ABSTRACT
Aims and objectives: To identify current perspectives and areas for research regarding care and management of tracheostomized adult patients discharged to general wards and the community.

Background: The increased number of tracheostomies being performed has led to more tracheostomized patients being discharged to non-specialized areas. Staff within these diverse areas may care for this patient group on an infrequent basis, and may lack the skills, knowledge and confidence to provide safe tracheostomy care. Although several guidelines and quality improvement initiatives have been developed to guide and improve tracheostomy care, concerns continue to be raised regarding this aspect of care. These factors inadvertently create significant risks for example, tube displacement in addition to the risks associated with procedures such as tracheal suctioning.

Search strategy: Database searches of MEDLINE, BRITISH NURSING INDEX and CINAHL (1998–2009). Inclusion criteria was literature regarding tracheostomized adult patients discharged to non-specialized areas. Exclusion criteria was paediatric literature.

Conclusions: Although best practice is applied to the care of tracheostomized adult patients in some areas, including support for ward staff from specialist nurses or teams, this is not always formalized or consistent. Furthermore studies indicate a lack of medical follow-up once the patient is discharged from specialized areas with a tracheostomy. Research is very limited in relation to the care and management of tracheostomized adult patients outside specialized areas, yet there is morbidity and mortality associated with this patient group. Staff education is widely recommended, but further development is needed to determine the best methods of delivering education, especially for health care professionals who care for tracheostomized patients on an infrequent basis.

Relevance to clinical practice: More tracheostomized patients are being discharged to non-specialized areas, and issues have been raised regarding risks to patients. Research is required to determine the best methods of promoting best practice to improve tracheostomy care.

Key words: Educational issues • Patient transfer from ICU • Educational needs of critical care nurses • Critical care education • Clinical governance • Respiratory care

INTRODUCTION
Tracheostomy care has traditionally been specific to specialized areas, e.g. ear, nose and throat (ENT) departments and intensive care units (ICU) (Heafield et al., 1999). The number of tracheostomies being performed internationally is increasing (Parker et al., 2007), particularly in ICUs (Docherty, 2001; Intensive Care Society, 2008) where as many as one-third of patients will require a tracheostomy to facilitate mechanical ventilation (Casserly et al., 2007). Although figures vary according to location, a recent UK survey indicated that approximately 50–200 tracheostomies are performed annually in general ICUs (Veenith et al., 2008). Most tracheostomized patients are decannulated prior to ICU discharge (Engoren et al., 2004; Stelfox et al., 2008), but some patients require the tracheostomy beyond the acute phase for secretion and airway management (Haines et al., 2001; Barnett, 2005, 2008), and others may require a permanent tracheostomy (Garner et al., 2007). Consequently, more tracheostomized patients are being nursed in general wards and the community (Haines et al., 2001; Docherty and Bench, 2002; Lewis and Oliver, 2005), and staff within...
these diverse settings are expected to provide safe and effective tracheostomy care (Phillips, 2005).

Despite increasing international literature and guidance aimed to improve tracheostomy care (Littlewood, 2005), some health care professionals may lack the relevant skills, knowledge, and confidence to provide safe and effective care for tracheostomized patients (Parker et al., 2007). Additionally, medical follow-up of tracheostomized patients is variable outside specialized and critical care areas (Fikkers et al., 2003; Krishnan et al., 2005; Koitschev et al., 2006; Kluge et al., 2008). Therefore, decisions regarding the ongoing management of tracheostomy tubes may be left to health care professionals who lack comprehensive tracheostomy experience (Heffner, 2008; Stelfox et al., 2008). There are serious risks associated with tracheostomies, e.g. airway occlusion (Thomas and McGrath, 2009), and issues for tracheostomized patients following ICU discharge have been highlighted (Tobin and Santamaria, 2008). These patients are mainly older adults and due to age-related physiological changes, they are more at risk of respiratory and cardiovascular complications (Russell, 1999; Baskin et al., 2004; Parker et al., 2007). Furthermore, there is a risk of increased mortality in certain tracheostomized patient groups who are discharged to a ward after ICU (Fernandez et al., 2008).

The recovery period following critical illness can be a difficult time for staff, patients and their families (Paul and Rattray, 2008), particularly if the patient is tracheostomized (Coad and Haines, 1999; Barnett, 2005; Phillips, 2005), and because these patients may have additional complex needs, they are likely to be more dependent on nursing care (Ball, 2005; NICE, 2007). Procedures such as suctioning and tube changes can be distressing for patients, and therefore staff must be knowledgeable in order to reassure and inform patients and provide appropriate care (Sherlock et al., 2009). This is especially important during an emergency tube change procedure, yet some health care professionals may lack knowledge and experience in this area (Casserly et al., 2007).

Psychological aspects of care are also important and some patients may be unable to communicate verbally, causing frustration and anxiety (Higgins, 2009). The presence of a tracheostomy tube can also affect the person’s body image, cause embarrassment and affect their psychosocial health (Ede and McGowan, 2001; Sherlock et al., 2009). Nurses have most contact with tracheostomized patients; therefore, their role in providing safe and effective care cannot be overestimated (Halfpenny and McGurk, 2000). Although nurses must recognize and work within their limits of competence, they must also participate in appropriate learning and practice activities to develop and maintain their competence (Nursing and Midwifery Council, 2008). Patients expect nurses to be competent and confident practitioners, and health care professionals who provide tracheostomy care have a professional responsibility to ensure that they possess the necessary skills and knowledge (Woodrow, 2002; NHS QIS, 2007). Without specific strategies to address tracheostomy care in non-specialized areas, patients may receive sub-optimal care (Tobin and Santamaria, 2008).

**LITERATURE REVIEW METHOD**

Searches of the MEDLINE, BRITISH NURSING INDEX and CINAHL databases were conducted to identify current perspectives and potential areas for research regarding the care and management of tracheostomized adult patients in non-specialized areas, particularly those patients discharged from ICU. Limits were applied to identify English language publications dated 1998–2009. Publications relating to paediatric patients were excluded. The keywords were: ‘tracheostomy’ or ‘tracheotomy’. Related terms were ‘adult’, ‘general ward’, ‘acute setting’, ‘acute care’, ‘community’, ‘temporary’, ‘long term’, ‘critical illness’, ‘recovery’ and ‘ICU discharge’.

**RESULTS AND SELECTION OF CITATIONS**

The search limits for date and language were applied during all databases searches and as three databases were used, all duplicates were removed prior to reviewing the abstracts for relevance. The keyword ‘tracheostomy’ or ‘tracheotomy’ was initially entered, and over 2200 citations were retrieved. To narrow this search, a series of individual searches was undertaken using each of the related terms and combining these with the keywords. This resulted in retrieving 153 potentially relevant citations/abstracts. After reviewing the abstracts, some citations were discarded due to the diverse literature relating to tracheostomies, e.g. publications about different tracheostomy procedures such as surgical and dilation techniques, complications of certain surgical procedures, tracheostomy procedures performed in ICU, timing of when the tracheostomy was performed and outcomes associated with weaning from ventilation with either endotracheal or tracheostomy tubes. In order to review a range of international publications relating to the care and management of tracheostomized patients in non-specialized areas, 76 publications were selected as these were most relevant to the area of interest. Several useful textbooks and guidelines which provided further references for care of tracheostomized patients in the
short and long term were also identified from library resources, but were not included due to the scope of this review, see for example, Dougherty and Lister (2008, pp. 982–1042).

Despite the large amount of international publications relating to tracheostomy care and management, research in this area is limited (Lewis and Oliver, 2005; Tobin and Santamaria, 2008), particularly regarding tracheostomized patients in general wards (NHS QIS, 2008). A few publications relate to tracheostomized patients discharged from ICU, but these mainly offer guidance on care, or relate to liaison nurses who provide support on various aspects of critical care. A few emerging initiatives are apparent involving multidisciplinary teams who provide specific tracheostomy advice and support for patients and staff. Much of the medical tracheostomy literature focuses on surgical techniques, although a few include tracheostomy management in non-specialized areas. Themes identified from the literature retrieved were ‘tracheostomy care and management in general wards’, ‘decannulation’, ‘tracheostomy education’, ‘continuity of care: hospital to community’ and ‘best practice’.

TRACHEOSTOMY CARE AND MANAGEMENT IN GENERAL WARDS

Tracheostomy care has been identified as a ‘high risk–low incidence’ skill (Smith-Miller, 2006, p. 222) within areas where staff care for tracheostomized patients on an infrequent basis and only perform tracheostomy care occasionally (Woodrow, 2002). Due to the low incidence of tracheostomies within these areas, staff may lack the necessary skills and knowledge to provide safe and effective care for tracheostomized patients (Griggs, 1998; Buglass, 1999; Gratrix et al., 2008; Day et al., 2009). Tracheostomies are associated with serious risks, e.g. airway occlusion, and mismanagement can be fatal (Day, 2000; Halffpenny and McGurk, 2000; Tamburri, 2000; Woodrow, 2002) (see Table 1 for potential risks associated with tracheostomies). The risks are further increased if the patient is discharged with a single lumen tracheostomy tube in situ (Ball, 2005).

It has been recommended that nurses working in all specialities should have the knowledge and skills to competently perform all aspects of tracheostomy care such as suctioning, stoma care and resuscitation and have knowledge of the appropriate equipment (Krishnan et al., 2005; Russell, 2005; Feber, 2006). However, staff in non-specialized areas may lack these skills and be unaware of the different types of tracheostomy tubes and equipment (Russell and Harkin, 2001; Hettige et al., 2008). Furthermore, a lack of knowledge of current

Table 1 Potential risks associated with tracheostomies

- Hyponxia, respiratory arrest, cardiac arrest (Casserly et al., 2007; Day et al., 2009)
- Airway occlusion/obstruction due to tenacious or profuse secretions, mucous plugging, excessive granulation tissue (Green and Edmonds, 2004; Casserly et al., 2007)
- Tube displacement or dislodgement (Tamburri, 2000)
- Inability to pass suction catheter or insert inner cannula (Dougherty and Lister, 2008)
- Bleeding (Hackeling et al., 1998, Dougherty and Lister, 2008)
- Tracheal stenosis (Littlewood, 2005)
- Infection (Björling et al., 2007)
- Aspiration (Phillips, 2005)
- Tracheal necrosis, due to over-inflation of cuff (Feber, 2006)

best practice may result in staff making individual judgments regarding tracheostomy care (Buglass, 1999; Lewarski, 2005). Although there are several types of tracheostomies, e.g. percutaneous, surgical and mini-tracheostomies, and a variety of tubes, e.g. single or double lumen, cuffed and uncuffed, the general principles of nursing care and management are similar in terms of aspects such as tracheal suctioning procedures and emergency bedside equipment (Dougherty and Lister, 2008). However specific care is required for some tracheostomy tubes, e.g. cuffed tubes which are mainly required to create a seal around the trachea for artificial ventilation (Feber, 2006).

Problems regarding emergency tracheostomy-related management in general wards have been highlighted (Russell, 1999; Russell and Harkin, 2001; Hettige et al., 2008). Tube displacement can be particularly serious (Tamburri, 2000) and re-insertion of the tube should only be performed by experienced staff due to factors which can complicate the procedure, e.g. copious secretions and excessive granulation tissue (Casserly et al., 2007). Re-admission to ICU may be necessary for some patients due to problems e.g. mucous plugging, which is potentially avoidable with appropriate care (Russell, 2000; Green and Edmonds, 2004). Patients who have recently had their tracheostomy tube removed are also at risk of respiratory compromise, therefore close observation is essential following decannulation particularly in the first 24 h (Choate et al., 2009). In a prospective descriptive study Choate et al. (2009) identified that decannulation failure in general wards occurred in a small proportion of patients, particularly within the first 24 h (4.8%, N = 823). This study indicated that most patients required re-establishment of the tracheostomy tube due to sputum retention or respiratory distress, which may occur if the patient has an ineffective cough reflex. This emphasizes the importance of closely observing patients’ respiratory function and assessing their cough reflex, as
specialist medical help may be required to re-insert the tracheostomy tube.

Tracheal suctioning is an important aspect of care and the nurses’ ability to safely perform suctioning is crucial (Day, 2000). However, issues regarding unsafe suctioning practices in general wards, indicating a lack of awareness of best practice recommendations are apparent (Heafield et al., 1999; Day, 2000; Day et al., 2002). Moreover, some nurses may lack suctioning skills and may be unaware of the risks associated with this procedure, e.g. hypoxaemia and bradycardia (Jayasekara, 2009; Day et al., 2009). Day et al. (2002) conducted an observational study involving acute and high-dependency ward nurses (N = 28) and found that some nurses did not apply best practice guidance when performing tracheal suctioning, despite reporting that they had knowledge of this. Although this study involved a small sample in one institution, it highlighted the need for further research to improve tracheostomy practice and the uptake of guidelines. It is important to note however that some areas within the same institution may use different tracheostomy protocols and guidelines, and some areas may be unaware of such resources, particularly if they only care for tracheostomized patients occasionally (Lewis and Oliver, 2005). Furthermore, although local polices and tracheostomy guidelines may be available, some nurses may not access these due to staff shortages or time constraints (Fokke and Coulter, 1999).

McKillop (2004) evaluated the impact of a Best Practice Information Sheet (BPIS) for tracheal suctioning of adult patients (Joanna Briggs Institute, 2000). The evaluation involved a survey and observation of critical care nurses’ (N = 105) suctioning procedures across three hospital sites before and after the BPIS was introduced. Although there was a trend towards a modest uptake of the BPIS 12 months later, this was variable across the three sites. However, the BPIS was intended to change nurses’ behaviours as well as their practice and multiple strategies were used to implement this. It is widely known that the implementation of evidence-based recommendations is a complex process and change management in organizations is challenging and resource intensive (McKillop, 2004; Smith-Miller, 2006).

Concerns have been raised regarding the morbidity and mortality associated with tracheostomized patients (Russell and Harkin, 2001; Russell, 2005; Feber, 2006). However, it is important to note that in some cases, mortality may not be directly related to the tracheostomy tube, but rather the patients’ co-morbidities. Fernandez et al. (2008) reviewed the records of ward patients who were discharged from ICU (N = 936). Approximately 14% (n = 130) of the patients were tracheostomized. Ward mortality was found to be higher in tracheostomized patients (26% versus 7%), P < 0.001, but those tracheostomized patients who died were older and their clinical condition was assessed subjectively by intensivists as being sicker and having more complications at the time of ICU discharge (Fernandez et al., 2006, 2008). Furthermore, the tracheostomy-related mortality in this study was low and the main causes of death were related to co-morbidities or infections. Although this study involved one centre, and despite the potential limitations of subjective assessments, it highlights the need for better methods of predicting mortality at the time of ICU discharge to aid decisions regarding patients’ care once they are transferred to general wards (Afessa and Kean, 2007).

There are expectations regarding nursing skills, knowledge and confidence in tracheostomy care (Docherty and Bench, 2002), yet some nurses may experience stress, anxiety and fear when taking over the care of tracheostomized patients from ICU (Coad and Haines, 1999; Haines et al., 2001; Ball, 2005). Staff may also feel anxious when caring for patients who require long-term tracheostomies following critical illness and are discharged to the community (Barnett, 2005, 2006), or attending clinics for other medical conditions (Garner et al., 2007). NICE (2007) states that health care professionals caring for patients following ICU require education about the effects of critical illness. This is important because patients may experience effects such as muscle weakness, reduced cough efficiency or swallow impairment leading to risks of aspiration (Serra, 2000; Phillips, 2005; Parker et al., 2007).

Ideally, in all areas where tracheostomized patients are transferred from ICU, staff should have access to care guidelines and formal liaison with experienced professionals (Phillips, 2005). However, tracheostomy practice varies within areas where patients are transferred from ICU (Heffner, 2008). In some areas, ward staff may seek advice from ICU colleagues (Haines and Coad, 2001), while others have enlisted the support of liaison nurses, critical care outreach teams or ENT specialist nurses to provide education and facilitate supervised tracheostomy practice (Russell, 2000; Lewis and Oliver, 2005). A few areas may have dedicated follow-up services for tracheostomized patients, and this may involve providing education, performing cough and swallow assessments and planning decannulation (Norwood et al., 2004; Arora et al., 2008; Tobin and Santamaria, 2008). Although such services are invaluable, they may not be formalized or consistent, and some areas may not have access to these (Garner et al., 2007; Tobin and Santamaria,
2008). Furthermore, similar to other countries, a UK survey identified that two-thirds of ICUs do not have a tracheostomy follow-up protocol, highlighting the need for development and resources in this area (Krishnan et al., 2005). Poor documentation of tracheostomy care and management is also apparent and may lead to fragmented care (Lewis and Oliver, 2005), yet accurate documentation is essential, particularly for staff who provide tracheostomy care occasionally (Woodrow, 2002).

DECANNULATION
For tracheostomized patients who are discharged from ICU, decannulation in the ward may be planned by a specialist team, critical care practitioners or the team taking over the care of the patient, which may lead to discrepancies in care. This may be compounded if a decannulation protocol or policy is not in place (Krishnan et al., 2005). Decannulation is an important step in the recovery process following critical illness, yet local practice and opinions tend to vary regarding the most appropriate time and methods for this procedure (Stelfox et al., 2008). This may be due to a lack of medical follow-up in non-specialized areas (Leung et al., 2003; Krishnan et al., 2005), and also a lack of scientific evidence to guide decisions about the optimal process and timing of decannulation (Lewarski, 2005; Choate et al., 2009). Although there is some consensus regarding factors such as the patient’s conscious level, cough effectiveness, secretions and supplementary oxygen requirements which are important to consider when deciding about decannulation, practitioners’ decisions may differ (Stelfox et al., 2008). This is partly due to subjectivity when assessing patients, e.g. secretions and cough effectiveness and the lack of available objective criteria to predict successful decannulation (Choate et al., 2009). Although peak cough flows can be measured, patients are required to be fully alert and co-operative and this may not always be possible (Choate et al., 2009).

TRACHEOSTOMY EDUCATION
Although tracheostomy education is recommended for inexperienced staff working in non-specialized areas (Russell and Harkin, 2001; Lewis and Oliver, 2005; Day et al., 2009), Smith-Miller (2006) found that ‘experienced’ nurses in tracheostomy care may not necessarily possess sufficient knowledge. Similarly, critical care or ENT staff may lack knowledge in certain aspects of tracheostomy care (Fokke and Coulter, 1999; Day et al., 2001; Lewis and Oliver, 2005; Casserly et al., 2007). A review of adverse events associated with airway devices, including tracheostomies within critical care areas highlighted concerns regarding health care professionals’ skills and knowledge and a lack of appropriate equipment (Thomas and McGrath, 2009). Therefore regardless of experience or the speciality, education is required for all members of the multidisciplinary team who are caring for tracheostomized patients (Casserly et al., 2007; Hettige et al., 2008), including undergraduate nursing and medical students (Heafield et al., 1999; Garner et al., 2007).

Although education is widely recommended, the impact of education on patient care may be difficult to measure due to confounding variables, and if health care professionals are exposed only to tracheostomy care occasionally, they may not retain the knowledge and skills (Woodrow, 2002; Ball, 2005; Day et al., 2009). Furthermore, skills and knowledge retention may be limited after attendance at one-off lectures, and may not lead to improvements in practice (Day et al., 2009). In a randomized controlled trial, a group of nurses and physiotherapists (n = 45) from general and high-dependency wards who received a traditional lecture, practical demonstrations and individualized performance feedback were found to have statistically significant higher knowledge (P = 0.014) and tracheostomy suctioning practice scores (P = 0.037) in comparison with a similar group (n = 50) who did not receive the feedback (Day et al., 2009). The researchers suggested that formative feedback as part of a structured education session may be more beneficial, however further research is needed to identify the impact of such training over time. Audit data collected over a 5-year period by ICU Liaison nurses indicated that the introduction of a tracheostomy education programme for ward-based staff along with bedside teaching reduced the number of preventable tracheostomy-related ICU re-admissions from 5 to 0 per year (Green and Edmonds, 2004).

CONTINUITY OF CARE: HOSPITAL TO COMMUNITY
Changes in health care and economic pressures have led to shorter stays in acute care facilities (Lewarski, 2005; National Institute for Health Research, 2009), and as the number of tracheostomies being performed in ENT and ICU are increasing, more tracheostomized patients are being discharged home or to care facilities (Garner et al., 2007). However, similar to acute settings, Lewarski (2005) highlights the lack of scientific evidence regarding the long-term management of tracheostomized adult patients. Care and management of long-term tracheostomy tubes tend to be based on
local practice or differing staffs’ opinions and this may cause confusion for staff, patients and carers (Björling et al., 2007). In addition, late complications such as tracheal stenosis can occur, which creates risks associated with morbidity and mortality (Littlewood, 2005). Risks of infection in long-term tracheostomy tubes are apparent, yet manufacturers’ advice can vary regarding inner cannula cleaning and the use of different costly decontamination agents (Björling et al., 2007). However, in a single-centre randomized cross over study, Björling et al. (2007) compared the use of a simple detergent with a chlorhexadine-based solution plus detergent and found that both methods similarly eliminated organisms in the inner cannulae (N = 49). Similar larger studies are warranted to identify the most clinically and cost effective care.

The transition from hospital to the community is an important phase in preparation for the long-term care of tracheostomized patients (Serra, 2000; Ede and McGowan, 2001; Bowers and Scase, 2006). For patients recovering from critical illness, communication between the multidisciplinary team in ICU, the ward and the community practitioners is paramount. It is recommended that the community nurse visits the hospital and observes and practices care if needed, especially tube changes and suctioning (Barnett, 2005; Lewarski, 2005). Although this may be difficult to facilitate due to workload, it is essential if the nurse is to support patients and carers. Early discharge planning, patient and carer education and preparation of the community nursing staff including equipment and supplies are also recommended (Serra, 2000; Barnett, 2005, 2006; Bowers and Scase, 2006). Medical follow-up is also important (Lewarski, 2005) yet, Garner et al., (2007) found that only 53% of otolaryngologists (N = 658) had a protocol for tracheostomized adult patients preparing for hospital discharge. Additionally, 33% reported that discharge planning and education was primarily the role of the general ward nurses, therefore there was possibly an assumption that ward nurses had knowledge of long-term tracheostomy care (Garner et al., 2007). A review of tracheostomy-related emergency department admissions indicated that patients may present from home on more than one occasion with potentially serious complications such as dislodged tubes and bleeding, and some patients required hospitalization (Hackeling et al., 1998). Such complications can be anxiety-provoking for patients, carers and staff (Hackeling et al., 1998), which emphasizes the need for education and support.

Despite the limited research focusing on tracheostomized adults in the community, there is some evidence that having a tracheostomy for conditions such as chronic respiratory failure can affect patients’ and carers’ quality of life, and may create a significant burden to carers (Rossi Ferrario et al., 2001; Krouse et al., 2004). Rossi Ferrario et al. (2001) interviewed carers who provided tracheostomy care at home, and those who reported higher levels of perceived strain were female carers whose relative had their tracheostomy in situ for <14 months. This study identified that carers needed ongoing reassurance, information and education to help them cope.

**BEST PRACTICE**

There is a need for research and evidence-based guidelines relating to all aspects of tracheostomy care (Stelfox et al., 2008), but due to the challenges of managing tracheostomized patients in uncontrolled environments, controlled studies are generally not possible (Lewarski, 2005). Despite the limited scientific evidence available (Lewis and Oliver, 2005; Littlewood, 2005; Heffner, 2008), and the limited studies specific to post-ICU tracheostomized patients (Tobin and Santamaria, 2008), there is literature to guide staff on tracheostomy care and management (Docherty and Benj, 2002; Tamburri, 2000; Bond et al., 2003; Edgtton-Winn and Wright, 2005; Higgins, 2009). Additionally, several published best practice statements and standards have been devised (Joanna Briggs Institute, 2000; NHS QIS, 2007; ICS, 2008). Examples of good practice have also been described regarding the benefits of using double lumen tracheostomy tubes for ward patients to prevent tube blockage and reduce the frequency of tube changes (Harkin and Russell, 2001; Phillips, 2005). Furthermore, standardizing tracheostomy tubes within organizations allows staff to familiarize themselves with the same equipment, regardless of the location (Lewis and Oliver, 2005). Visual prompt cards describing the care of tubes have also been produced for ward staff, along with tracheostomy discharge information sheets (Lewis and Oliver, 2005).

Quality improvement initiatives have led to the development of Tracheostomy Care Bundles (Arora et al., 2008). Care bundles are evidence-based protocols or packages relating to a specific aspect of care that have been developed according to current available evidence and best practice and are intended to improve patient care and outcomes (Fullbrook and Mooney, 2003). Care bundles are also useful tools for evaluating current practice against explicit criteria. However, such examples of good practice may not be fully implemented across all health care settings and issues regarding the care of tracheostomized patients, regardless of the clinical speciality, or experience of nurses continue to be reported (McKillop, 2004). The implementation of care bundles alone may not guarantee that
staff will comply; therefore additional measures are necessary to promote best practice. Hettige et al. (2008) implemented a monthly education programme for ward-based staff which included practical workshops and the introduction of a tracheostomy care bundle and care plan. A prospective audit over 3 months identified improvements regarding adequate humidification, the availability of bedside safety equipment and completion of tracheostomy documentation.

Tracheostomy care bundles encompass several components of care including humidification, inner tube care and weaning, and ideally 100% compliance with each component of care should be evident. Arora et al. (2008) found that compliance with a tracheostomy care bundle increased from 58% to 94% when a newly established ENT-led tracheostomy team provided regular patient follow-up and staff education regarding the bundle. It was also found that decannulation time (following ICU transfer) had reduced from 21 to 17 days. Similarly Tobin and Santamaria (2008) evaluated the implementation of an intensivist-led multidisciplinary team for ICU discharged tracheostomized patients over a 3-year period and compared this with data obtained from the year before the service began. They found that the mean length of the patients’ hospital stay in the year prior to the service was 30 days, and this reduced to 19 days (P < 0.05), over the 3-year period, and the mean decannulation time reduced from 14 to 7 days (P < 0.01). However, the researchers acknowledged that extraneous factors may have influenced this, e.g. the patients were already regularly followed up by ICU liaison nurses. Additionally, the senior doctor’s formal instructions could have reduced some of the complications that previously occurred before the new service, which may have prolonged the patients’ recovery and hospital stay. Due to difficulties measuring the effectiveness of such services, most researchers use retrospective and prospective data to compare patient outcomes pre- and post-tracheostomy service. However evaluations indicate that there is consensus regarding the benefits of having a dedicated tracheostomy team to support patients and staff outside specialized areas (Norwood et al., 2004; Parker et al., 2007; Arora et al., 2008; Tobin and Santamaria, 2008; Cameron et al., 2009).

DISCUSSION AND RECOMMENDATIONS

A range of international publications relating to tracheostomy care and management in non-specialized areas has been reviewed. To date, there is a lack of nursing studies which have specifically explored the views and experiences of nurses caring for tracheostomized patients recovering from critical illness in non-specialized areas. Furthermore, very few studies have focused on patients’ and carers’ experiences of tracheostomy following critical illness in the short and long term (Rossi Ferrario et al., 2001; Krouse et al., 2004). These are important areas, because more patients are being discharged to wards or home with tracheostomies for short- or long-term airway management, and carers may experience significant strain and burden. The few publications that have discussed the nursing role indicate that ward nurses feel anxious when taking over the care of tracheostomized ICU patients (Coad and Haines, 1999; Haines et al., 2001; Green and Edmonds, 2004; Ball, 2005), which may impact on their confidence and competence. However, it would be useful to further explore ward nurses’ experiences to identify better methods of providing support and tracheostomy education, and particularly the retention of skills and knowledge after education has been provided. The study by Haines et al. (2001) involved a small sample of nurses and focused on various aspects of caring for a patient after ICU discharge. A study involving a larger sample of ward staff would be valuable to expand specifically on caring for tracheostomized patients. This sample could include medical staff because studies indicate a lack of education and experience in some areas (Garner et al., 2007; Gratrix et al., 2008).

Education is frequently recommended for everyone involved in caring for tracheostomies, but further exploration of the best educational strategies would be valuable. Specialized training may enhance nurses’ confidence (Smith-Miller, 2003), and formative feedback in conjunction with structured education and bedside teaching may be beneficial (Day et al., 2009). Further investigation is needed to determine the impact of education on staff’s practice, confidence and uptake of guidelines. Regardless of nurses’ experience or speciality, McKillop (2004) suggests that research should include gaining nurses’ perspectives on the use of best practice guidelines in terms of readability, accessibility and practicality and the potential of computerized decision support systems for nurses working in busy clinical areas. Also there is potentially a gap in experienced nurses’ knowledge which warrants further study (Smith-Miller, 2006).

In summary, there are serious risks associated with tracheostomies in areas where staff care for tracheostomized patients on an infrequent basis, and therefore may lack skills and knowledge in this aspect of care. Ward staff may also experience anxiety or stress when taking care of tracheostomized patients after ICU. Quality initiatives such as tracheostomy care bundles have been shown to improve care, along
with education and support from specialist teams and critical care staff, however some areas may not
have access to these. Furthermore, despite the amount
of literature and guidelines available regarding best
practice in tracheostomy care and management, some
areas, including critical care wards may not fully apply
these in practice. Structured education and supervised
practice is frequently recommended which can be
effective in the short term, however better educational
strategies for retaining tracheostomy knowledge and
skills over time are warranted. Patients and relatives
also require education and support whether the
patients’ tracheostomy is required temporarily or
long term and further research is needed regarding
patients’ and relatives experiences’ of tracheostomies
after ICU.

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WHAT IS KNOWN ABOUT THIS TOPIC
- Some patients may require a tracheostomy tube after intensive care for airway and secretion management.
- Patients may be transferred to diverse areas where health care professionals may lack experience, skills and knowledge.

WHAT THIS PAPER ADDS
- This comprehensive literature review highlights several important issues regarding the care and management of tracheostomized patients in acute and community settings.
- There are significant risks associated with tracheostomies outside specialized areas; therefore improvements in practice are required to support staff, patients and carers.
- Several best practice initiatives have been highlighted in some areas, but this is not consistent across all health care areas.
- Potential areas for research have been considered to identify the best methods for supporting and educating staff, patients and carers and promoting best practice in tracheostomy care.

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