University of Mosul

College of Nursing

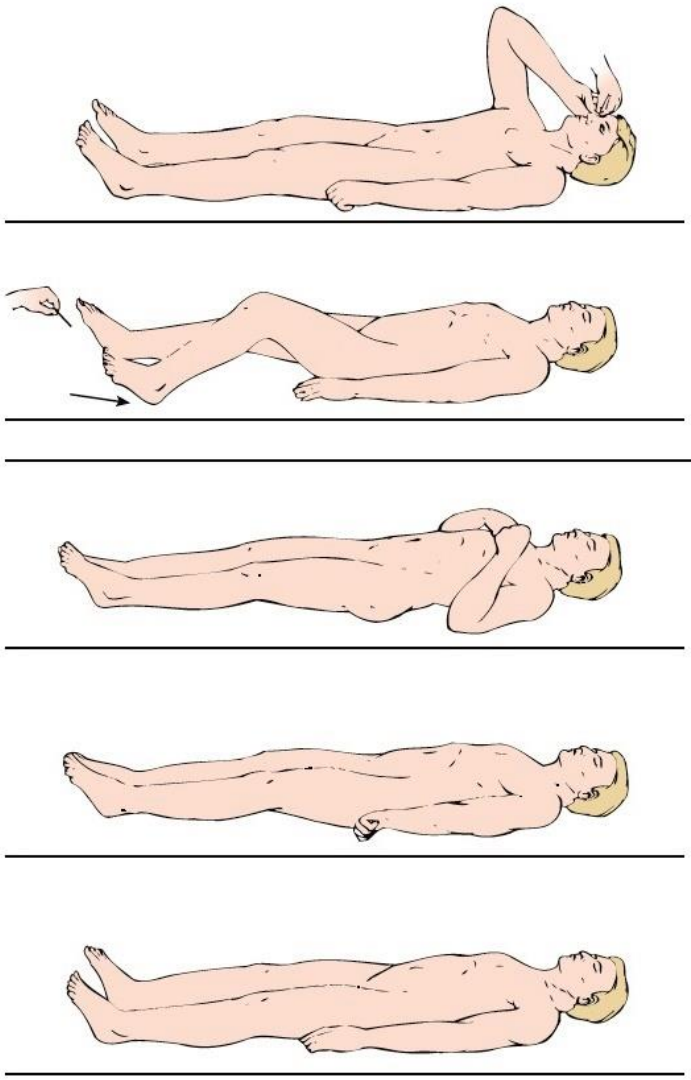
Critical Care Nursing Laboratory Training Guideline

Neurological Alterations

Levels of Consciousness

"Glasgow Coma Scale"

Faculty Measured	Response		Score	Total Score
Eye opening	Spontaneous		**4**	**4**
	To verbal command		**3**	
	To pain		**2**	
	No response		**1**	
Verbal response	Oriented, converses		**5**	**5**
	Disoriented, converses **(Confused)**		**4**	
	Uses inappropriate words		**3**	
	Makes incomprehensible sounds		**2**	
	No response		**1**	
Motor response	To verbal command		**6**	**6**
	To localized pain		**5**	
	Flexes and withdraws		**4**	
	Flexes abnormally (to pain)	Decorticate posturing spontaneously or in response to noxious stimuli	**3**	
	Extends abnormally (to pain)	Decerebrate posturing spontaneously or in response to noxious stimuli	**2**	
	No response		**1**	
Total Score				**15**



NORMAL

Localizing pain. An appropriate response is to reach up above shoulder level toward the stimulus. A focal motor deficit (eg, hemiplegia) may prevent a bilateral response.

Withdrawal. An appropriate response is to pull the extremity or body away from the stimulus.

ABNORMAL

Decorticate posturing. One or both arms in full flexion on the chest. Legs may be stiffly extended.

Decerebrate posturing. One or both arms stiffly extended. Possible extension of the legs.

Flaccid. No motor response in any extremity.

Figure (1) Motor Responses to Pain

Categories of Consciousness

Categories	Responses
Alert	• Patient responds immediately to minimal external stimuli.
Confused	• Patient is disoriented to time or place but usually oriented to person, with impaired judgment and decision making and decreased attention span.
Delirious	• Patient is disoriented to time, place, and person, with loss of contact with reality, and often has auditory or visual hallucinations.
Lethargic	• Patient displays a state of drowsiness or inaction, in which the patient needs an increased stimulus to be awakened.
Obtunded	• Patient displays dull indifference to external stimuli, and response is minimally maintained. • Questions are answered with a minimal response.
Stuporous	• Patient can be aroused only by vigorous and continuous external stimuli. • Motor response is often withdrawal or localizing to stimulus.
Comatose	• Vigorous stimulation fails to produce any voluntary neural response.

Stimulation Techniques in patient Arousal

	Body Part	Examination Sequence
Central Stimulation	Trapezius pinch:	Squeeze trapezius muscle between thumb and first two fingers.
	Sternal rub:	Apply firm pressure to sternum with knuckles, using a rubbing motion.
Peripheral Stimulation	Nail bed pressure :	Apply firm pressure , using object such as a pen, to nail bed.
	Inner aspect of arm or leg:	Firmly pinch small portion of patient's tissue on sensitive inner aspect of arm or leg.

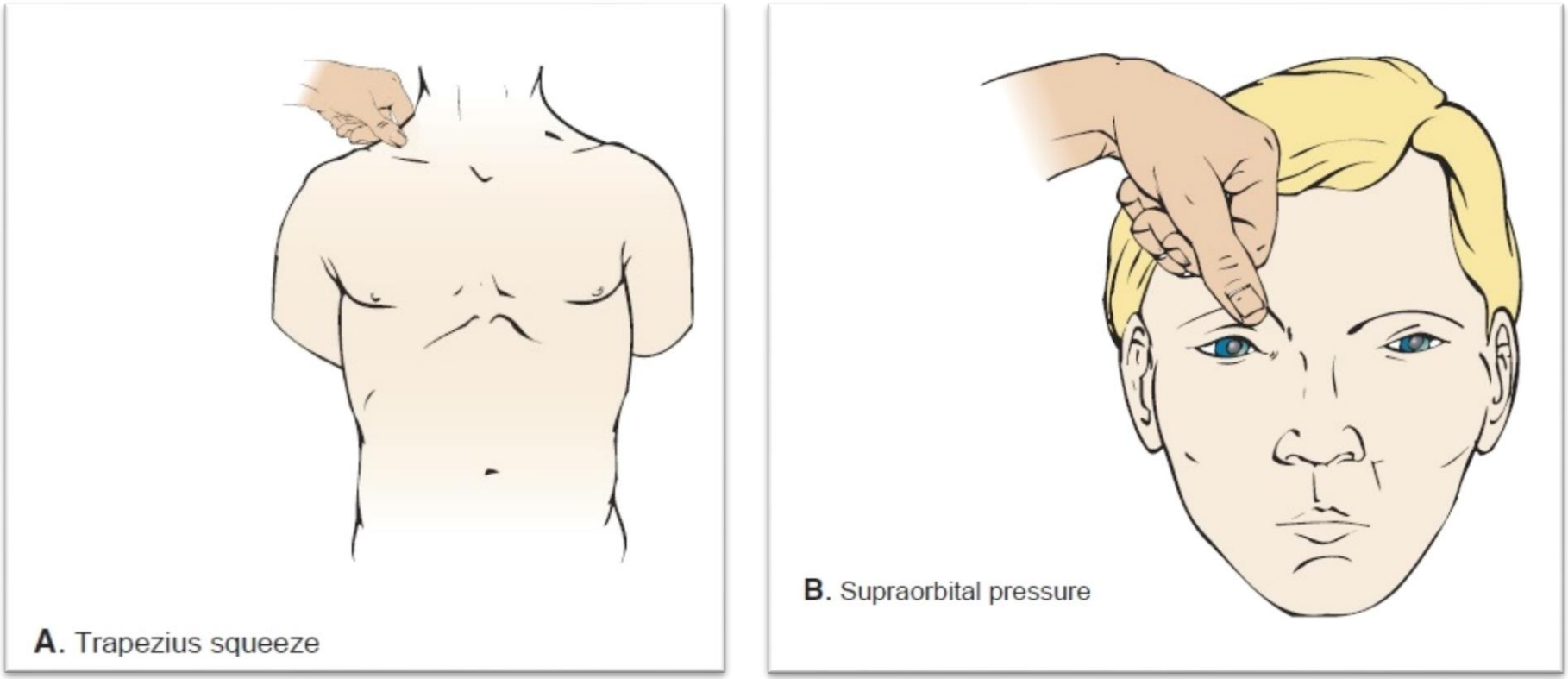
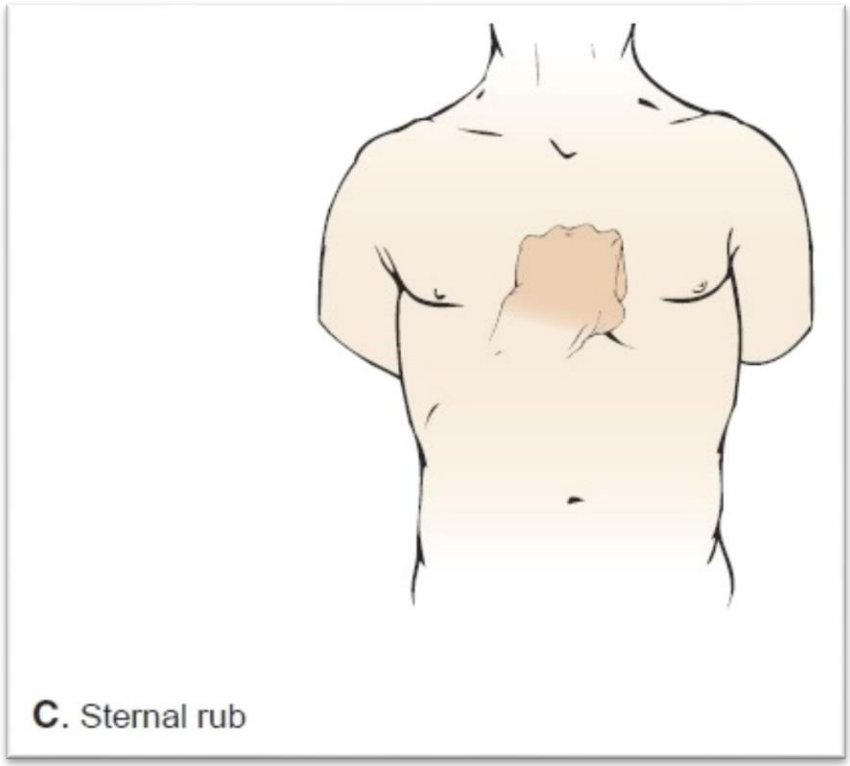


Figure (A, B) Methods of Stimulation Techniques



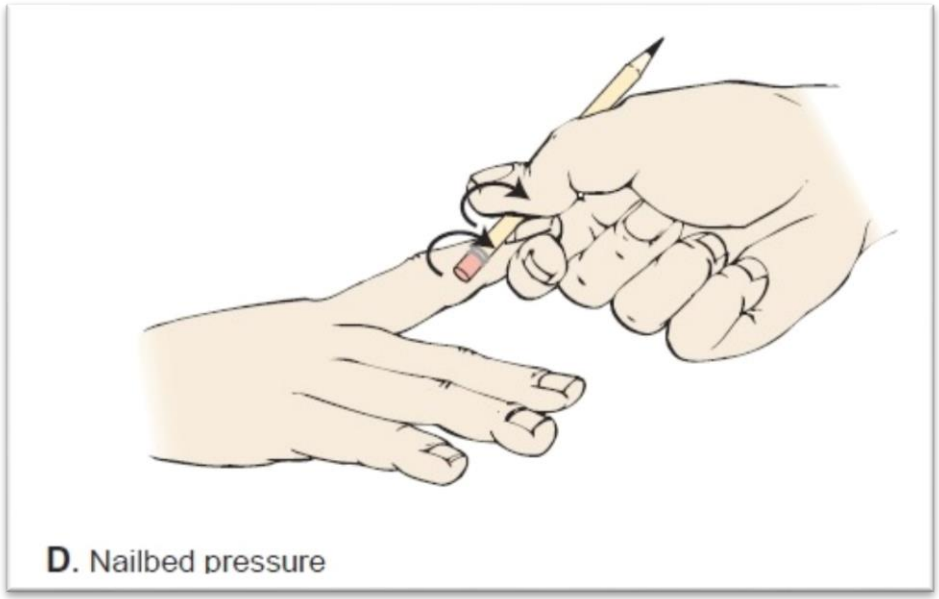


Figure (C, D) Methods of Stimulation Techniques

References

- **Kozier & Erb's fundamentals of nursing : concepts, process, and practice, 9th ed., 2012**
- Urden ,L,D., Stacy, K,M., Lough, M,F., **Critical Care Nursing Diagnosis and Management**, 7th edition, 2014, Elsevier Mosby, Canada.

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Pulmonary Alterations

Maintaining and Cleaning the Tracheostomy Tube

Equipment

1. Gloves
2. Sterile water or saline
3. Tracheostomy dressing (4 × 4 gauze without cotton lining)
4. Hydrogen peroxide
5. Cotton-tip applicators
6. Tracheostomy ties (twill tape, intravenous tubing, or commercially available Velcro ties).

Sequence of Skills Application Cleaning Tracheostomy Tube Site

❖ Preparation

1. Wash hands / hand hygiene, apply gloves, and assemble equipment (see Figure 32-22 on page 888).
2. Remove soiled dressing and discard.

❖ Skills Application

1. Cleanse neck plate of tracheostomy tube with cotton applicators moistened with hydrogen peroxide.
2. Rinse neck plate of tracheostomy tube with applicators moistened with sterile water or saline.
3. Cleanse skin under neck plate of tube with cotton applicator moistened with hydrogen peroxide (see Figure 32-23 on page 888).
4. Rinse skin under neck plate with applicators moistened with sterile water or saline.
5. Dry skin under neck plate with cotton applicators.
6. Using your clean hand, gently loosen the inner cannula of the tracheostomy tube by twisting the outer ring counterclockwise; then withdraw the inner cannula in a smooth motion.

7. Place the inner cannula into the basin of peroxide. Note: Some tracheostomy tubes use disposable inner cannulae that would be replaced at this point in the procedure. If replacing a disposable inner cannula, skip to action.
8. Using your sterile hand, pick up the cannula. Using your clean hand, pick up the nylon brush and scrub to remove any visible crusts or secretions from inside and outside the cannula (see Figure 32-24 on page 889).
9. Place the cannula into the container of sterile saline. Agitate so that all surfaces are bathed in saline.
10. Inspect the inner cannula again to be sure it is clean; then remove excess saline from the lumen by tapping the cannula against a sterile surface.
11. Gently replace the inner cannula, following the curve of the tube. When fully inserted, lock the inner cannula in place by rotating the external ring clockwise until it clicks into place.

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Cardiovascular Alterations

Procedure for Assessing Central Venous Pressure

1. The patient reclines in the bed. The highest point of pulsation in the internal jugular vein is observed during exhalation.
2. The vertical distance between this pulsation (top of the fluid level) and the sternal angle is estimated or measured in centimeters.
3. This number is then added to 5 cm for an estimation of central venous pressure (CVP). The 5 cm is the approximate distance of the sternal angle above the level of the right atrium.
4. Documentation: The degree of elevation of the patient is included in the report (e.g., "CVP estimated at 13 cm, using internal jugular vein pulsation, with the head of the bed elevated 45 degrees").

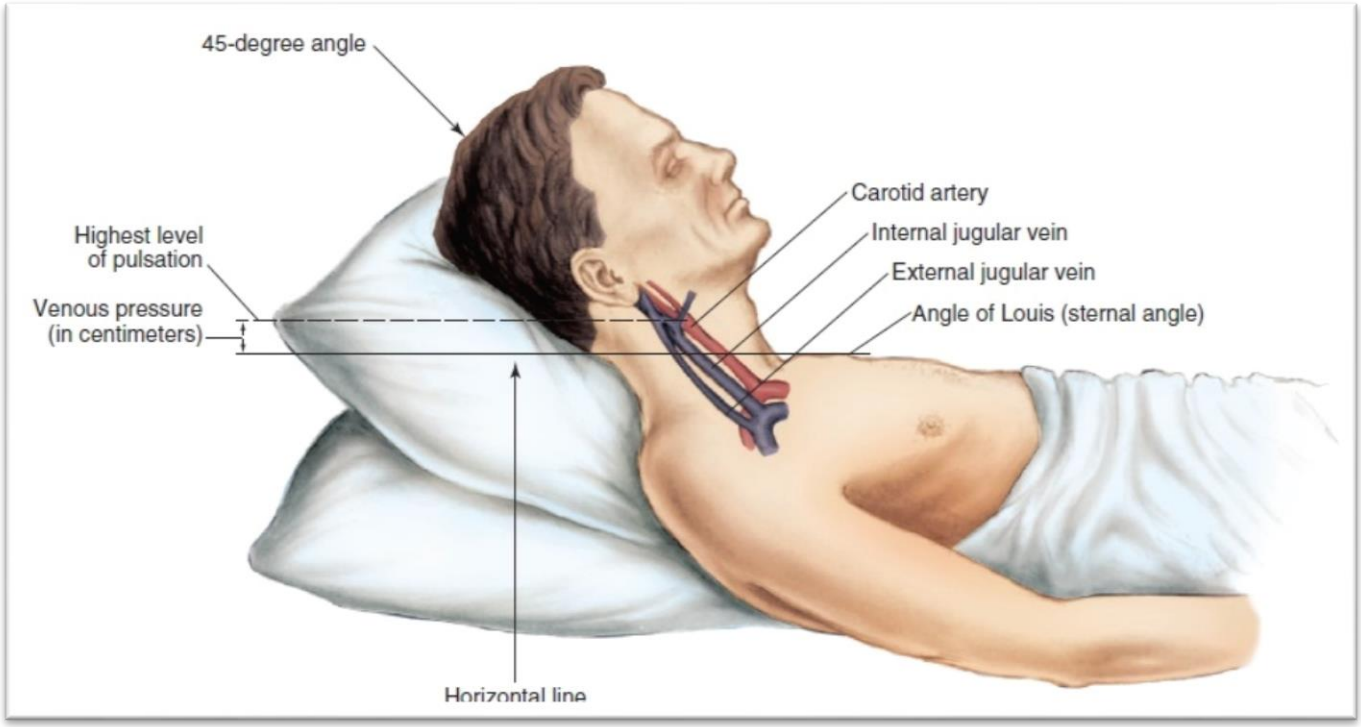

Figure (1) Position of internal & external jugular veins. Pulsation in the internal jugular vein can be used to estimate central venous pressure

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Cardiovascular Alterations

Procedure for Assessing Jugular Vein Distention

1. Patient reclines at a 30 – to 45 – degree angle.
2. The examiner stands on the patient's right side and turns the patient's head slightly toward the left.
3. If the jugular vein is not visible, light finger pressure is applied across the sternocleidomastoid muscle just above and parallel to the clavicle. This pressure fills the external jugular vein by obstructing flow .
4. After the location of the vein has been identified, the pressure is released, and the presence of jugular vein distention (JVD) is assessed.
5. Because inhalation decreases venous pressure, JVD should be assessed at end-exhalation.
6. Any fullness in the vein extending more than 3 cm above the sternal angle is evidence of increased venous pressure. Generally, the higher the sitting angle of the patient when JVD is visualized, the higher is the central venous pressure.
7. Documentation: JVD is reported by including the angle of the head of the bed at the time JVD was evaluated (e.g., "Presence of JVD with the head of the bed elevated to 45 degrees").

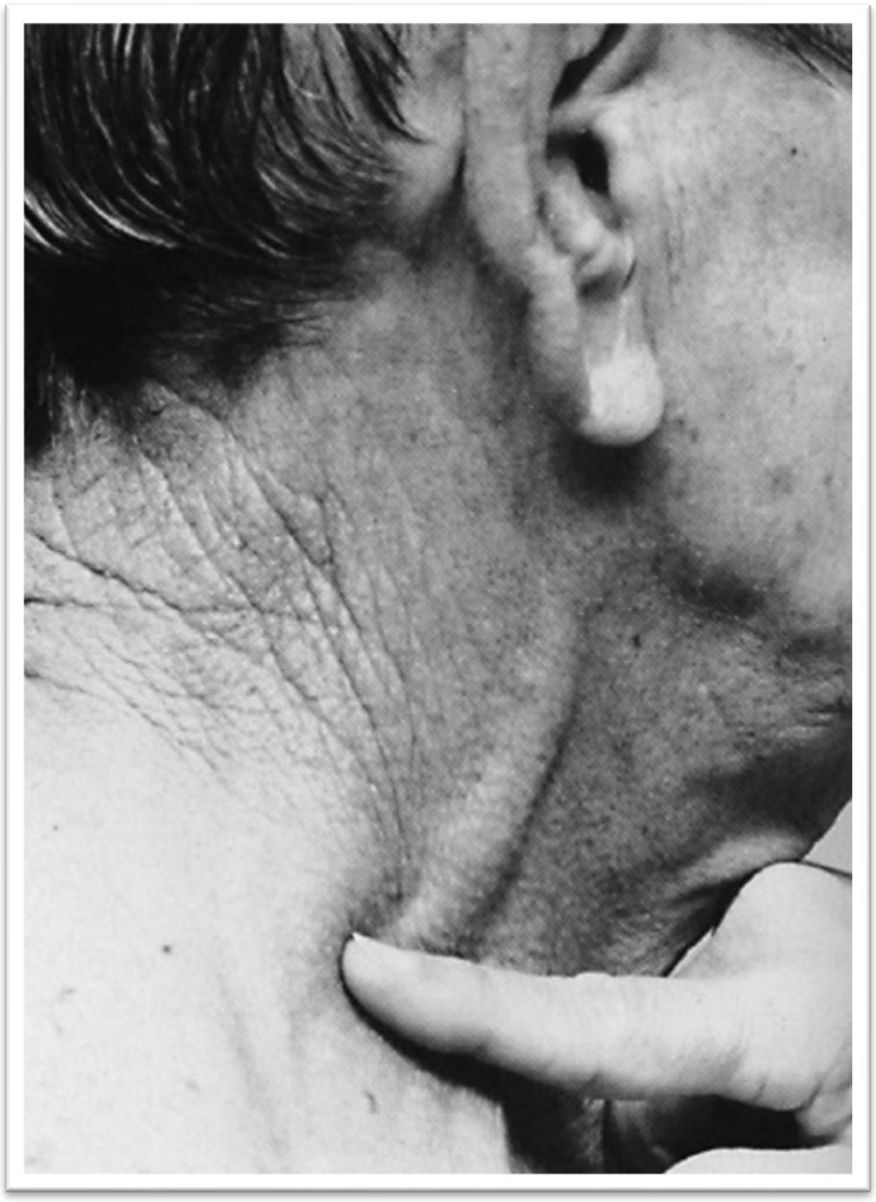

Figure (1) Assessment of Jugular Vein Distension (JVD)

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Pulmonary Alterations

Procedure for Endotracheal and Tracheostomy Suctioning

❖ Equipment

1. Sterile suction catheter sized for either endotracheal tube or tracheostomy
2. Sterile gloves
3. Sterile normal saline for irrigation, only when indicated
4. Sterile disposable container

❖ Patient Preparations

1. Administer medication.
2. Assemble equipment.
3. Explain the procedure to the patient.
4. Adjust the bed to a comfortable working position.
5. Prepare suction pressure.
6. Wash hands.
7. Prepare and open equipment and supplies.
8. Donning the gloves.

❖ Pre – Procedure Techniques

1. Hyperoxygenate the patient with 100% oxygen with the ventilator.
2. Preoxygenate must last at least (2)minutes.
3. Return to the previous oxygen setting after suctioning is completed and an in-line suctioning should be used to avoid loss of PEEP and desaturation.

❖ Procedure Application Techniques

1. Quickly but gently, insert the catheter as far as possible into the artificial airway without applying suction.
2. For tracheostomy patients, limit the distance to just beyond the end of the tracheostomy device.
3. Withdraw the catheter 1 to 2 cm, and apply intermittent suction while rotating and removing the catheter.
4. Limit suction pressure to 80 to 120 mm Hg.
5. Each suctioning attempt should not exceed 10 to 15 seconds (3 to 5 seconds for patients with a tracheostomy tube).
6. Monitor the patient's heart rate and rhythm and pulse oximetry values during and after suctioning.
7. Discontinue the procedure if the patient does not tolerate it, as evidenced by dysrhythmias, bradycardia, or a drop in arterial oxygen saturation (SaO2).

- **Hints**: **Prolonged suctioning can lead to severe hypoxemia, hemodynamic instability, and cardiac arrest.**

❖ Post – procedure Management

1. Remove equipment.
2. Provide oral hygiene. Cleanse suction tubing with a saline rinse to flush secretions into the suction container.
3. Wash your hands and document notes.

Figure (1) Attaching the resuscitation apparatus to the oxygen source.

Figure (2) Inserting the catheter into the trachea through the tracheostomy tube.

Note: Suction is not applied while inserting the catheter.

Figure (3) Attaching the resuscitator to the tracheostomy tube.

Reference :

1. Morton. P. G., Fontaine. D. K., **Essentials of Critical Care Nursing A Holistic Approach ,** 9th ed., Wolters Kluwer Health | Lippincott Williams & Wilkins, Philadelphia, USA, 2013.

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Critical Care Nursing Laboratory Training Guideline

Respiratory Procedure

Chest Tube Placement and Care

(Lab # 6)

Chest Tube Placement and Care

- A chest tube is a large catheter inserted through the thorax to remove fluid (effusions), blood (hemothorax), and/or air (pneumothorax).
- The location of the chest tube indicates the type of drainage expected.
- Apical (second or third intercostal space) and anterior chest tube placement promotes removal of air. Chest tubes placed low (usually in the fifth or sixth intercostal space) and posterior or lateral drain fluid.
- A mediastinal chest tube is placed in the mediastinum, just below the sternum ; and is connected to a drainage system. This tube drains blood or fluid, preventing its accumulation around the heart.
- There are two types of commercial drainage systems: the water-seal and the waterless systems.

Equipment

1. Prescribed chest drainage system
2. Suction source and setup (wall canister or portable)
   A. **Water-seal system:** Add sterile water or normal saline (NS) solution to cover the lower 2.5 cm (1 inch) of the water-seal *U* tube. Or pour sterile water or NS into the suction control chamber if suction is to be used (see manufacturer's directions)
   B. **Waterless system:** Add vial of 30 to 45 mL of sterile sodium chloride or water (for diagnostic air-leak indicator), 20-mL syringe, 21-gauge needle, and antiseptic swab.
   C. Dry suction system
3. Clean gloves
4. Sterile gauze sponges
5. Local anesthetic, if not an emergent procedure.
6. Chest tube tray (all items are sterile): Knife handle (1), chest tube clamp, small sponge forceps, needle holder, knife blade No. 10, 3-0 silk sutures, tray liner (sterile field), curved 8-inch Kelly clamps (2), 4 × 4–inch sponges (10), suture scissors, hand towels (3), sterile gloves.
7. Dressings: Petrolatum gauze, split chest-tube dressings, several 4 × 4–inch gauze dressings, large gauze dressings (2), and 4-inch tape or elastic bandage (Elastoplast).

8. Head cover.
9. Face mask/face shield
10. Sterile gloves.
11. Two rubber-tipped hemostats (shodded) for each chest tube
12. 1-inch adhesive tape for taping connections or plastic zip ties
13. Stethoscope, sphygmomanometer, and pulse oximeter

Intervention

1. Explain purpose, procedure, and possible complications to the patient, and have patient sign consent form.
2. Have pain medication available to administer before or immediately after chest tube insertion as appropriate according to patient's condition.
3. Perform hand hygiene.
4. Cleanse chest wall with antiseptic.
5. Apply mask and gloves.
6. Drape area of chest tube insertion with sterile towels.
7. Inject local anesthetic, and allow time to take effect.
8. Make a small incision over the rib space where tube is to be inserted. Thread a clamped chest tube through the incision. Health care provider clamps chest tube until system is connected to water seal.

9. Suture chest tube in place if suturing is policy or health care provider preference.
10. Cover the chest insertion site with sterile 4 × 4–inch gauze and large dressing to form an occlusive dressing supported with an elastic bandage (Elastoplast). Sterile petrolatum gauze is used around the tube.
11. **Water-Seal System:** Remove connector cover from patient's end of chest drainage tubing with sterile technique. Secure drainage tubing to the chest tube and drainage system.
12. **Water-Seal Suction:** Connect system to suction or supervise a nurse connecting it to suction if suction is to be used.
13. **Waterless System:** Remove connector cover from patient's end of chest drainage tubing with sterile technique. Secure drainage tubing to the chest tube and drainage system.
14. **Waterless Suction:** Turn on suction source. Set float ball level to prescribed setting.
15. The health care provider or nurse adds sterile water or normal saline (NS) to diagnostic indicator
16. Unclamp the chest tube.

Reference :

1. Morton. P. G., Fontaine. D. K., **Essentials of Critical Care Nursing A Holistic Approach ,** 9th ed., Wolters Kluwer Health | Lippincott Williams & Wilkins, Philadelphia, USA, 2013.

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Critical Care Nursing Laboratory Training Guideline

Respiratory Procedure

Incentive Spirometry

(Lab # 7)

Incentive Spirometry

❖ Incentive spirometry helps a patient deep breathe. An incentive spirometer (IS) is most often used following abdominal or thoracic surgery to reduce the incidence of postoperative pulmonary atelectasis. The use of (IS) is especially important in patients with underlying pulmonary diseases because of their risk for postoperative pneumonia.

Equipment

1. Flow or volume-oriented (IS).

Intervention

1. Complete preprocedure protocol.
2. Perform hand hygiene.
3. Position patient in the most erect position (e.g., high- Fowler's position if tolerated).
4. Instruct patient to exhale completely through mouth and place lips tightly around the mouthpiece.
5. Instruct patient to take a slow, deep breath and maintain a constant flow, like pulling through a straw. When the patient cannot inhale any more, he or she has reached maximal inspiration. Have patient hold breath for at least 3 seconds and then exhale normally.

Recording and Reporting

1. Record lung sounds before and after incentive spirometry, the frequency of use, the volumes achieved, and any adverse effects.
2. Report any changes in respiratory assessment or inability of patient to use (IS) to health care provider.

Reference :

1. Morton. P. G., Fontaine. D. K., **Essentials of Critical Care Nursing A Holistic Approach ,** 9th ed., Wolters Kluwer Health | Lippincott Williams & Wilkins, Philadelphia, USA, 2013.

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Gastrointestinal Procedure

Nasoenteral Tube (Placement and Irrigation)

(Lab # 8)

Nasoenteral Tube (Placement and Irrigation)

Equipment

1. Small-bore NG or nasoenteric tube with or without stylet (select the smallest diameter possible to enhance patient comfort)
2. 60-mL Luer-Lok or catheter-tip syringe
3. Stethoscope and pulse oximeter.
4. Hypoallergenic tape, semipermeable (transparent) dressing, or tube fixation device
5. Tincture of benzoin or other skin barrier protectant
6. PH indicator strip (scale 0.0 to 11.0)
7. Cup of water and straw or ice chips (for patients able to swallow)
8. Emesis basin.
9. Towel or disposable pad.
10. Facial tissues
11. Clean gloves
12. Suction equipment in case of aspiration
13. Penlight to check placement in nasopharynx
14. Tongue blade.

Intervention

A.Preparation :

1. Have patient close each nostril alternately and breathe. Examine each naris for patency and skin breakdown.
2. Assess patient's mental status (ability to cooperate with procedure, sedation), presence of cough and gag reflex, ability to swallow, critical illness, and presence of an artificial airway.
3. Perform physical assessment of abdomen.
4. Identify patient using two identifiers (e.g., name and birthday or name and account number) according to agency policy. Compare identifiers with information on patient's MAR or medical record.
5. Perform hand hygiene.
6. Position patient upright in high-Fowler's position unless contraindicated. If patient is comatose, raise head of bed as tolerated in semi-Fowler's position with head tipped forward, chin to chest. If necessary have an assistant help with positioning of confused or comatose patients. If patient is forced to lie supine, place in reverse Trendelenburg's position.
7. Determine length of tube to be inserted, and mark location with tape or indelible ink.
    A. Measure distance from tip of nose to earlobe to xiphoid process of sternum.

B. Implementation procedure

1. Prepare NG for intubation:
    A. Inject 10 mL of water from 30- to 60-mL Luer-Lok or catheter tip syringe into the tube.
    B. If using stylet, make certain that it is positioned securely within tube.
2. Cut hypoallergenic tape 10 cm (4 inches) long, or prepare membrane dressing or other fixation device.
3. Apply clean gloves.
4. Option: Dip tube with surface lubricant into glass of room temperature water, or apply water-soluble lubricant.
5. Explain the step, and gently insert tube through nostril to back of throat (posterior nasopharynx). This may cause patient to gag. Aim back and down toward ear.
6. Have patient flex head toward chest after tube has passed through nasopharynx.
7. Encourage patient to swallow by giving small sips of water or ice chips. Advance tube as patient swallows.
8. Emphasize need to mouth breathe and swallow during the procedure.
9. When tip of tube reaches carina (approximately 25 to 30 cm [10 to 12 inches] in the adult), stop and listen for air exchange from the distal portion of the tube.

10. Advance tube each time patient swallows until desired length has been passed.
11. Check for position of tube in back of throat with penlight and tongue blade.
12. Temporarily anchor tube to the nose with a small piece of tape.
13. Keep tube secure, and check placement of tube by aspirating stomach contents to measure gastric pH. (Anchor tube to patient's nose, avoiding pressure on nares. Mark exit site on tube with indelible ink) .
14. Fasten end of NG tube to patient's gown using a clip or piece of tape. Do not use safety pins to pin the tube to the patient's gown.

C.Post Intervention

1. Assist patient to a comfortable position. Remove gloves and perform hand hygiene.
2. Obtain x-ray film of chest/abdomen.
3. Apply clean gloves and administer oral hygiene. Clean tubing at nostril with washcloth dampened in mild soap and water.
4. Remove gloves, dispose of equipment, and perform hand hygiene.

Recording and Reporting

1. Record and report type and size of tube placed, location of distal tip of tube, patient's tolerance of procedure, and confirmation of tube position by x-ray film examination.
2. Report any type of unexpected outcome and the interventions performed.
3. Record time of irrigation and amount and type of fluid instilled.
4. Report if tubing has become clogged.

Reference :

1. Morton. P. G., Fontaine. D. K., **Essentials of Critical Care Nursing A Holistic Approach ,** 9th ed., Wolters Kluwer Health | Lippincott Williams & Wilkins, Philadelphia, USA, 2013.

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Critical Care Nursing Laboratory Training Guideline

Respiratory Alterations

Pulse Oximetry

(Lab # 9)

Pulse Oximetry

- Pulse oximetry is the noninvasive measurement of arterial blood oxygen saturation, the percent to which hemoglobin is filled with oxygen.
- A pulse oximeter is a probe with a light-emitting diode (LED) connected by cable to an oximeter.
- Normally oxygen saturation (SpO2) is greater than 95%.
- The measurement of oxygen saturation is simple and painless, and has few of the risks associated with more invasive measurements of oxygen saturation such as arterial blood gas sampling.
- A vascular, pulsatile area is needed to detect the change in the transmitted light when making measurements with a digit or earlobe probe.

Equipment

1. Oximeter
2. Oximeter probe appropriate for patient and recommended by oximeter manufacturer
3. Acetone or nail polish remover if needed
4. Pen and vital sign flow sheet or electronic health record (HER).

Intervention

A.Preparation :

1. Complete pre- procedure protocol.
2. Assess for signs and symptoms of alterations in oxygen saturation. (e.g., altered respiratory rate, depth, or rhythm; adventitious breath sounds; cyanotic nails, lips, mucous membranes, or skin; restlessness; difficulty breathing).
3. Assess for factors that influence measurement of SpO2 (e.g., oxygen therapy, respiratory therapy such as postural drainage and percussion, hemoglobin level, hypotension, temperature, nail polish and medications such as bronchodilators).
4. Determine most appropriate patient-specific site (e.g., finger, earlobe, bridge of nose, forehead) for sensor probe placement by measuring capillary refill time. If capillary refill time is less than 2 seconds, select alternative site.
   A. Site must have adequate local circulation and be free of moisture.
   B. A finger free of nail polish or acrylic is preferred
   C. If patient has tremors or is likely to move, use earlobe or forehead.
   D. If patient's finger is too large for the clip-on probe, as may be the case with obesity or edema, the clip-on probe may not fit properly obtain a disposable (tape-on) probe.

B. Implementation procedure

1. Bring equipment to the bedside and perform hand hygiene.
2. Attach sensor to monitoring site. If using finger, remove fingernail polish from digit with acetone or polish remover. Instruct patient that clip-on probe will feel like a clothespin on the finger but will not hurt.
3. Once sensor is in place, turn on oximeter by activating power. Observe pulse waveform/intensity display and audible beep. Correlate oximeter pulse rate with patient's radial pulse rate.
4. Leave sensor in place 10 to 30 seconds or until oximeter readout reaches constant value and pulse display reaches full strength during each cardiac cycle. Inform patient that oximeter alarm will sound if sensor falls off or patient moves it. Read SpO2 value on digital display.
5. If you plan to monitor oxygen saturation continuously, verify SpO2 alarm limits preset by the manufacturer at a low of 85% and a high of 100%. Determine limits for SpO2 value and pulse rate as indicated by patient's condition. Verify that alarms are activated. Assess skin integrity under sensor probe every 2 hours; relocate sensor at least every 4 hours and more frequently if skin integrity is altered or tissue perfusion compromised.

C.Post Intervention

1. If you plan on intermittent or spot-checking of SpO2 values, remove probe, and turn oximeter power off. Cleanse sensor and store sensor in appropriate location.
2.
3. Discuss findings with patient. Perform hand hygiene.
4. Compare SpO2 reading with patient's previous baseline and acceptable SpO2 values.
5. Complete post procedure protocol.

Recording and Reporting

1. Record SpO2 value on vital sign flow sheet, EHR, or nurses' notes; indicate type and amount of oxygen therapy used by patient during assessment.
2. Record any signs and symptoms of alterations in oxygen saturation in narrative form in nurses' notes and EHR.
3. Report abnormal findings to nurse in charge or health care provider.

Reference :

1. Morton. P. G., Fontaine. D. K., **Essentials of Critical Care Nursing A Holistic Approach ,** 9th ed., Wolters Kluwer Health | Lippincott Williams & Wilkins, Philadelphia, USA, 2013.

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Critical Care Nursing Laboratory Training Guideline

Cardiovascular Procedures

Central Venous Catheter

(Lab # 10)

Central Venous Catheters

- Is a thin , flexible tube that is inserted into a large vein , above the heart, it is used to give intravenous fluids , blood transfusion, chemotherapy, and medication .
- Site for Insertion. (more than 5 days).
  1. Subclavian (SC)
  2. Internal jugular (IJ)
  3. Femoral vein in the groin is used when the thoracic veins are not accessible.
- A range of CVC lumen infusion catheters options are available depending on the specific needs of the patient as:
  1. Single.
  2. Double.
  3. Triple.
  4. Quad.
- CVCs are made from a variety of materials ranging from polyurethane to silicone; most are soft and flexible.
- Catheters that are antimicrobial-impregnated or heparin coated have a lower rate of bloodstream infections.

Equipment

1. Ultrasound and sterile ultrasound sheath
2. Sterile trolley
3. Sterile field, gloves, gown and mask
4. Seldinger central line kit
5. Saline flush
6. Chlorhexidine
7. Lignocaine (4ml (2 vials) of 2% is reasonable)
8. Suture
9. Scalpel
10. Sterile dressing
11. Pressure bag to attach to monitoring

Intervention

A.Pre – Insertion preparation

1. Wash hands and don sterile gown and gloves
2. Clean the area and apply sterile field. Make sure to have some spare gauze
3. swabs ready.
4. Apply sterile sheath to the ultrasound probe
5. Confirm anatomy

B. Implementation procedure

1. Under ultrasound guidance insert lignocaine cutaneously, subcutaneously and around internal jugular.
2. Whilst lignocaine has time to work flush all lumens of the line and then clamp all lumens except the Seldinger port
3. Ensure caps are available for the lumens
4. Under ultrasound guidance take Seldinger needle attached to syringe and insert into the internal jugular vein
5. When blood is freely aspirated remove syringe and immediately inset Seldinger wire. This should pass easily.
6. Keeping hold of the inserted wire, remove the needle. Ensure the wire stays in the vein as you do this.

7. Use scalpel to make an small incision in the skin (approx 3mm). This should be done cutting away from the wire so as not to damage it.
8. Pass the dilator over the wire and gently but firmly dilate a tract through to the internal jugular. At this stage there may be some bleeding so ensure to have some swabs ready.
9. Remove the dilator and pass the central line over the Seldinger wire. Do not advance the line until you have hold of the end of the wire
10. Once the central line is in place, remove the wire
11. Aspirate and flush all lumens and re clamp and apply lumen caps.
12. Suture the line to allow 4 points of fixation
13. Dress with a clear dressing so the insertion point can be clearly seen.

C.Post Intervention.

1. Attach central line to pressure bag to allow CVP monitoring
2. Nursing staff can show you how to do this or will do it for you
3. Run a blood gas to ensure a venous sample
4. Chest x-ray to confirm placement and to check for pneumothorax
5. Clear documentation of date of insertion and monitor for infection

Reference :

1. Morton. P. G., Fontaine. D. K., **Essentials of Critical Care Nursing A Holistic Approach ,** 9th ed., Wolters Kluwer Health | Lippincott Williams & Wilkins, Philadelphia, USA, 2013.