Aneurin Bevan University Health Board

CLINICAL GUIDELINES

Adult Nebuliser Guidelines

Guideline for Adult Nebuliser	
Reference	
Date approved	
Approving Body	
Supporting Policy/ Working in New Ways (WINW) Package	
Implementation date	
Supersedes	
Consultation undertaken	***Add any other groups that have been consulted in the writing/review of the guidelines***
Target audience	
Document derivation / evidence base:	
Review Date	
Lead Executive	
Author/Lead Manager	
Further Guidance/Information	
Distribution:	
This guideline will be registered with the Health Board following approval. However, clinical guidelines are guidelines only. The interpretation and application of clinical guidelines will remain the responsibility of the individual clinician. If in doubt contact a senior colleague or expert. Caution is advised when using the guidelines after the review date.	

Introduction

The aim of nebuliser therapy is to safely and effectively deliver a therapeutic dose of the required drug to the patient as an aerosol in the form of respiratory particles within a fairly short time usually 5 – 10 minutes (British Thoracic Society, 1997)

Indications

Nebulisers are preferable to hand held inhalers when:

- Large drug doses are needed;
- Controlled co-ordinated breathing is difficult, e.g. in sick patients with acute severe asthma or an exacerbation of chronic obstructive pulmonary disease (COPD);
- The patient has chronic lung disease and hand held inhalers have been found ineffective in these circumstances;
- Drugs such as antibiotics are unavailable as an inhaler or nebuliser administration is preferred.

Contraindications

A known sensitivity to the drug being nebulised. See the most up to date edition of the British National Formulary for further information on specific drugs.

Nebulisation: General Points

- Treatment should be given using either an electrical compressor or compressed air. In acute severe asthma, oxygen as prescribed should be used as the driving gas whenever possible (BTS/SIGN, 2011).

- The volume of fluid in the nebuliser chamber is usually 2-4.5mls, although this may vary depending on the drug to be administered.

- Bronchodilators such as salbutamol (2.5mls) and ipratropium bromide (2mls) may be combined to make up to 4.5mls.

- The normal nebulising time is approximately 5-10 minutes. However, owing to the viscosity of antibiotics and steroids, nebulising time may need to be increased. For those, and other solutions, an appropriate nebuliser system should be used (see appendices 2 and 3).

- The nebulisation of particles to 1-5 microns is more likely to penetrate to the smaller conducting airways thus producing an optimal treatment effect (Higgenbottam, 1997).

- Bronchodilator responses are the same whether a mask or a mouthpiece is used. Face masks are better for children and for emergencies. Mouthpieces are recommended when steroids, antibiotics or antimuscarinic bronchodilators (anticholinergics) are being nebulised. If a face mask is used, it should be close fitting and not held away from the face (BTS, 2011).

- Nebulisers just before meals may spoil an already small appetite, but other patients who are severely breathless may need the bronchodilation to give them breath to eat.

- Patient education should be given to reinforce how to manage, clean and maintain the nebuliser unit and nebuliser chambers in case a patient has, or will need to have this therapy at home.

Hazards/Cautions

- Where the drug to be nebulised requires dilution, the diluent should be 0.9% sodium chloride. Water for injection should not be used as it may cause bronchoconstriction if nebulised (O'Callaghan, Milner, Webb. et. al., 1991).

- Nebuliser Therapy should be delivered via a compressor. Only in exceptional circumstances should oxygen be used either to deliver nebuliser therapy or given in conjunction with nebuliser therapy via a compressor for patients with severe asthma. This must be directed by a Clinician. (BTS, 2011).

- Antimuscarinic bronchodilators such as ipratropium bromide cause/exacerbate glaucoma, particularly when given with nebulised salbutamol (and possibly other β2 agonists) (BNF, 2011). Therefore, a mouthpiece should be considered.

- Mouthpieces(vent stream) should be used for nebulised steroids and antibiotics in order to prevent deposition to the face and eyes (see appendices 2 and 3)

- Drugs should only be added to the nebuliser chamber immediately prior to administration, as nebuliser drugs do not contain preservatives.

Equipment

- A Compressor at a flow rate of 6-8 litres/minute. Nursing staff should make sure they are competent to use this device

- Nebuliser chamber and mouthpiece/face mask set. Please note: **These are for single patient use only.**

- Straight tubing must be used in order to maintain the correct flow and to avoid disconnection. Bubble tubing should never be used, as it does not maintain a constant flow rate. Tubing is also **single patient use only.**

- Prescription chart

- Prescribed medication

- Peak flow meter and chart

Caution - Use of Oxygen

Normally, nebulisers are delivered via a compressor. However, in exceptional situations, e.g. acute asthma, oxygen may be used. This must be discussed with, and prescribed by, medical staff before it is instigated (BTS/SIGN, 2001)

PRINCIPLES OF CARE

1	Check prescription chart according to the local drug administration policy to ascertain type of medication and correct dosage needed. Check drug and expiry date. Undertake positive patient identification in accordance with Trust policy.	Drug is given as prescribed and the risk of drug errors if administered. Ensures correct patient receives the medication prescribed.
2	Assist the patient into a comfortable position, preferably sitting upright, and advise to take normal steady breaths (tidal breathing). An explanation about the nebuliser and its effects may be necessary.	To minimise dyspnoea and to allow maximum lung expansion in order to ensure medication reaches the bronchioles. To educate the patient.
3	If appropriate, measure peak flow and record on chart.	To give a baseline measurement prior to medication
4	Wash and dry hands Place medication into nebuliser chamber.	To reduce the risks of cross infection (ABHUB Infection Prevention Policy Hand Hygiene Policy, 2017) http://howis.wales.nhs.uk/sitesplus/866/opendoc/230419
5	Connect one end of the tubing to the gas delivery system and the other end to the nebuliser chamber. Select mouthpiece or face mask and connect to the nebuliser chamber. Fit the mask to the patient or ensure the mouthpiece is ready for use prior to starting the nebuliser.	To enable the drug to be nebulised correctly. Ensures that patient receives the complete dose and that staff are not unduly exposed to the nebulised medication.

6	Switch Compressor on Only when specified by medical advice use oxygen. Set the oxygen flow meter to 6-8 litres/minute. Additional monitoring is required to avoid potential for hypercapnic respiratory failure in patients with COPD Observe the patient during the procedure for any change in condition.	To monitor the patient during drug delivery for effect or adverse reactions
7	Occasionally tap the nebuliser pot during nebulisation. The patient could be encouraged to do this if able.	This shakes down the large droplets into the chamber and ensures maximum deliver of the drug.
8	Keep the nebuliser chamber upright.	This allows maximum amount of medication to be delivered effectively.
9	Nebulisation should be complete within 5-10 minutes. There will always be a small amount of fluid left in the chamber. Switch off the compressor. Ensure that the nebuliser mask and chamber are rinsed with sterile water, between doses, when administering more than one type of medication via the nebuliser.	Nebulisers should not be run to "dryness". To prevent drug interaction

10	If the peak flow was measured prenebulisation, record again 30 minutes after completion (NB: the onset of action of ipratropium is 30-40 minutes).	To measure effectiveness of prescribed medication.
11	Nebuliser pots, masks and tubing must be used for the duration of the hospital stay. All devices should have a sticker attached to the tubing indicating when the device was changed	To reduce the risk of the nebuliser jet becoming blocked. Replacing the equipment reduces the potential for the nebuliser pots to become reservoirs for legionella and pseudomonas bacteria (MHRA, 2004).
	Any wet nebuliser chamber should be allowed to air dry on paper towel.	This is to discourage the use of washing chambers and pouring the effluent down sinks which has a risk of aerosolising any pseudomonas.
12	Reconnect to the compressor and, if there is condensation present in the tubing, switch on and allow air to blow through the tubing.	Switching on the flow of air will remove excess water and drug crystals that may be present in the tubing.
13	The nebuliser unit should be covered and stored. The compressor should be unplugged and wiped clean after use.	To keep clean and dust free.

CARE OF EQUIPMENT

When the compressor unit is switched off, wipe it with an antimicrobial swab and store it away. The compressor should not be stored on the floor or near water hazards. If cylinder oxygen is used, ensure the cylinder is turned off using the key after use to prevent leakage.

References

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Author: . Respiratory Nurse Specialist.

Nursing Practice Guideline Group Link:

For review:

Appendix 1

Drugs which may be used in the nebuliser

Bronchodilators:

- β2 agonists e.g. salbutamol and terbutaline
- Antimuscarinics (anticholinergics) e.g. ipratopium bromide
- Combination therapy e.g. Combivent (salbutamol and ipratropium bromide).

Corticosteroids:

- Budesonide and Fluticasone (see appendix 2)

Antibiotics:

- Colistin (Colomycin) (see appendix 3)
- Ribavirin (specialist areas only)
- Pentamidine (specialist areas only)
- Amphotericin (specialist areas only)

Deoxyribonuclease (DNase):

- Used in the treatment of cystic fibrosis (contact the cystic fibrosis nurse specialists.

0.9% sodium chloride:

- May help in physiotherapy and for added humidification.

In some areas, drugs other than the above may be available for use via a nebuliser. **It is essential** to refer to local policy in these circumstances.

Appendix 2

Guidelines for the administration of Budesonide and Fluticasone

Nebulised budesonide (Pulmicort®) or fluticasone (Flixotide®) are corticosteroids and are sometimes used in the treatment of difficult asthma. The drug is administered as a liquid via a nebuliser chamber and compressor. Owing to the viscosity of the drugs and the potential side effects, the following guidelines for administration should be followed alongside the procedure for administration of a single dose nebuliser in adults.

	Principle	Rationale
1	The nebuliser chamber should be a Pari or Ventstream circuit (Contact Respiratory Nurse Specialist for advice re. ordering).	Budesonide and Fluticasone are viscous liquids and therefore need to be nebulised via an appropriate system which allows increased lung deposition.
2	A mouthpiece must be used – not a facemask.	The holes in a face mask direct vapour into the eyes and this could potentially cause problems to the eyes. A mouthpiece reduces the risk of skin irritation.
3	Budesonide or fluticasone should not be mixed with another solution nebulised	Possible drug incompatibility. Volume of solution may be too large

	Principle	Rationale
4	Encourage patient to rinse mouth with water and spit out after nebulisation.	To reduce the risk of oral thrush. Reduce systemic side effects.
5	After each use, discard the remaining fluid.	To reduce the risk of colonisation of the equipment. Organisms may multiply in any fluid left in the equipment and may then be inhaled by the patient. To reduce the risk of bacterial contamination and potential risk of transmission of Legionella bacteria being aerosolised.
6	All equipment should be replaced when soiled.	To reduce the risk of the nebuliser jet becoming blocked.
7	Reconnect to the compressor and, if there is condensation present in tubing, switch on and allow air to blow through tubing.	Switching on the flow of air will remove excess water and drug crystals that may be present in the tubing.

Appendix 3

Guidelines for the administration of Nebulised Colomycin

Nebulised colistin (Colomycin®) may be prescribed for the treatment of some chest infections. It may also be used in the management of bronchiectasis.

Owing to the potential for droplet dispersal into the atmosphere a filtered system is required. These guidelines should be followed alongside the procedure for administration of a single dose nebuliser in adults.

	Principle	Rationale
1	Prior to the commencement of treatment please contact the Respiratory Nurse Specialist.	Respiratory Nurse Specialist will be able to advise on the procedure and identify where stocks of the required filter system are held.
2	Check drug and expiry date. Reconstitute the prescribed drug as recommended in the manufacturer's literature or pharmacy advice.	To ensure correct dilution and dosage of solution.
3	Assemble the appropriate filter system (Pari or Ventstream). Mouthpiece only to be used on system.	To avoid the risk of dispersal of drug into the atmosphere. The holes in a face mask direct vapour into the eyes and this could potentially cause problems to the eyes. A mouthpiece reduces the risk of skin irritations.

	Principle	**Rationale**
4	The drug should not be mixed with another nebulised solution.	Possible drug incompatibility. Volume of solution may be too large.
5	Encourage patient to rinse mouth with water and spit out after nebulisation.	To reduce systemic side effects
6	After each use, discard the remaining fluid.	To reduce the risk of colonisation of the equipment. Organisms may multiply in any fluid left in the equipment and may then be inhaled by the patient. To reduce the risk of bacterial contamination and potential risk of transmission of Legionella bacteria being aerosolised.
7	All equipment should be replaced when soiled.	To reduce the risk of the nebuliser jet becoming blocked.
8	Discard the disposable filter from the Pari system after each dose.	To reduce the risk of cross infection.