Part III: Respiratory Disorders

- Acute lung and acute respiratory distress syndrome.
- Pneumothorax.
- Acute respiratory failure.
- Nursing intervention and management.

Learning Objectives

At the end of this chapter, the student should be able to:

1. Define concepts
2. Compare the various ARDS with regard to causes, clinical manifestations, nursing management, complications, and prevention.
3. Discuss the major risk factors for developing pneumothorax and nursing interventions to minimize or prevent these risk factors.
4. Compare and contrast the pathophysiology, clinical manifestations, medical management, and nursing management of acute respiratory distress syndrome, pneumothorax and acute respiratory syndrome.
5. Describe the diagnostic studies used to determine upper and lower respiratory tract functions.
6. Relate the therapeutic management techniques of acute respiratory distress syndrome, pneumothorax to the underlying pathophysiology of the syndrome.
7. Use the nursing process as a framework for care of patients with respiratory distress syndrome, pneumothorax, and acute renal failure.
Adult Respiratory Distress Syndrome (ARDS)

- Adult respiratory distress syndrome (ARDS) is also known as shock lung, wet lung, white lung, or acute respiratory distress syndrome, and occurs frequently after an acute or traumatic injury or illness involving the respiratory system.
- Acute Respiratory Distress Syndrome (ARDS) is a life threatening disease that causes severe fluid buildup in the lungs.
- This fluid buildup, along with associated collapsed air sacs, leads to increased difficulty in breathing and lower oxygen levels in the blood.
- About 1 out of every 3 people that developed ARDS will die.
- ARDS is usually noted 12-24 hours after the initial insult or 5-10 days after sepsis occurs.
- Dyspnea with hyperventilation and hypoxemia are usually the first clinical symptoms.
- Adventitious breath sounds frequently are not present initially.

Causes of ARDS

A: Direct Lung Injury, include

1. Inhalation of toxic fumes or smoke.
2. Severe pneumonia.
3. Aspiration (breathing in vomited stomach contents)
4. Physical injury or bruising of the lungs

B: Indirect Injury

8. Sepsis (a severe infection throughout the body).
9. Severe bleeding requiring blood transfusions.
10. Drug overdose.
11. Inflamed Pancreas.

**Some of the most common precipitating factors**

1. Trauma.
2. Aspiration.
3. Pneumonia.
4. near-drowning,
5. toxic gas inhalation.
6. sepsis, shock, DIC, oxygen toxicity, coronary artery bypass.
7. pancreatitis, fat or amniotic embolism, radiation.
8. Head injury, massive hemorrhage.
9. Smoke inhalation, drug overdose, or uremia.

**Stages of ARDS**

<table>
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<tr>
<th>Stage</th>
<th>Clinical features</th>
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| Exudative stage           | • Characterized by accumulation in the alveoli of excessive fluid, protein and inflammatory cells that have entered the air spaces from the alveolar capillaries.  
                            | • The exudative phase unfolds over the first 2 to 4 days after onset of lung injury. |
| Fibro proliferative (or proliferative) stage | • Connective tissue and other structural elements in the lungs proliferate in response to the initial injury.  
                            | • Under a microscope, lung tissue appears densely cellular.  
                            | • there is a danger of pneumonia sepsis and rupture of the lungs causing leakage of air into surrounding areas. |
|                           | • the lung reorganizes and recovers.                                               |
Resolution and Recovery

- Lung function may continue to improve for as long as 6-12 months and sometimes longer, depending on the precipitating condition and severity of the injury.
- It is important to remember that there may be and often are different levels of pulmonary recovery amongst individuals who suffer from ARDS.

Diagnostic Evaluation

1. Take the history of risk factors, which include:
   a. acute onset of respiratory distress.
   b. bilateral pulmonary infiltrates.
   c. absence of left heart failure and,
   d. severe refractory hypoxemia.

2. Chest X-ray shows bilateral infiltrates and pulmonary edema.
   - It is used to evaluate lung fields; early x-rays may be normal or have diffuse infiltrates.
   - later x-rays will show bilateral ground glass appearance or complete whiting-out of lung fields; assists with differentiation between ARDS and cardiogenic pulmonary edema since heart size is normal in ARDS

3. Laboratory tests
   - Cultures to identify causative organisms when bacterial infection is present and to identify proper antimicrobial agent.
   - C5A levels increase with disease process.
fibrin split products increase; platelets decrease; lactic acid levels increase

4. Arterial blood gases
- to identify acid-base problems, hypocapnia, hypercapnia, and hypoxemia, and,
- to evaluate progress of disease process and effectiveness of oxygen therapy.

5. Pulmonary function studies
- used to evaluate lung compliance and volumes which are normally decreased.
- physiologic dead space is increased and, alveolar ventilation is compromised.

MEDICAL CARE

The goals of treatment are to:
1. improve ventilation and perfusion.
2. treat the underlying disease process that caused the lung injury, and,
3. Prevent progression of potentially fatal complications.

Oxygen
- to correct hypoxia and hypoxemia

Ventilation
- It is to provide adequate oxygenation and ventilation in patients who are unable to maintain even minimal levels. As disease progresses, use positive and expiratory pressure PEEP (neuromuscular blocking
agent such as pancuronium (pavulon and vecuronium) (norcuron) maybe used to paralyzed patient for easier ventilation.

- **Provide circulatory support**: treat hypovolemia carefully; avoid overload.
- **Provide adequate fluid management**: administer intravenous solutions.
- **Provide nutritional support**: (35 to 45 kilocalories per kilogram daily)
- **Pharmacologic therapy** may include human recombinant interleukin-1 receptor antagonist, neutrophil inhibitors, pulmonary-specific vasodilators, surfactant replacement therapy, antisepsis agents, antioxidant therapy, and corticosteroids (late in the course of ARDS).

**ADULT RESPIRATORY DISTRESS SYNDROME (ARDS)**

Triggering event

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Cellular damage

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Increased capillary permeability

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Plasma proteins leak into interstitial spaces
Nursing Care Plan for Patients with Respiratory Distress Syndrome (ARDS)

Assessment

1. Tachypnea
2. Dyspnea
3. Decrease breath sounds
4. Deteriorating gas levels
5. Hypoxemia despite high concentration of delivered oxygen
6. Decreased pulmonary compliance
7. Pulmonary infiltrates

Primary Nursing Diagnosis

- Impaired gas exchange related to increased alveolar-capillary permeability, interstitial edema and decreased lung compliance

Other Diagnoses that may occur in Nursing Care Plans For ARDS

1. Ineffective airway clearance.
2. Ineffective breathing pattern.
3. Activity intolerance.
4. Anxiety (specify level: mild, moderate, severe, panic).
5. Risk for aspiration.

Nursing Intervention

1. Monitor arterial blood gas values, pulse symmetry, and pulmonary function testing.
2. Identify and treat cause of the Acute respiratory distress syndrome
3. Administer oxygen as prescribed.
4. Position client in high fowler’s position.
5. Restrict fluid intake as prescribed.
6. Provide respiratory treatment as prescribed.
7. Administer diuretics, anticoagulants or corticosteroids as prescribed.
8. Prepare the client for intubation and mechanical ventilation using PEEP.
9. Document the respiratory status of the patient should include: respiratory rate, breath sounds, and the use of accessory muscles; arterial blood gas (ABG) levels; pulse oximeter and chest x-ray results. Response to treatment, mechanical ventilation, immobility, and bedrest and, the Presence of any complications (depends on the precipitating condition leading to ARDS).

**Pneumothorax**

- Partial or complete collapse of the lung due to positive pressure in the pleural space
- A pneumothorax occurs when free air accumulates in the pleural cavity between the visceral and parietal areas, and causes a portion or the complete lung to collapse.
- Pressure in the pleural space is normally less than that of atmospheric pressure but following a penetration injury, air can enter the cavity from the outside changing the pressure within the lung cavity and causing it to collapse.
- Air can also migrate to the area when the esophagus is perforated or a bronchus ruptures, leaking air into the mediastinum
(pneumomediastinum).

- Barotrauma related to mechanical ventilatory support using high levels of **PEEP** leads to alveoli rupture and collapse.
- Gas formation from gas forming organisms can also result in pneumothorax.
- Pneumothorax may occur spontaneously in cases where a sub-pleural bleb or emphysematous bulla ruptures due to chronic obstructive pulmonary disease, tuberculosis, cancer, or infection and this is the most common reason in otherwise healthy individuals.
- A tension pneumothorax is a life-threatening emergency and occurs when air is permitted into the pleural cavity but not allowed to escape, resulting in increased intrathoracic pressure and complete collapse of the lung.

### Types of Pneumothorax

1. **Simple Pneumothorax**
   - A simple, or spontaneous, pneumothorax occurs when air enters the pleural space through a breach of either the parietal or visceral pleura.
   - Most commonly this occurs as air enters the pleural space through the rupture of a bleb or a bronchopleural fistula.

2. **Traumatic Pneumothorax**
   - A traumatic pneumothorax occurs when air escapes from a laceration in the lung itself and enters the pleural space or enters the pleural space through a wound in the chest wall.
   - **It may result from:**
     
     a. blunt trauma (e.g., rib fractures).
     
     b. penetrating chest or abdominal trauma (e.g., stab wounds or gunshot wounds).or,
c. diaphragmatic tears.
d. It may occur during invasive thoracic procedures (i.e., thoracentesis, trans bronchial lung biopsy, insertion of a subclavian line) in which the pleura is inadvertently punctured, or with barotrauma from mechanical ventilation.

3. Open pneumothorax

- Is one form of traumatic pneumothorax. It occurs when a wound in the chest wall is large enough to allow air to pass freely in and out of the thoracic cavity with each attempted respiration.

- Pneumothorax in which the pleural cavity is exposed to the atmosphere through an open wound in the chest wall.

4. Tension Pneumothorax

- A tension pneumothorax occurs when air is drawn into the pleural space from a lacerated lung or through a small opening or wound in the chest wall.

- It may be a complication of other types of pneumothorax.

- In contrast to open pneumothorax, the air that enters the chest cavity with each inspiration is trapped; it cannot be expelled during expiration through the air passages or the opening in the chest wall.

5. Artificial pneumothorax
an pneumothorax induced intentionally by artificial means.

6. **Catamenial pneumothorax**

This type occurring in young women during menstruation usually on the right side.

7. **Iatrogenic pneumothorax**

This type occur as a complication of some medical procedures, such as:

- Central venous catheter insertion
- Thoracentesis
- Transbronchial and transthoracic lung biopsy.

- **Extra-pleural pneumothorax**

The formation of a pneumothorax by introducing air into the space between the pleura and the inside of the rib cage.
Treatment

Varies according to type and amount of lung collapse

A: traumatic

- iatrogenic .
- Chest tube to closed water seal .
- chest drainage for lung expansion .
- surgery .
- bed rest

B: Spontaneous
If no sign of increased pleural pressure, less than 15% lung collapse, and no dyspnea or other indication of physiological compromise.

**Thoracostomy tube**

- If no fluid present (Second intercostal space).
- If fluid present (Fourth, fifth or sixth intercostal space).

**MEDICAL CARE**

**A: Laboratory:** hemoglobin and hematocrit may be decreased with blood loss.

**B: Chest x-ray:** used to evaluate air or fluid accumulations, collapse of lungs, or mediastinal shifts; a visceral pleural line may be visualized.

**C: Arterial blood gases:** vary depending on the severity of the pneumothorax; oxygen saturation usually decreases, PaO2 is usually normal or decreased, and PaCO2 is occasionally increased.

**D: Chest tube:** placement required to facilitate re-expansion of the collapsed lung and to permit drainage of fluid from lung.

**E: Thoracentesis:** needle thoracentesis is required for removing the accumulation air in the pleural cavity.

**Patient Care**

Vital signs

chest expansion

Pulse Oxymetry

blood gasses
Purpose for placing a chest tube explained to the pt.

**Nursing Diagnosis**

- Acute Pain related to recent injury, coughing, and deep breathing.
- Fear Related to threat to own well-being and difficulty breathing.
- Impaired Gas exchange related to ventilation perfusion imbalance.
- Risk for injury related to possible complications associated with closed chest drainage system.

**Nursing Interventions**

1. Reduce anxiety.
2. Foster cooperation with the procedure.
3. Semi Fowlers position
4. Encourage deep coughing exercise.
5. Incentive spirometry.
7. Administered analgesics as order.
8. If chest tube is accidentally dislodged, occlusive dressing *(petroleum gauze)*, to prevent lung collapse.

**Acute respiratory failure**

**Respiratory physiology**

**The act of respiration engages 3 processes:**

- Transfer of oxygen across the alveolus.
- Transport of oxygen to the tissues.
• Removal of carbon dioxide from blood into the alveolus and then into the environment

Respiratory failure may occur from malfunctioning of any of these processes.

Respiratory failure is a syndrome in which the respiratory system fails in one or both of its gas exchange functions:

a. oxygenation and,

b. carbon dioxide elimination.

Classification of acute respiratory failure

1. Hypoxemic respiratory failure (type I)
   - It is characterized by an arterial oxygen tension \( (P_{a}O_{2}) \) lower than 60 mm Hg with a normal or low arterial carbon dioxide tension \( (P_{a}CO_{2}) \).
   - This is the most common form of respiratory failure, and it can be associated with virtually all acute diseases of the lung, which generally involve fluid filling or collapse of alveolar units.
   - Some examples of type I respiratory failure are cardiogenic or noncardiogenic pulmonary edema, pneumonia, and pulmonary hemorrhage.

2. Hypercapnic respiratory failure (type II)
   - It is characterized by a \( PaCO_{2} \) higher than 50 mm Hg.
- Hypoxemia is common in patients with hypercapnic respiratory failure who are breathing room air.
- The pH depends on the level of bicarbonate, which, in turn, is dependent on the duration of hypercapnia.
- **Common etiologies include**
  1. drug overdose.
  2. neuromuscular disease.
  3. chest wall abnormalities, and
  4. severe airway disorders (e.g., asthma and **chronic obstructive pulmonary disease** [COPD]).

**Respiratory failure may be further classified as either acute or chronic.**

<table>
<thead>
<tr>
<th>Acute respiratory failure</th>
<th>Chronic respiratory failure</th>
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<tbody>
<tr>
<td>1. It is characterized by life-threatening derangements in arterial blood gases and acid-base status.</td>
<td>1. the manifestations of chronic respiratory failure are less dramatic and may not be as readily apparent.</td>
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<tr>
<td>2. Acute hypercapnic respiratory failure develops over minutes to hours; therefore, pH is less than 7.3.</td>
<td>3. develops over several days or longer, allowing time for renal compensation and an increase in bicarbonate concentration. Therefore, the pH usually is only slightly decreased.</td>
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Causes of acute renal failure

<table>
<thead>
<tr>
<th>Type I (hypoxemic) respiratory failure</th>
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<tbody>
<tr>
<td>COPD</td>
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<tr>
<td>Pneumonia</td>
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<td>Pulmonary edema</td>
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<td>Pulmonary fibrosis</td>
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<td>Asthma</td>
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<td>Pneumothorax</td>
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<td>Pulmonary embolism</td>
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<td>Pulmonary arterial hypertension</td>
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<td>Pneumoconiosis</td>
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<td>Granulomatous lung diseases.</td>
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<td>Cyanotic congenital heart disease.</td>
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<td>Bronchiectasis</td>
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<td>Fat embolism syndrome.</td>
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<td>Kyphoscoliosis., and</td>
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<td>Obesity</td>
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<table>
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<th>Type II (hypercapnic) respiratory failure</th>
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<tbody>
<tr>
<td>COPD.</td>
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<tr>
<td>Severe asthma.</td>
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<tr>
<td>Drug overdose.</td>
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<td>Poisonings.</td>
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<tr>
<td>Myasthenia gravis.</td>
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<tr>
<td>Polyneuropathy.</td>
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<td>Poliomyelitis.</td>
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<tr>
<td>Primary muscle disorders.</td>
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<tr>
<td>Porphyria.</td>
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<tr>
<td>Cervical cordotomy</td>
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<tr>
<td>Head and cervical cord injury.</td>
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<tr>
<td>Primary alveolar hypoventilation.</td>
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<tr>
<td>Obesity-hypoventilation syndrome.</td>
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<tr>
<td>Pulmonary edema.</td>
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<tr>
<td>ARDS.</td>
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<tr>
<td>Myxedema, and</td>
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<tr>
<td>Tetanus.</td>
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Diagnostic tests

1. **A complete blood count (CBC)** may indicate anemia, which can contribute to tissue hypoxia, whereas polycythemia may indicate chronic hypoxemic respiratory failure.
2. **Arterial blood gases** should be evaluated in all patients who are seriously ill or in whom respiratory failure is suspected.

3. **Chest radiography**.

4. **Echocardiography** is not routine but is sometimes useful.

5. **Pulmonary functions tests (PFTs)**.

6. **Electrocardiography** (ECG) to assess the possibility of a cardiovascular cause of respiratory failure; it also may detect dysrhythmias resulting from severe hypoxemia or acidosis.

7. Right-heart catheterization is controversial.

**Complications**

**A: pulmonary complications**, include

1. pulmonary embolism.
2. Barotrauma.
3. pulmonary fibrosis, and
4. complications secondary to the use of mechanical devices.

**B: Cardiovascular complications**, include

1. Hypotension.
2. reduced cardiac output.
3. Arrhythmia.
4. pericarditis, and,
5. acute myocardial infarction.

These complications may be related to the underlying disease process, mechanical ventilation, or the use of pulmonary artery catheters.

**C: Gastrointestinal complications**, include
1. hemorrhage.
2. gastric distention.
3. Ileus.
4. diarrhea, and
5. pneumoperitoneum.
6. Stress ulceration which can be reduced by routine use of anti-secretory agents or mucosal protectants.

D: Nutritional complications, include

1. malnutrition and its effects on respiratory performance and complications related to administration of enteral or parenteral nutrition. (hypoglycemia, electrolyte imbalance).

2. **NURSING CARE PLAN PATIENTS WITH ACUTE RESPIRATORY FAILURE**

3. Acute respiratory failure is a malfunction in the degree in which the respiratory gas exchange is inadequate to maintain adequate blood gases (Hudak and Gallo, 1994).

4. most of the nursing care plan for respiratory failure Patients

5. Priority nursing:
   1. Improve ventilation and oxygenation adequately
   2. Preventing Complications
   3. Provide emotional support to Patients and families
   4. Provides information about the disease process and treatment needs
6. Nursing care plan

Nursing diagnosis: ineffective breathing pattern related to the ratio of O2 and CO2 interference.

Data: changes in the frequency of breathing, intercostal retractions, decreased vital lung capacity, tachypnea or stopping breathing when the ventilator was stopped, cyanosis, decreased PO2 < 80, increased CO2 > 45, an increase in oxygen saturation, restless

Data: changes in the frequency of breathing, intercostal retractions, Decreased lung vital capacity, tachypnea or stopping breathing when the ventilator was stopped, cyanosis, Decreased PO2 < 80, Increased CO2 > 45, an increase of oxygen in saturation, anxiety

The purpose of nursing: The breathing pattern Effectively through the ventilator without the use of accessory muscles

Expected outcomes: normal oxygen saturation, no hypoxia, normal vital capacity, no cyanosis

Plan of action:

1. Investigate the causes of respiratory failure, rational understanding of the important causes of respiratory failure to provide care.

2. Observations of breathing patterns and note the frequency of breathing, the distance between spontaneous breathing and breathing ventilator, rational Patients with ventilator can experience hyperventilation / hypoventilation and Patients trying to improve the lack of oxygen to the breathing pattern of increasing the frequency increases.

3. Auscultation of the chest periodically, record sound when breathing disorders. Rationale: Provides information on the obstruction of the airway, chest symmetric changes do not precisely
indicate the location of endotracheal tube.

4. Sum of Respiratory Patients for 1 full minute and compare it to construct the Desired frequency ventilator. Rationale: Respiratory Patients Quickly leads to respiratory alkalosis, respiratory acidosis cause slow sednagkan Patients (Increased PaCO2)

5. Develop appropriate balloon endotracheal tube using a technical barrier to a minimum, check the development of every 4 hours. Rational: inflate balloons must be appropriate to assure adequate ventilation is not Desired corresponding volume

6. Check the hoses if there is a blockage / folds. Rational hose folds obstruct the flow of air volume inadequate. The presence of water Allows the bacteria grow so that the originator of the colonization of bacteria.

7. Check the ventilator alarm function. Rational: ventilator alarms that have a variety of abnormalities can be detected early as a Decrease in gas pressure, oxygen saturation, the ratio of inspiration and expiration, etc. ..

8. Help Patients preformance kontorl breathing when weaning sought. Rational train the patient to breathe slowly premises ways abdominal breathing and use relaxation techniques so that respiratory function can be Maximized.

9. Collaboration for the examination of blood gas analysis by order. Rational to know the success of breath relief.

10. see tidal volume. The rationale for determining the amount of air inspiration and expiration

11. Supervision den inspiration expiration ratio. Rational: Usually expiratory phase is 2 times the length of the speed of inspiration.
7. **Nursing diagnosis:** ineffective airway clearance related to the presence of secretions in the airway due to inability to cough effectively.

Data: Changes in the frequency of breathing, cyanosis, abnormal breath sounds (stridor), anxiety

The purpose of nursing: The patient is able to maintain airway abnormalities clean, with no breath sounds.

Expected outcomes: No stridor, normal respiratory rate

Nursing care plan:

1. Observation of breath sounds. Rational: obstruction due to the accumulation of secretions, bronchospasm, perlengketran muskosa, and or a problem with the endotracheal.

2. Evaluation of chest movement. Rational: symmetrical chest movement with breath sounds indicates where appropriate intervals. Lower airway obstruction results in a change of breath sounds like ronkhi and wheezing.

3. Note Bial no sudden spasms, high pressure ventilator alarm sounds, the secretions on the hose. Rational: Patients typically undergo intubation ineffective cough reflex.

4. Suction mucus, limit the exploitation of 15 seconds or less, choose the appropriate suction catheter, fill in physiologic saline if indicated. Use 100% oxygen if available. Rational: exploitation should not ruin, and the length should be limited to reduce the occurrence of hypoxia. Diameter catheter <diameter endotrakel.

5. Perform chest physiotherapy as indicated. Rational to increase of lung ventilation in all segments and for drainage of secretions.

6. Give bronchodilators to order. Rational to increase of ventilation and thins secretions by bronchial smooth muscle relaxation.
8. • Nursing diagnosis: High risk of oral mucous membrane changes associated with ineffective oral clearance.

The purpose of nursing: The patient was Able to demonstrate the proper health of the oral mucosa without any sign of inflammation.

Expected outcomes: Signs no oral mucosal inflammation, mouth clean and odorless.

Plan of action:
1. Routine observation of the oral cavity, teeth, gums for any injury or bleeding. Rationale: Early identification provides the opportunity for prevention appropriately.
2. Provide oral care routine. Rationale: Prevent the mucous membranes of the mouth sores and reduce bacterial growth media and Increased comfort.
3. Reposition the endotracheal tube on schedule. Rational: to reduce the risk of injury to the lips and mucous membranes of the mouth.

• Nursing diagnosis: changes in nutrition, less than body requirements related to an impaired ability to digest.

Data: weight loss, muscle tone, weakness, inflammation of the mouth, bowel sounds weak.

The purpose of nursing: The need for sufficient nutrition

Expected outcomes: weight gain, normal serum albumin, strong muscle tone

Nursing care plan:
1. Evaluation of the ability to eat. Rational: Patients with an endotracheal tube feeding needs should be met through parenteral or tube eat.
2. Observe decreased muscle strength and loss of subcutaneous fat. Rational: decreasing the number of components of nutrition resulting in decreased energy reserves in muscles and can reduce respiratory muscle function.

3. Whenever possible weights. Rational to know that weight loss of 10% is abnormal.

4. Record oral input when possible

5. Give fluid intake of at least 2500 cc/day. Rational: to prevent dehydration.

6. Supervision of laboratory tests: serum, glucose, and BUN/creatinine. Rationale: provide adequate information on nutritional support or not.


The purpose of nursing: Patients showed there were no signs of infection during treatment.

Expected Outcomes: Increased endurance, diff. Count normal, decreased monosyt no, normal leukocytes:

- > 10,000/mm

Nursing care plan:

1. Note the factor of risk of infection. Rational: the factors that cause the infection, among others; malnutrition, age, intubation, ventilator installation time, invasive. This factor should be limited/minimized.

2. Wash hands before and after the action. Rational to reduce secondary infections

3. Maintain adequate hydration and nutrition. Rational, helps
increase of endurance.

4. Collaboration with giving antibitika to order. Rational: to kill and reduce the presence of germs.

- Nursing diagnosis: high risk of ventilator weaning response dysfunction associated with inability to weaning.

Goals of care: patient Able to Participate actively in the process of weaning.

Expected outcomes: respiratory failure tanga no

10. Nursing care plan:

1. Assess the physical factors in the process of weaning: vital sign. Rational: weaning is hard work, an indication of the temperature increase of of 7% Increased oxygen demand, tachycardia and hypertension heart marks the hard work in the work that weaning is not allowed, reducing weaning stress in stamina so that the immune system decreases.


3. Weaning spamming techniques. Rational: helping Patients to be ready face the weaning.


5. Record the patient’s progress. Rasonal: to know the progress in the process of weaning.


7. Assess the chest photos and blood gas analysis. Rational: oxygen saturation should be satisfactory to check blood gas analysis, fio2
<40%