

Caring for children with a tracheostomy: a national survey of Australian and New Zealand nurses

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Abstract

Caring for a child with a tracheostomy in the ward or home environment places additional responsibility on nurses' knowledge and competency to meet the unique needs of the paediatric patient and to fulfil the obligations of education and support to families and carers. This study set out to gain an overview of the care and management of children with tracheostomies through surveying facilities that provided dedicated support to children requiring long-term tracheostomy care in Australia and New Zealand. No recent review of nursing practice and management of the paediatric tracheostomy patient existed. Fifteen units throughout Australia and New Zealand were identified as the sample population. A nurse specialist from each area was asked to comment on their unit practice by completing a survey based on variables identified in the literature regarding tracheostomy care in adult and paediatric populations.

Many areas of practice were consistent throughout the units surveyed and, for the most part, practice was based on evidence. Two areas of practice were identified as deviating significantly from the evidence and were therefore highlighted for modification. Those practices were the use of saline instillation as a method of loosening secretions, and the depth to which suction catheters were inserted during tracheal suctioning. These identified areas of concern were highlighted to participating units for modification in practice. Within the research facility immediate changes to practice were implemented, with saline installation being withdrawn from practice standard guidelines. Ongoing quality activities have resulted from these findings.

Key words: tracheostomy; paediatric; survey; benchmark.

What is already known on the topic

There is a plethora of papers written on the individual aspects of tracheostomy care which communally provide a strong evidence base.

Previous studies have shown that the foundations for practice of tracheostomy care are not necessarily based in evidence and that nurses experienced in the care of the tracheostomy patient do not understand the rationales behind the practice guidelines.

What this paper adds

This paper reviews current nursing practice with regard to tracheostomy care both within hospitals and the community. Through this study we have gained an overview of the care and management of paediatric tracheostomy patients. Through benchmarking clinical practice in this manner, we have gained a snapshot of care facilities throughout Australian and New Zealand and been able to identify areas of practice that fall both within and outside evidence-based guidelines.

Introduction

The focus of management and care for patients following an acute period of illness requiring respiratory support is aimed at promoting a return to normal ventilation or optimising existing ventilatory function. This requires varying levels of intervention on the nurses' part in order to protect and maintain the patient's airway. Patients with tracheostomies are being cared for in ward or home environments, well outside the critical care areas where their acute care is initially managed^{1,2}. This places additional responsibilities on the nurses' knowledge and competency levels as airway

management during this process can be complex, especially when considering the unique needs of children³.

As patient acuity has increased and clinicians' roles have expanded and developed, the question is whether practice remains evidence-based and consistent across varying units and facilities. Previous studies have evaluated nurses' knowledge, underlying their practice in relation to tracheostomy care, and their findings have demonstrated that there is little relationship between the two. One study revealed a general lack of awareness of evidence-based practice, with concerning numbers of nursing staff not understanding the rationale

behind practice guidelines or the potential complications of practice⁴. The findings of this and other similar studies have identified the need for nurses to have support and education relating to the care of the tracheostomy patient, as well as hands on training in clinical practice in order to be able to provide safe and competent care¹⁻⁶.

Numerous studies have examined and compared tracheostomy suctioning, tube changes, tube removal, parental management and experience and support in the community. However, at the time that this study was conducted, there had been no single recent review of nursing practice and management of children with tracheostomies within hospitals or in the community. This study set out to gain an overview of the care and management of children with tracheostomies through surveying facilities that provided dedicated support for long-term tracheostomy care. Secondary aims of the study were to benchmark care across units and compare with evidence-based recommendations.

Methods and materials

The sample population consisted of 15 units throughout Australia and New Zealand which were identified through their membership of a paediatric tracheostomy support group. In 2004 a nurse specialist in each unit was asked to comment on their unit practice by completing a survey developed by the investigators based on variables identified in the literature on tracheostomy care in adult and paediatric populations. The data generated would be used to assess and justify current practice and inform prospective changes in healthcare/ service delivery⁷. Included in the survey were questions on patient activity, staffing levels, stoma care, humidification, suction, securing device, tube types, decannulation, home care, schooling and respite care. Additionally, there was an open-ended question which invited participants to provide suggestions for further investigation. Only aggregate data are reported here. Frequencies and descriptive statistic analysis were undertaken on the data received utilising the Statistical Package for Social Sciences⁸.

Results

All but one of the respondents returned the questionnaires, giving a return rate of 93% (n=14). The characteristics of the respondents, their units, activity and clientele are listed in Table 1.

Patient activity and staffing levels

Patients with tracheostomies were largely cared for in multiple ward areas throughout the hospitals surveyed (63%), with just five hospitals having dedicated tracheostomy wards. Half the hospitals surveyed reported that they had specialist nurses to advise on and provide dedicated care for children with tracheostomies. These nurses were predominantly titled clinical nurse consultants but also clinical nurse specialists and nurse coordinators. Of the remaining hospitals, staff caring for children with tracheostomies included the ward staff, educators and clinical nurse specialists in other areas.

The median number of patients the nurses cared for was four, but ranged from 1-50, indicative of the varied scope that

exists within and outside of the hospital environment. Some hospitals (6; 43%) operated at a nurse patient ratio of 1:2, with just two (14%) operating at a 1:1 and the remaining five equally divided between 1:3 and 1:4. In most cases (12; 85%), it was nursing staff who decided the staff patient ratio, with the patient's condition being the major determinant for staffing levels (6; 43%). Other influencing factors included patient age, location of patient (i.e. side room), parental attendance and overall staffing acuity. Twelve of the hospitals (86%) did not have a policy guiding the nurse patient ratio for care of children with a tracheostomy. Those that did have a policy in place took into account the aforementioned factors.

Stoma care

The majority of respondents (9; 64%) reported that they cared for a new stoma at least daily plus as required (PRN). Four hospitals reported fourth hourly stoma care and one hospital reported second hourly stoma care. The majority of respondents (11; 78%) used an aseptic technique when providing stoma care. The remaining three did not clarify what other technique they used if not aseptic. Saline was the predominant solution used for cleaning a new stoma (13; 93%). A range of dressing materials were used, with the condition of the stoma dictating the choice of dressing (level

Table 1. Demographic details of sample group.

Participant profile	n	(%)	
Location patients nursed			
All over the hospital	8	57	
One ward only	5	36	
Surgical wards/day procedure	1	7	
Number of patients currently under unit's care			
1-5	8	57	
10-15	2	14	
35-50	4	29	
Is there a specialist nurse that case manages patients			
Yes	7	50	
No	7	50	
Title of nurse responsible for patient care			
Clinical nurse specialists	3	21	
Community resource nurses	1	7	
Clinical nurse consultants	6	43	
Paediatric liaison nurse	1	7	
Respiratory nurse consultant	1	7	
Ward nurses	2	14	
Nurse patient ratio*			
	General	Children<2	Children>7
1:4	2	3	7
1:3	3	3	2
1:2	6	3	0
1:1	2	3	1
Other†	1	2	4

* Multiple responses allowed. One non-respondent

† Determined by presence of parents or other variables

of secretions, exudate etc). Once the stoma was considered established, the majority of units (10; 71%) continued to use gauze and saline to cleanse the stoma but other units reported using gauze and tap water (2; 14%) or a washcloth with soap and water (2; 14%).

The units used a range of treatments for managing granulation tissue around the stoma. Most stated they used silver nitrate (13; 93%), but they might also use foam dressings (6; 43%) or betadine solution (3; 21%). Five units (38%) also reported taking patients to the operating theatre to debride the granulomatous tissue.

Humidification

Just over half the units surveyed reported using active humidification (8; 57%). Only seven units provided an answer about the decision to use active humidification versus a (passive) heat moisture exchange (HME) device that was based on the viscosity and volume of secretions, the presence (or not) of infection, the requirement for oxygen or ventilatory support, time of day, and the age of the stoma. Twelve units (85%) stated that they occasionally used nebulised saline to aid in the hydration and removal of secretions. Once the child and the stoma were considered established, most patients continued to use HMEs (9; 64%), with the reasoning for non-use being copious secretions or no need perceived. These were largely changed on an as, required basis, (11; 78%) as opposed to daily intervals (3; 22%).

Suction

Ten units (71%) acknowledged occasionally instilling saline during suction, while the remaining four units (29%) did not use saline at all. The median amount of saline used was 0.40mls, with a range of 0.10-1.5mls. The main reason cited for using saline was to loosen secretions and all the units that used saline believed it to be effective. The major indication for initiating suctioning was perceived patient distress (10; 71%), with the other four units (29%) citing the presence of secretions. The end of the tracheostomy tube was cited as the reference point for depth of insertion by 11 units (85%), with the carina or just beyond the end of the tube alternative reference points. Most units (11; 78%) used a sterile catheter for each episode of suctioning and, if a catheter was reused, it was rinsed with water (3; 22%).

Tracheostomy tapes and tubes

A combination of cotton twill or Velcro tapes were used by 10 units (71%), with two units each using either device. Both types of tapes were changed on a daily basis by the majority of units (>71%) and the decision about which device to use was related to patient age (1; 7%), patient/child preference (4; 30%) or a combination of these (8; 62%).

When asked about the type of tube used at the hospital, most respondents stated a combination of Portex® tubes [Smith's Medical International, UK] and Shiley® [Nellcor, Tyco Healthcare, USA] (9; 64%). Clinical requirement or doctor preference were the main indicators for type of tracheostomy tube chosen (13; 93%). Most units did not use cuffed tubes (9; 64%) but five units (36%) said they occasionally did. When

a unit did use a cuffed tube they all stated that their policy was to check the cuff pressure using a manometer on an eight hourly basis. One unit did state that they sometimes checked the pressure using a syringe. Eleven units (79%) changed tracheostomy tubes on a weekly basis, with one unit changing tubes monthly and with two units changing tubes quarterly. The majority of units (13; 93%) did not reuse tracheostomy tubes in the hospital. The one unit that did reuse tubes cleaned the tube according to instructions and stored it in a clean, dry container.

Decannulation

The majority of units (9; 64%) stated that they had a policy guiding the decannulation process and similarly that they used a 1:1 nurse/patient ratio. A range of clinical areas were utilised when a child was to undergo elective decannulation. These included the ward, intensive care or operating theatre.

Home care

When preparing parents to care for their child with a tracheostomy at home, all units used a combination of teaching aids, with written information and demonstration being the most reported educational tool used (13; 93%). Eight units (57%) stated that they also employed video and parent networking. Most units said their hospital provided the suction units for parents' use at home, with the remaining five units stating that a private company or external organisation fulfilled this requirement. Parents from half of the units received one suction unit with the other half receiving two. Laerdal® [Laerdal Medical Ltd, UK] was the main type of suction unit supplied and used, but one other unit was also used ResQvac® [Trademark Medical, USA]. The provider of the suction unit maintained the working order of the unit, with half of suction units (7; 50%) being tested on annual basis, one unit servicing on a 6 monthly basis, and the remainder on an 'as required' basis.

The majority of respondents (9; 64%) stated that they did not advocate that parents reuse suction catheters at home. Of the five units that did prescribe this, the catheters were cleaned with soap and water. The same number of respondents stated they did not advocate that parents reuse tracheostomy tubes. Of the five units that did, the duration of tube use before disposal ranged from 1-2 months, to 6 months to 'until worn'. Cleansing techniques advocated also varied, ranging from soap and water to chemical or boil sterilisation.

Half of the units said that they supplied parents with monitoring equipment. Six of the units supplied a pulse oximetry machine, with one unit supplying both an oximeter and an apnoea mat. Consumables for parental use at home were either supplied by the hospital (9; 64%) or government supplier (5; 36%). Three of the units (21%) stated that parents were asked to pay for these at cost ranging from \$30-50 a month.

Nearly all the units (13; 94%) provided parent education on cardiopulmonary resuscitation (CPR). One unit used an external organisation for this task. Of the 13 units that coordinated CPR training, all used demonstration as a method for education but also employed lectures (9; 64%), booklets (8; 57%) or video (5; 35%).

School/respice services

The median number of children under the care of these specialist units/nurses attending school was five (range 1-40). The majority of the schools had a dedicated teacher aide or carer (10; 71%) to look after the child's special needs in the school environment. Three schools also used parental assistance either when an aide was not available or by choice. Three units did not respond to this question. Six units (43%) spoke of difficulty with securing trained staff or access to training to support students with tracheostomies in the school environment. Ten of the units surveyed said they provided training to schools and community groups. Three of the four units that did not provide training cited that an outside provider (community) fulfilled this role.

A number of support measures were available to parents/carers of children with tracheostomies in the home. Nine units (64%) provided or facilitated respice care, six units (43%) arranged community nurse visits, while five units (38%) arranged a clinical nurse specialist visit to the home. One unit said they did not provide support and one unit did not answer this question. Ten of the units (71%) stated that having a tracheostomy was officially classed as a disability in their State. For children less than 5 years old, community assistance and/or respice were only available for eight of the units (57%) and this was usually based on an individual assessment. General consensus was that respice services were particularly difficult or impossible to secure for parents/carers (12; 86%).

Future implications

Just five units (36%) responded positively to the suggestion of contribution to a quarterly newsletter for parents/carers of children with tracheostomies. However, all units were unanimous in their willingness to participate in research related to paediatric tracheostomy care, with 12 units nominating specific areas including best practice (tracheostomy care), feeding issues, speaking valves, humidification, tube change frequency, parental experience and the value of community and respice care (Tables 2 & 3).

Discussion

In undertaking this study, the researchers sought to document the care that was being provided to paediatric tracheostomy patients in specific facilities throughout Australia and New Zealand. Tracheostomies are becoming an increasingly common treatment option for airway management in patients who require alternative airway access, have risk of aspiration or secretion retention or who require long-term ventilation support⁹. Their management must take into account the individual patient's needs, especially when age appropriate care has to be a consideration. From the results of this study we can see that there are a number of clinical practices that are routinely implemented in management of the tracheostomy patient.

Stoma care

The long-term tracheostomy tube is not dissimilar to other long-term indwelling devices (e.g. gastrostomy tubes, suprapubic catheters, intravascular catheters)¹⁰. Like all

foreign bodies, it elicits an inflammatory response from the surrounding tissue and the site has potential to become colonised with bacteria. The development of granulation tissue around the stoma and the related sequelae is a major complication with long-term tracheostomies¹⁰. The literature fails to provide evidence that could guide optimal care of the tracheostomy tube and stoma, but it has been suggested that careful attention to skin care at the stoma site decreases the incidence of infection and irritation of the surrounding tissue, which in turn could reduce the formation of granulation tissue¹⁰. A range of preference in dressings was reported, each being dictated by the condition of the stoma. This survey found that an aseptic dressing technique using saline and gauze performed as required was generally considered optimal for wound management.

Humidification

Because the upper respiratory tract is bypassed in the patient with a tracheostomy, the function of warming, filtering and moistening inhaled gases is lost¹¹. It is important that adequate heat and moisture is applied to the airways of a tracheostomy patient to maintain mucociliary function, facilitate the removal of secretions and optimise gaseous exchange⁹. As indicated by our respondents, selection of the most appropriate humidification device relies on the nurse to assess the individual needs of the patient. Electric humidifiers were utilised by the units in the survey predominantly for new tracheostomies, those with respiratory infections or requiring supplemental oxygen, or for those who had excess secretions. Otherwise HMEs were encouraged to be worn at all times and were changed PRN.

Suctioning

Suctioning of the airway is essential to assist the patient to remove secretions and prevent the formation of mucous plugs that can block a tracheostomy tube³. There are many complications associated with airway suctioning that range from tracheal trauma, hypoxia, infection, bronchospasm, cardiac arrhythmia, arrest and death^{3,4,12}. There is little support for, and indeed, growing evidence against the use of normal saline installation to facilitate the removal of secretions¹²⁻¹⁴. Research has suggested that this practice is harmful; its deleterious effects including a reduction in oxygen saturation and increased risk of infection^{3-7, 12, 15, 16}. It was of concern to the researchers that 71% of the units surveyed continue to use saline instillation during suctioning. Instead it is recommended that the clinician maintains adequate humidification of airways and optimises the patient's hydration status as a means of facilitating easier removal of secretions^{12, 15, 17}.

Traditionally, nursing practice has dictated that suctioning be carried out at regular intervals even if there was no evidence that the treatment was required¹⁷. Evidence now indicates that the individual patient's respiratory status should be assessed regularly and suctioning only employed if necessary, with the patient encouraged to cough secretions up unassisted if they are able^{16, 17}. The participating units predominately reported using clinical signs such as patient distress, decreased saturations and inability of the patient to clear their own secretions as indicators for suctioning.

The majority (85%; n=12) of the units surveyed identified utilising nebulised saline as a means of loosening tenacious secretions. Although this has been shown to be an effective means of delivering heavily saturated air via an endotracheal tube or tracheostomy and therefore a management option for tenacious secretions^{3, 18}, there is limited evidence to support this practice. In fact, in neonates and small babies, one paper has cautioned against saline nebulisation for routine management of tenacious secretions because of the potential for over-hydration of the airways. This impacts on

Table 2. Practice issues with a consensus >70%.

Practice issues with a consensus >70%	n (%)
Staffing	
Nurse responsible for deciding nurse patient ratio	12 (86)
Stoma care	
Aseptic technique on new stoma*	11 (85)
Saline solution around a new stoma	13 (93)
Gauze and N/S on an established stoma	10 (71)
Granulation	
Silver nitrate to treat granulation tissue	13 (93)
Humidification	
Nebulised saline for thick secretions	12 (86)
HMEs changed PRN	11 (79)
Suctioning	
Saline instillation during suctioning	10 (71)
Saline for thick secretions†	10 (83)
Distress indicator for suctioning	10 (71)
Depth of catheter insertion to end of tracheostomy tube*	11 (85)
Single use of suction catheters	11 (79)
Do not reuse suction catheters in hospital	13 (93)
Tapes	
Combination of cotton or velcro used	10 (71)
Change cotton tapes daily*	11 (85)
Change Velcro tapes daily	10 (71)
Tubes	
Weekly tracheostomy tube change while in hospital	11 (78.6)
Don't reuse tracheostomy tube on same patient	13 (92.9)
Home care	
Parents don't pay for consumables	11 (79)
Nurse taught CPR	13 (93)
School/respite services	
Community teaching of tracheostomy care	10 (71)
Dedicated carers or aides in schools	10 (71)
Tracheostomy considered to be a disability	10 (71)
Respite services difficult to secure	12 (86)

n=14 *n=13 †n=12

mucociliary lung function and can also effect overall fluid balance¹⁹. Recommended practice is to ensure consistent and active humidification which will reduce production of secretions and prevent the development of thick secretions in the tracheostomy patient²⁰. The practice of nebulisation offers no additional benefits¹⁹.

Evidence has shown that the insertion of a suction catheter too far or too forcefully can damage the fragile mucosal membranes the catheter comes into contact with, as well as causing vagal stimulation and potential arrhythmias⁴.

Table 3. Practice issues without a consensus <70%.

Practice issues without a consensus <70%	n (%)
Staffing	
Tracheostomy patients cared for in wards throughout hospital	9 (64)
Tracheostomy patients cared for in dedicated wards	5 (38)
Dedicated nurse specialists (only care for tracheostomy pts)	7 (50)
Nurse patient ratio*	
1:1	2 (14)
1:2	6 (43)
1:3-1:4	5 (36)
Stoma care	
Daily wound care for new stomas	9 (64)
Fourth hourly wound care	4 (29)
Second hourly wound care	1 (7)
Granulation	
Foam dressing	6 (43)
Betadine dressing	3 (21)
Surgical intervention	5 (38)
Humidification	
Active humidification	8 (57)
HMEs once stoma established	9 (64)
Tubes	
Portex or Shiley tubes used	9 (64)
Uncuffed tubes used	9 (64)
Decannulation	
1:1 policy for decannulation	9 (64)
Home care	
Hospital provides suction units for home	9 (64)
No reuse of suction catheters at home	9 (64)
No reuse of tracheostomy tubes at home	9 (64)
Consumables supplied from hospital	9 (64)
School/respite services	
Support and respite care provided	9 (64)
Community nurse visits organised	6 (43)
Clinical nurse specialist visits organised	5 (38)
Respite/community assistance available for children <5	8 (57)

n=14 *n=13; multiple responses allowed

Some respondents indicated that they would pass a suction catheter beyond the length of the tracheostomy tube and possibly to the carina when suctioning. Gentle insertion only to the length of the tracheostomy tube is recommended in the conscious patient, and to the carina, then withdrawn 1 cm in the unconscious patient¹⁶ with suction only applied as the catheter is withdrawn⁴. Due to potential inconsistencies in the interpretation of questions relating to the reuse of suction catheters, we did not gain a clear picture of clinical practice in the study units. However, evidence supports the rinsing of suction catheters between passes with tap water and discarding catheters between suction episodes in the hospital environment.

Tracheostomy tapes and tubes

Our respondents indicated preference for either cotton twill or a Velcro product for securing tracheostomy tubes, with device selection depending on appropriateness for individual patients. One study²¹ specifically examined the use and effectiveness of tracheostomy securing devices and concluded that Velcro, despite being the more expensive option, was the more economical and efficient when nursing time and ease of use were also considered. This study did not assess for patient outcomes such as safety and comfort and recommended further research evaluating these²¹. Because of the increased risk of a child pulling at or undoing tapes and the tracheostomy tube being dislodged, safety should always be the priority when considering a tracheostomy tube securing device in the paediatric setting.

Following the initial tube change, regular tube changes are recommended so as to minimise complications such as formation of granulation tissue that can result in bleeding and airway obstruction. Tube selection in the clinical areas surveyed was dependant on clinical requirement or doctor preference and a small number of units reported occasionally using cuffed tubes. The majority performed weekly tube changes while the patient was in hospital. Obstruction related to granulation tissue has been cited as the cause of death in several patients²². Yaremchuk's¹⁰ study demonstrated that a regime of early initial tube change and thereafter every two weeks had a subsequent decrease in the incidence of surgical intervention for excision of granulation tissue.

Home care

Most children with a tracheostomy can be discharged home once the tracheostomy is stable. The benefits of returning to the home environment, routine, community, school, etc make this an important and beneficial step for the child and family. Providing care for a child with a tracheostomy in the home is challenging and can create a number of stressors for parents and the family unit²³ and can cause disruption to the social interactions within and outside of the family²⁴. Fiske²³ believed that the healthcare professional, through dedicated support, education and engendering an awareness of available resources, could enable the family to adapt to the care and management of the child with a tracheostomy at home.

There have been a number of studies that have identified the need for discharge protocols and home care manuals as

reference for the parents^{25, 26}. It is essential that parents have access to appropriate, meaningful and easily utilised educational material and that health professionals ensure that information provided to parents is current and evidence-based. Future research needs to take into consideration individual family characteristics when tailoring education to meet needs, such as socioeconomic factors, emotional stability, maturity, ethnicity and available resources (i.e. extended family assistance)^{22, 24}. Respite care for the parents is a very important component in the home care plan and can make a significant difference in how parents cope with this stress.

Another aspect of the care of children with tracheostomies in the home by parents is the access to and use of consumables. Bahng and colleagues²⁷ found no studies describing how medical supplies were cared for, cleaned and used in the home environment. From their own descriptive study, they identified that a wide variety of methods were being used when suctioning the child, with differences relating to frequency, clean and sterile techniques and reuse of catheters²⁷. Solutions used to clean suction catheters also varied from vinegar to water. In our survey population, reuse of tracheostomy tubes occurred in 55% of participants. Sixty percent of patients who reused tracheostomy tubes reported having pneumonia within a 12 month period. Tracheostomy tube change also varied from weekly to second monthly and solutions used to clean the tubes ranged from hydrogen peroxide to soap and water. These variations in the care given to the children in the home have many implications for health professionals when educating parents in tracheostomy care.

School/respite services

Children with tracheostomies must be watched at all times and attended by person/s that are trained in the provision of tracheostomy cares. In Australia not all children with a tracheostomy who attend school have an allocated carer. It is therefore necessary for teaching staff to provide care as needed to the child during school hours. Recommendations by Smith and colleagues²⁸ from a study describing the experience of children with tracheostomies in the school environment included liaison with school staff before the child attends school to assist in the allocation of carers, provision of tracheostomy training to carers/teaching staff by a health professional, and regular follow up training sessions for carer/teaching staff to maintain skills in tracheostomy care. The responses to this survey demonstrated that the issue of many facets of care of tracheostomies within the community remains a difficulty. While measures such as home visits, education and training and facilitation of respite are in place in some areas, the overall message is that this is an area that needs greater attention.

Summary

Many areas of practice were uniformly performed throughout the units surveyed and for the most part practice was based on evidence (Table 2). Areas of practice without a majority consensus are summarised in Table 3. Two areas were identified as significantly deviating from best practice and were therefore of concern. Those were the use of saline instillation as a method of loosening secretions, and the

depth to which suction catheters were being inserted during suctioning; both practices were highlighted for modification in clinical practice.

Strengths and limitations

A very high response rate of 93% was achieved in this study, with a high level of consensus amongst respondents for many areas of practice. But, as with any survey-based research project, the results obtained are limited to the questions that were asked in the first instance. In order to promote participation, a survey-based study needs to be user friendly, with the duration for completion and the number of questions being asked taken into consideration. For this reason, not all aspects of care for the tracheostomy patient could be included. The results obtained from this survey, as well as identifying current practice in Australian and New Zealand specialist tracheostomy care units, can also be used to direct researchers to future areas for exploration.

Conclusions

This study provides an overview of the care and management of the paediatric tracheostomy patient both within the hospital and in the community through surveying facilities that provide dedicated support to children requiring long-term tracheostomy care in Australia and New Zealand. The results enabled us to identify areas of consensus in practice that adhere to the best evidence available at this point in time, and areas of practice that are not supported by the evidence.

Dissemination of results from this study through written reports has taken place, with all participants receiving feedback that highlighted the areas of practice that significantly deviated from best practice. Specifically, the use of saline instillation as a method of loosening secretions and the depth to which suction catheters are being inserted during suctioning were highlighted for modification in clinical practice. Within the facility that conducted this study there have been immediate changes to practice, with the various aspects of nursing standards updated to reflect best practice and the evidence. This study was the impetus for a secondary quality exercise looking at the use of bead chain securing devices on paediatric patients.

All participating units were unanimous in their willingness to participate in further research relating to paediatric tracheostomy care. Specific areas that were nominated for future investigation were feeding issues, speaking valves, humidification, tube change frequency, parental experience and the value of community and respite care. As patients' needs become more complex and sophisticated, we must ensure that our practice, education and research remain equal to these challenges.

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