'On the Right Trach?' A review of the care received by patients who undergo tracheostomy

An National Confidential Enquiry into Patient Outcome and Death (NCEPOD) study published in June 2014 reviewed the care of more than 2000 patients who had a new tracheostomy formed during an 11-week period in 2013 in the UK, two thirds of which were inserted at the bedside in a critical care unit. Many more patients in hospitals now have a tracheostomy, and this article summarizes the lessons from the report which are particularly important for secondary care clinicians.

Tracheostomies are performed for a variety of reasons and in recent years there has been a particular increase in using temporary tracheostomies to improve patient comfort, reduce sedation requirements and assisting with weaning from artificial ventilation in critical care. This increase in tracheostomy insertions has coincided with an improvement in the quality and range of equipment available, along with the skills to perform tracheostomy as a percutaneous bedside procedure. However, this increase in the number of procedures leads to a new set of potential issues, from ensuring the organization of care is suitable for these patients including multidisciplinary input to providing training for those staff involved in the ongoing care of this group of patients. This article summarizes some of these issues.

The National Confidential Enquiry into Patient Outcome and Death (NCEPOD, 2014) report 'On the Right Trach?' presents an overview of the care received by adults following tracheostomy insertion, and includes a survey of organizational aspects of care. The report provides 25 recommendations, many of which reinforce those already made by others in recent years (Intensive Care Society, 2008; Cook et al, 2011; UK National Tracheostomy Safety Project, 2013). The Intensive Care Society has published revised standards to coincide with the NCEPOD report (Intensive Care Society, 2014).

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This article provides a brief summary of the report, concentrating on key findings and recommendations relevant to all hospital clinicians.

Study methodology

The study followed the entire care pathway of patients from insertion to decannulation, death or discharge from critical care, and for up to 30 days after admission to a ward while a tracheostomy remained in place. Data were collected from 213 hospitals over an 11-week period in 2013. Questionnaires were returned for 2199 patients undergoing an insertion and 402 cases were peer reviewed in detail by multidisciplinary clinical advisors. Of the 237 hospitals identified as providing tracheostomy care, 219 submitted data for an organizational questionnaire (92% returns). An additional questionnaire was completed for 474 wards across 174 hospitals.

Report findings

How many tracheostomy insertions are being performed?

Before publication of the NCEPOD study there were few data on how many tracheostomy procedures were carried out in the UK annually. NCEPOD has shown that there are approximately 12 000 tracheostomies performed annually across England, Wales and Northern Ireland. This is much higher than some previous estimates (5000 insertions) and hospitals need to be aware of the number of insertions they undertake, both in critical care as well as surgically. Without that knowledge there is no way of planning the ongoing care for patients with tracheostomies, especially with regard to equipment and trained staff for ward care once they are discharged from critical care.

Insertion

The majority (70%) of tracheostomy insertions were percutaneous, with 89.3% of percutaneous tracheostomies and 62.3% of surgical insertions classed as urgent or emergency procedures. The most common underlying diagnosis at the time a decision was made to perform tracheostomy was respiratory disease (68% of percutaneous cases and 44.8% of surgical insertions), with neurological disease also being relatively common (23.5% of percutaneous and 9.3% of surgical insertions). In the surgical group 39% of patients underwent tracheostomy in association with (mostly planned) head and neck surgery.

Pre-procedure safety checklists were used in 97.6% of surgical insertions, but were used comparatively infrequently in just 16% of percutaneous cases. Similarly written consent was recorded in 95.8% of surgical cases in comparison to just 48.8% of percutaneous insertions. This leaves opportunities for highlighting risks to be missed, and NCEPOD recommends that safety checks are performed in all locations before tracheostomy insertion. Increasing communication between team members and between clinicians and patients and/or relatives may help identify such risks.

Insertion complications were relatively unusual but both the peer review and organizational data in this report showed that the use of capnography was not universal at tracheostomy insertion in critical care. Just 286/312 (92%) of critical care areas that replied to the survey stated that capnography was available at all times at insertion, and continuous capnography was used in only 71.5% of areas. This was a key recommendation of NAP4 (Cook et al, 2011) and is again reinforced by the NCEPOD report.

Most patients receiving percutaneous insertion of tracheostomy had a standard cuffed tube inserted. However, 13.5% of

tubes had no inner cannula (to help prevent tube blockage). Of patients on critical care 29% were obese or morbidly obese, but despite this standard length tubes were commonly used, with only 30/277 (10.8%) of obese patients receiving an adjustable flanged tube at insertion.

Of tubes in critical care 27% were changed relatively early (at or before 7 days after insertion). About half of these changes (57/113) were unplanned.

NCEPOD concluded that tubes should be selected with more attention to patient size and clinical need. The report also recommended that unplanned tube changes should be reported locally as critical incidents.

Regular cuff pressure measurement is important to avoid tracheal mucosal damage. Despite the fact that 95% of patients left critical care with a cuffed tube in place, cuff pressure was measured in just 75% of patients thereafter in other hospitals wards. There is further evidence in the report that the skills and equipment were not always available to measure cuff pressure on wards, e.g. in 12% of hospital wards the equipment to measure cuff pressure was not available.

NCEPOD recommends that careful consideration should be given to the need for a cuffed tube at critical care discharge, and whether ward areas are equipped and competent to measure cuff pressure.

Organization of care

Most hospitals had fewer than four wards including critical care which looked after patients with a tracheostomy. However, there were 15 hospitals that participated in the study where there were more than 10 wards where tracheostomy patients could be cared for. These findings reveal differing approaches to care and skill provision with some larger centres preferring centralization of tracheostomy care while in others there are many more wards which need to maintain the equipment, staffing levels and skills to do so.

Respondents were asked whether there were ward nurses available at all times to carry out routine elements of tube care and to deal with management of common emergencies such as blocked or displaced tubes. Even in specialist wards the competences to care for tracheostomy patients were not always available; for example in 18/81 neurology and neurosurgery wards the skills were not available to manage blocked or displaced tubes, and in 26/81 measurement of cuff pressure was not a routine competency.

Only 54% of hospitals had a policy for the resuscitation of patients with a tracheostomy and a patent upper airway, and even fewer (45.3%) had a policy which covered laryngectomy patients (*Table 1*).

NCEPOD recommends that core competences for the care of tracheostomy patients, including resuscitation, should be set out by hospitals using existing resources, making this the responsibility of medical directors and directors of nursing to implement.

No doubt much of the organizational framework for the care of tracheostomies could be facilitated by appointed leads. However, NCEPOD has found that medical leads are present in only about one third of hospitals, and nursing leads in about a half (*Table 2*).

The multidisciplinary team

About two thirds of patients that had a newly created tracheostomy and subsequently were cared for in a ward were discussed by a multidisciplinary team. Gaps in team composition were also identified. While participation of speech and language therapists in multidisciplinary team review appeared to be high, in 65 of 295 (22%) cases that were peer reviewed there was felt to be a lack of attention to the patient's communication needs in either critical care, the ward or in both locations. Notably about 50% (220/554) of patients on wards with a new tracheostomy had swallowing difficulty at some point and this was as common after surgical as percutaneous insertion.

NCEPOD recommends early involvement of speech and language therapists to facilitate in the communication needs of patients with a tracheostomy. There is also a need to improve recognition of swallowing difficulties and early referral to a speech and language therapist with specific competences is recommended.

Complications and outcome

A total of 23.6% patients in critical care and 31.3% of ward patients experienced a defined complication. About 30% of patients had more than one complication. The most serious of these were blocked and displaced tubes, major haemorrhage and severe barotrauma resulting in pneumothorax. For most individual complications the incidence was similar in critical care and the ward. However, tube displacements were more common in ward patients (6.3% *vs* 4.1%) and this may relate to both reduced supervision and a greater level of independent activity in patients at this stage in their care.

A case scenario from the report highlights exactly this, in the care of a middle-

Table 1. Resuscitation policies and protocols

	Yes		No		Subtotal	Not answered
	n	%	*n*	%	*n*	*n*
Resuscitation policy covering the patient with a tracheostomy but whose upper airway may still be patent	116	54.0	99	46.0	215	4
Resuscitation policy covering the patient who is totally reliant on breathing through the stoma in the neck, i.e. a laryngectomy stoma	97	45.3	117	54.7	214	5
Protocol for the management of neck breathers who present as an emergency	77	36.3	135	63.7	212	7

Table 2. Presence of trained leads for tracheostomy

	Medically trained		Non-medically trained	
	n	%	*n*	%
Yes	75	34.4	112	51.1
No	143	65.6	107	48.9
Subtotal	218		219	
Not answered	1		0	
Total	219		219	

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aged patient who had sustained a high cervical fracture after a fall, with a high thoracic sensory level as a result of spinal cord trauma. There were other injuries to chest and face and the patient underwent a difficult insertion of a surgical tracheostomy, in part because the patient had a high body mass index. At day 10 after insertion and during day time hours the tube became either blocked or displaced, resulting in a cardiac arrest. Thankfully, the patient responded well to a short period of cardiopulmonary resuscitation and tube re-insertion, but management of the patient was complicated by the lack of venous access at this point. Despite the potential for major harm the patient was successfully decannulated about 1 month later.

This example illustrates the need for prompt management of a patient whose tracheostomy tube becomes blocked or displaced. The patient sustained a cardiac arrest secondary to the rapid onset of severe hypoxia. However, in the context of critical care, and during the normal working day when there were resident staff available in larger numbers, the patient was rapidly resuscitated and a serious outcome from the complication was avoided. Ensuring staff on wards caring for patients with a tracheostomy have the same skills is crucial to the quality of care of this group of patients.

Overall there were 12 (4.1%) serious outcomes in the 396 patients where clinical notes were peer reviewed as a result of a tracheostomy complication. In three of these this outcome was hypoxic brain damage. The full report provides further details of the events surrounding these severe complications as well as a description of the other outcomes for patients who had a tracheostomy inserted.

NCEPOD asked about staff training in managing blocked or displaced tubes. This was not undertaken in 27.9% of hospitals and in 19.4% of hospitals there was no policy for management of blocked or displaced tubes.

NCEPOD recommends that bedside staff caring for patients with a tracheostomy must be competent in recognizing and managing common airway complications including tube obstruction and displacements.

Other outcomes

Data were available for 1956 critical care discharges, which included 17.5% in-patient critical care mortality. Of those decannulated, 48.6% occurred before critical care discharge with reported success rates of 98.8%. Others were transferred to wards (78.1%), other critical care areas (12.9%), or to rehabilitation facilities or other sites. Wards frequently received patients outside of 'normal' working hours, with 165/348 (47.4%) ward admissions with new tracheostomies occurring after 18.00 hours and before 08.00 hours.

NCEPOD recommends that critical care areas avoid discharge of patients with tracheostomies to wards at night, but that wards are in a state of readiness for such admissions should they occur.

Conclusions

Tracheostomy insertion is regarded as a relatively low risk procedure which can now be carried out at the bedside in many high-risk patients – however, planning for the ongoing care of these patients is not routinely undertaken.

Information on how many procedures are carried out percutaneously has been poor and not captured by existing data collection systems to date – hospitals need to know this to be able to plan effectively.

There needs to be greater multidisciplinary input into the care of patients undergoing a tracheostomy insertion.

While improving patient comfort the importance of meticulous ongoing care of the tracheostomy patient is recognized and bedside staff must have the competence and confidence to deal with common emergencies.

NCEPOD presents a study which encompasses the full care pathway in patients with a new tracheostomy in hospital, alongside an extensive review of organizational aspects of care.

The study reinforces recommendations made by other health-care groups, and presents new information which can be used as a basis for discussion and future planning to improve patient outcomes. BJHM

LEARNING POINTS

- Tracheostomy insertion should be prepared for and should be recorded as for an operative procedure.
- The diameter and length of a tracheostomy tube should be appropriate for the size and shape of the patient and include an inner cannula.
- Training in dealing with common tracheostomy emergencies should be provided for all staff who care for the patient, and equipment should always be readily available to facilitate this.
- Good tracheostomy care involves a large multidisciplinary team and communication between team members and with the patient facilitates improved outcomes.
- Excellent up to date resources for tracheostomy care are provided within the National Tracheostomy Safety project (www.tracheostomy.org.uk).

Conflict of interest: none.

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Further reading

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