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Document Title: Policy and Procedure of Metered Dose Inhaler (MDI) Usage for Mechanically Ventilated Patients

Approval Process

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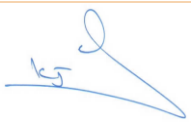
Approved by	Dr. Kadhim Sulaiman	DG of DGSMC	Ministry of Health	Dec 2021	

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Acknowledgement

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Acronyms:

COPD	Chronic Obstructive Pulmonary Disease
DOB	Date of Birth
HME	Heat and Moisture Exchanger
MAR	Medication Administration Record
MDI	Metered Dose Inhaler
RCS	Respiratory Care Services
Rx	Medical Prescription (“recipe”)

Policy and Procedure of Metered Dose Inhaler (MDI) Usage for Mechanically Ventilated Patients

1. Introduction

The delivery of bronchodilators with metered-dose inhaler (MDI) in mechanically ventilated patients has attracted considerable interest in recent years. This is because the use of the MDI has several advantages over the nebulizer, such as reduced cost, ease of administration, less personnel time, reliability of dosing and a lower risk of contamination. A spacer device is fundamental in order to demonstrate the efficacy of the bronchodilator therapy delivered by MDI. Provided that the technique of administration is appropriate, MDIs are as effective as nebulizers, despite a significantly lower dose of bronchodilator given by the MDI.

Bronchodilator therapy is commonly used in mechanically ventilated patients. The delivery of bronchodilators with an MDI and a spacer device in mechanically ventilated patients is effective and results in bronchodilatation.

In patients with obstructive lung disease (chronic obstructive pulmonary disease [COPD] or asthma), these drugs are part of the standard therapy and play an important role in patient management. MDI's can take the place of or be added as an additional respiratory medication when treating the chronic respiratory patient.

2. Scope

This policy is applicable to all Respiratory Therapist and Nursing Service in all healthcare institutions in Ministry of Health.

3. Purpose

3.1. To deliver aerosol bronchodilation to mechanically ventilated patients using MDI's

3.2. To assure the safe, effective delivery and timely use of MDI medications in mechanically ventilated patients.

3.3. To assure that proper technique is carefully executed to reverse bronchoconstriction, that decreases the work of breathing, and/or relieve dyspnea.

4 Definitions

4.1. Metered-Dose Inhaler (MDI): a device that delivers a specific amount of medication to the lungs, in the form of a short burst of aerosolized medicine that is usually self-administered by the patient via inhalation.

4.2. Bronchodilators: drug that relaxes bronchial muscle resulting in expansion of the bronchial air passages

4.3. Airway: a passageway for air into or out of the lungs specifically or a device passed into the trachea by way of the mouth or nose or through an incision to maintain a clear respiratory passageway

4.4. Bronchoconstriction: is the constriction of the airways in the lungs due to the tightening of surrounding smooth muscle, with consequent coughing, wheezing, and shortness of breath

4.5. Bronchospasm: or a bronchial spasm is a sudden constriction of the muscles in the walls of the bronchioles or when the muscles in the lungs tighten, causing restricted airflow.

4.6. Sympathomimetic: a pharmacological agent that mimics the effects of stimulation of organs and structures by the sympathetic nervous system. It functions by occupying adrenergic receptor sites and acting as an agonist or by increasing the release of the neurotransmitter norepinephrine at postganglionic nerve endings

5. Policy

5.1. Metered Dose Inhalers (MDI's) will be administered by the Respiratory Therapists/ Respiratory Care Services (RCS) and nurses.

5.2. When ordered by a physician Pharmacologic agents from antibiotics to sympathomimetic shall be delivered to mechanically ventilated patients via metered dose inhalers (MDI's) that delivers medication using propellants which disperse a "metered dose" per puff (dosage in micrograms).

5.3. All patients with an order for nebulized medications that have an artificial airway in place will be considered candidates for conversion to MDI.

5.4. The patient will be switched to MDI administration if the ordered drug is available in MDI form.

5.5. MDI's shall take the place of or be added as an additional respiratory medication when treating the chronic respiratory patient.

5.6. A patient with a "do not substitute" order from a physician will be excluded from this therapeutic conversion.

6. Procedure

6.1. Read the patient's order sheet for the physician's specific instructions.

6.2. Check the physician order for medication, medication dosage, and frequency.

6.3. Verify the patient's name, DOB, and bed location.

6.4. Upon arrival of the MDI from Pharmacy, therapy will be initiated.

6.4.1. Obtain the ordered MDI from the patient's medication drawer on the nursing unit.

6.4.2. Proceed to the patient's bed, introduce yourself, and explain what you are about to do and that it has been ordered by the patient's doctor.

6.4.3. Check the patient's name and DOB verbally and by the patient's wristband.

6.4.4. Be reassuring.

6.5. Wash your hands

6.6. Heat-and-moisture exchanger (HME), must be removed before therapy begins.

6.7. Check Ventilator modes and settings to allow proper deposition of medications.

6.8. Check Inhalers if it dispense dry powder for they are not suitable for use in ventilator circuits.

6.9. Each MDI medication delivered to the ventilated patients will be administered at a dosage of four (4) puffs unless otherwise ordered by the physician.

6.10. To ensure maximum efficiency, each puff should be delivered one (1) minute apart.

6.10.1. Place MDI Adapter (holding chamber) on inspiratory side between the patient wye and the inspiratory limb according to the manufacturer's recommendations.

6.10.2. Remove the MDI canister from the mouthpiece.

6.10.3. Shake the MDI canister vigorously 3-5 times and place in the MDI receptacle port.

6.10.4. Using only enough force to actuate the canister, deliver the desired number of puffs during the inspiratory phase one minute apart.

6.10.5. Following each treatment wipe the tip of the canister with alcohol and store with cover in patient's medication box.

6.10.6. Place back the HME after treatment.

6.11. Assess the patient before and after Rx

6.11.1. Heart Rate

6.11.2. Respiratory Assessment (Respiratory Rate and Breath Sounds)

6.11.3. Breath Sounds

6.12. Document time and response to therapy on the ventilator flowsheet and sign on Medication Administration Record (MAR).

7. Responsibilities

7.1. **Respiratory Therapists** is responsible for

7.1.1. Explaining the purpose of therapy and procedure to the patient if conscious.

7.1.2. Administering MDI's to patients on mechanical ventilation and those patients with tracheostomies.

7.1.3. Monitoring patient's respiratory rate and pulse and auscultate patient's chest prior to beginning treatment, during and after treatment.

7.1.4. Modification of dosages and/or frequency according to patient response

7.1.5. Notifies physician of any significant changes.

7.1.6. Complying with Standard Precautions, as set forth by the Centers for Disease Control and Prevention (CDC)

7.2. **Nursing Staff** is responsible for

7.2.1. Explaining the purpose of therapy and procedure to the patient if conscious.

7.2.2. Administering MDI's to patients on mechanical ventilation and those patients with tracheostomies.

7.2.3. Monitoring patient's respiratory rate and pulse and auscultate patient's chest prior to beginning treatment, during and after treatment.

7.2.4. Notifies physician of any significant changes.

7.2.5. Overseeing the balance of the dispensed MDI.

7.2.6. Understanding and complying with Standard Precautions.

8. Document History and Version Control

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

9. Related Documents:

There is no related document for this policy

10. References:

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