Institution Name: Directorate General of Specialized Medical Care, MoH

Document Title: Policy and Procedure of the Initiation of Mechanical Ventilation

Approval Process

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Table of Contents:

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Acronyms:

ARDS	Acute Respiratory Distress Syndrome
BP	Blood Pressure
Cdyn	Dynamic Compliance
CO2	Carbon Dioxide
Cstat	Static Compliance
DNI	Do Not Intubate
EtCO2	End Tidal Carbon Dioxide
ETS	Expiratory Trigger Sensitivity
FIO2	Fraction of Inspired Oxygen
HME	Heat and Moisture Exchanger
HR	Heart Rate
ICU	Intensive Care Unit
MV	Mechanical Ventilation/ Mechanical Ventilator
O2	Oxygen
PaO2	Partial Pressure of Oxygen
PEEP	Positive End Expiratory Pressure
Pinsp	Inspiratory Pressure
RCS	Respiratory Care Services
RN	Registered Nurse

RR	Respiratory Rate
RT	Respiratory Therapists
SPO2	Peripheral Capillary Oxygen Saturation
SST	Short System Trial
Ti	Inspiratory Time
Tt RR	Total Respiratory Rate
Ve	Minute Volume
VT	Tidal Volume
Vte,	Exhaled Tidal volume

Policy and Procedure of the Initiation of Mechanical Ventilation

1. Introduction

Mechanical Ventilation (MV) is a life-saving treatment to support patients that are unable to ventilate and oxygenate on their own. Mechanical ventilation uses endotracheal intubation and a ventilator to replace spontaneous respiration and ventilation. The ventilator provides the functions of the respiratory muscles; the endotracheal tube establishes a patent and unobstructed airway and the oxygen source gives a patient a therapeutic concentration of the gas. Mechanical ventilation should be considered early in the course of illness and should not be delayed until the need becomes emergent. Mechanical ventilation initiation includes patient who requires proper ventilation and oxygenation, hypercapnia, hypoxemia and uncompensated respiratory acidosis refractory oxygenation failure. Careful, vigilant monitoring and in-depth understanding of the complications of mechanical ventilation and their treatment is essential for a good outcome. It is important to note that mechanical ventilation does not heal the patient. Rather, it allows the patient a chance to be stable while the medications and treatments help them.

2. Scope

The policy is applicable to all Respiratory therapists and health care practitioners in all healthcare institution of the Ministry of Health. This will apply to intensive care, high dependency and dedicated specialist respiratory units with a higher level of clinical support.

3. Purpose

The purpose of this policy is:

3.1. To be a references for Respiratory therapist, nurses and doctors, to follow with patient who requires an initiation of mechanical ventilation.

3.2. To augment or assist the respiratory function of patients through mechanical ventilation.

3.3. To provide policies for the assembly, calibration, function testing of all mechanical ventilator.

3.4. To establishes guidelines for mechanical ventilator initiation and safety alarm settings in accordance to orders from appropriate physician.

4. Definitions

4.1. Mechanical ventilation: the technique through which gas is moved toward and from the lungs through an external device connected directly to the patient.

4.2. Positive-pressure ventilation: airway pressure applied at the patient's airway through an endotracheal or tracheostomy tube.

4.3. Acute Respiratory Distress Syndrome (ARDS): a rapidly progressive disease occurring in critically ill patients. The main complication in ARDS is that fluid leaks into the lungs making breathing difficult or impossible.

4.4. Resuscitation: the action or process of reviving someone from unconsciousness or apparent death

4.5. Ventilation: exchanges air between the lungs and the atmosphere in order for oxygen to be absorbed and carbon dioxide can be eliminated; Ventilation changes PaCO2

4.6. Oxygenation: the addition of oxygen to the body delivering O2 from the alveoli to the tissues in order to maintain cellular activity; Oxygenation changes PaO2

5. Policy

5.1. Clinical nurses and RT shall adhere to this policy for all patients receiving mechanical ventilation.

5.2. Mechanically ventilated patients will be cared for in the Intensive Care Unit (ICU) and other critical care areas.

5.3. Initiating mechanical ventilator settings, ventilator assessments, interventions, establishing ventilator alarm settings and patient/family education shall be in accordance to this policy and procedure.

5.4. Respiratory Care Services Department shall provide the highest standard of respiratory care in initiating mechanical ventilation in accordance to guidelines and procedure that will be presented hereafter to deliver a quality of care for the patients who will require such mechanical ventilation management.

6. Procedure

6.1 The physician has to write orders for an initiation of mechanical ventilation according to the specified patients condition:

6.1.1. All Patients who manifests absence of breathing, central or obstructive apnea, narcotic application and overdose, state of coma, cerebral edema.

6.1.2. Patients who suffers from increase work of breathing, excessive use of respiratory muscles, respiratory distress.

6.2 Physician has to specifically verify if there is an official written request for "do not intubate (DNI)" "no ventilation" status to avoid initiation of mechanical ventilation.

6.3 Ventilator System Pre-Hooking

6.3.1. All ventilators shall be properly cleaned and disinfected before setting up with disposable ventilator circuit.

6.3.2. After cleaning and assemble SST (Short System Trial) checking will be performed to ensure updated calibration.

6.4 Ventilator Setting and Adjustment in Accordance to physicians order

6.4.1. Set Respiratory Rate according to normal range of each patient category

6.4.2. 12- 18 bpm for adult, 16-30 bpm for pediatric, 25-40 bpm for infants and 30 -40 bpm for newborn.

6.4.3. Set Tidal Volume should be greater than or equal to 4ml and less than or equal to 6ml multiply the predicted body weight (with ARDS); greater than or equal to 6ml to less than or equal to 8ml multiply by predicted body weight (without ARDS). Any other preferred ranges should be manifested by physician.

6.4.4. Set FIO2 (Fraction of Inspired Oxygen) should be set according to physicians' reference that will be based on patient's invasive and Non-invasive monitoring of oxygenation status.

6.4.5. Set PEEP will be set 3-5 cmH2O or according to physicians' preference.

6.4.6. Set peak flow will be set to deliver and give a standard I:E ratio of 1:2 unless specific instruction from physician is required

6.4.7. Set sensitivity should be set to +-2 cmH20 in pressure trigger and 3-5 lpm in flow trigger or as per manufactures optimal standard preset setting

6.4.8. Alarm setting shall be set tailor fitted to individual patient. Alarms must be audibly sufficient, alarms must not be disregarded and must be responded immediately by the nearest available Respiratory Therapist, nurse or physician for assessment and correction.

6.5 Patient Ventilator Hooking and Initiation

6.5.1. Respiratory Therapist shall connect preset mechanical ventilator to patient

6.5.2. Respiratory Therapist shall assess and document accordingly the following

I. Primary Setting (VT, RR, PEEP, FIO2)
II. Secondary Setting (ETS, Trigger, Peak flow, Ramp, Ti)
III. Monitored Parameters (Vte, Ve, Pinsp., Tt RR, Cstat, Cdyn, Resistance)
IV. Non-Invasive Monitoring (ETCO2, Pulse Oximetry)
V. breath sound and chest movements
VI. Airway preference stability and compensation assessment
VII. Alarm settings
VIII. ABG shall be drawn accordingly depending on physicians order.

6.6 Equipment and Documents for mechanical ventilation shall consist of:

6.6.1. Positive Pressure ventilator, set up with appropriate ventilator tubing and HME or humidifier

6.6.2. Self- Inflating resuscitation bag with oxygen tubing and flow meter

7. Responsibilities

7.1. Respiratory therapist is responsible for:

7.1.1. Initiation of mechanical ventilation, setting the alarms and providing adjunctive ventilator equipment.

7.1.2. Respiratory assessment to include chest auscultation, work of breathing and patients comfort with artificial airways who are connected to mechanical ventilators.

7.1.3. Monitoring, adjusting and documenting ventilator settings according to physicians order.

7.2. Nursing Staff is responsible for:

7.2.1. Monitoring patients receiving mechanical ventilation that includes vital signs: Temperature, HR, RR, BP, Sp02, EtC02, sedation score.

7.2.2. The prompt communication with the RT relating to Physician orders and ventilator setting change requests

7.2.3. Assisting the doctor to evaluate the patient and write orders for plan of treatment.

7.2.4. Covering the Respiratory Therapist responsibilities if the Respiratory Care Services department cannot provide the necessary staff.

7.3. Physician is responsible for:

7.3.1. Taking care of patients with artificial airways who are connected to mechanical ventilators. The physician is usually an anesthesiologist, pulmonologist, intensivist, or critical care physician. These doctors have special training on mechanical ventilation.

7.3.2. Writing orders to initiate Mechanical Ventilation, to change ventilator settings and to wean and extubate.

7.3.3. Covering the Respiratory Therapist responsibilities if the Respiratory Care Services department cannot provide the necessary staff.

8. Document History and Version Control

Document History and Version Control			
Version	**Description of Amendment**	**Author**	**Review Date**
01	Initial Release	Respiratory Care Team	May/ 2024
02			
Written by	**Reviewed by**	**Approved by**	
Respiratory Care Services Team	Khalsa Al Siyabi	Dr. Kadhim Sulaiman	

9. Related Documents:

There are no related documents for this policy

10. References:

Title of book/ journal/ articles/ Website	Author	Year of publication	Page
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