the tracheotomy tube. No patients required
a return to the operating room to manage their complication, no patients developed a tracheoinnominate fistula and none of the tracheotomy sites became infected. The post tracheotomy ventilator wean to trach-collar supplemental oxygen protocol was accomplished with a mean of 6 days in 119 patients for whom data was available. Results demonstrate that the open tracheotomy procedure is a safe and frequently life saving manoeuvre in situations with an unsecured airway, and it provides better outcomes in patients requiring long term ventilatory support. Mortality rates are low and its potential morbidity is exceeded by its benefits. Published by Elsevier Ltd.

**Back to basics: caring for people with a tracheostomy.**

**Author(s)** Barnett, Margaret

**Citation:** Nursing & Residential Care, 01 August 2012, vol./is. 14/8(390-393), 14659301

**Publication Date:** 01 August 2012

**Abstract:** It is essential that nursing staff deliver the appropriate care to manage these residents safely and effectively. Margaret Barnett outlines the general principles of tracheostomy care.

**Source:** CINAHL

Available in fulltext from Nursing & residential care : the monthly journal for care assistants, nurses and managers working in health and social care at EBSCOhost.

**Liberation of neurosurgical patients from mechanical ventilation and tracheostomy in neurocritical care.**

**Author(s)** Lazaridis, Christos, DeSantis, Stacia M., McLawhorn, Marc, Krishna, Vibhoro

**Citation:** Journal of Critical Care, 01 August 2012, vol./is. 27/4(0-5), 08839441

**Publication Date:** 01 August 2012

**Abstract:** Neurosurgical patients commonly require mechanical ventilation and monitoring in a neurocritical care unit. There are only few studies that specifically address the process of liberation from mechanical ventilation in this population. Patients who remain ventilator or artificial airway dependent receive a tracheostomy. The appropriate timing for the procedure is not well defined and may be different among an inhomogeneous population of critically ill patients. In this article, we review the general principles of liberation and the current literature as it pertains to neurosurgical patients with primary brain injury. The criteria for "readiness of extubation" include a combination of neurologic assessment, hemodynamic, and respiratory parameters. Future studies are required to better assess indicators for extubation readiness, evaluate the predictors of extubation failure in brain-injured patients, and define the most appropriate timing for a tracheostomy.

**Source:** CINAHL

Available in fulltext at Journal of Critical Care; Collection notes: On first login to a ProQuest journal you will need to select 'Athens (OpenAthens Federation)' from Select Region, and then 'NHS England' from Choose your Library.

**Tracheotomy timing and outcomes in the critically ill.**

**Author(s)** Tong CC, Kleinberger AJ, Paolino J, Altman KW

**Citation:** Otolaryngology - Head & Neck Surgery, July 2012, vol./is. 147/1(44-51), 0194-5998;1097-6817 (2012 Jul)

**Publication Date:** July 2012

**Abstract:** OBJECTIVE: To examine the impact of early tracheotomy in nontrauma patients on duration of mechanical ventilation (MV), intensive care unit (ICU) stay, and overall hospital stay DESIGN: Case series with chart review. SETTING: Tertiary care medical center. METHODS: A retrospective study was performed for patients undergoing tracheotomy from 2005 to 2010. Demographics; survival; duration of endotracheal intubation, MV, ICU, and overall hospital stay; and incidence of ventilator-associated pneumonia (VAP) were assessed. Tracheotomy was considered early if it was performed by day 7 of MV and late thereafter. Nonparametric statistics were used to compare results from each group. RESULTS: Of the 592 patients included in the analysis, 128 received tracheotomy early and 464 late. Differences between age, sex, and overall survival were not statistically significant. Duration of MV was 45% less (mean + standard error: 21.47 + 1.86 days vs 39.33 + 1.33 days; P < .001), total ICU stay was shortened by 33% (17.52 + 1.38 days vs 26.27 + 0.73 days; P < .001), and length of overall hospital course was reduced by 34% (35.85 + 2.57 days vs 54.28 + 1.60 days; P < .001) in the early tracheotomy group. Three patients (2.3%) from the early tracheotomy group developed VAP as compared with 15 (3.2%) from the late group. Duration from tracheotomy to ICU
transfer and 30% overall mortality did not differ significantly between groups.

CONCLUSION: Early tracheotomy in ICU patients is associated with earlier ICU discharge, shorter duration of mechanical ventilation, and decreased length of overall hospital stay without affecting mortality.

Source: Medline

Is percutaneous dilational tracheotomy equivalent to traditional open surgical tracheotomy with regard to perioperative and postoperative complications?

Author(s): Weissbrod PA, Merati AL

Citation: Laryngoscope, July 2012, vol./is. 122/7(1423-4), 0023-852X;1531-4995 (2012 Jul)

Publication Date: July 2012

Early tracheostomy is associated with improved outcomes in patients who require prolonged mechanical ventilation after cardiac surgery.


Citation: Journal of the American College of Surgeons, June 2012, vol./is. 214/6(1008-16.e4), 1072-7515;1879-1190 (2012 Jun)

Publication Date: June 2012

Abstract: BACKGROUND: The best time to perform a tracheostomy in cardiac surgery patients who require prolonged postoperative mechanical ventilation remains unknown. The primary aim of this investigation was to determine if tracheostomy performed before postoperative day 10 improves patient outcomes. STUDY DESIGN: We conducted a retrospective review of prospectively collected patient information obtained from the Anesthesiology Institute Patient Registry on adult patients recovering from coronary artery bypass grafting and/or valve surgery. Demographic and comorbidity patient variables were obtained. Patients were divided into 2 groups based on the timing of their tracheostomy: early (less than 10 days) and late (14 to 28 days). The 2 patient groups were matched using propensity scores and compared on morbidity and in-hospital mortality outcomes. The primary outcomes measures were length of stay, morbidity, and in-hospital mortality. RESULTS: After propensity matching (n = 114 patients/group), early tracheostomy was associated with decreased in-hospital mortality (21.1% vs 40.4%, p = 0.002) and cardiac morbidity (14.0% vs 33.3%, p < 0.001), along with decreased ICU (median difference 7.2 days, p < 0.001) and hospital (median difference 7.5 days, p = 0.010) durations. The occurrence of sternal wound infection (6.0% vs 19.5%, p = 0.009) was less in the early tracheostomy group, but mediastinitis did not differ significantly (3.5% vs 7.0%, p = 0.24). CONCLUSIONS: Tracheostomy within 10 postoperative days in cardiac surgery patients who require prolonged mechanical ventilation was associated with decreased length of stay, morbidity, and mortality. Copyright 2012 American College of Surgeons. Published by Elsevier Inc. All rights reserved.

Source: Medline

Implementation of a specialized tracheostomy team as a strategy for quality improvement.

Author(s): Freeman BD

Citation: Critical Care Medicine, June 2012, vol./is. 40/6(1980-1), 0090-3493;1530-0293 (2012 Jun)

Publication Date: June 2012

Safety, efficiency, and cost-effectiveness of a multidisciplinary percutaneous tracheostomy program.


Citation: Critical Care Medicine, June 2012, vol./is. 40/6(1827-34), 0090-3493;1530-0293 (2012 Jun)

Publication Date: June 2012

Abstract: OBJECTIVE: The frequency of bedside percutaneous tracheostomies is
Early versus late percutaneous dilational tracheostomy in critically ill patients anticipated requiring prolonged mechanical ventilation.

Author(s) Zheng Y, Sui F, Chen XK, Zhang GC, Wang XW, Zhao S, Song Y, Liu W, Xin X, Li WX

Citation: Chinese Medical Journal, June 2012, vol./is. 125/11(1925-30), 0366-6999;0366-6999 (2012 Jun)

Publication Date: June 2012

Abstract: BACKGROUND: Tracheostomy should be considered to replace endotracheal intubation in patients requiring prolonged mechanical ventilation (MV). However, the optimal timing for tracheostomy is still a topic of debate. The present study aimed to investigate whether early percutaneous dilational tracheostomy (PDT) can reduce duration of MV, and to further verify whether early PDT can reduce sedative use, shorten intensive care unit (ICU) stay, decrease the incidence of ventilator associated pneumonia (VAP), and increase successful weaning and ICU discharge rate.

METHODS: A prospective, randomized controlled trial was carried out in a surgical ICU from July 2008 to June 2011 in adult patients anticipated requiring prolonged MV via endotracheal intubation. Patients meeting the inclusion criteria were randomly assigned to the early PDT group or the late PDT group on day 3 of MV. The patients in the early PDT group were tracheostomized with PDT on day 3 of MV. The patients in the late PDT group were tracheostomized with PDT on day 15 of MV if they still needed MV. The primary endpoint was ventilator-free days at day 28 after randomization. The secondary endpoints were sedation-free days, ICU-free days, successful weaning and ICU discharge rate, and incidence of VAP at day 28 after randomization. The cumulative 60-day incidence of death after randomization was also analyzed.

RESULTS: Total 119 patients were randomized to either the early PDT group (n = 58) or the late PDT group (n = 61). The ventilator-free days was significantly increased in the early PDT group than in the late PDT group ((9.57 + 5.64) vs. (7.38 + 6.17) days, P < 0.05). The sedation-free days and ICU-free days were also significantly increased in the early PDT group than in the late PDT group (20.84 + 2.35 vs. 17.05 + 2.30 days, P < 0.05; and 8.0 (interquartile range (IQR): 5.0 - 12.0) vs. 3.0 (IQR: 0 - 12.0) days, P < 0.001 respectively). The successful weaning and ICU discharge rate was significantly higher in early PDT group than in late PDT group (74.1% vs. 55.7%, P < 0.05; and 67.2% vs. 47.5%, P < 0.05 respectively). VAP was observed in 17 patients (29.3%) in early PDT group and in 30 patients (49.2%) in late PDT group (P < 0.05). There was no significant difference between the two groups in the cumulative 60-day incidence of death after randomization (P = 0.949).

CONCLUSIONS: The early PDT resulted in more ventilator-free, sedation-free,
and ICU-free days, higher successful weaning and ICU discharge rate, and lower incidence of VAP, but did not change the cumulative 60-day incidence of death in the patients’ anticipated requiring prolonged mechanical ventilation.

Source: Medline
Available in fulltext from Chinese Medical Journal at Free Access Content
Available in fulltext from Chinese Medical Journal at Directory of Open Access Journals

Effect of decannulation on pharyngeal and laryngeal movement in post-stroke tracheostomized patients.

Author(s) Jung SJ, Kim DY, Kim YW, Koh YW, Joo SY, Kim ES
Citation: Annals of Rehabilitation Medicine, June 2012, vol./is. 36/3(356-64), 2234-0645,2234-0653 (2012 Jun)
Publication Date: June 2012
Abstract: OBJECTIVE: To investigate effects of tracheostomy tube on the movement of the hyoid bone and larynx during swallowing by quantitative analysis of videofluoroscopic swallowing study.METHOD: 19 adult stroke patients with tracheostomies, who met the criteria of decannulation participated. Serial videofluoroscopic swallowing studies were done over 14 days before decannulation, within 24 hours before decannulation, within 24 hours after decannulation, and over 14 days after decannulation. The kinematic parameter such as pharyngeal transition time, stage transition duration, maximal hyoid bone movement, and maximal laryngeal prominence movement were obtained by 2-D quantitative analysis of videofluoroscopic swallowing study.RESULTS: Pharyngeal transition time and stage transition duration were not significantly changed all the time. The maximal hyoid bone movement and maximal laryngeal prominence just after decannulation were improved significantly compared to just before decannulation (p<0.05), especially on vertical movement.CONCLUSION: The hypothesis that a tracheostomy tube disturbs the hyoid bone and laryngeal movement during swallowing may be supported by this study.

Source: Medline
Available in fulltext from Annals of Rehabilitation Medicine at National Library of Medicine

Safety analysis of percutaneous dilational tracheostomies with bronchoscopy in the obese patient.

Author(s) McCague A, Aljanabi H, Wong DT
Citation: Laryngoscope, May 2012, vol./is. 122/5(1031-4), 0023-852X;1531-4995 (2012 May)
Publication Date: May 2012
Abstract: OBJECTIVES/HYPOTHESIS: Since originally described in 1985 by Ciaglia, percutaneous dilational tracheostomy (PDT) has grown in popularity, and today is widely used for critically ill patients requiring long-term mechanical ventilation. Since the inception of PDT, obesity has been considered a relative contraindication to its use. The purpose of this study is to evaluate the risks of PDT in obese patients.STUDY DESIGN: Retrospective review.METHODS: A retrospective review was performed of prospectively collected data from 426 patients who underwent PDT at a single teaching institution from July 2003 to October 2009. The groups were separated into those who had a body mass index (BMI) of <30 or >30 kg/m(2) . The following variables were collected: blood loss at the time of procedure, difficulty in tracheotomy dilation and/or tracheostomy placement, presence of tracheal ring breaks, any bleeding episodes requiring treatment by surgery or blood transfusion, pre- and postprocedure pneumonia, and stoma infection requiring antibiotics. All tracheostomies were placed using the Ciaglia Blue Rhino Introducer Kit (Cook Medical Inc., Bloomington, IN). Statistical analysis was performed with nonparametric statistics using chi(2) testing with P < .05 as significant.RESULTS: No statistically significant difference was found between the obese and nonobese groups for any of the variables studied. Similar results were found when BMI of 40 was used for grouping.CONCLUSIONS: PDT can be performed safely in obese patients. There were no statistically significant differences in measured variables found between the two study groups. This study supports the use of intensive care unit bedside PDT in the obese population. Copyright 2012 The American Laryngological, Rhinological, and Otological Society, Inc.

Source: Medline
Available in fulltext from Laryngoscope at EBSCOhost

Preparation, clinical support, and confidence of speech-language therapists managing clients with a tracheostomy in the UK.
Abstract: BACKGROUND: Literature regarding the education, training, clinical support and confidence of speech-language therapists (SLTs) working with patients with a tracheostomy is limited; however, it suggests that many clinicians have reduced clinical confidence when managing this complex population, many face role and team challenges practising in this area, and most are seeking more opportunities for professional development and training. AIMS: To investigate the education, training, clinical support and confidence of SLTs in the UK who manage patients with a tracheostomy in order to identify current challenges and inform the future clinical training needs of this professional group. METHODS & PROCEDURES: Via an online survey, the clinical training, clinical support and confidence of SLTs with more than one year of clinical experience was examined. A total of 106 SLTs from the UK completed the survey. Within the questionnaire, clinicians were also asked to identify if their workplace had a tracheostomy competency training programme (CTP) to allow further exploration of the preparation, clinical support and confidence of respondents with (43% of respondents) and without (32% of respondents) a CTP. OUTCOMES & RESULTS: Most SLTs (71%) were confident managing patients with a tracheostomy. The majority were accessing professional development and receiving expert support, though many identified specific areas where more support and training was needed. Less than half the group felt up to date with the current evidence. Only 35% of clinicians felt they worked in an optimal team for tracheostomy management, and poor recognition of the role of the SLT in managing dysphagia in patients with a tracheostomy was an issue for many clinicians, particularly on more general care wards. SLTs in workplaces with a CTP were found to have received significantly more expert support, on-the-job training, access to evidence-based practice and were significantly more confident in managing ventilator-assisted patients. CONCLUSIONS & IMPLICATIONS: SLTs are eager to access further professional development and training; however, such training needs to target specific areas of need. The significant difference in the preparation, support and confidence of SLTs with CTPs in their workplace highlights potential benefits that can be achieved through workplace training and support. 2012 Royal College of Speech and Language Therapists.
An audit of characteristics and outcomes in adult intensive care patients following tracheostomy.

Author(s) Ho YM, Wysocki AP, Hogan J, White H

Citation: Indian Journal of Critical Care Medicine, April 2012, vol./is. 16/2(100-5), 0972-5229;1998-359X (2012 Apr)

Publication Date: April 2012

Abstract: BACKGROUND: Tracheostomies are commonly performed on critically ill patients requiring prolonged mechanical ventilation. The purpose of this study was to review our experience with surgical and percutaneous tracheostomies and identify factors affecting outcome.

MATERIALS AND METHODS: Patients who underwent tracheostomy between January 1999 and June 2008 were identified on the basis of Diagnostic Related Group coding and the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification procedural code. The primary endpoint was in-hospital mortality. Contingency tables were generated for clinical variables and a chi-squared test was used to determine significance.

RESULTS: One hundred and sixty-eight patients underwent tracheostomy between January 1999 and 30 June 2008. In-hospital mortality was 22.6%. The probability of death was found to be independent of timing of tracheostomy, technique used (percutaneous vs. surgical), number of failed extubations and obesity. On univariate analysis, the null hypothesis of independence was rejected for age on admission (P = 0.014), diagnosis of sepsis (P = 0.0008) or cardiac arrest (P = 0.0016), Acute Physiology and Chronic Health Evaluation II score (P = 0.0319) and the Australasian Outcomes Research Tool for Intensive Care calculated risk of death (P = 0.0432).

CONCLUSION: Although a number of patient factors are associated with worse outcome, tracheostomy appears to be a relatively safe technique in the Intensive Care Unit population.

Source: Medline

Available in fulltext from Indian Journal of Critical Care Medicine at Free Access Content Available in fulltext from Indian Journal of Critical Care Medicine at Directory of Open Access Journals

Percutaneous tracheostomy, a systematic review.

Author(s) Cabrini L, Monti G, Landoni G, Biondi-Zoccai G, Boroli F, Mamo D, Plumari VP, Colombo S, Zangrillo A

Citation: Acta Anaesthesiologica Scandinavica, March 2012, vol./is. 56/3(270-81), 0001-5172;1399-6576 (2012 Mar)

Publication Date: March 2012

Abstract: BACKGROUND: Percutaneous dilatational tracheostomy (PDT) is a common procedure in intensive care units and the identification of the best technique is very important. We performed a systematic review and meta-analysis of randomized studies comparing different PDT techniques in critically ill adult patients to investigate if one technique is superior to the others with regard to major and minor intraprocedural complications.

METHODS: BioMedCentral and other database of clinical trials were searched for pertinent studies. Inclusion criterion was random allocation to at least two PDT techniques. Exclusion criteria were duplicate publications, nonadult studies, and absence of outcome data.

STUDY DESIGN: Population, clinical setting, and complications were extracted.

RESULTS: Data from 1130 patients in 13 randomized trials were analyzed. Multiple dilators, single-step dilatation, guide wire dilating forceps, rotational dilatation, retrograde tracheostomy, and balloon dilation techniques were always performed in the intensive care unit. The different techniques and devices appeared largely equivalent, with the exception of retrograde tracheostomy, which was associated with more severe complications and more frequent need of conversion to other techniques when compared with guide wire dilating forceps and single-step dilatation techniques. Single-step dilatation technique was associated with fewer failures than rotational dilatation, and fewer mild complications in comparison with balloon dilation and guide wire dilating forceps (all P<0.05).

CONCLUSIONS: Among the six analyzed techniques, single-step dilatation technique appeared the most reliable in terms of safety and success rate. However, the number of available randomized trials was insufficient to confidently assess the best PDT technique.


Source: Medline

Available in fulltext from Acta Anaesthesiologica Scandinavica at EBSCOhost

The importance of choosing the tracheostomy tube: how do we do it?
Chest X-ray after tracheostomy is not necessary unless clinically indicated.

Author(s): Tobler WD Jr, Mella JR, Ng J, Selvam A, Burke PA, Agarwal S
Citation: World Journal of Surgery, February 2012, vol./is. 36/2(266-9), 0364-2313;1432-2323 (2012 Feb)
Publication Date: February 2012
Abstract: BACKGROUND: Chest radiography is routinely used post-tracheostomy to evaluate for complications. Often, the chest X-ray findings do not change clinical management. The present study was conducted to evaluate the utility of post-tracheostomy X-rays.METHOD: This retrospective review of 255 patients was performed at a single-center, university, level I trauma center. All patients underwent tracheostomy and were evaluated for postprocedure complications. RESULTS: Of the 255 patients, 95.7% had no change in postprocedure chest X-ray findings. New significant chest X-ray findings were found in 4.3% of patients, including subcutaneous emphysema, pneumothorax, and new significant consolidation. Only three of these patients required change in clinical management, and all changes were based on clinical presentation alone. CONCLUSIONS: Routine chest X-ray following tracheostomy fails to provide additional information beyond clinical examination. Therefore radiographic examination should be performed only after technically difficult procedures or if the patient experiences clinical deterioration. Significant cost savings and minimization of radiation exposure can be achieved when chest radiography after tracheostomy is performed exclusively for clinical indications.

Source: Medline
Available in fulltext from World Journal of Surgery at EBSCOhost
Available in fulltext at World Journal of Surgery; Collection notes: On first login to a ProQuest journal you will need to select 'Athens (OpenAthens Federation)' from Select Region, and then 'NHS England' from Choose your Library.

Surveillance and management practices in tracheotomy patients.

Author(s): Zhu H, Das P, Brereton J, Roberson D, Shah RK
Citation: Laryngoscope, January 2012, vol./is. 122/1(46-50), 0023-852X;1531-4995 (2012 Jan)
Publication Date: January 2012
Abstract: OBJECTIVES/HYPOTHESIS: To ascertain the surveillance and management practices for tracheotomy patients. STUDY DESIGN: Survey of tracheotomy management. METHODS: An electronically distributed 26-question survey was distributed under the auspices of the American Academy of Otolaryngology-Head and Neck Surgery Foundation. RESULTS: There were 478 responses. The mean number of years in practice was 21.2 years (standard deviation [SD], 11.0 years). Sixty-five percent of respondents perform mainly adult tracheotomy. There is variation in surveillance patterns of immediate, postoperative, intermediate, and long-term surveillance. On average, respondents follow a fresh tracheotomy daily for about 6 days, monthly for about 3 months, and long-term surveillance every 4 months on average. Almost all respondents perform long-term surveillance during routine tracheotomy changes; 61.4% perform this surveillance with an endoscope, and a minority rely on history and examination. The mean frequency of tracheotomy tube changes was 2 months (SD, 2.2 months; median, 1.1 month; range, 0.06-12 months). Two hundred sixty-one respondents have or have used a decannulation algorithm. The vast majority, 96.2%, are comfortable with their current management practices. Over half of the respondents perceive value in a clinical practice guideline to help them with standardizing care, and 80% of respondents feel that it would assist other specialties in the care and surveillance of tracheotomy patients. CONCLUSIONS: There is marked variability in the surveillance and management of tracheotomy patients. There exists opportunity to improve care through standardization of surveillance and management of these patients. Copyright 2011 The American Laryngological, Rhinological, and Otological Society, Inc.

Source: Medline
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A multi-institutional analysis of tracheotomy complications.


**Citation:** Laryngoscope, January 2012, vol./is. 122/1(38-45), 0023-852X;1531-4995 (2012 Jan)

**Publication Date:** January 2012

**Abstract:**

**OBJECTIVES/HYPOTHESIS:** To define the prevalence of tracheotomy tube complications and evaluate risk factors (RFs) associated with their occurrence.

**STUDY DESIGN:** Multi-institution historical cohort.

**METHODS:** Data regarding tracheotomy tube complications from consecutive surgeries performed across eight participating institutions between January 1, 2008 and December 31, 2009 were retrospectively collected. Patient demographics, comorbidities, physician specialty, and surgical technique were recorded and statistically analyzed to identify the incidence of surgical complications following tracheotomy and associated RFs.

**RESULTS:** The charts of 1,175 tracheotomy procedures were reviewed from eight academic institutions. Otolaryngologists performed 66.2% of the tracheotomies. Intraoperative, early (<1 week), and late complication rates were 1.4%, 5.6%, and 7.1%, respectively. Postoperative bleeding was identified as the most common early complication (2.6%), whereas airway stenosis was the most common late complication (1.7%). The use of outer flange security sutures to anchor the tracheostomy tube was negatively associated with the incidence of early complication (P<.0001). The use of large endotracheal tubes (size>7.5) and obesity were associated with the development of airway stenosis (P<.05). Twenty-two percent of patients undergoing tracheotomy died during hospitalization.

**CONCLUSIONS:** Perioperative tracheotomy complications are rare; however, the rate of death for all causes is high (22%) in this population. Obesity and the use of endotracheal tubes over 7.5 in size are major risk factors for the development of airway stenosis. Although percutaneous tracheotomy resulted in a significantly higher rate of postoperative bleeding (6.6%) than the open method (1.9%) (P<.05), the use of outer flange tracheostomy tube sutures may reduce this complication. Copyright 2011 The American Laryngological, Rhinological, and Otological Society, Inc.

**Source:** Medline

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**Percutaneous dilatational tracheostomy: review of technique and evidence for its use.**

**Author(s)** Susarla SM, Peacock ZS, Alam HB

**Citation:** Journal of Oral & Maxillofacial Surgery, January 2012, vol./is. 70/1(74-82), 0278-2391:1531-5053 (2012 Jan)

**Publication Date:** January 2012

**Abstract:**

Tracheostomy is a technique for airway management commonly used by surgeons who care for critically ill patients. Patients with traumatic facial injuries, severe odontogenic infections, and head and neck malignancies are often recipients of tracheotomies. As such, the oral and maxillofacial surgeon who frequently treats such patients should be well-trained in tracheostomy placement. For decades, the standard technique for tracheostomy was the open surgical technique. However, during the past 20 years, the use of percutaneous dilatational tracheostomy has increased. The purpose of the present report is to review the percutaneous dilatational tracheostomy technique, describe the use of intensive care units as proxies for the operating room, and review the available evidence comparing percutaneous dilatational tracheostomy to open tracheostomy. Copyright 2012 American Association of Oral and Maxillofacial Surgeons. Published by Elsevier Inc. All rights reserved.

**Source:** Medline

Available in print at Lincoln County Hospital Professional Library

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**Percutaneous dilation tracheostomy versus surgical tracheostomy in critically ill patients.**

**Author(s)** Pauliny M, Christova E, Mackova J, Liska M

**Citation:** Bratislavské Lekarske Listy, 2012, vol./is. 113/7(409-11), 0006-9248;0006-9248 (2012)

**Publication Date:** 2012

**Abstract:**

**OBJECTIVES:** This study was done to compare surgical tracheostomy and percutaneous dilation tracheostomy in respect to their early postoperative complications in critically ill patients.

**METHODS:** At a university hospital general intensive care unit, we studied 109 critically ill patients who underwent either elective surgical tracheostomy (n=63) or percutaneous dilation tracheostomy (n=46). The number and type of complications...
demonstrated during operation and early postoperative period were recorded and compared.

RESULTS: When comparing the perioperative period of surgical versus percutaneous dilation tracheostomy, we recorded 2 vs 0 complications (NS difference). Average durations of postoperative observation (time until decannulation, release or death) were 16.04 and 16.09 days in group 1 and group 2, respectively; the difference in time was insignificant. When comparing the surgical versus percutaneous groups we have found no significant difference in postoperative complications in respect of bleeding and leakage through the space between the cannula and the stoma (bleeding 2 (3.2 %) vs 3 (6.5 %), NS; leakage 6 (9.5 %) vs 4 (8.7 %), NS). A significant difference was found in infectious complications and disintegration of tracheostomy (inflammation 17 (27 %) vs 0 (0 %), p<0.001, disintegration 14 (22.2 %) vs 0 (0), p<0.001, total number of complications 39 (61.9 %) vs 7 (15.2 %), p<0.001). No other complications were recorded.

CONCLUSION: Percutaneous dilation tracheostomy is an equally safe method compared with surgical tracheostomy. While posing the same perioperative risk, it requires neither the transport to the operating theater, nor the presence of the whole surgical team. In the early postoperative period, it significantly reduces the complications, mainly infections in a critically ill patient. The latter benefits make it a method of choice in elective tracheostomies at ICU (Tab. 2, Ref. 11).

Source: Medline

Early versus late tracheostomy for critically ill patients.

Author(s) Gomes Silva BN, Andriolo RB, Saconato H, Atallah AN, Valente O

Citation: Cochrane Database of Systematic Reviews, 2012, vol./is. 3/(CD007271), 1361-6137;1469-493X (2012)

Publication Date: 2012

Abstract: Background: Long-term mechanical ventilation is the most common situation where tracheostomy is indicated for patients in intensive care units (ICU). 'Early' and 'late' tracheostomies are two categories of the timing of tracheostomy. The evidence on the advantages attributed to early over late tracheostomy is somewhat conflicting but includes shorter hospital stays and lower mortality rates. Objectives: To evaluate the effectiveness and safety of 10 days after intubation versus late tracheostomy (> 10 days after intubation) in critically ill adult patients predicted to be on prolonged mechanical ventilation and with different clinical conditions. Search Methods: We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2010, Issue 12); MEDLINE (via PubMed) (1966 to December 2010); EMBASE (via Ovid) (from 1974 to December 2010); LILACS (1986 to December 2010); PEDro (Physiotherapy Evidence Database) at www.pedro.fhs.usyd.edu.au (1999 to December 2010) and CINAHL (1982 to December 2010). Selection Criteria: We included all randomized or quasi-randomized controlled trials which compared early tracheostomy (two to10 days after intubation) against late tracheostomy (> 10 days after intubation) for critically ill adult patients expected to be on prolonged mechanical ventilation. There was no language restriction. Data Collection and Analysis: Two authors extracted data and conducted a quality assessment. Meta-analyses using the random-effects model were conducted for mortality and pneumonia. Main Results: We included four studies, with a high risk of bias, in which a total of 673 patients were randomized to either early or late tracheostomy. We could not pool data in a meta-analysis because of clinical, methodological and statistical heterogeneity between the included studies. There is no strong evidence for real differences between early and late tracheostomy in the primary outcome of mortality. In one study a statistically significant result favouring early tracheostomy was observed in the outcome measuring time spent on ventilatory support (mean difference (MD) -9.80 days, 95% CI -11.48 to -8.12, P < 0.001). Authors' Conclusions: Updated evidence is of low quality, and potential differences between early and late tracheostomy need to be better investigated by means of randomized controlled trials. At present there is no specific information about any subgroup or individual characteristics potentially associated with better outcomes with either early or late tracheostomy.

Source: Medline

Available in fulltext from Cochrane Library, The at Wiley

Comparative clinical trial between Ciaglia and Griggs techniques during tracheostomy performed in patients admitted to intensive care unit

Author(s) Karvandian K, Yousefian M, Khan ZH, Baigmohammadi T, Shabani S

Citation: Acta Medica Iranica, 2012, vol./is. 50/8(525-9), 0044-6028;1735-9694 (2012)

Publication Date: 2012
Abstract: Percutaneous dilatation tracheostomy (PDT) is one of the most frequent interventions in ventilator dependant ICU patients. Ciaglia and Griggs are two common PDT techniques. Few studies are available comparing these two methods, but there is no data available to compare these two techniques in Iranian population. The aim of this study was to compare Ciaglia and Griggs technique in our population in order to recognize advantages and disadvantages of each technique in order to identify the most beneficial one. This study is a comparative clinical trial conducted on 100 consecutive ICU admitted patients who needed prolonged intubation; half of them underwent PDT with Ciaglia method and other half with Griggs method. Procedural time and short term complications including bleeding, vital signs instability and technical errors were compared in both two methods. Both groups were comparable in demographic characteristics. Griggs method performed significantly faster than Ciaglia method (P=0.001). Complications such as high grade bleeding (P=0.01) and cardiac dysrhythmias (P=0.07) were less in Ciaglia technique than Griggs. Skin incision smaller than required was reported more with Griggs method than Ciaglia (P=0.03). We conclude that PDT with Ciaglia method is safer with less complications than the Griggs method. We suggest use of Ciaglia for less experienced operators.

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Correlation between timing of tracheostomy and duration of mechanical ventilation in patients with potentially normal lungs admitted to intensive care unit.

Author(s) Masoudifar M, Aghadavoudi O, Nasrollahi L
Citation: Advanced Biomedical Research, 2012, vol./is. 1/(25), 2277-9175;2277-9175 (2012)
Publication Date: 2012
Abstract: BACKGROUND: There is insufficient evidence to conclude that the timing of tracheostomy alters the duration of mechanical ventilation, hence this study was designed to investigate the correlation between timing of tracheostomy and duration of mechanical ventilation for patients admitted to intensive care unit (ICU) with potentially normal lungs.MATERIALS AND METHODS: In a retrospective study for a period of 2 years, all adult patients admitted to the medical ICU of Al-Zahra Hospital in Isfahan University of Medical Sciences who needed endotracheal intubation and prolonged mechanical ventilation were considered for inclusion in this study. Data of underlying disease, causes of respiratory failure, age and gender, duration of mechanical ventilation, and interval between intubation time and tracheostomy were collected. The correlations between intubation period and ventilation period were analyzed using a Pearson correlation test.RESULTS: Sixty-six percent of patients (100 patients) were men. The mean ± SD of age of patients was 56.2 ± 20.8 years (18-90 years.). The timing of tracheostomy (duration of endotracheal intubation until tracheostomy) did not exhibit any correlation with the length of mechanical ventilation (P = 0.43, r = 0.08). The timing of tracheostomy had not any correlation with the age of patients (P = 0.20, r = 0.129). The length of mechanical ventilation had not any correlation with the age of patients (P = 0.83, r = 0.02). The timing of tracheostomy was similar in men and women (P = 0.5). Mechanical ventilation period was not significantly different in both genders (P = 0.89).CONCLUSION: Our study with mentioned sample size could not show any relationship between timing of tracheostomy and duration of mechanical ventilation in patients under mechanical ventilation with good pulmonary function in ICU.

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Early complications of elective and emergency tracheostomy.

Author(s) Muhammad R, Khan F, Rehman F, Iqbal J, Khan M, Ullah G
Citation: Journal of Ayub Medical College, Abbottabad: JAMC, January 2012, vol./is. 24/1(44-7), 1025-9589;1025-9589 (2012 Jan-Mar)
Publication Date: January 2012
Abstract: BACKGROUND: Tracheostomy is a life saving procedure when it is performed...
for an appropriate indication and surgical technique. The aim of this study was to compare
the early complications of elective and emergency tracheostomy in our setup.METHODS: This comparative study was conducted at the ENT Department, Hayatabad Medical
Complex (HMC) from March 2009 to March 2010. A total of 100 patients included in this
study were divided in to two equal groups, group A undergoing elective tracheostomy and
group B undergoing emergency tracheostomy. The results of hundred patients were
compared and analysed from stand point of age, sex, disease pattern, operative procedure
and postoperative complications associated with tracheostomy.RESULTS: A total of 100
patients were included with age ranging from 17 to 88 years. The average age was 35
years in elective cases and was 32 years in emergency cases. The male to female ratio
was 2.9:1 in elective cases and 4.6:1 in emergency cases. The overall complications rates
were 38% in elective cases and 56% in emergency cases.CONCLUSION: Early
complications of emergency tracheostomy are more common than elective tracheostomy.

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Journals

Broken tracheostomy tube: A fractured mandate.  
Author(s) Krishnamurthy A, Vijayalakshmi R  
Citation: Journal of Emergencies Trauma & Shock, January 2012, vol./is. 5/1(97-9), 0974-
2700;0974-519X (2012 Jan)  
Publication Date: January 2012  
Abstract: Tracheostomy is a common airway procedure for life support. This procedure is
safe, although occasional early and late complications are known to occur. Fracture and
hence aspiration of a tracheostomy tube in the tracheobronchial tree is a rare late
complication, which can be potentially life threatening. Published reports of a fractured
tracheostomy tube presenting as a foreign body in the tracheobronchial tree are few. The
most common dislodged sites reported were the trachea and the right main bronchus, the
inner flange in our patient was lodged in the trachea and the left main bronchus. Foreign-
body aspiration is a serious medical emergency demanding timely recognition and prompt
action as was successfully done in our patient. Therapeutic rigid bronchoscopic removal is
the mainstay of treatment. A periodic review of the techniques of tracheostomy care
including timely check-ups for signs of wear and tear can possibly eliminate such avoidable
late complications.

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Medicine

Predictors of successful decannulation using a tracheostomy retainer in patients with
prolonged weaning and persisting respiratory failure.  
Author(s) Budweiser S, Baur T, Jorres RA, Kollert F, Pfeifer M, Heinemann F  
Citation: Respiration, 2012, vol./is. 84/6(469-76), 0025-7931;1423-0356 (2012)  
Publication Date: 2012  
Abstract: BACKGROUND: For percutaneously tracheostomized patients with prolonged
weaning and persisting respiratory failure, the adequate time point for safe decannulation
and switch to noninvasive ventilation is an important clinical issue.OBJECTIVES: We aimed
to evaluate the usefulness of a tracheostomy retainer (TR) and the predictors of successful
decannulation.METHODS: We studied 166 of 384 patients with prolonged weaning in
whom a TR was inserted into a tracheostoma. Patients were analyzed with regard to
successful decannulation and characterized by blood gas values, the duration of previous
spontaneous breathing, Simplified Acute Physiology Score (SAPS) and laboratory
parameters.RESULTS: In 47 patients (28.3%) recannulation was necessary, mostly due to
respiratory decompensation and aspiration. Overall, 80.6% of the patients could be
liberated from a tracheostomy with the help of a TR. The need for recannulation was
associated with a shorter duration of spontaneous breathing within the last 24/48 h (p <
0.01 each), lower arterial oxygen tension (p = 0.025), greater age (p = 0.025), and a higher
creatinine level (p = 0.003) and SAPS (p < 0.001). The risk for recannulation was 9.5%
when patients breathed spontaneously for 19-24 h within the 24 h prior to decannulation,
but 75.0% when patients breathed for only 0-6 h without ventilatory support (p < 0.001). According to ROC analysis, the SAPS best predicted successful decannulation [AUC 0.725 (95% CI: 0.634-0.815), p < 0.001]. Recannulated patients had longer durations of intubation (p = 0.046), tracheostomy (p = 0.003) and hospital stay (p < 0.001). CONCLUSION: In percutaneously tracheostomized patients with prolonged weaning, the use of a TR seems to facilitate and improve the weaning process considerably. The duration of spontaneous breathing prior to decannulation, age and oxygenation describe the risk for recannulation in these patients. Copyright 2012 S. Karger AG, Basel.

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Ultrasound-guided percutaneous tracheostomy in critically ill obese patients.
Author(s) Guinot PG, Zogheib E, Petiot S, Marienne JP, Guerin AM, Monet P, Zaatar R, Dupont H
Citation: Critical Care (London, England), 2012, vol./is. 16/2(R40), 1364-8535;1466-609X (2012)
Publication Date: 2012
Abstract: INTRODUCTION: The purpose of this study was to evaluate the feasibility of ultrasound (US)-guided percutaneous tracheostomy (PCT) and the incidence of complications in critically ill, obese patients.METHODS: Fifty consecutive patients were included in a prospective study in two surgical and critical care medicine departments. Obesity was defined as a body mass index (BMI) of at least 30 kg/m2. The feasibility of PCT and the incidence of complications were compared in obese patients (n = 26) and non-obese patients (n = 24). Results are expressed as the median (25th-75th percentile) or number (percentage).RESULTS: The median BMIs were 34 kg/m2 (32-38) in the obese patient group and 25 kg/m2 (24-28) in the non-obese group (p < 0.001). The median times for tracheostomy were 10 min (8-14) in non-obese patients and 9 min (5-10) in obese patients (p = 0.1). The overall complication rate was similar in obese and non-obese patient groups (35% vs. 33%, p = 0.92). Most complications were minor (hypotension, desaturation, tracheal cuff puncture and minor bleeding), with no differences between obese and non-obese groups. Bronchoscopic inspection revealed two cases of granuloma (8%) in obese patients. One non-obese patient developed a peristomal skin infection, which was treated with intravenous antibiotics. Ultrasound-guided PCT was possible in all enrolled patients and there were no surgical conversions or deaths.CONCLUSIONS: This study demonstrated that US-guided PCT is feasible in obese patients with a low complication rate. Obesity may not constitute a contra-indication for US-guided PCT. A US examination provides information on cervical anatomy and hence modifies and guides choice of the PCT puncture site.TRIAL REGISTRATION: ClinicalTrials.gov: NCT01502657.
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