Continuous Nebulized Bronchodilator Therapy (Large and Medium Volume Continuous Nebulizer)

Purpose

To standardize the use of continuous aerosol therapy as a modality used for the rescue of patients with severe bronchospastic disease who do not respond to conventional therapy. This is not a replacement for routine, periodic treatment.

Scope

Respiratory Care Services will provide equipment and therapy for the aerosolization of pharmacological agents to maintain airway patency and provide clearance of retained secretions. The patient must be on a cardiac monitor and an oximeter.

Accountability/Training

May be administered by a Licensed Respiratory Care Practitioner with minimal supervision of the Supervisor with understanding of age specific requirements of patient population treated.

Physician's Order

The written physician's order must include:

- Type of solution/medication.
- Amount/dose to be delivered.
- Frequency/duration.
- Mode of administration.

Goals

- Improved drug efficiency.
- Continuous drug administration.

Contra-indications

Adverse side effects of medications.

Equipment

- Large or Medium volume continuous nebulizer
- Oxygen and Medical Air (optional if using blender)
- Blender (optional)
- Oxygen supply tubing or flow meter adapter
- Flow meter (0-15 L/min.)
- Non Invasive Monitor (pulse oximeter)
- Aerosol tubing (large volume nebulizer only), aerosol mask.

Procedure

Step	Action
1	Check physician's order. Verify patient by two identifiers.
2	Explain purpose of therapy and procedure to the patient.

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Procedure Continued

Step	Action
3	Wash hands.
4	Patient Assessment • Heart rate • Respiratory rate • Skin color • Breath sounds • Chest excursion • Mental status • Airway status
5	Select either Large or Medium volume continuous nebulizer.
6	Attach flow meter to source gas (blender, medical air, or oxygen).
6	Attach oxygen supply tubing to flow meter and to **NEBULIZER** source gas inlet of nebulizer.
7	For large volume nebulizer, attach aerosol tubing to nebulizer and aerosol mask. For medium volume nebulizer, attach aerosol mask directly to nebulizer. Attach aerosol tubing to nebulizer (for large volume nebulizer only) and aerosol mask
8	Obtain mixed medication from pharmacy or see calculation protocol below.
10	Pour medication into nebulizer.
11	For large volume nebulizer, set flow meter to 11 L/min (output 30 mL/hr). For medium volume nebulizer, set flowmeter to 2.5 L/min (output 8mL/hr).
12	Attach mask to patient.
13	Be sure to check nebulizer at 60 minutes and 120 minutes to determine output of setup and adjust flow accordingly for desired output.
14	After use, discard remaining solution and rinse with sterile water.

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15	Change nebulizer every 48 hours. **DO NOT REUSE**.

Continuation of Therapy

- A physician who has directly observed the patient should reorder the treatment every 8 hours.
- On rounds check physician's order, check position and fitting of apparatus, check for adequate flow. Always check the patient's response to therapy.
- Record pertinent data in EPIC under the "Doc Flowsheet' or 'RCS Assessment' sections and on RCS department treatment care

Discontinuation

- Check physician's order.
- Explain change in therapy to patient.
- Discard all disposable equipment.
- Record the date and time the therapy was discontinued in EPIC.

Undesirable Side Effects

- Tachycardia
- Palpitation
- Headache
- Nausea

Assessment of Outcome

The effectiveness of continuous aerosol treatment will be judged on how well it accomplishes the stated clinical goals. Observation of the following should be noted on the RCS flow sheet and in the patient progress notes. Includes, but is not limited to:

- Sputum - color, amount, consistency.
- Auscultation - comparison of pre- and post-treatment breath sounds; breath sounds improved.
- Arterial blood gas measurement and/or pulse oximetry.
- Work of breathing - evaluating the ventilatory pattern, use of accessory muscles; decreased WOB.
- Change in heart rate.
- Patient's subjective response ("breathing easier").
- Peak flow improvement.

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Patient Teaching

Step	Action
1	Explain to the patient why he/she is receiving continuous aerosol treatment. Relate it to the disease or injury state.
2	Place in 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 trach 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.

Infection Control

Follow procedures outlined in Healthcare Epidemiology Policies and Procedures #2.24; Respiratory Care Services.
http://www.utmb.edu/policy/hcepidem/search/02-24.pdf

Corresponding Policies

RCS Policy and Procedure Manual, Guidelines for Medical Record Documentation, #7.1.1.
RCS Policy and Procedure Manual, Therapist Treatment Cards, # 7.1.2.

Safety

- Instruct patient and visitors in safety rules for oxygen.
- Safety guidelines as outlined in section 3.6.1 of this manual will be followed.

References

Berlinski A, Waldrep JC. Four Hours of Continuous Albuterol Nebulization. Chest. 1998; 114:847-853.Baker EK, Willsie SK, Marinac JS, Salzman GA. Continuously nebulized albuterol in severe exacerbations of asthma in adults: a case-controlled study. Journal of Asthma. 1997; 34:521-30.

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nebulization in children with severe status asthmaticus. Pediatric Emergency Care. 1996; 12:1-5.

Attachments

Medication calculation chart.

Misty Finity Large Volume Continuous Nebulizer = 11 L/min									
	Hours	1	2	3	4	5	6	7	8
mg/hr	2.5	0.5	1	1.5	2	2.5	3	3.5	4
	5	1	2	3	4	5	6	7	8
	10	2	4	6	8	10	12	14	16
	15	3	6	9	12	15	18	21	24
	20	4	8	12	16	20	24	28	32
	Fill to Total Volume (mL)	30	60	90	120	150	180	210	240

Misty Finity Medium Volume Low Flow Continuous Nebulizer =2.5 L/min					
	Hours	1	2	3	4
mg/hr	2.5	0.5	1	1.5	2
	5	1	2	3	4
	10	2	4	6	8
	15	3	6	9	12
	20	4	8	12	16
	Fill to Total Volume (mL)	8	16	24	32

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References Continued

Shrestha M, Bidadi K, Gourlay S, Hayes J. Continuous vs intermittent albuterol, at high and low doses, in the treatment of severe acute asthma in adults. Chest. 1996; 110:42-7

Moler FW, Johnson CE, Van Laanen C, et al. Continuous versus intermittent nebulized terbutaline: plasma levels and effects. American Journal of Respiratory Critical Care Medicine. 1995; 151:602-6.

Moler Fw, Hurwitz ME, Custer JR. Improvement in Clinical Asthma Score and $PaCO_2$ in Children With Severe Asthma Treated With Continuously Nebulized Terbutaline. Journal of Allergy & Clinical Immunology 1988, 81:1101-1109.