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Tracheostomy care

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Aims and intended learning outcomes

The aims of this article are to discuss the pre- and post-operative requirements of adult patients who have a tracheostomy and to increase nurses' knowledge of the complications and psychosocial implications of the surgery. After reading this article you should be able to:

- Identify the pre- and post-operative needs of the tracheostomy patient and plan appropriate nursing interventions to meet those needs.
- Identify the features of a variety of tracheostomy tubes.
- Illustrate the common complications of tracheostomy surgery.
- Discuss resuscitation practices for these patients.
- Plan a strategy to promote self-care.
- Identify actual and potential communication problems for adult patients who have a tracheostomy.
- Demonstrate interventions that might help reduce the impact of a tracheostomy.

Introduction

The trachea is a continuation of the larynx and is 10-13cm long in adults. A tracheostomy (sometimes called a tracheotomy) is created surgically by making an opening through the skin of the neck into the trachea (Fig. 1). This reduces the anatomical dead space of the upper airways by approximately 150ml. At the time of total laryngectomy (surgical removal of the larynx usually performed to treat cancer of the larynx), a permanent end tracheostomy (or tracheostome) is formed when the cut end of the trachea is stitched onto the skin of the neck. Box 1 illustrates some common indications for tracheostomy.

Pre-operative care

Where appropriate, it is important that the patient and his or her relatives are given as much information as possible about the tracheostomy before surgery. Information should include:

- Details of the site of the tracheostomy opening.
- Equipment likely to be used, including tubes.
- Humidification and suction.
- The anticipated duration of the tracheostomy, if possible.

There is no reason why the patient should not see or handle the equipment. He or she should also be given information about how tracheostomy will affect breathing, coughing, speaking and eating, and how these changes will be managed to eliminate or reduce potential problems. It is essential that several discussions take place to ensure that the patient and relatives understand and remember the information given. A well-informed patient is likely to be more satisfied and compliant with care (Ley 1988).

Simple line drawings that illustrate the altered anatomy are often helpful (Fig. 1). The anticipated loss of voice will be a frightening aspect of the surgery and many patients will readily admit to being terrified of the thought of being alone and unable to call for help. Thorough and frank discussion on how effective communication can be maintained, including the use of speaking valves, pen and paper, slates, picture cards and appropriate electronic devices, should be undertaken and patient preferences noted in the care plan. If time allows, non-verbal signs can be worked at and agreed on. If laryngectomy is performed, a speech and language therapist must be involved before surgery because of the permanence of the procedure.

Operations that affect how people breathe, cough,

in brief

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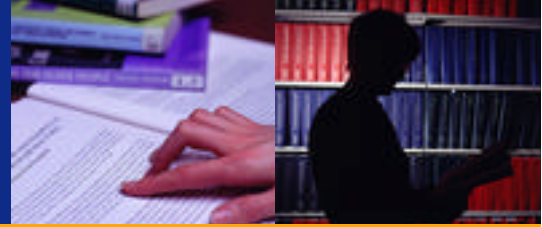
Summary

The author considers airway maintenance in the care of adult patients by providing a clinical overview of the pre- and post-operative requirements of tracheostomy care, including complications and the longer term implications that can arise immediately after tracheostomy surgery.

Keywords

- ENT
 - ENT disorders
- These key words are based on the subject headings from the British Nursing Index. This article has been subject to double-blind review.

Tracheostomy care



Box 1. Reasons for tracheostomy

To bypass possible or actual mechanical obstructions, including:

- Tumours
- Congenital abnormalities
- Inflammation
- Trauma – accidental and surgical
- Foreign bodies
- Vocal cord paralysis

To aid prolonged and assisted ventilation due to:

- Coma
- Neuromuscular disorders
- Chronic obstructive pulmonary disease (COPD)
- Multiple injuries

To aid aspiration of bronchial secretions. A mini-tracheostomy might be performed for this problem

At the time of total laryngectomy a permanent end tracheostomy is performed

Partners, family and friends can play a valuable role in providing support and boosting self-esteem and this should be encouraged.

TIME OUT 1

Reflect on ways in which you could help a patient and relatives to understand aspects of the surgery, such as the anatomy involved and how the tube will look.



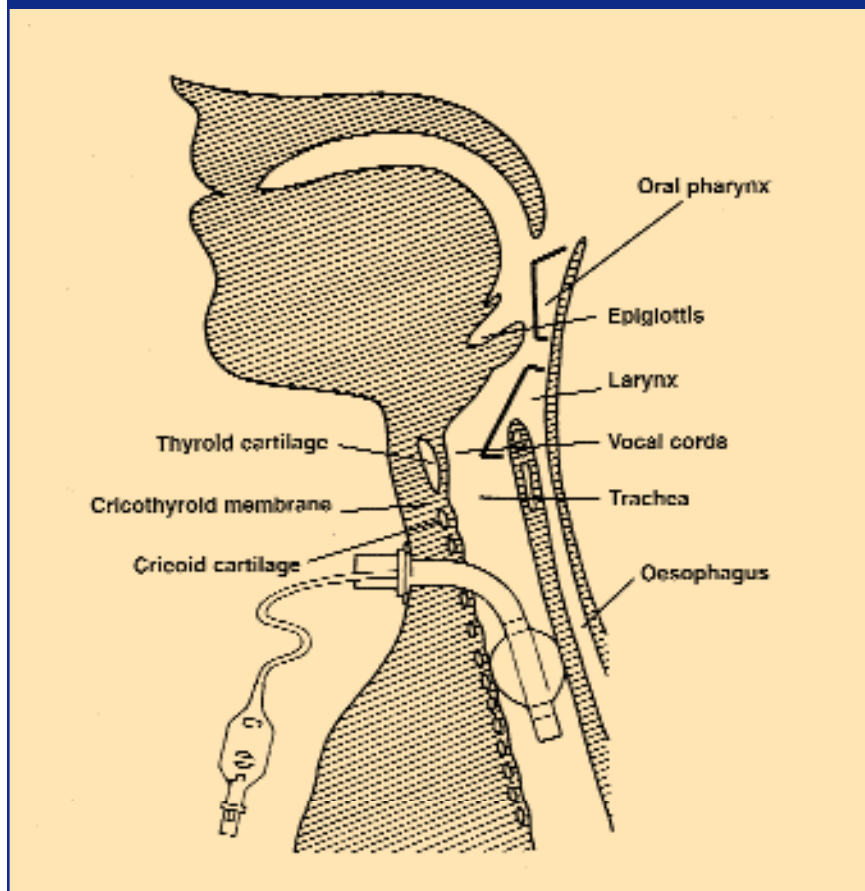
The procedure

A tracheostomy may be performed as an emergency or planned procedure and other surgery may be performed simultaneously. The procedure may be necessary for major head and neck surgery when upper respiratory tract obstruction is anticipated due to surgical trauma and oedema. There is controversy over what is considered to be the optimum timing of the tracheostomy procedure in an intubated patient. Prichard (1994) suggests that once the decision to perform the procedure has been made, the operation must be expedited.

Conventionally, the patient is, if possible, placed in the supine position before the procedure, with the neck hyper-extended by placing a roll or sandbag under the shoulders. After the skin incision has been made, the underlying muscles are separated and a hole is made in the anterior wall of the trachea, usually between the second and fourth tracheal rings. The incision can be made by removing a piece of tracheal ring by creating a Bjork flap. A tracheostomy tube is then immediately inserted. One or two sutures at each side of the tube usually close the wound. The flanges of the tube may be stitched to the skin if there are fears about replacement of the tube should it accidentally come out. Figure 2 illustrates sites for tracheostomy insertion.

A mini-tracheostomy (cricothyroidotomy), carried out under local anaesthetic, involves the insertion of a fine bore, cuffless tracheostomy tube through a small incision in the neck. It is generally performed to aid removal of retained sputum after thoracic surgery (Nelson 1992). The percutaneous tracheostomy has several benefits, including a shorter operating time and a low complication rate. As with the mini-tracheostomy, a disposable sterile kit is available for the procedure, which can also be performed at the bedside. However, it has limited use in patients undergoing head and neck surgery as many of these patients' necks are anatomically unsuitable for the procedure (Fisher and Howard 1992).

Fig. 1. The anatomical position of a tracheostomy tube

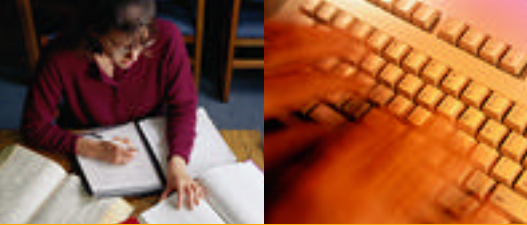


Speak and appear are likely to affect their body image. Interventions to help patients make the necessary adjustments can start with ensuring that pre-operative information is understood and that there is adequate time and opportunity for questions to be answered.

TIME OUT 2

Write down any equipment that you can think of that will be necessary post-operatively.





Post-operative care

Before a patient returns from theatre, the necessary equipment should be assembled, checked and made available for use (Box 2).

Care plans The nursing model or framework used should be creative, responsive, holistic and individualised, based on sound knowledge in accordance with local policies. A recent tracheostomy nursing care audit indicated a need for further education to increase overall competency (Fokke and Coulter 1999).

Tube types After a tracheostomy has been performed, the opening must be kept patent with a tube. This may not be necessary with a laryngectomy as the circumference of the incised trachea is stitched to the neck skin. The size and style of the tube chosen will vary according to the size of the trachea and the needs of the individual patient. If ventilation is required, a cuffed tube should be used. The most common materials used for tracheostomy and laryngectomy are:

- Polyvinyl chloride (PVC) or PVC-based, such as siliconised PVC.
- Silver.
- Silicone.

Silver is expensive, but durable because it withstands repeated cleaning and sterilising procedures. PVC and silicone tubes are disposable, although the inner cannula can be cleaned and some can be reused several times on the same patient.

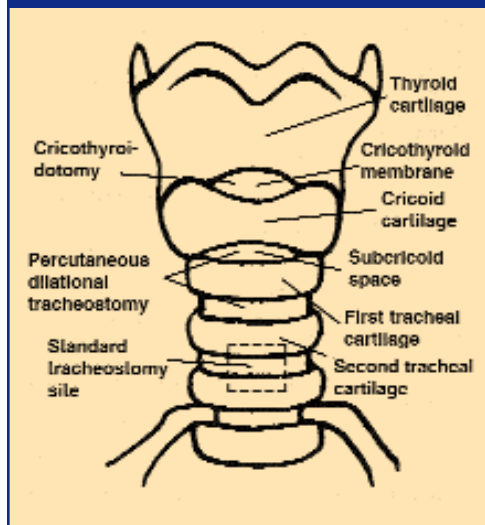
These tubes are lighter than the silver and some soften at body temperature, which can make them more comfortable to wear. PVC or silicone tubes are always used when radiotherapy is given to an area that includes the tracheostomy, because the presence of metal in the treated area can result in tissue necrosis. These tubes have an enormous range of features, from decannulation plugs through to speaking attachments for cuffed tubes.

Cuffed tubes are used in the immediate post-operative period in ventilated patients as well as non-ventilated patients if there is any risk to, or alteration in, airway maintenance. This is because cuffed tubes reduce the aspiration of any blood secretions from the wound trickling down into the trachea.

Over-inflation of the cuff can cause tracheal mucosal injury and necrosis, and low-pressure cuffs are available to avoid this response. Intra-cuff pressure should be below 20mmHg to maintain adequate capillary perfusion (Prichard 1994). Measuring devices are available to monitor cuff pressure, which should be regularly checked and recorded. To avoid damage, cuffed tubes are only used when absolutely necessary.

Tube cleansing If re-usable, and only for the same patient, PVC and silicone inner and outer tubes can be cleansed by soaking the parts in a cleansing solution, such as a mild detergent, half-strength hydrogen peroxide, normal saline or a weak solution of sodium bicarbonate for a maximum of two hours. The lumen

Fig. 2. Sites for tracheostomy insertion



of silver tubes is cleaned with a soft bottle brush under running water, but this practice should be avoided with plastic tubes because brushing could damage the tube. The tube should be stored dry. Silver parts can also be autoclaved.

Outer tube changing The first outer tube change usually takes place after five to seven days, to allow for the formation of a tract (Serra *et al* 1986, Sigler and Schuring 1993). After this period, the frequency of changing depends on individual needs and may vary from daily to every few weeks.

The procedure should always be carried out by two nurses: one to remove the soiled tube, the other to immediately insert the clean tube, remove the introducer and tie the tapes. The need to adhere to local policy and guidelines when changing tubes is well illustrated in the professional misconduct case reported on by Castledine (1999).

Inner tube changing The inner tube should be changed at least twice daily. Once it has been removed, a clean one should be inserted immediately. Two American studies (Sievers *et al* 1988, Wagner and Sigler 1988) have shown there to be no reduction in quality of care, but a significant reduction in nursing time, and therefore costs, when using disposable inner cannulae (Fig. 3).

Box 2. Essential equipment following a tracheostomy

- A spare tracheostomy tube of the same style and size as that being used, and one the next size down
- Tracheal dilators
- Suction equipment – catheters, connection tubing, containers, gloves
- Sterile water
- Humidification equipment and tracheal masks
- Syringes and cuff pressure monitor
- Stoma dressings
- Communication aids
- Call bell

TIME OUT 3

Reflect on the stoma care of patients with tracheostomies whom you have nursed. Has the procedure followed an aseptic technique? What cleansing solutions have you used? After reading the information that follows, consider whether you would recommend any changes to current methods of stoma care.



Tracheostomy care

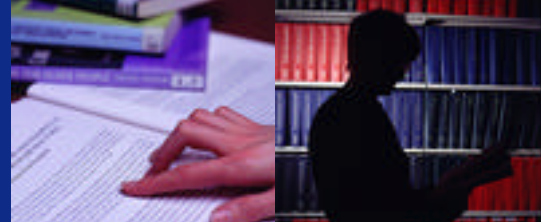
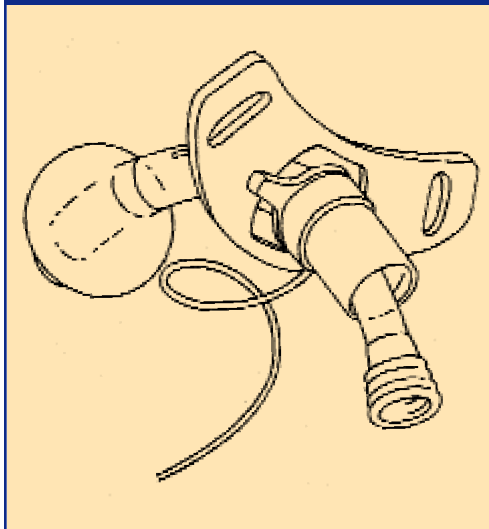


Fig. 3. A tracheostomy tube with an inner cannula



Stoma care The tracheostomy is kept open by the tracheostomy tube, held in place by tapes. The skin wound might have one or two sutures at each side of the neck incision. Occasionally, the surgeon sutures the flanges of the tube to the neck skin, making it almost impossible for the tube to fall out. This is usually performed when difficulty in replacing the tube is anticipated, for example, if it is accidentally coughed out.

The neck incision site must be cleaned twice a day because tracheal secretions can easily infect it. Cleaning might be needed much more frequently during the immediate post-operative period. During stoma toilet, the soiled dressing is removed and the wound, under the tube flanges, is cleansed using a moistened cotton wool applicator or swab. The use of cheap cotton wool, which fragments easily, should be avoided to prevent particles from entering the site. Normal saline is often the chosen cleansing product and can be followed with the application of a small amount of mild lubricant, such as white soft paraffin, if the skin needs further protection.

The wound is protected from tube flanges and secretions by a keyhole dressing. Gauze, or similar materials should be avoided as they tend to stick to the wound and can be inhaled.

Tapes should be tied in a reef knot at each side of the neck with the head flexed down towards the neck if possible, because the circumference of the neck is smallest at this point. After tying the tapes, check the tension and comfort level by inserting the little finger between the tapes and the neck. Tapes should be changed daily.

There is some debate about whether stoma care should be carried out as an aseptic technique and there are wide variations in practice. Harris (1984) and Harris and Hyman (1984) support the use of a clean

rather than aseptic technique as this had been associated with lower rates of infection. Clean techniques should be taught to patients for home care before discharge. Greaves *et al* (1980) recommend the use of gloves on both hands if there is an exposure to tracheal secretions, to avoid the risk of herpetic whitlow, a herpes simplex virus infection.

The stoma should always have a light protective covering and there is a wide range of protectors available in many colours, although not on prescription. The covering acts as a filter and protector, as well as being aesthetically pleasing.

There is no reason why a man cannot wear a collar and tie if he prefers. Many women use scarves and neck jewellery to cover their stoma and the cotton protectors.

Suction and humidification Tracheostomy suctioning is carried out to maintain a clear airway and normal breathing sounds and pattern, without exaggerated effort or awareness of the sensation of breathing and without causing trauma or hypoxia. Suctioning needs to be carried out when the patient is unable to clear his or her own secretions, or is only able to clear them into the tracheostomy tube with cough-like mechanisms.

As the upper airway of a patient with a tracheostomy has been bypassed, the natural warming and humidification of air are adversely affected. It is important, therefore, to maintain systemic hydration. The patient requires humidification immediately following a tracheostomy, to warm and moisten inspired air. After a few days alternative humidification methods can be used. Buglass (1999) and Feber (2000) provide detailed information of the methods involved in these procedures.

Decannulation The removal of the tube can take place from days to months after surgery, but never until the patient breathes with the tube occluded for 24 hours continuously.

If the tube has been in place for any significant length of time, occlusion is carried out gradually to determine the patient's ability to breathe with the tracheostomy closed and to help him or her become accustomed, psychologically and physically, to breathing without the tube. Strategies used to work toward decannulation include:

- Reducing the size of the tube at each tube change.
- Using a fenestrated tube, allowing the patient to breathe through the larynx – the external tube opening can be blocked by a speaking valve or decannulation plug (Fig. 4).
- Blocking the tube with a 'cork' or capping device, or a decannulation plug, for varying and increasing lengths of time.

Irrespective of the method used, close observation for respiratory distress is necessary. The tube should not be removed until a full and continuous 24-hour



period has passed without the tube being used for respiration.

Once the tube is removed, a firm, airtight dressing should be applied to prevent air entering and escaping the tracheostomy site and to promote healing. A small tube and tracheal dilators should be available at the bedside for a minimum of 48 hours after removal in case respiratory distress occurs.

TIME OUT 4

Before reading the next section, write down any complications of tracheostomy surgery that you can think of, as well as ways that you could manage each. Compare your notes with the following information.



Potential complications

Prichard (1994) divides the potential problems that can arise from tracheostomy into pre-operative and early and late post-operative, lists 21 physical items and comments on reported incidences varying by up to 45 per cent. Most of the nursing problems that arise after tracheostomy are due to the upper airway being bypassed, resulting in reduced ability to heat, moisten and filter incoming gases and to cough, smell or speak.

A retrospective study by Hackeling *et al* (1998) reports on 35 patients with tracheostomy who presented at an emergency department with a total of 60 complications.

TIME OUT 5

Choose one complication to consider in depth and attempt to identify areas of strength and weakness in your practice that might have affected the prevention or development of this complication.



Displaced tubes Tracheostomy tubes can come completely and visibly out of the stoma, or they can become dislodged from the trachea, but not come out onto the neck, having been displaced into the pre-tracheal tissues (Prichard 1994). Tube displacement is more likely in patients with a full neck, or in obese patients who have a large amount of fatty tissue in the neck. It can also be a result of poorly tied tapes, or insufficient checking of tape tension in the patient with subsiding swelling in the area.

If the tube is completely dislodged, the tracheostomy can be kept open by tracheal dilators and the spare,

Fig. 4. A fenestrated tracheostomy tube



clean tube inserted. In an emergency, the used tube can be reinserted if a clean one is not available. Displacement into the soft tissues may not be immediately apparent, because the patient may have an airway that is sufficient to avoid any obvious respiratory distress.

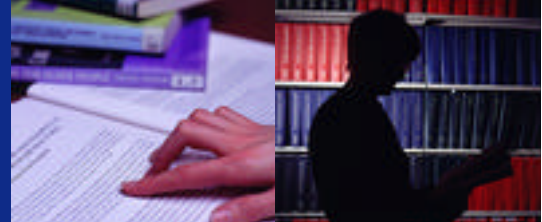
A patient with a tracheostomy is not capable of speaking with a normal speaking voice, because there is not enough air passing through the larynx (Seay and Gay 1997). If the patient can speak normally without a speaking valve or occluding tube, this could indicate that the tube has slipped into the soft tissues of the neck. This possible displacement can be ascertained by checking the tube for airflow. If the upper airway is obstructed, the patient will have acute respiratory distress. Help must be sought immediately, the displaced tube removed and the trachea kept open by dilators until the fresh tube is inserted.

When a tube has been out for any length of time, it may be necessary to insert a smaller tube, hence the need to include one in the patient's bedside equipment. If the tracheostomy opening has started to close and tube insertion is proving difficult, a suction catheter can be inserted as a guide for the tube and to give some passage of air (Sigler and Schuring 1993). The tube can then be threaded over the suction catheter, which is not connected to suction equipment.

Blocked tubes These are usually caused by a large plug of mucous or a piece of crust blocking the tube. Initially, patients might make an attempt to clear the obstruction by vigorous coughing. If suction and changing any inner tube fails to remove the blockage, the outer tube needs to be changed immediately. The crust or plug is usually attached to the end of the inner or outer tube.

Good humidification, frequent inner tube changes

Tracheostomy care



and adequate suction should prevent blockages from occurring. Clarke (1995) gives an interesting account of this complication in the intensive care unit (ITU) by applying critical analysis techniques and reflection to a real life experience.

Surgical emphysema Suturing the wound too tightly causes surgical emphysema, as air enters the neck tissues, rather than leaking out around the tube. A simple and effective remedy is to release any sutures.

Wound and respiratory tract infections The altered airway and poor techniques could contribute to potential infections.

Haemorrhage A haemorrhage can be primary, reactionary or secondary and large haemorrhages can be fatal. If the tube is close to the innominate artery, it may pulsate or move in time with the heartbeat. The pulse should be taken to indicate the possibility of haemorrhage (el-Kilany 1980). A cuffed tube would be useful here, as the pressure can help to control bleeding and to prevent aspiration of blood coming off any point above the cuff (Fig 1).

Tracheal stenosis Narrowing of the trachea can occur up to five years after the procedure. It is suspected in patients who have increasing dyspnoea on exertion, cough and retained secretion. Laser or resection can remove the stenosed area and end-to-end anastomoses can then be performed (Prichard 1994).

TIME OUT 6

Check the resuscitation equipment in your working environment. Are the adaptors needed to make the connection between tracheostomy tube and ventilation bag available?



Resuscitation

The position and steps taken for resuscitation are the same as for any patient without an altered airway, while remembering to remove any stoma cover but not removing any tube. The additional equipment needed to resuscitate a patient who has a tracheostomy should be readily available on the ward, as well as on a larger resuscitation trolley serving several wards.

There are several adaptors available that will allow the connection between cuffed tube and manual ventilation bag.

As long as the cuff is inflated, manual ventilation via the bag can be given.

If a plain (uncuffed) tube is present and it is not possible to change it to a cuffed one, then mouth to stoma ventilation can be given. The nose and mouth should be closed, by tilting the chin up to close the

mouth, while holding the nose shut between the index finger and thumb. Mouth to stoma breathing can then be given in the same way as mouth to mouth.

Communication difficulties

Loss of speech is always frustrating and can be frightening. The most obvious alternative way of communicating is writing. It is essential, however, that the nurse ascertains the patient's literacy level before going ahead with this method. It is estimated that between seven and eight million people in the UK are functionally illiterate to the degree that they cannot fill in a job application (ALBSU 1994).

Poor communication can reduce the accurate and adequate exchange of information necessary to improve satisfaction and compliance (Box 3).

TIME OUT 7

Do not allow yourself to speak to anyone for at least 30 minutes. Do this in a social situation when you are in the company of at least one other person.

Make a note of how many times you spoke or were about to speak and how you felt about your aphonia. Reflect on your findings and discuss them with a mentor or colleague.



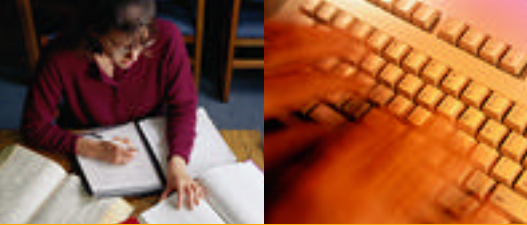
If a plain (uncuffed) tube or cuffed fenestrated tube is *in situ*, the patient may be able to speak with a speaking valve or by simply occluding the tube with a finger. There is such a wide selection of aids available that almost all patients can achieve some voice, unless the structures involved in phonation and articulation are damaged or temporarily dysfunctional due to post-operative oedema.

Patients who have had a total laryngectomy are unable to phonate until speech rehabilitation helps produce a new voice. In the immediate post-operative period, the same methods available for tracheostomy need to be used.

Speech therapy usually starts after the feeding tube has been removed, about ten days after surgery, because by this time the pharyngeal repair will have healed. There are several methods available for voice production after laryngectomy including speech valves – inserted into a surgically created fistula – and oesophageal speech and electronic devices.

Impaired swallowing

Patients may have pain or difficulty on swallowing, or be unable to swallow due to post-surgical oedema or the risk of aspiration. Assessment by the speech and



language therapist is beneficial and any dietary recommendations should be followed. Aspiration (overspill) of fluids and food is a potential problem, so it is necessary to assess each patient's ability to eat and drink without aspiration. Some patients find foods of a thick consistency better tolerated and easier to swallow. Taking smaller mouthfuls of food and fluid can be helpful, as can the patient being aware of the various movements the body goes through when swallowing.

Sigler and Schuring (1993) suggest that asking the patient to eat in a sitting position and to maintain this position for an hour after each meal will help to reduce aspiration. On other occasions, they suggest inflating the cuff on a cuffed tube during, and for up to an hour after, a meal.

The tracheostomy tube can cause pressure on the tracheal wall and oesophagus, resulting in regurgitation and aspiration. In such circumstances, a different type of tube should be used.

Because a tracheostomy tube is held firmly in place, it can restrict the amount of laryngeal elevation needed to ensure complete closure of the lower respiratory tract during swallowing. An over-inflated cuff can also anchor the larynx firmly in the neck and contribute towards aspiration. Air is no longer drawn through the nasal cavity and, as a result, the sense of smell is greatly reduced or even absent. In some patients this affects their appetite and enjoyment of food.

On occasions tube feeding is necessary if body weight is to be maintained, wound healing promoted and aspiration pneumonia avoided. As patients with a tracheostomy are unable to close their glottis and build up intrathoracic pressure (the air escape through the stoma), this may cause the patient to have difficulty during defecation. A high fibre diet is, therefore, advisable and a mild aperient may be used when necessary.

Altered body image

According to Price (1992), body image is concerned with control and function, as well as with physical appearance. The presence of a hole on the neck that is kept open by a tube, and through which sputum is expectorated, is unlikely to reduce anxiety and enhance self-esteem. Patients may express their fears and distress by refusing to look at the tracheostomy or become involved in their own care.

Dropkin (1989), in a descriptive study on the relationship between disfigurement and dysfunction and coping ability after surgery for head and neck cancer, found that for most patients the fourth to sixth post-operative days could be considered the significant time in terms of accepting the defect. Dropkin (1989) considered that acceptance of the stoma could be demonstrated through self-care tasks and that these

Box 3. Communicating with a person who has lost the ability to speak following tracheostomy

- Ensure that as much pre-operative explanation and information as possible is given in the time available
- Ensure that adequate materials (pen, paper, picture cards, 'magic' slates) are available (and that the patient knows they are available) before surgery and at all times thereafter
- Be patient, maintain a calm and unhurried atmosphere and allow the patient time to write
- Always give encouragement and praise
- Remember that previous hearing levels have not been altered. There is no need for you to raise your voice or write down information
- Pay extra attention to non-verbal communication, such as facial expressions and hand and body positions and movements
- If appropriate, stress that the inability to communicate is temporary. Skill levels will considerably improve in almost all patients
- Develop your own lip reading skills
- If the person is only able to say a few words or part of a sentence, repeat what you have understood and ask him or her to fill in what you have missed

When only able to communicate by writing, remember that:

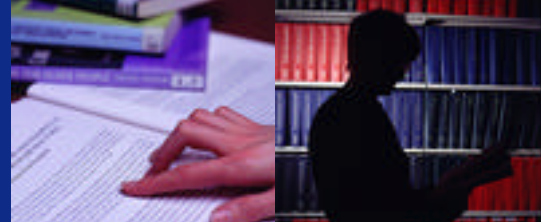
- Some people cannot write
- Writing takes much longer than speaking
- Writing can be disruptive to thought processes
- For most people, it is difficult to communicate depth of emotions and feelings in writing
- There is lack of privacy – a 'magic' slate may prove useful
- You should never read a previously written communication unless invited to
- Never ask two questions at once
- It is helpful, where possible, to ask questions that only require a yes or no answer
- Don't finish sentences for the patient

normally preceded resocialisation behaviours. A part of the nurse's role in caring for patients with a tracheostomy is to provide support when patients feel ready to look at their altered neck and become involved in their own care. It is essential that patients are not hurried or forced. If fears and worries are discussed in a supportive environment, there is a much better chance of these patients being physically and emotionally able to become actively involved in their own care. According to MacGinley (1993), nurses need good interpersonal skills, which include empathy, trust and touch when caring for those with an altered body image.

The first sight of a stoma can be equally distressing for family and friends. Whether they are allowed to see the stoma is a decision that must be left up to the patient. How others react will affect how the patient feels about him or herself.

Sexuality can be affected, as this is an element of body image. Feber (1996) considers that the presence of a laryngectomy stoma and an altered (more masculine) voice may particularly affect female sexuality.

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However, this should not be taken to indicate that men do not experience at least as many problems as women. Negative effects on male self-esteem and sexual relationships, due to the surgery and the subsequent alteration in voice, can equally occur.

Many patients will go through the grief response, as well as various stages of adjustment from recognising the change through to acceptance. An enormous range of defence and coping mechanisms, such as denial, anger, regression, passivity and projection, can be brought into play during this time and nurses need to be aware of these reactions and to act sensitively should they occur.

Self-care

The stoma created at the time of total laryngectomy is permanent and a sizeable proportion of these patients will go home with either a tube or stoma button in position. Some patients who have a tracheostomy may have it for several months before closure. Both groups of patients should not go home until they can care for their altered airway and any appliance competently and confidently.

Community staff who are to be involved in the care should be given the opportunity to familiarise themselves with the nursing interventions involved. Most patients

will need community and outpatient staff for continuing support and problem solving (Minsey and Wrenn 1996).

The promotion of self-care is one of the major reasons for giving information long before the planned surgery. The least satisfactory aspect of hospitalisation for most patients is the lack of information received. Better informed patients are more able to follow instructions. They have been shown to seek care and respond to symptoms more quickly and are therefore less likely to experience further ill health than those who have less understanding (Hyland and Donaldson 1989).

The Nottingham System allows patients and carers to progress and nurses to identify those who will need extra support if effective self-care is to continue after discharge. It is made up of ten aspects of tracheostomy care, each divided into five teaching phases, moving from the professional carer performing the task through to unsupervised self-care (Mason *et al* 1992).

TIME OUT 8

Now that you have completed the article, you might like to think about writing a practice profile. Guidelines to help you write and submit a profile are outlined on page 54.



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