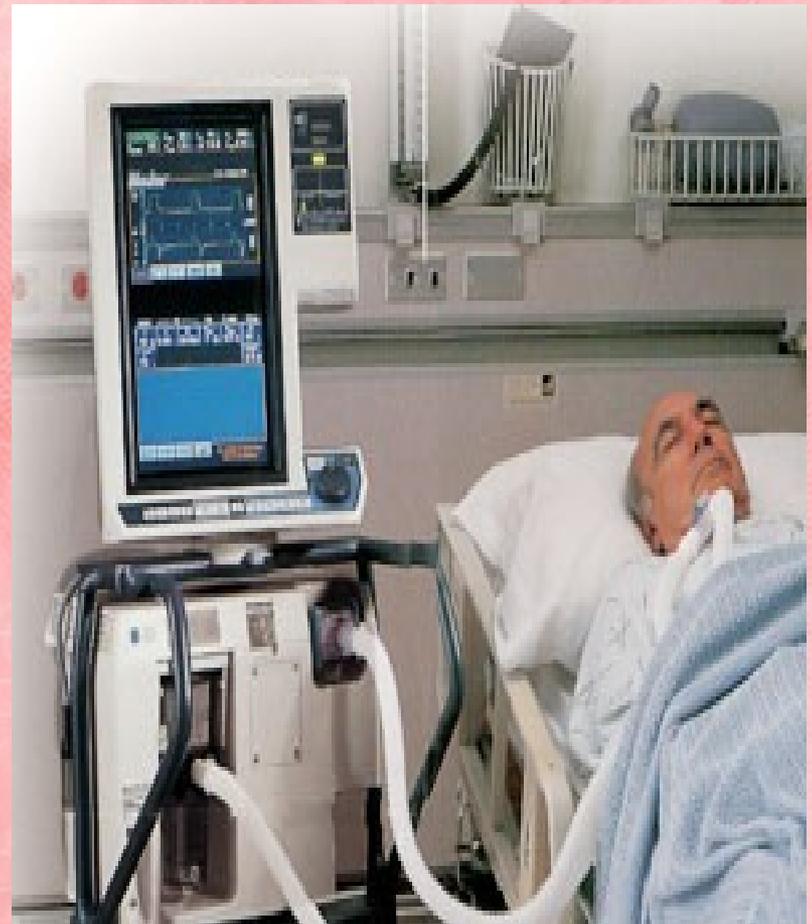


CARING OF PATIENT ON MECHANICAL VENTILATION

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 - **October, 2016**



MECHANICAL VENTILATOR

Functions for below thoracic cage & diaphragm. It can maintain ventilation automatically for prolonged time. It is indicated in patient who unable to maintain safe level of oxygen or CO₂ by sopntaneous brathing even with assistantance and some other neurologic and metabilic condition.



- 
- **The longer a patient remains on mechanical ventilation,**
 - **the greater the risk of complications, which increase the likelihood that the patient will require a longer hospital stay.**
 - **Patients on mechanical ventilation are occupying beds not only in ICUs, where its use is typical, but also on intermediate care and step-down, medical–surgical, pulmonary rehabilitation, and long-term care units.**

Case:

- **Barbara Liston, a 65-year-old retired social worker, has been diagnosed with ventilator-associated pneumonia after 10 days on a positive-pressure mechanical ventilator.**
- **A chest X-ray shows bilateral infiltrates with increased densities that are worse on the right side.**
- **Her ventilator settings include fractional concentration of oxygen in inspired gas (FiO_2), 80% (increased from 40% in response to a rise in nighttime hypoxemia); tidal volume, 500 mL; ventilation rate, 12 breaths per minute; and positive end-expiratory pressure (PEEP), 8 cm H₂O.**

- Values for her arterial blood gases, drawn two hours earlier, are pH, 7.35; (PaO₂), 75 mmHg; (PaCO₂), 55 mmHg; and bicarbonate, 20. Thus, Ms. Liston's PaO₂-FiO₂ ratio, an indicator of oxygenation status, is 94.
- She has an extensive history of chronic obstructive pulmonary disease and supplemental oxygen use at home.
- She has an enteral feeding tube in place, but feeding has been suspended because her gastric residual volumes have been greater than 100 mL per hour.
- She is lying flat in bed with a temperature of 103°F.
- Heavily sedated, she responds only to suctioning.
-

What are the most important interventions to consider? and

- **what are the best, evidence-based nursing practices to help Ms. Liston be liberated from the ventilator?**



This session addresses several integral areas of care, including:

- **Promote respiratory function**
- **weaning from mechanical ventilation,**
- **preventing ventilator associated pneumonia,**
- **providing nutritional support,**
- **managing anxiety, pain and sedation**
- **promoting sleep**
- **Prevent hemodynamic instability, renal, neurological, skin, muskeleskeletal, ... complications**
- **Patient, family education**

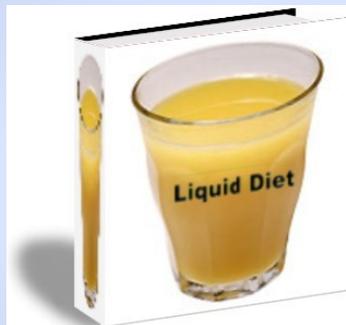
NURSING Diagnosis for MV Patients

- ◆ **Inability to sustain spontaneous ventilation related to imbalance between ventilatory capacity ventilator demand.**
- ◆ **Impaired gas exchange and ineffective breathing pattern related to underlying disease process and artificial airways and ventilator system.**
- ◆ **Ineffective airways clearance related to cough and increased secretions formation in the lower tracheobronchial tree from ET tube.**
- ◆ **Anxiety related to dependence on CMV for breathing.**
- ◆ **High risk for complication of CMV and positive pressure ventilation (PPV).**
- ◆ **Risk for infection related to impaired primary defenses in respiratory tract**
- ◆ **Altered nutrition : Less than body requirements related to lack ability to eat while on ventilator and increased metabolic needs.**
- ◆ **Impaired verbal communication related to mute state when ET tube is in place.**
- ◆ **Altered oral mucous membranes related to nothing by mouth (NPO) status, ET & NGT placement.**
- ◆ **High risk for skin integrity, fluid & electrolyte imbalance, ...**

PLAN OF CARE FOR THE VENTILATED PATIENT

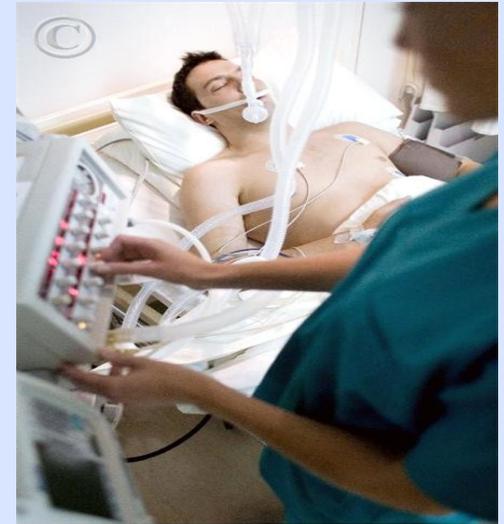
- *Patient Goals:*

- Patient will have effective breathing pattern.
- Patient will have adequate gas exchange.
- Patient will not develop a pulmonary infection.
- Patient will not develop problems related to immobility.
- Patient's nutritional status will be maintained to meet body needs.
- Patient and/or family



PROMOTE RESPIRATORY FUNCTION

1. Chest movement & respiration pattern
2. Auscultate lungs frequently to assess for abnormal sounds.
3. Suction as needed.
4. Turn and reposition every 2 hours.
5. Secure ETT properly.
6. Monitor ABG value and pulse oximetry.
7. Check ventilator settings and modes



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FOTOSEARCH



Check ventilator settings and modes

- Read the patient's order and obtain information about the ventilator.
- Compare current ventilator settings with the settings prescribed in the order.
- Familiarize yourself with ventilator **alarms** and the actions to take when an alarm sounds.

Ensuring humidification and thermoregulation

- All air delivered by the ventilator passes through the water in the humidifier, where it is warmed and saturated.
- Humidifier temperatures should be kept close to body temperature **35 °C- 37°C**.
- In some rare instances (severe hypothermia), the air temperatures can be increased.
- The humidifier should be **checked for adequate water levels**

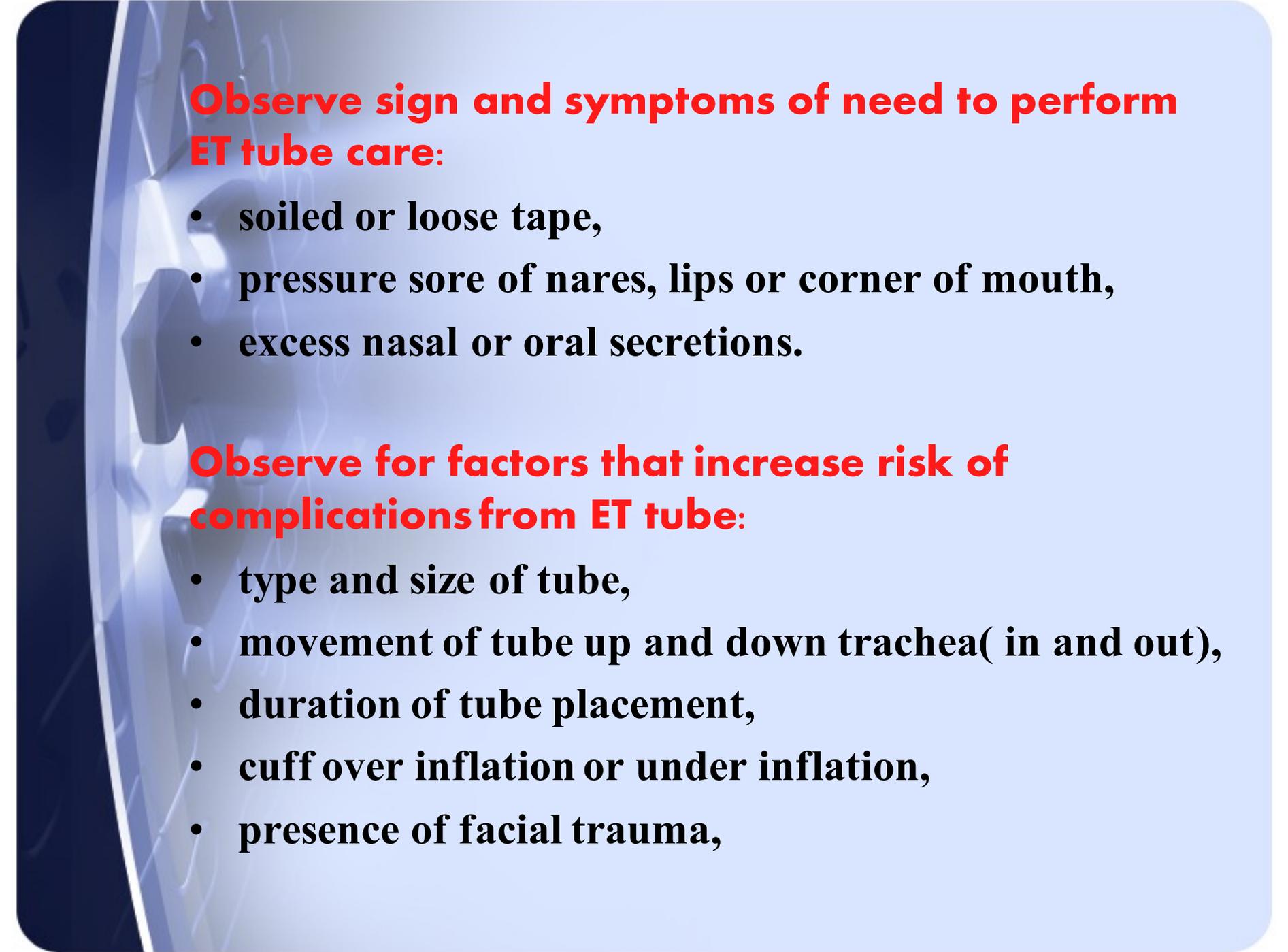
- **An empty humidifier contributes to drying the airway, often with resultant dried secretions, mucus plugging and less ability to suction out secretions.**
- **Humidifier **should not be overfilled** as this may increase circuit resistance and interfere with spontaneous breathing.**
- **As air passes through the ventilator to the patient, **water condenses in the corrugated tubing**. This moisture **is considered contaminated and must be drained into a receptacle and not back into the sterile humidifier**.**

- **If the water is allowed to build up, resistance is developed in the circuit and PEEP is generated. In addition, if moisture accumulates near the endotracheal tube, the patient can aspirate the water.**
- **The humidifier is an ideal medium for bacterial growth.**
- **The nurse and respiratory therapist jointly are responsible for preventing this condensation buildup.**

ET tube care



- **ETT stabilization/repositioning**
- **Cuff pressure monitoring**
- **suctioning**



Observe sign and symptoms of need to perform ET tube care:

- soiled or loose tape,
- pressure sore of nares, lips or corner of mouth,
- excess nasal or oral secretions.

Observe for factors that increase risk of complications from ET tube:

- type and size of tube,
- movement of tube up and down trachea(in and out),
- duration of tube placement,
- cuff over inflation or under inflation,
- presence of facial trauma,

- 
- **Obtain another nurse's assistance in the procedure.**
 - **Explain procedure and client's participation including importance of the following: not biting or moving ET tube with tongue, trying not to cough when tape is off ET tube, keeping hands down and not pulling on tubing, removal of tape from face can be uncomfortable.**

- 
- **Assist client to assume position comfortable for both nurse and client (usually supine or semi fowler's)**
 - **Wash hands**

ETT Stabilization/Repositioning

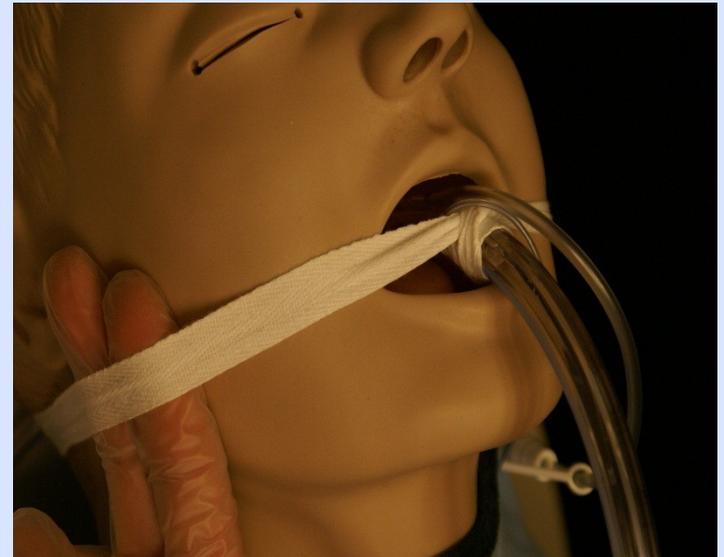
- **Stabilization and regular repositioning of an ETT is performed to prevent unplanned extubation, minimize skin/mucosal breakdown and enhance patient comfort.**
- **Stabilization can be accomplished using a twill ties, tapes or commercial securing devices.**
- **Staff should become familiar with the particular devices used in their facility.**

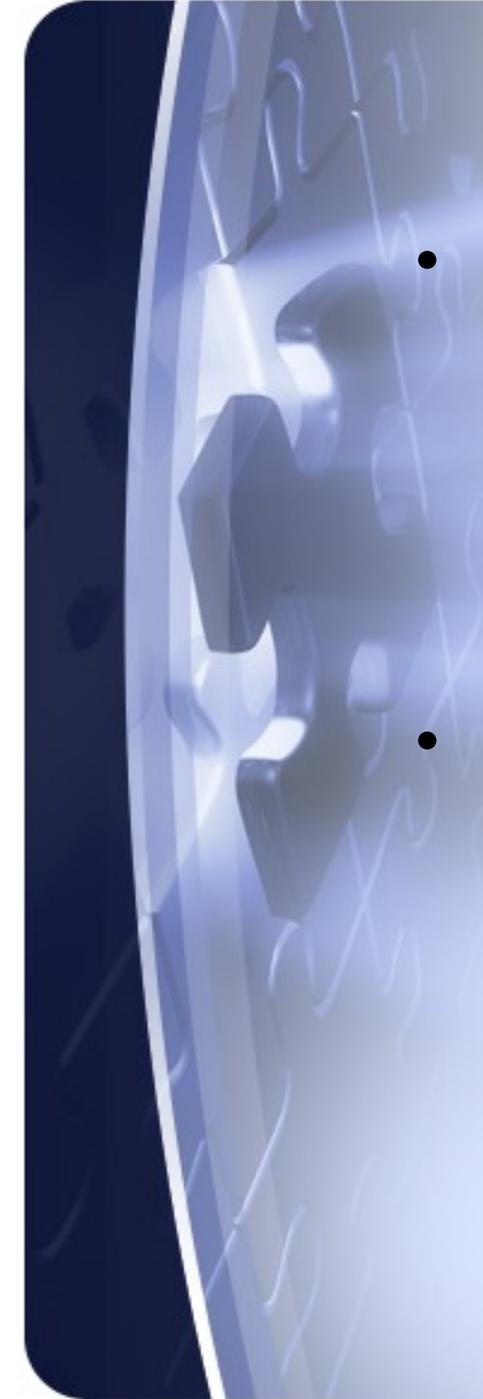


Key Points

- ETT's must be repositioned at least every ? hrs and more frequently if required and recorded in the patient medical record.
- Assessment of ETT position and tautness of ETT securing device should be performed as per hospital policy.
- Skin preparation is required when using tapes or devices with adhesives. This may include:
 - Shaving (consent may be required before shaving), cleaning and drying.
 - Preparation with skin prep solutions

- **Ensure tape/device is taut enough to hold securely in place but not too tight as to cause skin/mucosal breakdown.**
- **Two fingers** should fit underneath the stabilizing material/device at the patient's cheek.



- 
- **Securing tape/devices must be placed on the upper lip when possible and must encircle the neck unless patient condition dictates otherwise.**
 - **Patients with elevated ICP, burns or facial trauma may require alternate securing methods as not to compromise circulation to affected areas.**

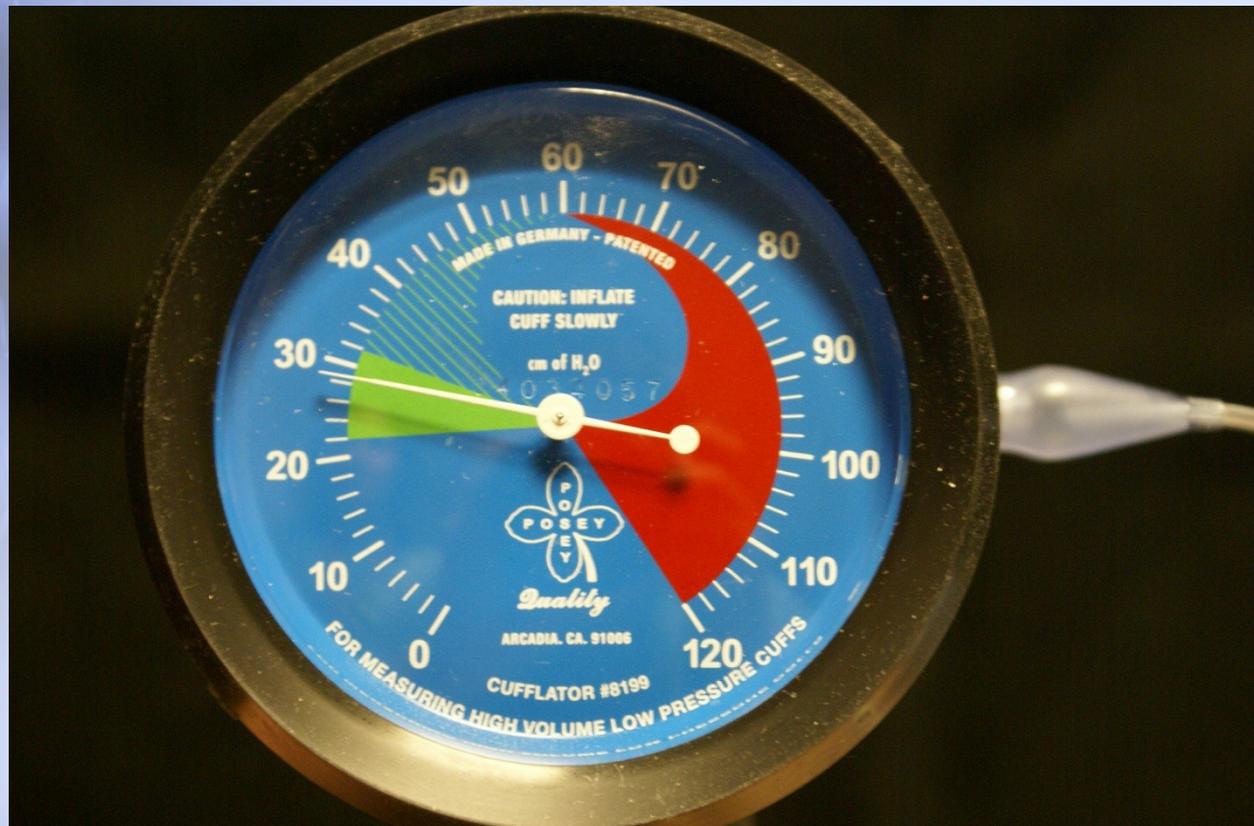
- **During ETT stabilization/repositioning special care must be taken to ensure insertion depth is maintained at the most recent confirmed tube placement level.**
- **If an ETT requires advancing or withdrawing, the patient's oral airway should be suctioned and then the cuff deflated prior to moving the ETT.**





Cuff Pressure Monitoring

SPHYGMOMANOMETERS



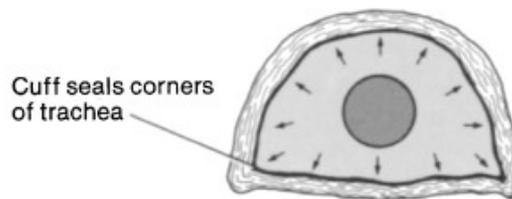
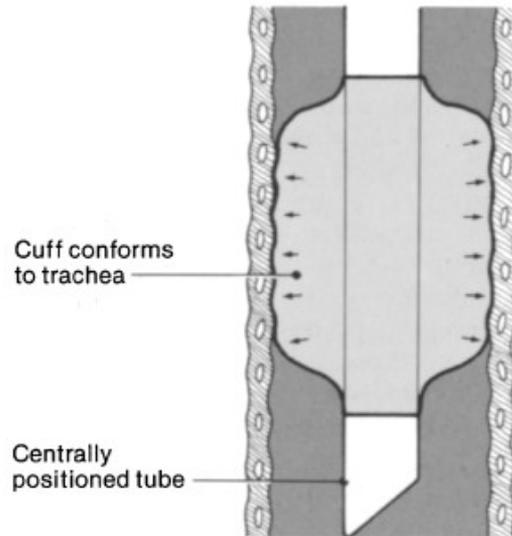
Cuff Pressure Monitoring

- **ETT cuff pressure is monitored to minimize the risk of tracheal necrosis and to reduce aspiration of oral secretions into the airway.**
- **Cuff pressure should be monitored at least every four hours or as per hospital policy and recorded in the patient medical record.**
- **Each patient should have their own cuff pressure manometer.**

High Volume Low Pressure Tubes

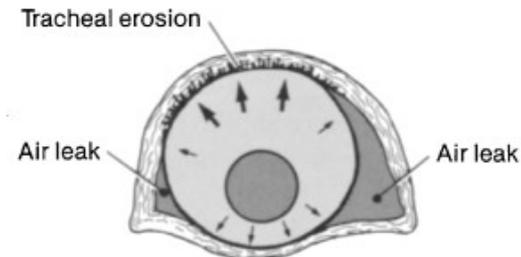
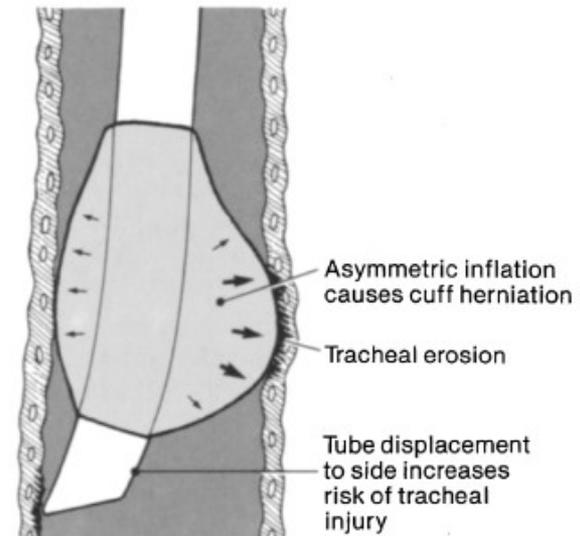
SOFT CUFF

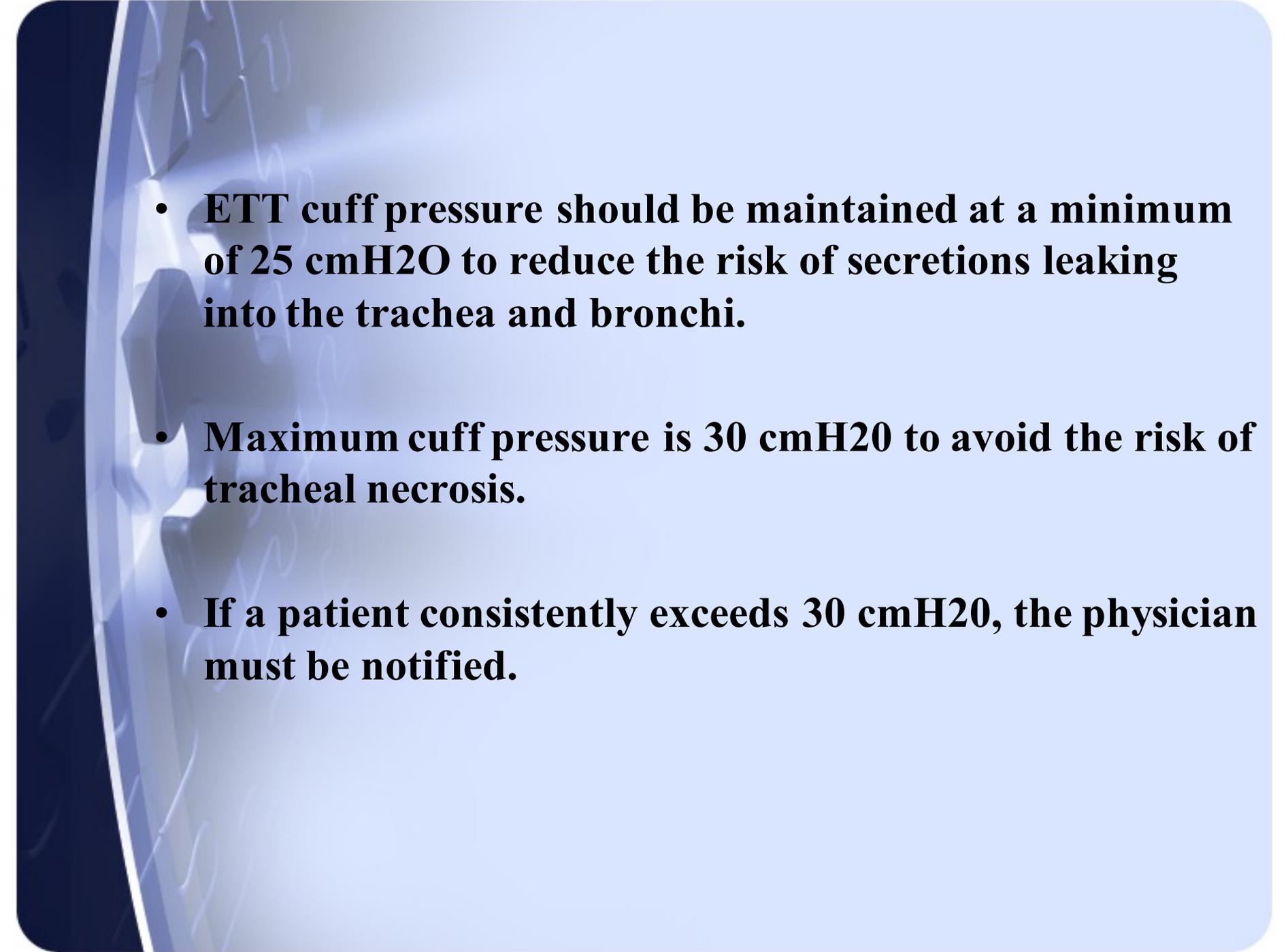
- High volume
- Exerts low and equal lateral tracheal wall pressure (TWP) (arrows)
- Minimizes tracheal injury



HARD CUFF

- Low volume
- Exerts high and unequal lateral TWP (arrows)
- Causes tracheal injury



- 
- **ETT cuff pressure should be maintained at a minimum of 25 cmH₂O to reduce the risk of secretions leaking into the trachea and bronchi.**
 - **Maximum cuff pressure is 30 cmH₂O to avoid the risk of tracheal necrosis.**
 - **If a patient consistently exceeds 30 cmH₂O, the physician must be notified.**

Cuff Pressure Measurement

- The measuring device connects to the one way valve of the ETT pilot balloon and the pressure is read at end of inspiration.





suctioning

PURPOSES

- **To maintain a patent airway by removing accumulated tracheobronchial secretions using sterile technique.**
- **To improve oxygenation and reduce the work of breathing.**
- **Stimulate the cough reflex.**
- **Prevent infection and atelectasis from the retained secretion.**

INDICATIONS:

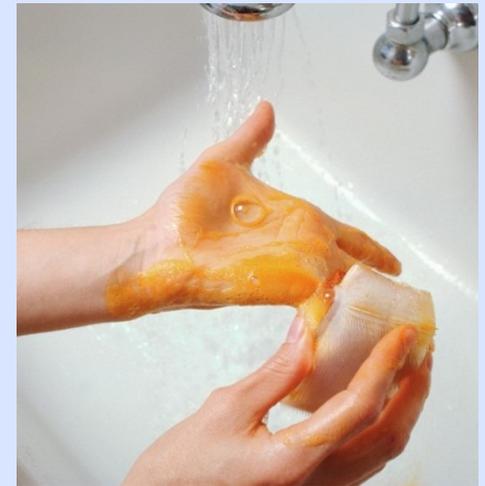
- **Coarse breath sounds by auscultation of lungs or 'noisy' breathing.(rhonchi sound)**
- **Increased peak inspiratory pressures during volume-controlled mechanical ventilation or decreased tidal volume during pressure-controlled ventilation.**
- **Changes in monitored flow and pressure graphics.**
- **Patient's inability to generate an effective spontaneous cough.**
- **Visible secretions in the airway.**
- **Deterioration of arterial blood gas values.**
- **Suspected aspiration of gastric or upper airway secretions.**
- **Clinically apparent increased work of breathing.**

PATIENT PREPARATION:

- **Explain the procedure to the patient (If patient is conscious).**
- **The patient should receive hyper oxygenation by the delivery of 100% oxygen for >30 seconds prior to the suctioning.**
- **Position the patient in semi fowler positin if is not contraindicated.**
- **Auscultate the breath sounds.**

PROCEDURE:

1. Perform hand hygiene, wash hands. It reduces transmission of microorganisms.



2. Turn on suction apparatus and set vacuum regulator to appropriate negative pressure. For adult a pressure of 100-120 mmHg, 80-100mmhg for children & 60-80mmhg for infants.



PROCEDURE, CON...

3. Goggles, mask & apron should be worn to prevent splash from secretions.

**4. Open the end of the suction catheter package & connect it to suction tubing
(If you are alone)**

Select appropriate catheter size

5. Wear sterile gloves with sterile technique

6. With a help of an assistant open suction catheter package & connect it to suction tubing



PROCEDURE, CON...

8. With a help of an assistant disconnect the ventilator

9. Kink the suction tube & insert the catheter in to the ET tube until resistance is felt.

10. Resistance is felt when the catheter impacts the carina or bronchial mucosa,

11. the suction catheter should be withdrawn 1cm out before applying suction



PROCEDURE, CON...

12. Apply continuous suction while rotating the suction catheter during removal

13. The duration of each suctioning should be less the 15sec.

14. Assistant resumes the ventilator

15. Give four to five manual breaths with bag or ventilator

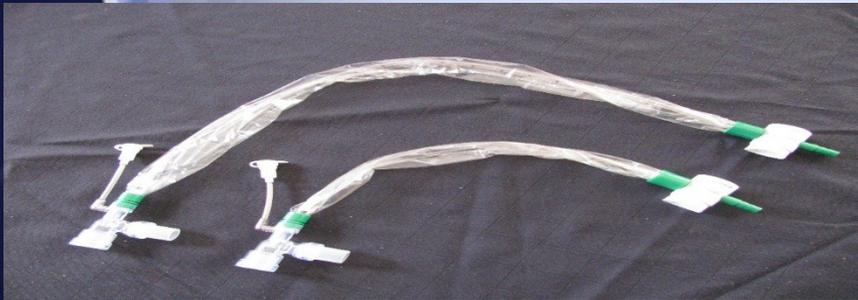


PROCEDURE, CON...

- 16. Continue making suction passes, bagging patient between passes, until clear of secretions, but no more than three to four passes**
- 17. Return patient to ventilator**
- 18. Flush the catheter with hot water in the suction tray**
- 19. Suction nares & oropharynx above the artificial airway**
- 20. Discard used equipments**
- 21. Flush the suction tube with hot water**
- 22. Auscultate chest**
- 23. Wash hands**
- 24. Document including indications for suctioning & any changes in vitals & patient's tolerance**

CLOSED IN-LINE SUCTION

- **Closed in-line suction catheters are used for secretion removal in all mechanically ventilated patients.**
- **In-line catheters minimize breaking of the patient circuit which increases the risk of infection to both the patient and health care worker.**
- **They also prevent the loss of PEEP and resulting de-recruitment in the intubated and ventilated patient.**



CLOSED SUCTIONING PROCEDURE

- 1. Wash hands**
- 2. Wear clean gloves and eye protection.**
- 3. Select appropriate catheter size**
- 4. Connect tubing to closed suction port**
- 5. Pre-oxygenate the patient with 100% O₂**
- 6. Gently insert catheter tip into artificial airway without applying suction, stop if you met resistance or when patient starts coughing and pull back 1cm out**



CONTINUE ...

7. Place the dominant thumb over the control vent of the suction port, applying continuous or suction for no more than 10 sec as you withdraw the catheter into the sterile sleeve of the closed suction device

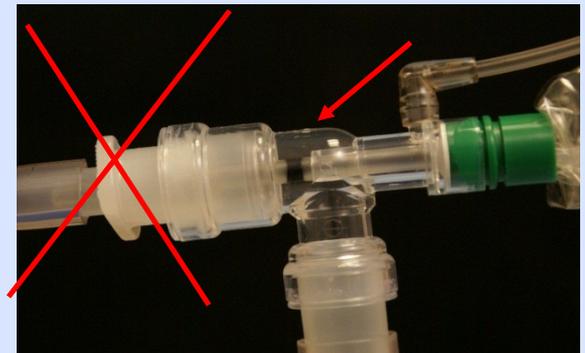
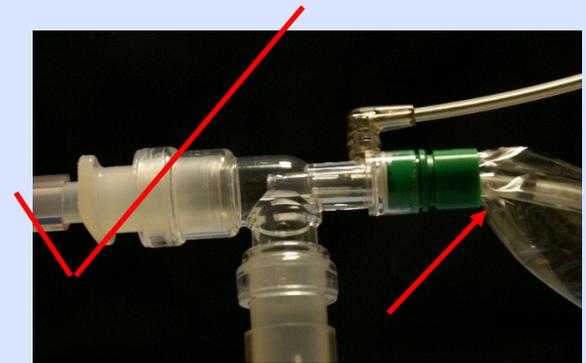
Use higher suction levels, 140-180 mmHg, due to increased resistance with in-line catheters.

8. Repeat steps above if needed



CONTINUE ...

- Completely withdraw the catheter from the ETT post suction. A black indicator line on the catheter should be visible just inside the plastic sleeve.
- **Airway resistance will be increased if the catheter is left in the ETT.**
- Clean suction catheter with sterile saline until clear; being careful not to instill solution into the ET tube
- Suction oropharynx above the artificial airway
- Wash hands
- Disconnect the suction tubing from the in-line catheter whenever the patient is being mobilized or is at high risk of self extubation.
- Lock the suction control valve when the in-line catheter is not being used.



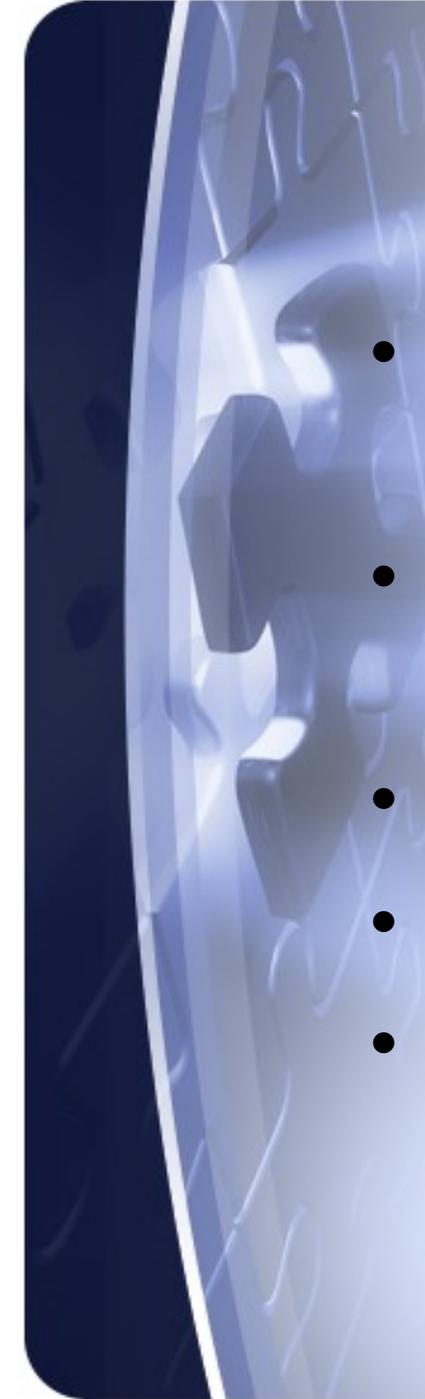


ASSESSMENT OF OUTCOME

- **Improvement in breath sounds.**
- **Decreased peak inspiratory pressure;
Increased tidal volume delivery during ventilation.**
- **Improvement in arterial blood gas values or saturation as reflected by pulse oximetry.**
- **Removal of pulmonary secretions.**

LIMITATIONS OF METHOD

- **Suctioning is potentially an harmful procedure if carried out improperly.**
- **Suctioning should be done when clinically necessary (not routinely).**
- **The need for suctioning should be assessed at least every 2hrs or more frequently as need arises.**



Change the In-line Catheter When:

- **Visible soiling is evident on either the inside or outside of the catheter.**
- **Mechanical Failure of the suction control valve occurs.**
- **The catheter does not move freely.**
- **Air fills the sleeve of the catheter.**
- **There is failure of the one way valve on the instillation port.**

Trouble Shooting Tips

- **If the in-line suction does not adequately remove the patient's secretions try the following before attempting open suction or breaking the circuit to replace the in-line system:**
 - **Ensure proper vacuum pressure.**
 - **Rinse the catheter with normal saline.**
 - **Ensure valve is properly depressed**
 - **Verify that the catheter and suction tubing are not kinked.**



weaning from mechanical ventilation

1. Ensure that all factors that may interfere with successful weaning are corrected:-

- Acid-base abnormalities**
- Fluid imbalance**
- Electrolyte abnormalities**
- Infection**
- Fever**
- Anemia**
- Hyperglycemia**
- Sleep deprivation**

- 2. Assess readiness for weaning**
- 3. Ensure that the weaning criteria / parameters are met.**
- 4. Explain the process of weaning to the patient and offer reassurance to the patient.**
- 5. Initiate weaning in the morning when the patient is rested.**
- 6. Elevate the head of the bed & Place the patient upright**
- 7. Ensure a patent airway and suction if necessary before a weaning trial,**
- 8. Evaluate and document the patient's response to weaning.**

9. Monitor the respiratory rate, vital signs, ABGs, diaphoresis and use of accessory muscles frequently

- **Wean only during the day.**

If signs of fatigue or respiratory distress develop.

- **Discontinue weaning trials.**

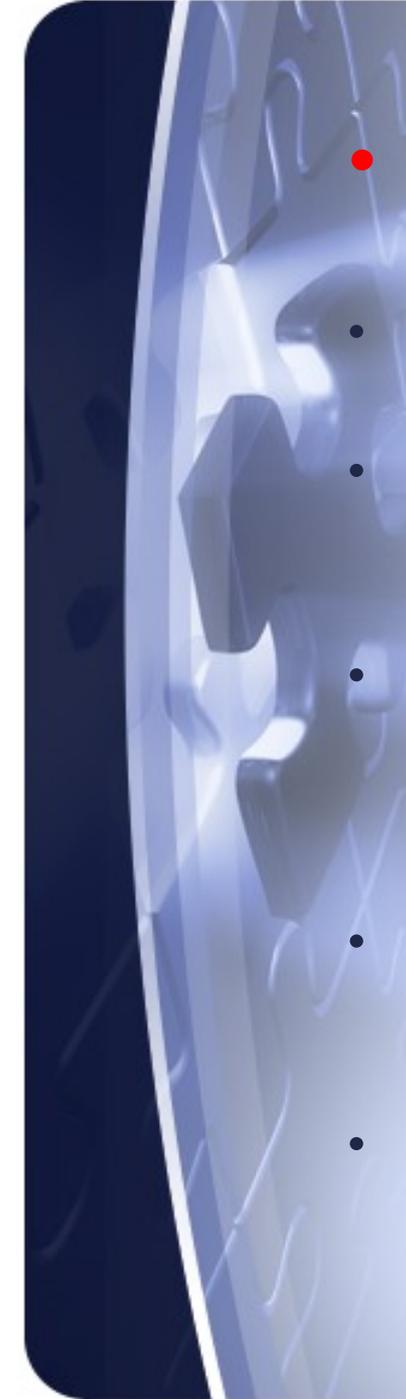


PREVENTING VENTILATOR-ASSOCIATED PNEUMONIA

- Nosocomial pneumonia is most commonly caused by aspiration of oropharyngeal secretions.
- **Risk Factors Include:**
 - critical illness, immunosuppression, use of an artificial airway or mechanical ventilation, lengthy hospitalization, and long ventilator length of stay.
- Patients on mechanical ventilation are six to 21 times more likely to develop nosocomial pneumonia than those not on mechanical ventilation.

- nosocomial pneumonia occurred less often in patients in a semirecumbent position (**45° angle**) than in those in a supine position (**8% versus 34%**).
- risk of nosocomial pneumonia increased with “long-duration mechanical ventilation and decreased consciousness.”
- Oral microorganisms, which tend to concentrate in dental plaque, can migrate to and colonize the lungs.

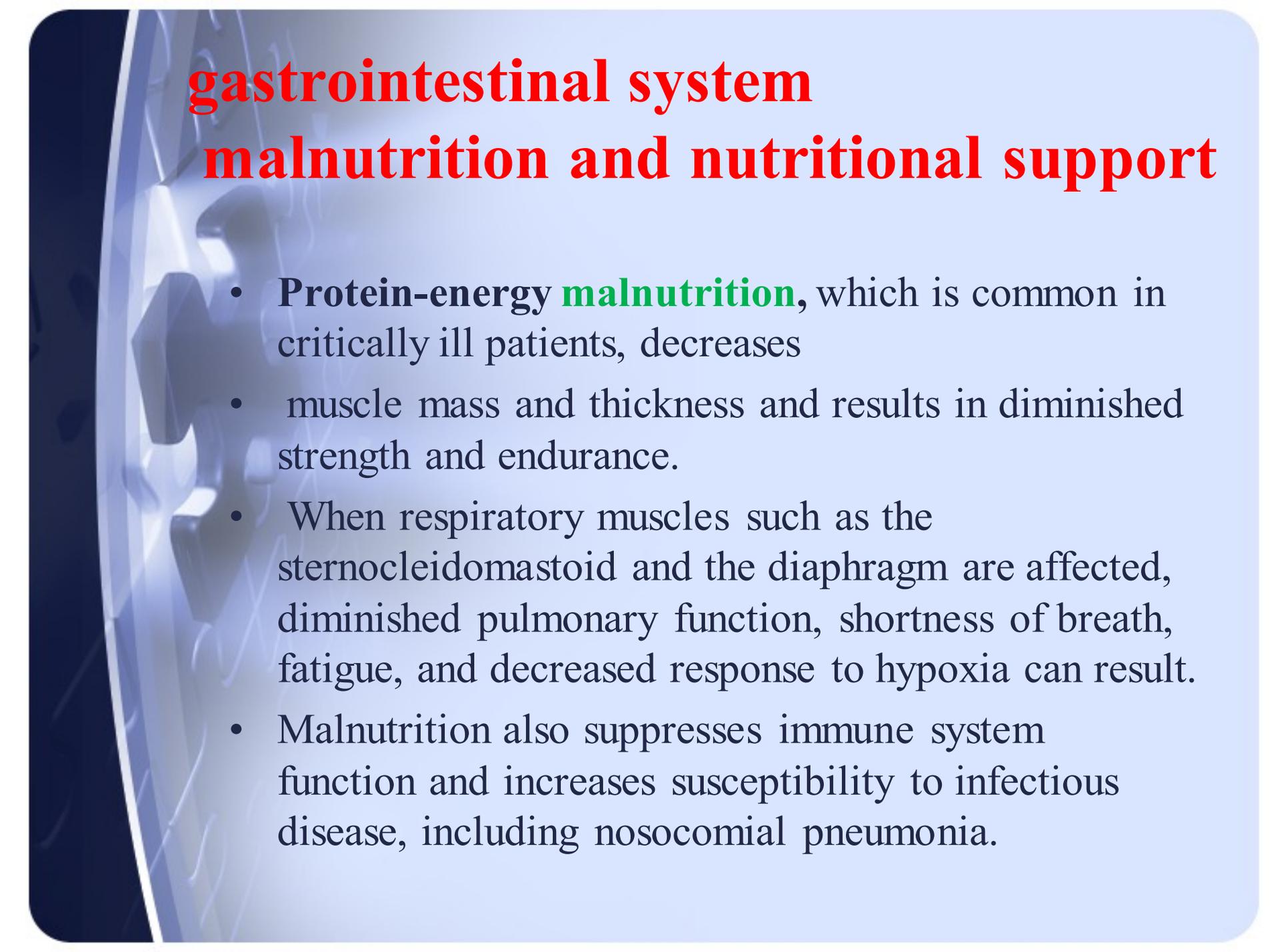
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- **Best nursing practice**

- **Weaning and extubation** should occur as soon as the patient is ready.
- Elevating the head of the patient's bed to a 45° angle will reduce the likelihood of aspiration of oral secretions.
- Oral care should include tooth brushing at least every 12 hours. The use of sponge toothettes every two to four hours to stimulate the oral mucosa is also recommended, but it should not replace tooth brushing.
- Subglottic secretions should be suctioned regularly, and proper cuff pressure should be maintained to prevent leakage of contaminated secretions.
- Application of chlorhexidine by spray or swab to cover all oral surfaces may also be useful.

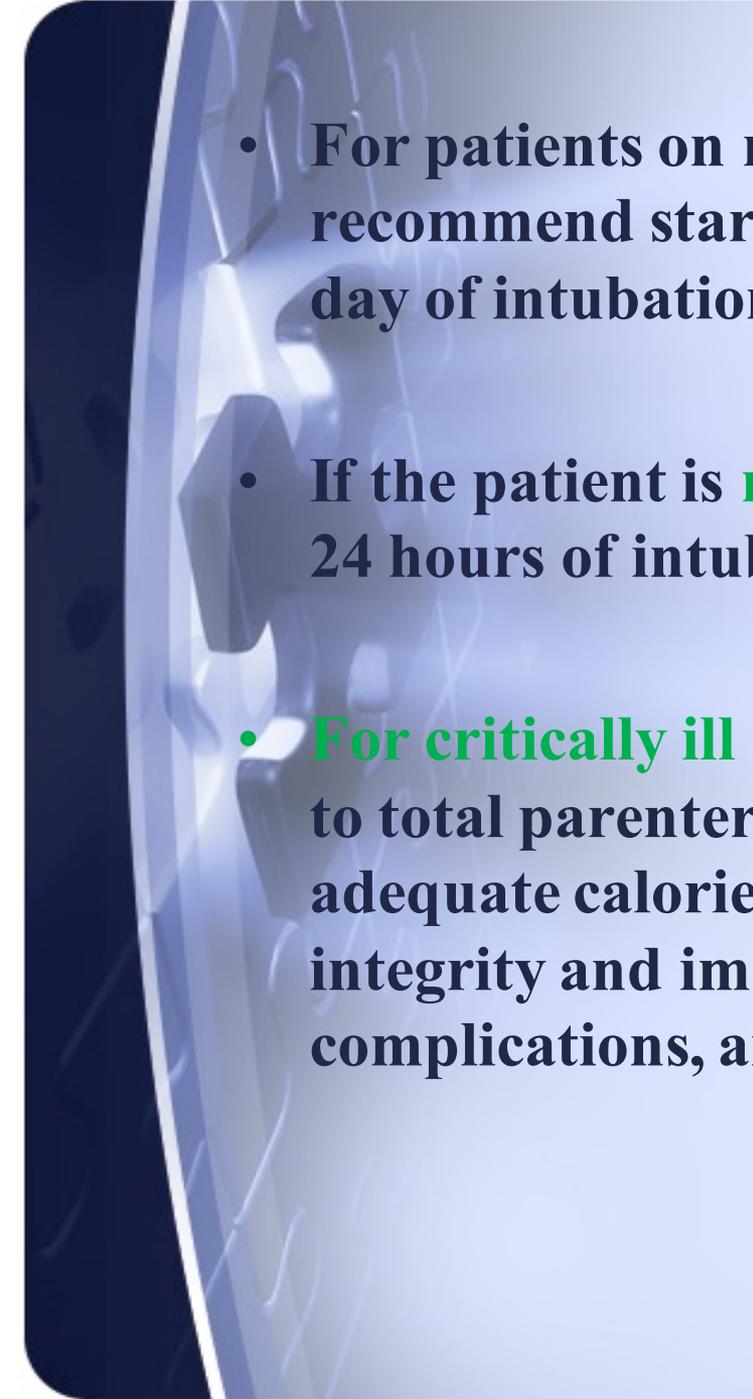


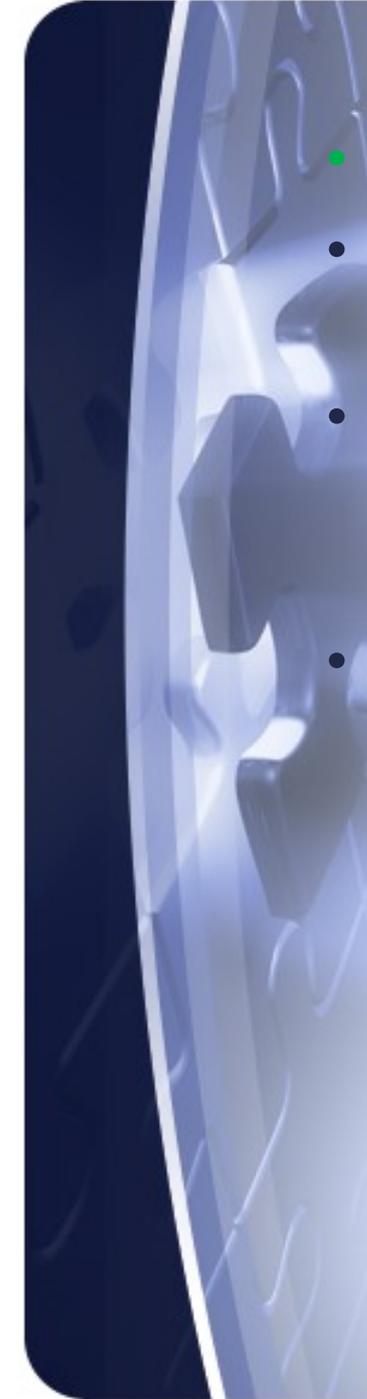


gastrointestinal system

malnutrition and nutritional support

- **Protein-energy malnutrition**, which is common in critically ill patients, decreases
 - muscle mass and thickness and results in diminished strength and endurance.
 - When respiratory muscles such as the sternocleidomastoid and the diaphragm are affected, diminished pulmonary function, shortness of breath, fatigue, and decreased response to hypoxia can result.
 - Malnutrition also suppresses immune system function and increases susceptibility to infectious disease, including nosocomial pneumonia.

- 
- For patients on mechanical ventilation, experts recommend starting nutritional support by the third day of intubation.
 - If the patient is **malnourished**, this should begin within 24 hours of intubation.
 - **For critically ill** patients, enteral nutrition is preferred to total parenteral nutrition because it provides adequate calories and more nutrients, preserves gut integrity and immune function, is associated with fewer complications, and is less expensive.



- **indirect calorimeter**

- the fact that it requires trained personnel and specialized, expensive equipment.
- Decreased protein intake diminishes the body's nitrogen store, causing nitrogen deficiency, which a 24-hour urinalysis can reveal.
- Some electrolyte imbalances can impair ventilatory muscle function. Low magnesium levels have been associated with muscle weakness, as has hypophosphatemia; the latter has also been associated with weaning failure.

- incorporation of prokinetics at initiation and tolerates a higher gastric residual volume (250 mL) should be considered as a strategy to optimize delivery of [enteral nutrition] in critically ill adult patients.



- 
- **Nasogastric tubes are generally used for no longer than six to eight weeks, in part because prolonged use can result in nasal septal or esophageal erosion, sinusitis, or distal esophageal stricture.**
 - **Gastrostomy, duodenostomy, and jejunostomy tubes enter percutaneously through the stomach or abdominal wall.**

A gastrostomy tube permits bolus as well as continuous feedings; this type is most appropriate for patients with intact gag and cough reflexes and adequate gastric emptying.

- **Duodenostomy and jejunostomy tubes require slow, continuous feeding over the course of 12 to 24 hours, because the small bowel cannot buffer osmotic loads as effectively as the stomach.**

If a patient's residual volume level is high enough to cause concern

- Position the patient on the right side for 15 to 20 minutes before checking residual volume levels; this helps the patient to avoid aspirating secretions from the fundus gastricus.
- In some cases transpyloric placement of the feeding tube might help.
- using a more calorie-dense formula at a reduced rate (less volume per hour).
- Monitor glucose levels because hyperglycemia may lead to gastroparesis; if glucose levels rise above 200 mg/dL, the physician should be notified.
- Opioids should be avoided when possible because these drugs tend to cause constipation.
- Gastroparesis can usually be managed with prokinetic agents such as metoclopramide



totally

1. Monitor bowel sounds.
2. MONITOR FOR GI BLEEDING every shift
3. Check serum glucose, pro, electrolyte, ...
4. Interventions for prevention of peptic ulcer.
Chemical agent,...
5. Cares for NGT & appropriate gavage technique.
6. Check bowel elimination pattern



Managing anxiety

- Having to depend on a machine to breathe and being unable to speak can bring about anxiety, **which can result in:**
 - sleep disturbances,
 - increased myocardial oxygen consumption, and
 - Increased sympathetic output; the last can lead to tachypnea, tachycardia, or hypertension, making **weaning more difficult**

Best nursing practice.

- **In patients who are alert and oriented, anxiety can be assessed using a Likert scale.**
- **In patients who are not alert and oriented, assess for behaviors associated with anxiety, such as pulling on tubes or catheters, restlessness, and agitation.**
- **When a patient exhibits anxiety, first rule out possible clinical causes such as hypoxemia, metabolic abnormalities, cerebral hypoperfusion, adverse drug reactions, and alcohol or drug withdrawal.**
- **Richmond Agitation–Sedation Scale**, has demonstrated both validity and reliability and is the first scale capable of “detect[ing] changes in sedation status over consecutive days of [ICU] care.

- 
- If sedation is needed, the minimum amount that will achieve the sedation goal should be given, preferably either as small-bolus doses or, if through continuous IV infusion, with daily interruption and reassessment of the patient's need.

- Another intervention is developing a **communication plan**. Nurses should assess each patient to determine which communication methods are best and share this information with team members and the patient's family. Give the patient paper and pencil to determine whether the handwriting is legible. Picture and alphabet boards can be useful as well. Music therapy may also help reduce anxiety.



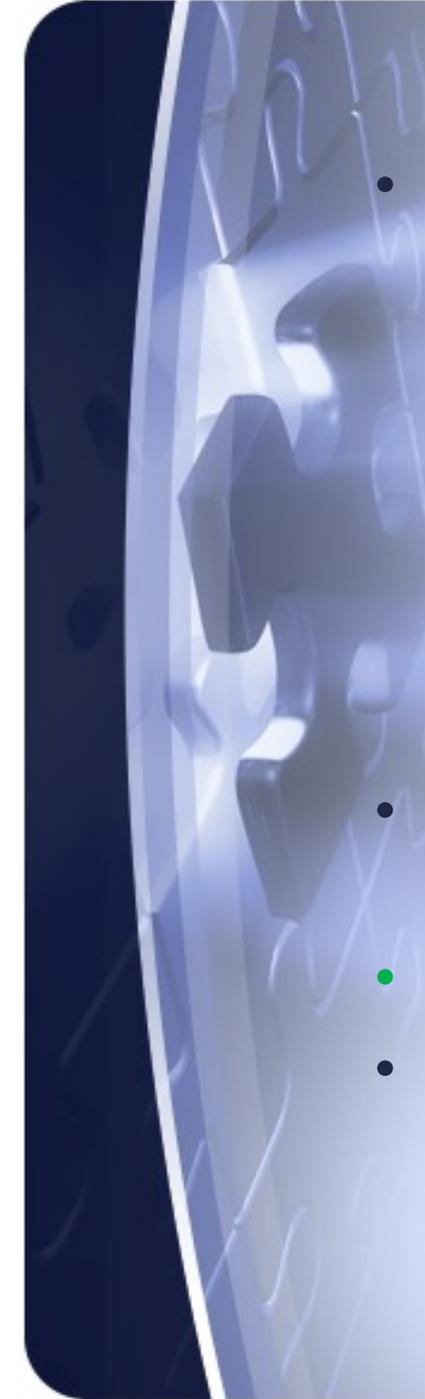
Assess pain and sedation needs

- Even though your patient can't verbally express her needs, you'll need to **assess her pain level** using a **reliable scale**.
- Keep in mind that a patient's acknowledgment of pain means pain is present and must be treated.
- It's best to treat agitation and anxiety with medication and non pharmacologic methods, such as communication, touch, presence of family members, music, guided imagery, and distraction.



sleep

- Possible **causes** include:
environmental factors
(such as excessive light and noise), diagnostic
and
other procedures, routine patient care, and pain.
- Possible **consequences** of disrupted sleep include:
upper airway collapse, endocrine and immune
system dysfunction, cognitive impairment,
changes in the brain's metabolic functioning,

- 
- other nursing **interventions**, including:
 - assessing for and **managing pain**.
 - promoting **comfort at bedtime** through such measures as good oral care and proper positioning.
 - **reducing anxiety** by communicating with the patient about upcoming procedures.
 - coordinating care with team members to **minimize nighttime interruptions**.
 - Listening to soft music or reading may help some **patients relax**.
 - **back massage** improved the quality of sleep.
 - If these measures are ineffective, the nurse can ask a physician to order a **sleeping agent** at bedtime.

MONITOR FOR COMPLICATIONS

1. Assess for possible **early complications**

Rapid electrolyte changes.

Severe alkalosis.

Hypotension secondary to change in

Cardiac output.

2. Monitor for signs of **respiratory distress:**

Restlessness

Apprehension

Irritability and increase HR.



3. Assess for signs and symptoms of **barotrauma (rupture of the lungs)**

Increasing dyspnea

Agitation

Decrease or absent breath sounds.

Tracheal deviation away from affected side.

Decreasing PaO₂ level .

4. Assess for **cardiovascular depression:**

Hypotension

Tachy. and Bradycardia

Dysrhythmias.



Neurological system cares

- 1. Assess LOC**
- 2. Pupil check (movement & reaction) for assess brain stem function**
- 3. Assess brain stem reflexes**
- 4. Senses & movement inspection**
- 5. Assess respiratory pattern**
- 6. Assess sensory deprivation & overload**
- 7. Check V.S & sign and symptom of IICP**

Cardiovascular system cares

- 1. Check V.S**
- 2. CF**
- 3. Heart monitoring**
- 4. I&o**
- 5. Prevention of thromboemboli**
- 6. Active & passive movement**
- 7. Mechanical intervention**
- 8. Chemical agent**

Prevent hemodynamic instability

- **you may need to increase I.V. fluids or administer a drug such as dopamine or norepinephrine. If ordered:**
- **Guidelines published recommend that patients be formally assessed to determine their readiness for discontinuation of mechanical ventilation.**

Renal system cares

- 1. I & O q 1h, 500 cc intake volume more than output/day**
- 2. Serum electrolyte**
- 3. Renal function test**
- 4. Folley catheter care**
- 5. Hydrate patient**

Skin integrity and musculoskeletal

- 1. Assess skin every shift**
- 2. Change of position /2h**
- 3. Special Cares for areas under pressure**
- 4. Back rub**
- 5. Proper position for prevention of trochanter deformity**
- 6. Limb physiotherapy**
- 7. Prevention of deformities**
- 8. Prevention of foot drop**

Educate the patient and family

- **Seeing a loved one attached to a mechanical ventilator is frightening.**
- **To ease distress in the patient and family, teach them: why mechanical ventilation is needed and emphasize the positive outcomes it can provide. Each time you enter the patient's room, explain what you're doing.**
- **Reinforce the need and reason for multiple assessments and procedures, such as laboratory tests and X-rays.**
- **Communicate desired outcomes and progression toward outcomes so the patient and family can actively participate in the plan of care.**

Nursing Interventions, summary

- 1- Maintain airway patency & oxygenation**
- 2- Promote comfort**
- 3- Maintain fluid & electrolytes balance**
- 4- Maintain nutritional state**
- 5- Maintain urinary & bowel elimination**
- 6- Maintain eye , mouth and cleanliness and integrity:-**
- 7- Maintain mobility/ musculoskeletal function:-**

- 8- Maintain safety:-**
- 9- Provide psychological support**
- 10- Facilitate communication**
- 11- Provide psychological support & information to family**
- 12- Responding to ventilator alarms
/Troubleshooting
ventilator alarms**
- 13- Prevent nosocomial infection**
- 14- Documentation**

QUESTIONS!!!

