

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

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### **Introduction:**

Without specific strategies to address tracheostomy care on the wards, patients discharged from the intensive care unit (ICU) with a tracheostomy may receive suboptimal care. We formed an intensivist-led multidisciplinary team to oversee ward management of such patients. To evaluate the service, we compared outcomes for the first 3 years of the service with those in the year preceding the service.

### **Methods:**

Data were prospectively collected over the course of 3 years on ICU patients not under the care of the ear, nose, and throat unit who were discharged to the ward with a tracheostomy and compared with outcomes in the year preceding the introduction of the service. Principal outcomes were decannulation time, length of stay after ICU discharge, and stay of less than 43 days (upper trim point for the diseaserelated group [DRG] for tracheostomy). Analysis included trend by year and multivariable analysis using a Cox proportional hazards model. P values of less than 0.05 were assumed to indicate statistical significance. As this was a quality assurance project, ethics approval was not required.

### **Results:**

Two hundred eighty patients were discharged with a tracheostomy over the course of a 4-year period: 41 in 2003, 60 in 2004, 95 in 2005, and 84 in 2006. Mean age was 61.8 (13.1) years, 176 (62.9%) were male, and mean APACHE (Acute Physiology and Chronic Health Evaluation) II score was 20.4 (6.4). Length of stay after ICU decreased over time (30 [13 to 52] versus 19 [10 to 34] days;  $P < 0.05$  for trend), and a higher proportion of decannulated patients were discharged under the upper DRG trim point of 43 days (48% versus 66%;  $P < 0.05$ ). Time to decannulation after ICU discharge decreased (14 [7 to 31] versus 7 [3 to 17] days;  $P < 0.01$  for trend). Multivariate analysis showed that the hazard for decannulation increased by 24% (3% to 49%) per year.

### **Conclusion:**

 [Critical Care. 2008; 12\(2\): R48.](#)

An intensivist-led tracheostomy team is associated with shorter decannulation time and length of stay which may result in financial savings for institutions.

## **Are tracheostomized patients safe on regular hospital wards?**

Wilcox SR, Schmidt UH.

Tracheostomies are commonly performed in critically ill patients, with approximately 10% of patients receiving tracheostomies during their time in the intensive care unit (ICU). Accordingly, much research has centered on the optimal timing of tracheostomy during the ICU course, immediate complications of the procedure, and ICU outcomes such as ventilator weaning and ventilator-associated pneumonia. Less research has focused on outcomes after patients are discharged from the ICU. A small but growing body of evidence suggests that the inability to decannulate a patient prior to ICU discharge is associated with worse outcomes, including higher mortality.

## **Clinical consensus statement: tracheostomy care**

Mitchell RB, Hussey HM, Setzen G, Jacobs IN, Nussenbaum B, Dawson C, Brown CA 3rd, Brandt C, Deakins K, Hartnick C, Merati A.

### **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.

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

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### **Abstract:**

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

## **Evaluation of the role of a specialist tracheostomy service. From critical care to outreach and beyond**

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### **Abstract:**

The impact that a new specialist tracheostomy service, designed specifically for the care of patients with tracheostomies, was assessed in terms of type of tracheostomy tube used, time to first tube change, time to decannulation, and incidence of tracheostomy related complications in a teaching hospital with no on-site ear, nose, and throat facility. A total of 170 patients were studied. After service implementation, fewer patients (17.6%, n=21) were discharged from the intensive treatment unit to the wards with tracheostomy tubes compared with the first group (39%, n=20) ( $p=0.006$ ), and the number of tracheostomy related complications on the wards were significantly reduced ( $p= .031$ ).

## **Multidisciplinary care for tracheostomy patients: a systematic review**

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### **Introduction:**

Appropriate care for patients with tracheostomies in hospital settings is an important issue. Each year more than 7000 patients receive tracheostomies in Australia and New Zealand alone. Many of these tracheostomy patients commence their care in the intensive care unit (ICU) and once stabilised are then transferred to a general ward. Insufficient skills and experience of staff caring for tracheostomy patients may lead to sub-optimal care and increased morbidity. The purpose of this review was to identify whether multidisciplinary tracheostomy outreach teams enable the reduction in time to decannulation and length of stay in acute and sub-acute settings, improve quality of care or decrease adverse events for patients with a tracheostomy.

### **Methods:**

We included all relevant trials published in English. We searched Medline, CINAHL, All EBM and EMBASE in June 2009. Studies were selected and appraised by two reviewers in consultation with colleagues, using inclusion, exclusion and appraisal criteria established a priori.

### **Results:**

Three studies were identified which met the study selection criteria. All were cohort studies with historical controls. All studies included adult patients with tracheostomies. One study was conducted in the UK and the other two in Australia. Risk of bias was moderate to high in all studies. All papers concluded that the introduction of multidisciplinary care reduces the average time to decannulation for tracheostomy patients discharged from the ICU. Two papers also reported that multidisciplinary care reduced the overall length of stay in hospital as well as the length of stay following ICU discharge.

### **Conclusions:**

In the papers we appraised, patients with a tracheostomy tube in situ discharged from an ICU to a general ward who received care from a dedicated multidisciplinary team as compared with standard care showed reductions in time to decannulation, length of stay and adverse events. Impacts on quality of care were not reported. These results should be interpreted with caution due to the methodological weaknesses in the historical control studies.

## **Outcome in Tracheostomized Patients with Severe Traumatic Brain Injury Following Implementation of a Specialized Multidisciplinary Tracheostomy Team**

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### **Objective:**

To evaluate the effect of a specialized multidisciplinary tracheostomy team on outcome of patients with severe traumatic brain injury (sTBI).

### **Design:**

Retrospective study with historical controls.

### **Participants:**

Twenty-seven patients with sTBI tracheostomized before implementation of the tracheostomy team approach and 34 patients followed by the team.

### **Setting:**

A regional level 1 tertiary care trauma center, McGill University Health Centre– Montreal General Hospital. Main outcome measures: Time to decannulation, length of stay (LOS), Passy-Muir speaking valve use, and extended Glasgow Outcome Scale (GOS-E) scores given at acute care discharge.

### **Results:**

The groups were similar for injury severity, age, and premorbid health conditions. Postteam patients had a significantly shorter LOS ( $P = .025$ ) and more of them used Passy-Muir speaking valves ( $P = .004$ ). Furthermore, there was a trend toward decreased time to decannulation in the postteam group. GOS-E scores did not differ significantly between groups ( $P > .05$ ).

### **Conclusion:**

Implementation of the tracheostomy team appears to have had positive clinical benefits for this population. Keywords: early rehabilitation, speaking valves, tracheostomy, team, traumatic brain injury



## **Outcomes of patients with spinal cord injury before and after introduction of an interdisciplinary tracheostomy team**

Tanis S Cameron, Anita McKinstry, Susan K Burt, Mark E Howard, Rinaldo Bellomo, Douglas J Brown, Jacqueline M Ross, Joanne M Sweeney and Fergal J O'Donoghue

### **Objectives:**

To assess outcomes in patients with spinal cord injury (SCI) and a tracheostomy tube (TT), before and after the introduction of a tracheostomy review and management service (TRAMS) for ward-based patients.

### **Design:**

Matched-pairs design with two cohorts, before and after the intervention.

Setting: 900-bed tertiary hospital in Melbourne, Victoria.

Participants: SCI patients with a TT that was removed: 34 patients in the post-TRAMS period (September 2003 to September 2006) were matched to 34 from the pre-TRAMS period (September 1999 to December 2001). Intervention: TRAMS was introduced as a consultative team of specialist physicians, clinical nurse consultants, physiotherapists and speech pathologists. The team coordinated tracheostomy care, conducted twice-weekly rounds, and provided policy, education, and support. Main outcome measures: Comparison of length of stay (LOS), duration of cannulation (DOC), improved communication through use of a one-way valve, number of adverse events and related costs.

### **Results:**

Median patient LOS decreased from 60 days (interquartile range [IQR], 38–106) to 41.5 days (IQR, 29–62) ( $P = 0.03$ ). The pre-TRAMS median DOC decreased from 22.5 days (IQR, 17–58) to 16.5 days (IQR, 12–25) ( $P = 0.08$ ). Speaking-valve use increased from 35% (12/34) to 82% (28/34) ( $P < 0.01$ ). Median time to a valve trial decreased from 22 days (IQR, 13–44) to 6 days (IQR, 4–10) after TT insertion ( $P < 0.01$ ). There were two tracheostomy-related medical emergency calls pre-TRAMS and none post-TRAMS. There were no tracheostomy-related deaths in either group. The annual cost savings from implementing TRAMS were about eight times greater than the cost of service provision.

### **Conclusion:**

Implementing a tracheostomy review and management service improved outcomes for SCI patients: they left acute care sooner, spoke sooner, and the TT was removed earlier, with associated cost savings.

## **Passy-Muir Speaking Valve Use in a Children's Hospital: An Interdisciplinary Approach**

Lauren Hofmann

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### **Abstract:**

At The Children's Hospital of Philadelphia (CHOP) we treat many children requiring tracheostomy tube placement. With potential for a tracheostomy tube to be in place for an extended period of time, these children may be at risk for long-term disruption to normal speech development. As such, speaking valves that restore more normal phonation are often key tools in the effort to restore speech and promote more typical language development in this population. However, successful use of speaking valves is frequently more challenging with infant and pediatric patients than with adult patients. The purpose of this article is to review background information related to speaking valves, the indications for one way valve use, criteria for candidacy, and the benefits of using speaking valves in the pediatric population. This review will emphasize the importance of interdisciplinary collaboration from the perspectives of speech-language pathology and respiratory therapy. Along with the background information, we will present current practices and a case study to illustrate a safe and systematic approach to speaking valve implementation based upon our experiences.

## **Patients Requiring Tracheostomy and Mechanical Ventilation: A Model for Interdisciplinary Decision-Making**

Carrie Windhorst, Ricque Harth & Cheryl Wagoner

### **Excerpt:**

Patients with respiratory failure and distress are now surviving with the help of medical advances including tracheostomy tubes and mechanical ventilation. At the Madonna Rehabilitation Hospital in Lincoln, Neb., we accept patients with tracheostomy tubes; in this 185-bed inpatient hospital, the number of patients who require a tracheostomy tube or mechanical ventilation has increased 19% over the last five years. Between July 2007 and June 2008, 188 patients were admitted with tracheostomy tubes, 116 of whom required mechanical ventilation during part or all of their stay. While some acute rehabilitation hospitals do not accept vents, our hospital has a unique program in which we work on trach and vent weaning. During the past fiscal year, we have used the protocol to wean successfully 58% of patients requiring a tracheostomy tube and 57% of patients requiring mechanical ventilation. Standing admission orders call for completion of an initial one-way speaking valve assessment by both a speech-language pathologist and respiratory therapist within 48 hours.

## **Tracheostomy patients on the ward: multiple benefits from a multidisciplinary team?**

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### **Abstract:**

Patients requiring tracheostomies tend to have a longer length of stay due to their underlying disease. After a thorough literature search, Garrubba and colleagues found only three studies assessing the impact of multidisciplinary teams (MDTs) on tracheostomy patients on the ward. One consistent observation was the decreased time to decannulation after institution of MDT care when compared with historical controls. Although a large prospective randomized trial is desirable before MDT is recommended, many institutions may have already formed a team approach to provide coordinated care resulting in improved outcome and length of stay.

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

Speed L, Harding KE.

### **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.