Patients with tracheostomies are at risk of serious complications. A review of care given to these patients has resulted in a range of recommendations.

Safe care of patients with tracheostomies

In this article...

- Complications associated with tracheostomies
- Review of care provided to patients with tracheostomies
- Recommendations for nursing practice

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Abstract

The National Confidential Enquiry into Patient Outcome and Death has reviewed the care of patients undergoing a tracheostomy or laryngectomy, what happened to them in hospital and potential problems. This article discusses the findings and nursing implications.

Tracheostomy is one of the earliest surgical procedures performed – it is mentioned in Egyptian records from more than 5,500 years ago, while Hippocrates warned of its associated risk of life-threatening haemorrhage (National Confidential Enquiry into Patient Outcome and Death, 2014).

Practitioners undertaking tracheostomies or caring for patients with tracheostomies need expertise and have to follow evidence-based guidance to avoid complications. These can include haemorrhage, obstruction, secondary wound infection, accidental decannulation, formation of false passage and hypoxia.

Review of tracheostomy care
NCEPOD reviewed the care of adults who had a surgical or percutaneous tracheostomy or a laryngectomy between 25 February and 12 May 2013 (NCEPOD, 2014).

The review found the number of tracheostomies performed has increased in recent years, a trend that affects nurses.

A total of 2,755 cases were reported to NCEPOD, of which 2,546 were included in the study; 426 were selected for peer review and, of these, 402 had case notes reviewed. The following questionnaires were used to collect further data:

- Hospital questionnaire to gather data on staffing, competency and training, policies and procedures;
- Ward care questionnaire to gather data on patient numbers, equipment and facilities;
- Tracheostomy insertion questionnaire completed by the clinician responsible for the procedure;
- Critical care questionnaire to gather clinical information and data on complications and facilities.

The ward questionnaire was completed when the tracheostomy was removed, the patient was discharged or died, or 30 days after transfer to the ward. As well as clinical information, it collected data on complications and facilities.

The review report contains 25 recommendations and identifies who is responsible for ensuring each one is implemented within organisations (Box 1). This article summarises the findings and recommendations, and identifies what nurses can do to help ensure they are achieved.

Tracheostomy population
Patients with tracheostomies were nursed in critical care units or general wards; they are a high-risk population because they have potential airway problems and often associated comorbidity.

NCEPOD was unable to ascertain how many patients a year have tracheostomies because hospitals do not routinely gather this information. Those who received surgical tracheostomies were coded, as is usual practice in operating theatres;
however, in the majority of CCUs, where patients received percutaneous tracheostomies, numbers were not routinely collected. Without this information, hospital wards cannot plan care on discharge from CCUs. Nurses in CCUs should review their practices and work with medical colleagues to ensure these events are correctly coded.

Airway concerns in critical care
Not all CCUs had access to difficult-airway equipment such as bronchoscopes and fiberoptic laryngoscopes, nor did they all routinely use capnography to monitor the position of the tracheostomy.

There is strong evidence that capnography should be used for all patients who are critically ill and ventilated to ensure tracheostomy or endotracheal tube are in the correct position by monitoring carbon dioxide levels (Intensive Care Society, 2014). Critical care senior nurses need to ensure capnography, bronchoscopes and fiberoptic laryngoscopes are readily available in their units and that all staff know where they are kept.

Capnography was available in 286 of the 312 (91.7%) CCUs in the review, but used only by 218 of 305 (71.5%) CCUs. Senior nurses should ensure that all patients who are ventilator dependent are monitored with capnography at all times.

Care competency
Only 135 of 212 (63.7%) hospitals reported they had a level of competency expected of staff caring for patients with tracheostomies. Of those who responded, 68.8% had wards that cared for fewer than two patients with tracheostomies per month. In the majority of hospitals (56%), most patients with tracheostomies were cared for in 2-4 different wards; this ranged from one to more than 10 wards. An audit of tracheostomy care was reportedly carried out in 21.2% of hospitals.

If hospitals limited the number of wards where patients with tracheostomies were nursed, nurses on these wards would gain more experience in providing this type of care and therefore be more competent. This is an area on which nurses could lead within their own organisations.

All nurses caring for patients with a tracheostomy have a responsibility to ensure they are competent to do this and that they have the skills to respond in emergencies. Educational resources to ensure competency include the online Tracheostomy Safety, developed by the National Tracheostomy Safety Project with the Royal College of Anaesthetists and e-Learning for Health-care (tinyurl.com/eLH-Tracheostomy).

Emergency care needs improvement. Only 97 of 214 (45.3%) had a resuscitation policy for patients who breathed entirely through stomas in the neck, and 77 of 212 (36.3%) had protocols for the management of patients who breathe through the neck presenting as emergencies.

Tracheostomy insertion
Although nurses do not insert tracheostomy or endotracheal tubes, they play important roles in the procedure. NCEPOD found that not all patients had had consent taken before the procedure; of 638 who had a surgical tracheostomy in theatre, only 611 (95.8%) gave consent and, of the 1,491 who had percutaneous tracheostomies, only 728 (48.8%) did so. Although doctors are responsible for obtaining consent for these procedures, nurses can remind them of its importance.

The World Health Organization surgical safety checklist (or locally adapted versions) is used in many organisations before surgery starts (WHO, 2009). However, one was used only for 239 of 1,490 (16%) patients who had percutaneous tracheostomies inserted in CCUs. Critical care nurses could ensure these checklists are used; the NCEPOD report gives an example of a checklist adapted by Nottingham University Hospitals Trust (Fig 1). Critical care nurses should have an important role in the checklist procedure.

As tracheostomy tube diameter and length should be selected depending on the patient’s size and anatomy, hospitals should ensure they have a range of sizes and lengths available. The review found that 566 of 1,910 (29.6%) patients were obese or morbidly obese but adjustable flanged tubes were used in only 96 out of 510 (18.8%) of them. It is important to use such tubes in patients who are obese as these are longer than standard tubes and can be adjusted to account for varying distances from the skin surface to the trachea.

The use of inner tubes was not universal; 14% of patients did not have one. Inner tubes can be removed easily for cleaning and reduce the incidence of blockages in the tracheostomy tube, which result in significant airway problems. Higgins (2009) provides further information for nurses on the care of inner tubes.

Senior nurses should ensure all tracheostomy tubes meet patients’ individual requirements and that flanged tubes are purchased and used with inner tubes.

Protocols for care
All hospitals should have protocols for tracheostomy care and all staff who care for patients with tracheostomies should have mandatory training.

Nurses in particular should have the knowledge and skills around humidification methods and understand the importance of cuff pressure monitoring and cleaning inner cannulas. All staff should know what to do in an emergency and during resuscitation; failure to care properly for a patient with a tracheostomy will result in harm or even death.

BOX 1. RECOMMENDATIONS AFFECTING NURSES

- Training in blocked/ displaced tubes/airways and difficult tube changes should be delivered in line with clinical consensus guidelines set out by the National Tracheostomy Safety Project and the Intensive Care Society
- Core competences for the care of tracheostomy patients, including resuscitation, should be set out by all trusts using existing national resources
- Tube placement must be obtained using capnography. This should be readily available and events documented
- All unplanned tube changes should be reported locally as critical incidents and investigated to ensure lessons are learned and reduce the risk of future events
- All trusts should have a protocol and mandatory training for tracheostomy care
- Tracheostomy care should be the subject of local quality improvement initiatives. Tube data should be more clearly recorded and available for review at the bedside and thereafter facilitated by a “passport” for each patient
- Bedside staff who care for tracheostomy patients must be competent in recognising and managing common airway complications
- In patients undergoing a tracheostomy without a trial of extubation, the reason should be clearly documented
- Wards accepting tracheostomy patients should be in a state of readiness in terms of equipment and competencies
- Quality of discharge documentation should be improved, and provide a structured and detailed summary at the point of transfer

www.nursingtimes.net / Vol 110 No 31 / Nursing Times 30.07.14 13

“Nurses need to take the lead in promoting healthy lifestyles”
Zoe Mclean p30

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- All trusts should have a policy for patients who breathed entirely through stomas in the neck, and a protocol and mandatory training for tracheostomy care
- Tracheostomy care should be the subject of local quality improvement initiatives. Tube data should be more clearly recorded and available for review at the bedside and thereafter facilitated by a “passport” for each patient.
- Bedside staff who care for tracheostomy patients must be competent in recognising and managing common airway complications.
- In patients undergoing a tracheostomy without a trial of extubation, the reason should be clearly documented.
- Wards accepting tracheostomy patients should be in a state of readiness in terms of equipment and competencies.
- Quality of discharge documentation should be improved, and provide a structured and detailed summary at the point of transfer.
In the NCEPOD review, three patients who died in CCUs with a tracheostomy in place were thought to have died directly as a result of a tracheostomy-related problem; one of the deaths on wards was attributed to a tracheostomy complication.

**Tube changes**

Tracheostomy tube changes should be planned, and staff performing them should be aware of potential complications, especially if there is difficulty in reinserting the tube. It is recommended that tracheostomy tubes with inner tubes are changed about 30 days after insertion; those with no inner tubes should be changed at about 12–14 days. Delaying a tube change may result in it becoming blocked and/or tracheal damage.

Unplanned tracheostomy tube changes occurred when tubes accidentally became displaced or removed, and put patients at additional risk. It is recommended that all unplanned changes are reported as critical incidents and investigated to establish what happened and reduce future risks. Nurses are essential to this reporting and should be involved in investigation teams.

**Discharging patients**

Critical care nurses have an important role in ensuring patients have the appropriate tube when discharged from CCUs. A cuffed or uncuffed tracheostomy tube. The review found that 551 of 580 (95%) patients discharged from critical care left with cuffed tubes, and that many cuffs were left continuously inflated with pressures not monitored. If pressures are not monitored and maintained within the 25–34 cmH₂O range, the tracheal mucosa can be damaged, which may result in tracheal stenosis.

**NURSES Practice Review**

The team agree tracheostomy is in patient’s best interest and it is safe to proceed

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**Tube type**

Nurses, doctors and other team members need to consider whether patients who are discharged from CCUs need a cuffed or uncuffed tracheostomy tube. The review found that 551 of 580 (95%) patients discharged from critical care left with cuffed tubes, and that many cuffs were left continuously inflated with pressures not monitored. If pressures are not monitored and maintained within the 25–34 cmH₂O range, the tracheal mucosa can be damaged, which may result in tracheal stenosis.

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When patients are in CCUs, tracheostomies should be reviewed at least daily with multidisciplinary team. Decannulation should be planned as soon as it is appropriate for the individual. Patients with tracheostomies are a high-risk group so should not be discharged from CCUs or wards at night; neither should their discharges be unplanned. Nurses are essential in planning discharge from CCU to ward, and from ward to community.

**Complications with tracheostomies**

In this review, 461 of 1,956 (23.6%) patients had tracheostomy complications while in the CCU, and 173 of 553 (31.3%) had complications while on the ward. These included:

- Major bleeding
- Pneumothorax
- Accidental decannulation
- Surgical emphysema
- Aspiration
- Respiratory infections
- Cardiac arrests

Nurses must be competent at recognising these and other complications such as respiratory infections, dysphasia and minor bleeding, and be able to manage common airway complications. There must be clear emergency plans that show how to summon senior staff when patients with a tracheostomy have airway problems.

**Summary**

Patients with tracheostomies are vulnerable and at high risk. The NCEPOD report sets out 25 recommendations to ensure patient safety, many of which do not involve additional expenditure. Many of the recommendations have been made by others but this timely report highlights the importance of acting now; this is something many nurses can readily achieve.

**References**


National Confidential Enquiry Into Patient Outcome and Death (2014) On the Right Track? A Review of the Care Received by Patients who Underwent a Tracheostomy. tinyurl.com/NCEPOD-Tracheostomy