UNEXPECTED SITUATIONS AND ASSOCIATED INTERVENTIONS

- *Patient was previously fine but now is cyanotic, and the pulse oximeter reading is <93%:* Check to see that the oxygen tubing is still connected to the flow meter and the flow meter is still on the previous setting. Someone may have stepped on the tubing, pulling it from the flow meter, or the oxygen may have accidentally been turned off. Assess lung sounds for any changes.
- *Areas over ear or back of head are reddened:* Ensure that areas are adequately padded and that tubing is not pulled too tight. If available, a skin care team may be able to offer some suggestions.

SPECIAL CONSIDERATIONS

- Different types of face masks are available for use.
- It's important to ensure the mask fits snugly around the patient's face. If it's loose, it will not effectively deliver the right amount of oxygen.
- The mask must be removed for the patient to eat, drink, and take medications. Obtain an order for oxygen via nasal cannula for use during mealtimes and limit the amount of times the mask is removed to maintain adequate oxygenation.

Skill 39-5 Suctioning the Tracheostomy: Open System

EQUIPMENT

- Portable or wall suction unit with tubing
- A commercially prepared suction kit with an appropriate size catheter (See General Considerations) or
  - Sterile suction catheter with Y-port in the appropriate size
  - Sterile disposable container
  - Sterile gloves
- Towel or waterproof pad
- Goggles and mask or face shield
- Additional PPE, as indicated
- Disposable, clean gloves
- Resuscitation bag connected to 100% oxygen

IMPLEMENTATION

ACTION	RATIONALE
1. Bring necessary equipment to the bedside stand or overbed table.	Bringing everything to the bedside conserves time and energy. Arranging items nearby is convenient, saves time, and avoids unnecessary stretching and twisting of muscles on the part of the nurse.
2. Perform hand hygiene and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on transmission precautions.
3. Identify the patient.	Identifying the patient ensures the right patient receives the intervention and helps prevent errors.
4. Close curtains around bed and close door to room if possible.	This ensures the patient's privacy.
5. Determine the need for suctioning. Verify the suction order in the patient's chart. **Assess for pain or the potential to cause pain. Administer pain medication as prescribed before suctioning.**	To minimize trauma to airway mucosa, suctioning should be done only when secretions have accumulated or adventitious breath sounds are audible. Suctioning can cause moderate to severe pain for patients. Individualized pain management is imperative (Arroyo-Novoa et al., 2007). Suctioning stimulates coughing, which is painful for patients with surgical incisions.
6. Explain to the patient what you are going to do and the reason for doing it, even if the patient does not appear to be alert. Reassure patient you will interrupt procedure if he or she indicates respiratory difficulty.	Explanation alleviates fears. Even if patient appears unconscious, the nurse should explain what is happening. Any procedure that compromises respiration is frightening for the patient.

(continued)

Skill 39-5 Suctioning the Tracheostomy: Open System *continued*

ACTION	RATIONALE
7. Adjust bed to comfortable working position, usually elbow height of the caregiver (VISN 8, 2009). Lower side rail closest to you. **If patient is conscious, place him or her in a semi-Fowler's position (Figure 1). If patient is unconscious, place him or her in the lateral position, facing you.** Move the overbed table close to your work area and raise to waist height.	Having the bed at the proper height prevents back and muscle strain. A sitting position helps the patient to cough and makes breathing easier. Gravity also facilitates catheter insertion. The lateral position prevents the airway from becoming obstructed and promotes drainage of secretions. The overbed table provides work surface and maintains sterility of objects on work surface.
8. Place towel or waterproof pad across patient's chest.	This protects bed linens and the patient.
9. **Turn suction to appropriate pressure (Figure 2).** For a wall unit for an adult: 100–120 mm Hg (Roman, 2005); neonates: 60–80 mm Hg; infants: 80–100 mm Hg; children: 80–100 mm Hg; adolescents: 80–120 mm Hg (Ireton, 2007). For a portable unit for an adult: 10–15 cm Hg; neonates: 6–8 cm Hg; infants: 8–10 cm Hg; children: 8–10 cm Hg; adolescents: 8–10 cm Hg. **Put on a disposable, clean glove and occlude the end of the connecting tubing to check suction pressure. Place the connecting tubing in a convenient location. If using, place resuscitation bag connected to oxygen within convenient reach.**	Higher pressures can cause excessive trauma, hypoxemia, and atelectasis. Glove prevents contact with blood and body fluids. Checking pressure ensures equipment is working properly. Allows for an organized approach to procedure.

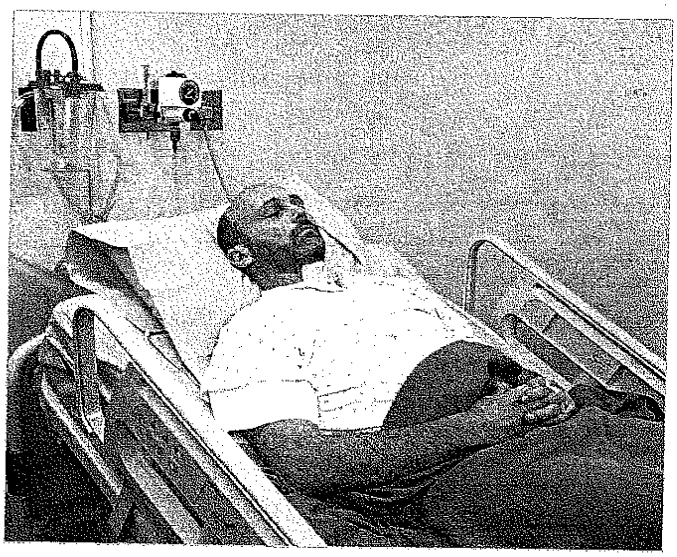

FIGURE 1. Patient in semi-Fowler's position.

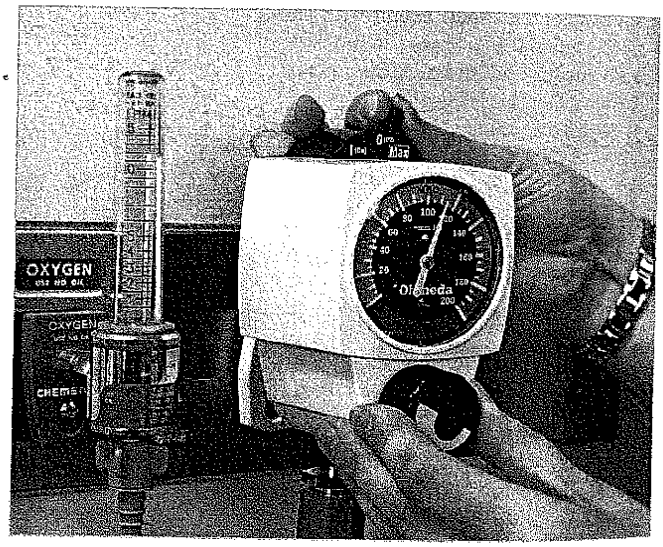

FIGURE 2. Turning suction device to the appropriate pressure.

10. Open sterile suction package using aseptic technique. The open wrapper or container becomes a sterile field to hold other supplies. Carefully remove the sterile container, touching only the outside surface. Set it up on the work surface and pour sterile saline into it.	Sterile normal saline or water is used to lubricate the outside of the catheter, minimizing irritation of mucosa during introduction. It is also used to clear the catheter between suction attempts.
11. Put on face shield or goggles and mask (Figure 3). Put on sterile gloves. **The dominant hand will manipulate the catheter and must remain sterile. The nondominant hand is considered clean rather than sterile and will control the suction valve (Y port) on the catheter.**	Handling the sterile catheter using a sterile glove helps prevent introducing organisms into the respiratory tract; the clean glove protects the nurse from microorganisms.

ACTION	RATIONALE
12. With dominant gloved hand, pick up sterile catheter. Pick up the connecting tubing with the nondominant hand and connect the tubing and suction catheter (Figure 4).	Sterility of the suction catheter is maintained.

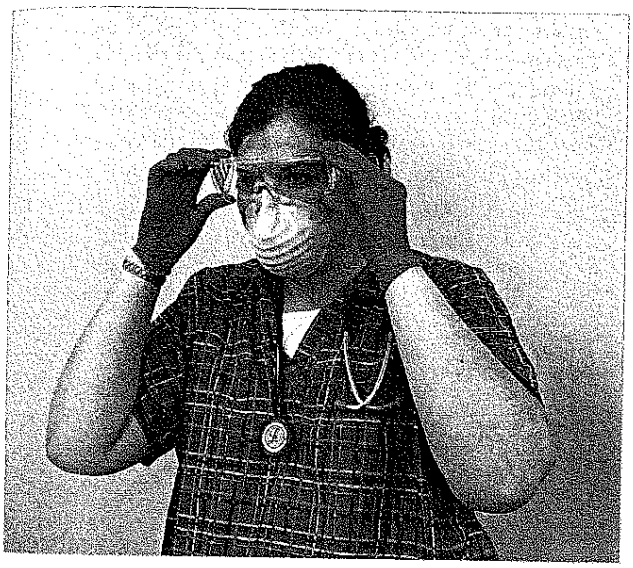

FIGURE 3. Putting on goggles and mask.

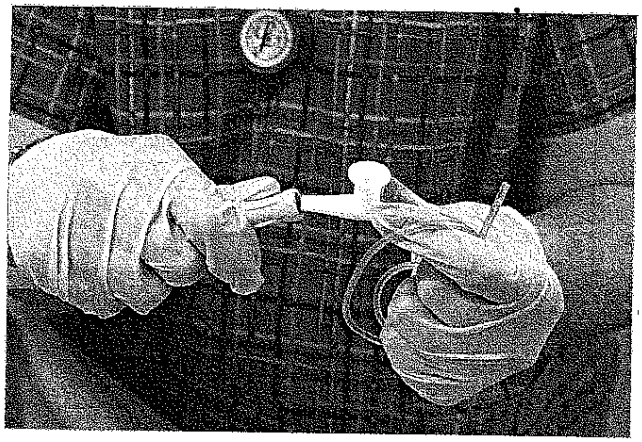

FIGURE 4. Connecting suction catheter to the suction tubing.

13. Moisten the catheter by dipping it into the container of sterile saline, unless it is a silicone catheter (Figure 5). Occlude Y-tube to check suction (Figure 6).	Lubricating the inside of the catheter with saline helps move secretions in the catheter. Silicone catheters do not require lubrication. Checking ensures equipment is working properly.

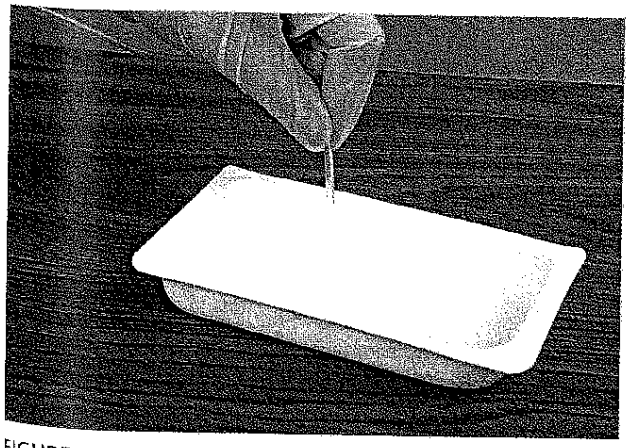

FIGURE 5. Moistening catheter in saline solution.

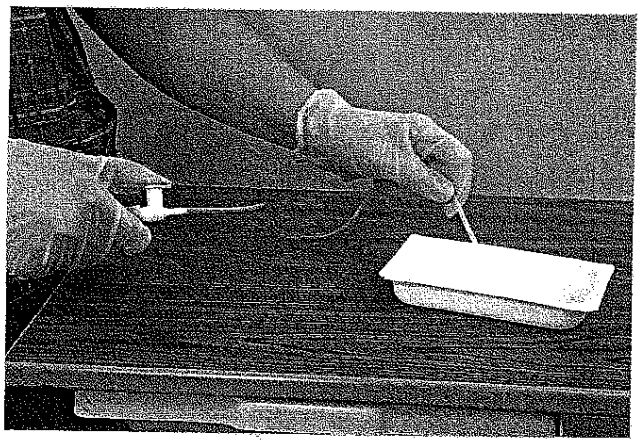

FIGURE 6. Occluding Y-port to check for proper suction.

14. Using your nondominant hand and a manual resuscitation bag, hyperventilate the patient, delivering 3 to 6 breaths or use the sigh mechanism on a mechanical ventilator.	Hyperoxygenation and hyperventilation aid in preventing hypoxemia during suctioning.
15. Open the adapter on the mechanical ventilator tubing or remove oxygen delivery setup with your nondominant hand.	This exposes tracheostomy tube without contaminating sterile gloved hand.

(continued)

Skill 39-5 Suctioning the Tracheostomy: Open System *continued*

ACTION	RATIONALE
16. Using your dominant hand, gently and quickly insert catheter into trachea. **Advance the catheter to the predetermined length. Do not occlude Y-port when inserting catheter.**	Catheter contact and suction cause tracheal mucosal damage, loss of cilia, edema, and fibrosis, as well as increasing the risk of infection and bleeding for the patient. Insertion of the suction catheter to a predetermined distance, no more than 1 cm past the length of the endotracheal tube, avoids contact with the trachea and carina, reducing the effects of tracheal mucosal damage (Ireton, 2007; Pate, 2004; Pate & Zapata, 2002). If resistance is met, the carina or tracheal mucosa has been hit. Withdraw the catheter at least 1/2″ before applying suction. Suctioning when inserting catheter increases the risk for trauma to airway mucosa and increases risk of hypoxemia.
17. Apply suction by intermittently occluding the Y port on the catheter with the thumb of your nondominant hand, and gently rotate the catheter as it is being withdrawn (Figure 7). **Do not suction for more than 10 to 15 seconds at a time.**	Turning the catheter as it is withdrawn minimizes trauma to the mucosa. Suctioning for longer than 10 to 15 seconds robs the respiratory tract of oxygen, which may result in hypoxemia. Suctioning too quickly may be ineffective at clearing all secretions.

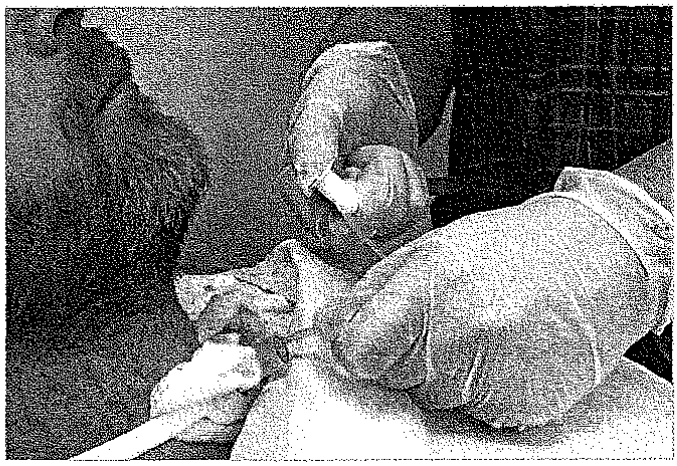

FIGURE 7. Applying intermittent suction while withdrawing catheter.

18. Hyperventilate the patient using your nondominant hand and a manual resuscitation bag, delivering 3 to 6 breaths. Replace the oxygen delivery device, if applicable, using your nondominant hand and have the patient take several deep breaths. If the patient is mechanically ventilated, close the adapter on the mechanical ventilator tubing and use the sigh mechanism on a mechanical ventilator.	Suctioning removes air from the patient's airway and can cause hypoxemia. Hyperventilation can help prevent suction-induced hypoxemia.
19. Flush catheter with saline. Assess effectiveness of suctioning and repeat as needed and according to patient's tolerance. Wrap the suction catheter around your dominant hand between attempts.	Flushing clears catheter and lubricates it for next insertion. Reassessment determines need for additional suctioning. Prevents inadvertent contamination of catheter.
20. **Allow at least a 30-second to 1-minute interval if additional suctioning is needed. No more than three suction passes should be made per suctioning episode. Encourage patient to cough and deep breathe between suctionings.** Suction the oropharynx after suctioning the trachea. Do not reinsert in the tracheostomy after suctioning the mouth.	The interval allows for reventilation and reoxygenation of airways. Excessive suction passes contribute to complications. Alternating nares reduces trauma. Clears the mouth of secretions. More microorganisms are usually present in the mouth, so it is suctioned last to prevent transmission of contaminants.

ACTION	RATIONALE
21. When suctioning is completed, remove gloves from dominant hand over the coiled catheter, pulling it off inside out (Figure 8). Remove glove from nondominant hand and dispose of gloves, catheter, and container with solution in the appropriate receptacle. Assist patient to a comfortable position. Raise bed rail and place bed in the lowest position.	This technique reduces transmission of microorganisms. Ensures patient comfort. Proper positioning with raised side rails and proper bed height provides for patient comfort and safety.

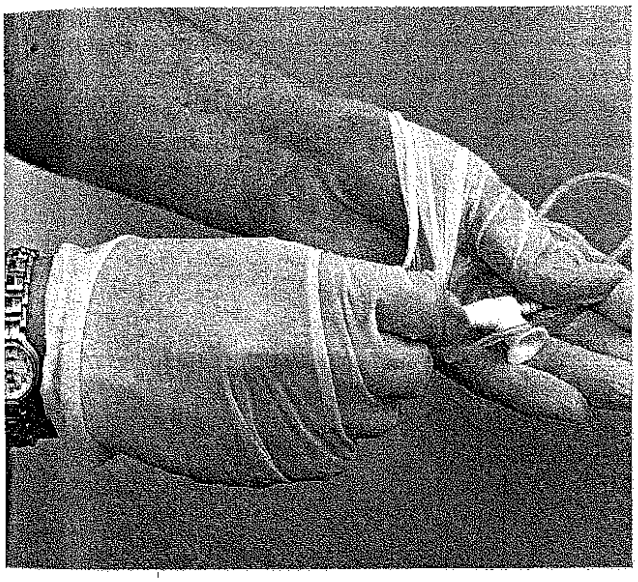

FIGURE 8. Removing gloves while keeping catheter inside.

22. Turn off suction. Remove supplemental oxygen placed for suctioning, if appropriate. Remove face shield or goggles and mask. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents transmission of microorganisms.
23. Offer oral hygiene after suctioning.	Respiratory secretions that are allowed to accumulate in the mouth are irritating to mucous membranes and unpleasant for the patient.
24. Reassess patient's respiratory status, including respiratory rate, effort, oxygen saturation, and lung sounds.	These assess effectiveness of suctioning and the presence of complications.
25. Remove additional PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents the spread of microorganisms.

DOCUMENTATION

Guidelines

Document the time of suctioning, your pre- and post-intervention assessment, reason for suctioning, and the characteristics and amount of secretions.

Sample Documentation

9/1/12 1515 Lungs auscultated for wheezes in upper and lower lobes bilaterally. Respirations at 24 breaths per min. Weak, ineffective cough noted. Tracheal suction completed with 12F catheter. Large amount of thick, yellow secretions obtained. Specimen for culture collected and sent as ordered. After suctioning, lung sounds clear all lobes, oxygen saturation at 97%, respirations 18 breaths per min.

—C. Bausler, RN

(continued)

Skill 39-5 Suctioning the Tracheostomy: Open System *continued*

UNEXPECTED SITUATIONS AND ASSOCIATED INTERVENTIONS

- *Patient coughs hard enough to dislodge tracheostomy:* Keep a spare tracheostomy and obturator at the bedside. Insert obturator into tracheostomy tube and reinsert tracheostomy into stoma. Remove obturator. Secure ties and auscultate lung sounds. Palpate for any subcutaneous emphysema.
- *Lung sounds do not improve greatly and oxygen saturation remains low after three suctionings:* Allow patient time to recover from previous suctioning. If needed, hyperoxygenate again. Suction the patient again and assess whether the oxygen saturation increases, lung sounds improve, and secretion amount decreases.

SPECIAL CONSIDERATIONS

- Determine the size catheter to use by the size of the tracheostomy. The external diameter of the suction catheter should not exceed half of the internal diameter of the tracheostomy. Larger catheters can contribute to trauma and hypoxemia.
- Emergency equipment should be easily accessible at the bedside. Keep bag-valve mask, oxygen, and suction equipment at the bedside of a patient with a tracheostomy tube at all times.

Skill 39-6 Providing Tracheostomy Care

EQUIPMENT

- Disposable gloves
- Sterile gloves
- Goggles and mask or face shield
- Additional PPE, as indicated
- Sterile normal saline
- Sterile cup or basin
- Sterile cotton-tipped applicators
- Sterile gauze sponges
- Disposable inner tracheostomy cannula, appropriate size for patient
- Sterile suction catheter and glove set
- Commercially prepared tracheostomy or drain dressing
- Commercially prepared tracheostomy holder
- Plastic disposal bag
- Additional nurse

IMPLEMENTATION

ACTION	RATIONALE
1. Bring necessary equipment to the bedside stand or overbed table.	Bringing everything to the bedside conserves time and energy. Arranging items nearby is convenient, saves time, and avoids unnecessary stretching and twisting of muscles on the part of the nurse.
2. Perform hand hygiene and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on transmission precautions.
3. Identify the patient.	Identifying the patient ensures the right patient receives the intervention and helps prevent errors.
4. Close curtains around bed and close door to room if possible.	This ensures the patient's privacy.
5. Determine the need for tracheostomy care. **Assess patient's pain and administer pain medication, if indicated.**	If tracheostomy is new, pain medication may be needed before performing tracheostomy care.
6. Explain what you are going to do and the reason to the patient, even if the patient does not appear to be alert. Reassure patient you will interrupt procedure if he or she indicates respiratory difficulty.	Explanation alleviates fears. Even if patient appears unconscious, the nurse should explain what is happening. Any procedure that compromises respiration is frightening for the patient.
7. Adjust bed to comfortable working position, usually elbow height of the caregiver (VISN 8, 2009). Lower side rail closest to you. **If patient is conscious, place him or her in a semi-Fowler's position. If patient is unconscious, place him or her in the lateral position, facing you.** Move the overbed table close to your work area and raise to waist height. Place a trash receptacle within easy reach of work area.	Having the bed at the proper height prevents back and muscle strain. A sitting position helps the patient to cough and makes breathing easier. Gravity also facilitates catheter insertion. The lateral position prevents the airway from becoming obstructed and promotes drainage of secretions. The overbed table provides work surface and maintains sterility of objects on work surface. Trash receptacle within reach prevents reaching over sterile field or turning back to field to dispose of trash.