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PROSES FT PADA GAGAL NAFAS

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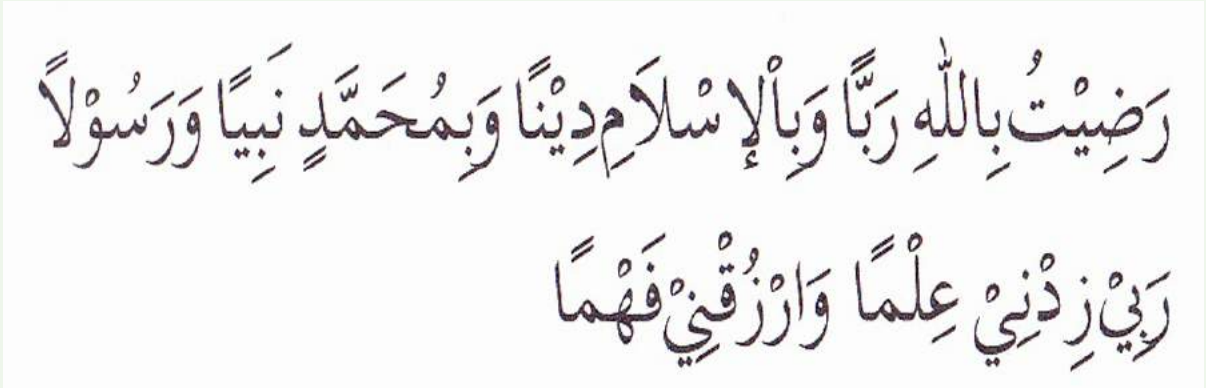
DOA BELAJAR



“Kami ridho Allah SWT sebagai Tuhanku, Islam sebagai agamaku, dan Nabi Muhammad sebagai Nabi dan Rasul, Ya Allah, tambahkanlah kepadaku ilmu dan berikanlah aku kefahaman”

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DEFINITION

Respiratory failure can be defined as a syndrome in which the respiratory system fails to meet one or both of its gas exchange functions,

Oxygenation

Carbondioxide Elimination

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TYPES OF RESPIRATORY FAILURE

TYPE 1 (HYPOXEMIC): PO2 < 60 mmHg on room air.

TYPE 2 (HYPERCAPNIC / VENTILATORY): PCO2 > 50 mmHg

TYPE 3 (PERI-OPERATIVE): This is generally a subset of type 1 failure but is sometimes considered separately because it is so common.

TYPE 4 (SHOCK): secondary to cardiovascular instability.

Type 3 (Peri-operative) Respiratory Failure

Residual anesthesia effects, post-operative pain, and abnormal abdominal mechanics contribute to decreasing FRC and progressive collapse of dependant lung units.

Causes of post-operative atelectasis include;

***Decreased FRC ***

Supine/ obese/ ascites

***Anesthesia**

***Upper abdominal incision**

***Airway secretions**

Type 4 (Shock) Type IV

Describes patients who are intubated and ventilated in the process of resuscitation for shock

***cardiogenic**
***hypovolemic**
***septic**

The respiratory System

Lungs

Pulmonary Failure

- PaO_2 ⬇⬇
- $PaCO_2$ N/⬇

Hypoxic Respiratory Failure

Respiratory pump

Ventilatory Failure

- PaO_2 ⬇
- $PaCO_2$ ⬆⬆

Hypercapnic Respiratory Failure

Hypoxemic Respiratory Failure	Hypercapnic Respiratory Failure
Known as: Type I ARF, Lung Failure, Oxygenation Failure, Respiratory Insufficiency	***Known as:*** Type II ARF, Pump Failure, Ventilatory Failure
Definition: The failure of lungs and heart to provide adequate O_2 to meet metabolic needs	***Definition:*** The failure of the lungs to eliminate adequate CO_2
Criteria: $PaO_2 < 60$ mmHg on $F_IO_2 \geq .50$ or $PaO_2 < 40$ mmHg on any F_IO_2 $SaO_2 < 90$	***Criteria:*** Acute ↑ in $PaCO_2 > 50$ mmHg or Acutely above normal baseline in COPD with concurrent ↓ in pH < 7.30
Basic Causes: R-L shunt V/Q mismatch Alveolar hypoventilation Diffusion defect Inadequate FIO_2	***Basic Causes:*** Pump failure (drive, muscles, WOB) ↑ CO_2 production R-L shunt ↑ Deadspace

Type 1respiratory failure

Type 1 respiratory failure is defined as a low level of oxygen in the blood (hypoxemia) without an increased level of carbon dioxide in the blood (hypercapnia), and indeed the P_aCO_2 may be normal or low.

It is typically caused by a ventilation/perfusion (V/Q) mismatch; the volume of air flowing in and out of the lungs is not matched with the flow of blood to the lungs.

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TYPE 1 RESPIRATORY FAILURE

The basic defect in is failure of oxygenation characterized by

P_aO_2 decreased (< 60 mmHg)

P_aCO_2 normal or decreased (<50 mmHg)

$P_{A-a}O_2$ increased

Hypoxic Respiratory Failure

Low ambient oxygen (e.g. at high altitude)

V/Q mismatch (parts of the lung receive oxygen but not enough blood to absorb it, e.g. pulmonary embolism)

Alveolar hypoventilation (decreased minute volume due to reduced respiratory muscle activity, e.g. in acute neuromuscular disease); this form can also cause type 2 respiratory failure if severe

Diffusion problem (oxygen cannot enter the capillaries due to parenchymal disease, e.g. in pneumonia or ARDS)

Shunt (oxygenated blood mixes with non-oxygenated blood from the venous system, e.g. right-to-left shunt)

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TYPE 2 RESPIRATORY FAILURE

Hypoxemia with hypercapnia

The basic defect in type 2 respiratory failure is characterized by:

P_aO_2 decreased (< 60 mmHg)

P_aCO_2 increased (> 50 mmHg)

$P_{A-a}O_2$ normal

Ph decreased

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Type 2 respiratory failure is caused by inadequate alveolar ventilation; both oxygen and carbon dioxide are affected.

Defined as the buildup of carbon dioxide levels (P_aCO_2) that has been generated by the body but cannot be eliminated. The underlying causes include:

Increased airways resistance (chronic obstructive pulmonary disease, asthma, suffocation)

Reduced breathing effort (drug effects, brain stem lesion, extreme obesity)

A decrease in the area of the lung available for gas exchange (such as in chronic bronchitis)

Neuromuscular problems (Guillain-Barré syndrome,motor neuron disease)

Deformed (kyphoscoliosis), rigid (ankylosing spondylitis), or flail chest.

Physical Findings

These are signs that suggest a possible underlying cause of respiratory failure include:

- ✓ Hypotension usually with signs of poor perfusion suggest severe sepsis or pulmonary embolus
- ✓ Hypertension usually with signs of poor perfusion suggests cardiogenic pulmonary edema
- ✓ Wheeze & stridor suggest airway obstruction
- ✓ Tachycardia and arrhythmias may be the cause of cardiogenic pulmonary edema
- ✓ Elevated jugular venous pressure suggests right ventricular dysfunction
- ✓ Respiratory rate < 12b/m in spontaneously breathing patient with hypoxia or hypercarbia and acidemia suggest nervous system dysfunction
- ✓ Paradoxical respiratory motion suggest muscular dysfunction
- ✓ see also A-E respiratory assessment

Physiotherapy Management

Physio-therapeutic interventions aim to maximize function in pump and ventilatory systems and improve quality of life.

In mechanically ventilated patients, early physiotherapy has been shown to improve quality of life and to prevent ICU-associated complications like de-conditioning, ventilator dependency and respiratory conditions.

Main indications for physiotherapy are excessive pulmonary secretions and atelectasis. Timely physical therapy interventions may improve gas exchange and reverse pathological progression thereby avoiding ventilation.

Interventions include:

- Positioning: the use of specific body position aimed at improving
- Postural drainage and Percussion: uses gravitational effects to facilitate mucociliary clearance
- Suction: used for clearing secretions when the patient cannot do so independently (Guglielminotti et al recommended a saw-tooth pattern seen on ventilator's flow-volume loop and/or respiratory sounds over the trachea as good indicators for tracheal suction in a ventilated patient).

- Manual Hyperinflation: aims to re-inflate atelectatic areas of the lung as such improving pulmonary compliance and facilitate the clearance of pulmonary secretions when used with other techniques.
- Active cycle of breathing technique and manual techniques such as shaking and vibration to facilitate mucus clearance
- Limb exercises: passive, active-assisted, active exercises may optimize oxygen transport and reduce the effects of immobility

- Inspiratory muscle training: aims to improve inspiratory muscle strength and it facilitates weaning from mechanical ventilation. It has be shown to improve whole body exercise performance, particularly in less fit subjects.
- The study by Hoffman L et showed positive outcomes with inspiratory muscle training in patients with advanced lung disease.
- Early mobilisation: improves function, mobility and quality of life

DOA SESUDAH BELAJAR

بِسْمِ اللهِ الرَّحْمَنِ الرَّحِيمِ

اللَّهُمَّ أَرِنَا الْحَقَّ حَقًّا وَارْزُقْنَا اتِّبَاعَهُ وَأَرِنَا الْبَاطِلَ بَاطِلًا وَارْزُقْنَا اجْتِنَابَهُ

Ya Alloh Tunjukkanlah kepada kami kebenaran sehinggga kami dapat mengikutinya Dan tunjukkanlah kepada kami kejelekan sehingga kami dapat menjauhinya

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