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Metered Dose Inhaler Treatment (MDI) Formulated: 01/92	Effective: 11/02/94 Revised: 12/02/14 Revised: 04/17/18

Metered Dose Inhaler Treatment (MDI)

Purpose	To standardize the delivery of aerosolized medication to the lungs using a Metered Dose Inhaler (MDI) and the appropriate spacing device to enhance deposition
Scope	Respiratory Care Services will provide therapy for the aerosolization of pharmacological agents to maintain airway patency and provide clearance of retained secretions.
Audience	MDI therapy may be administered by Licensed Respiratory Care Practitioners or nurses with the understanding of age specific requirements.
Physician's Order	<p>The physician's order must include:</p> <ul style="list-style-type: none"> • Type of solution/medication. • Amount/dose to be delivered in micrograms or puffs. • Frequency/duration. • Mode of administration <p>Guidelines for mode of administration:</p> <ul style="list-style-type: none"> • On a coherent patient without facial injuries, the preferred method is with a spacer and mouthpiece. • For patients with facial injuries, children and infants, use a spacer with mask. • For patients with laryngectomy or tracheostomy, use a spacer with necessary adapters.
Indications	<ul style="list-style-type: none"> • Demonstrated reversibility of airway obstruction with bronchodilator medications secondary to bronchospasm. • The patient is able to understand and cooperate with the correct use of a MDI and spacer. • Patients that currently use or will be using MDIs as part of their home care regime.
Goals	<ul style="list-style-type: none"> • Improved drug efficacy. • Improved dosing accuracy. • Easier, more rapid administration. • Reduced nosocomial risk. • Reduced cost.
Contra-indications	<ul style="list-style-type: none"> • Adverse side effects of medications. • Patients in extreme distress with increased work of breathing and inspiratory flow too low to inhale from the MDI.
Equipment	<ul style="list-style-type: none"> • MDI, to be kept in the patient's medication drawer at the nurse's station (unless patient is in contact isolation and then MDI should be kept in

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patient room.)

- Appropriate spacer device, to be kept at the patient's bedside.
- Plastic bag to store spacer device at bedside.

Procedure

Step	Action
1	Verify physician's order sheet and identify patient using two identifiers.
2	Wash hands thoroughly.
3	Explain purpose of therapy and procedure to the patient.
4	Shake canister vigorously prior to use.
5	Connect MDI canister to appropriate spacer device.
6	Position patient in semi-Fowler's sitting position as tolerated.
7	Monitor patient's respiratory rate and pulse and auscultate patient's chest prior to beginning treatment.
8	<p>Methods of Administration:</p> <p>Via Mouthpiece:</p> <ul style="list-style-type: none"> • Instruct the patient to breathe out fully, then immediately place the mouthpiece of the spacer device over the tongue and well into the mouth. Close the lips tightly around the mouthpiece. As the patient inhales deeply, have them press the top of the canister firmly between the fingers and thumb to discharge the drug. • Instruct the patient to continue inhaling to carry the aerosol deep into the lungs and hold the breath as long as is comfortable. • Release the pressure on the canister and remove the spacer from the mouth and breathe out gently. • If multiple puffs are ordered, wait at least 1 minute after each puff and then repeat procedure, shaking the inhaler each time. <p>Via Spacer with Mask:</p> <ul style="list-style-type: none"> • Apply to appropriately sized spacer with mask to the patient's face. • Observe the thin membrane window on the mask, movement is seen with a good seal. • Follow procedure for use with a mouthpiece.

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**Procedure
Continued**

Step	Action
8 Continued	<p>Via tracheostomy or endotracheal Tube:</p> <ul style="list-style-type: none"> • Attach the MDI spacer directly to tracheostomy or endotracheal tube using the necessary adapters. • To assist patient with taking a deep breath, attach a resuscitation bag to the spacer using necessary adapters. • Shake canister vigorously prior to use. • Insert canister into the spacer device. • As a breath is being given using the resuscitation bag, depress the canister to administer the medication. • If multiple puffs are ordered, wait at least 1 minute after each puff and then repeat procedure, shaking the inhaler each time.
9	Stay with the patient for duration of treatment.
10	Monitor patient's respiratory rate and pulse during and after treatment; notify physician of any significant changes.
11	Encourage any spontaneous cough during treatment and ask patient for voluntary cough following treatment. Note patient's effort and sputum production.
12	Auscultate the patient's chest.
13	Place spacer device in plastic bag to be kept at the patient's bedside.
14	Document in Epic as outlined in RCS Policy # 7.1.1.
15	Patients will be evaluated after every treatment. If the patient is not able to perform independently, the therapist will continue administering therapy, re-instructing and reinforcing training until patient is able to perform correctly.

**Undesirable
Side Effects**

- Bronchospasm from the aerosol droplets and certain medications.
- Adverse side effects of medications.

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**Assessment
of Outcomes**

The effectiveness of MDI therapy will be judged on how well it accomplishes the stated clinical goals. .

**Patient
Teaching**

Step	Action
1	Explain to the patient why he/she is receiving Metered Dose Inhaler treatment. Relate it to the disease or injury state.
2	Show the proper body alignment for maximal breathing efficiency.
3	Perform proper cough instruction or cough assistance.
4	Explain how to breathe through the mouth or tracheostomy and to breathe slowly and deeply - a slight inspiratory pause is ideal.
5	Show how to breathe diaphragmatically to assure that the maximum distribution and deposition of aerosol will occur in the basilar areas of the lung.
6	Alert patient to possible onset of strong cough.
7	As a result of the educational aspects of this therapy, the patient should be able to verbalize and demonstrate understanding of this therapy.

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Infection Control

To decrease risk of Candidiasis, the patient will be instructed to rinse mouth after treatment.

Follow procedures outlined in Healthcare Epidemiology Policies and Procedures #2.24; Respiratory Care Services.

<http://www.utmb.edu/policy/hcepidem/search/02-24.pdf>

References

AARC Clinical Practice Guidelines: Delivery of Aerosols to the Upper Airway, Respiratory Care, 1994; 39(8): 803-807

Woodcock A. Use of Spacers With Metered Dose Inhalers. Lancet. 1997; 349:446

Boyd G. The Continued Need for Metered Dose Inhalers. Journal Aerosol Medicine. 1995; 8 Supplement 1:S9-12.

Grossman J. The Evolution of Inhaler Technology. Journal Asthma. 1994; 31:55-64.
