CLINICAL GUIDELINE FOR THE USE OF NEBULISERS

This guidance does not override the individual responsibility of health professionals to make appropriate decision according to the circumstances of the individual patient in consultation with the patient and /or carer. Health care professionals must be prepared to justify any deviation from this guidance.

INTRODUCTION

THIS GUIDELINE IS FOR USE BY THE FOLLOWING STAFF GROUPS :

This guideline covers the use of nebulisers in all in-patient and out-patient areas across the Trust

THIS GUIDELINE IS FOR USE BY THE FOLLOWING STAFF GROUPS :
Medical staff
Qualified Nursing Staff
Physiotherapists

Lead Clinician(s)

Sarah Austin	Respiratory Nurse Specialist
Approved by Respiratory Directorate:	13th November 2019
Approved by Clinical Governance Group on:	3rd December 2019
Review Date:	3rd December 2022
This is the most current document and is to be used until a revised version is available:	

Key amendments to this guideline

Date	Amendment	Approved by:
22 November 2002	Document was first approved	Clinical Effectiveness Committee
October 2004	Document was reviewed by Clinical Lead and extended with no amendments made	Sarah Austin
April 2015	Complete review of document to ensure Trust in line with the British and European Guidelines on the use of nebulisers in asthma and COPD	Amended by Sarah Austin Approved by Medicines Safety Committee
August 2017	Document extended for 6 months as per TMC paper approved on 22nd July	TMC
5th December 2017	Sentence added in at the request of the Coroner	
December 2017	Document extended for 3 months as per TLG recommendation	TLG
March 2018	Document extended for 3 months as approved by TLG	TLG
June 2018	Document extended for 3 months as per TLG recommendation	TLG
July 2018 7/10/2019 13/11/2019	Review of document to ensure it is in line with the latest national guidelines for nebulisers in asthma, COPD and bronchiectasis Approved by TIPCC with minor amendments Approved by Respiratory Directorate Governance	Sarah Austin

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INTRODUCTION

"A nebuliser is a device that can convert a liquid into aerosol droplets suitable for patient inhalation." (Boe et al, 2001)

Nebulisers are widely used in the Trust, most commonly for delivery of bronchodilator medication to treat breathlessness for people with asthma or Chronic Obstructive Pulmonary Disease (COPD); though other medications including saline, steroids and antibiotics may also be given by this route.

KEY ISSUES

Inhaled medication delivery is more complex than using the oral route.

1. Different medications require different nebuliser equipment
2. The particles generated by a nebuliser need to be of the correct size to penetrate the lungs. It is important to ensure the correct flow rate of the driving gas is set.
3. The driving gas selected (oxygen or air) differs according to the clinical condition of each patient
4. Because nebulisers deliver a higher dose of the drug when compared to an inhaler, there is the potential for a higher incidence of side effects
5. There is a risk of bacterial contamination of the equipment if it is not cleaned and maintained properly

DETAILS OF GUIDELINE

Action	Rational
Nebulised medication must be prescribed on the patient's drug chart and the medication must be checked and administered in accordance with the Trust's medicines policy.	To act in accordance with the Trust's key policies
The prescription must specify whether the drug is to be given via air or oxygen	Patients with type I respiratory failure should have their nebuliser driven by oxygen, to maintain their oxygen levels during treatment. Patients with type 2 respiratory failure (T2RF) should have their nebuliser driven by air, to reduce the risk of disturbing their blood gas balance. Where a patient has T2RF and is hypoxic, oxygen can be given via nasal specs at the same time as the patient receives their nebulised medication, to maintain their SpO2 in the patient's target range. It is the responsibility of the prescriber to determine the correct driving gas for the nebuliser

Gather the correct equipment: Standard nebuliser and mask is appropriate for people having beta 2 agonists or saline Standard nebuliser and mouthpiece should be used where ipratropium is being administered High efficiency/breath enhanced nebuliser and mouthpiece should be used where steroids are being administered High efficiency/breath enhanced nebuliser with mouthpiece and filter or exhaust tubing should be used where antibiotics are being administered.	 These drugs do not have localised side effects Ipratropium has the potential side effect of causing glaucoma if it is in contact with the eyes To maximise drug deposition in the lungs and minimise steroid deposition on the skin To maximise drug deposition in the lungs and minimise exposure of staff and other patients to aerosolised antibiotics (which are a risk factor for occupational asthma)
Label the equipment with the patient's name and hospital number	To ensure that the equipment remains with the same patient
Explain the procedure to the patient	For courtesy and consent
Ensure the patient is positioned so that the nebuliser can function effectively and so that the mask or mouthpiece is correctly positioned. Generally, being sat up-right is best	To ensure patient can obtain best benefit from the medication
Connect the nebuliser tubing to the appropriate air dial, air compressor or oxygen flow meter, depending on prescribed driving gas, and turn gas to an appropriate flow	Flow rate will be specified on the nebuliser product information. Inadequate flow rate will fail to generate a small enough particle size to penetrate the lung fields effectively. Generally a flow rate of 6 l/min is required for salbutamol, ipratropium, saline and steroids. A flow rate of 8 l/min may be required for antibiotics.
Place the mask in position on the patient's face, or ensure they are holding the mouthpiece to their mouth.	To administer drug
Advise the patient to relax and breathe normally, unless physiotherapists have advised otherwise	To avoid symptoms of hyperventilation
Ensure that the medication is aerosolising	Dirty or incorrectly connected nebulisers will not function. If the medication is not aerosolising, then check that nebuliser is connected properly, ensure the driving gas flow rate is correct. If there is still no aerosolisation then replace the nebuliser
When no more aerosol is being produced, switch off the driving gas and remove the nebuliser mask / mouthpiece from the patient	There is no benefit to leaving the nebuliser in place once aerosolisation has ceased

Ensure the patient is comfortable following the procedure	
If the patient has had a nebulised steroid, provide the opportunity for them to rinse their mouth with water (and spit rather than swallow) after the nebuliser	To minimise steroid deposition in the mouth
After each dose: • Empty any residual solution from the nebuliser into a clean dry tissue, • Do NOT wipe out the nebuliser as there is a risk of residual particles from the tissue being left and aerosolised with the next dose. • Invert the nebuliser on a clean paper towel on the locker top and allow to air dry. • Reattach the nebuliser once dry or when administering the next dose. The mask and nebuliser should be replaced each morning with the first nebuliser of the day or sooner if visibly soiled or solution has precipitated out. Dispose of the used mask and tubing into the offensive waste stream and the nebuliser into the medicinally contaminated soft waste cardboard clinisafe bin. Label the patient's nebuliser with their details, using a patient label. Write the date that the nebuliser was supplied on the label	Nebulisers, masks and mouthpieces are single patient use which means they can be re-used by the same patient but need to be kept clean and dry. As there are risks associated with hand washing equipment, the risk needs to be managed by alternative methods, to ensure that bacterial contamination of the equipment is minimised. To conform to the waste management requirements. To ensure that the correct equipment is used by the correct patient. To demonstrate that the nebuliser has been changed on a daily basis.
Once the patient's clinical condition allows and where there is a continued need for inhaled medication, the patient should be swapped to inhalers	Where medication is available in both nebulised and inhaler form, the nebulised dose is usually higher. The higher dose should usually be reserved for acute episodes. There is a higher risk of side effects (e.g. cardiac dysrhythmias from salbutamol) with nebulisers than with inhalers Nebulisers do not offer better lung deposition than inhalers A correct inhaler technique is important and it is essential that patients have optimised their technique, using a spacer if needed, and developed their skill and confidence with these devices before discharge

Home nebulisers:

Home nebulisers may be required under the following circumstances:

1. Where the inhaled drug that the patient requires is not available in an inhaler, e.g. antibiotics, hypertonic saline
2. Where the patient has an altered airway and requires humidification
3. Where the patient is failing to benefit from standard doses on medication via an inhaler.

Specific home nebuliser issues:

Antibiotics:
Long term nebulised antibiotics are used for people with non-CF bronchiectasis with chronic bacterial colonisation with *P aeruginosa*. The aim of treatment is to improve symptoms and decrease exacerbation rate (BTS 2018). For nebulised antibiotics, the assessment should include:

- Explanation of the principles, benefits and risks of treatment
- Identification of the antibiotic to be used, based on the results of sputum microbiology, culture and sensitivity
- Review of sputum management techniques, including frequency and type of chest physiotherapy, (with referral to physiotherapy if this has not been previously assessed).
- Administration of a test dose of the antibiotic, with pre-treatment with inhaled bronchodilator and monitoring of peak expiratory flow prior to and every 10 minutes following antibiotic administration (with patient observed for an hour)
- Demonstration of how to use and maintain the equipment.
- Arrangements for review of exacerbation frequency.

Hypertonic saline:
Under the supervision of a physiotherapist or at the request of a respiratory specialist, hypertonic saline may be used to aid expectoration and enhance established chest clearance techniques, (BTS 2018)

- Explanation of the principles, benefits and risks of treatment
- Identification of the concentration of the hypertonic saline to be used
- Review of sputum management techniques, including frequency and type of chest physiotherapy.
- Administration of a test dose with pre-treatment with inhaled bronchodilator and monitoring of peak expiratory flow/spirometry prior to and every 10 minutes following saline administration (with patient observed for an hour)
- Demonstration of how to use and maintain the equipment. (Pasteur et al, 2010).

High dose bronchodilators
Where it is thought that a patient may benefit from a nebuliser at home, a formal nebuliser assessment must be completed, usually as an outpatient. Referral for nebuliser assessment is via Respiratory Consultant.

Nebulised bronchodilators may be considered for patients with severe COPD, who have distressing or disabling symptoms despite being on maximal inhaler therapy, (NICE 2018). Nebuliser assessment should include:

- Explanation of the principle, benefits and risks of treatment
- A review of the patient's current medication and their inhaler technique
- Demonstration of how to use and maintain the equipment

- A trial of treatment comparing standard dose bronchodilators via inhaler, high dose bronchodilators via inhaler (up to 1mg of salbutamol or 2.5 mg of terbutaline and 160 mcg of Ipratropium) and nebulised bronchodilators
- Each treatment arm should be tested over a 2 week period.
- Evaluation of effect should be assessed by use of rescue salbutamol inhaler use, activity diary and symptom score, e.g. BORG, Asthma Control Test (ACT), with a positive trial demonstrated by an improvement in symptom score or exercise capacity.

Heavy use of inhaled beta 2 agonists is a risk factor for asthma death (BTS 2016) .Home nebulisers for people with asthma should only be considered after full assessment of the patient by a respiratory consultant, usually in the out-patient setting. The use of nebulisers should form part of an individual asthma plan.

MONITORING OF GUIDELINE

Monitoring will be carried out via a once yearly nebulised audit, completed by the Respiratory Nursing Teams at the relevant site.

Spot checks will take place on the wards during Respiratory Nurse Specialist ward visits, to check for appropriate use and management of nebulisers.

STANDARDS	%	CLINICAL EXCEPTIONS
Ward nebuliser units labelled with patient's name	100%	None
Infection control measures are followed	100%	None
Documented evidence that patients supplied with home nebulisers from the Trust have had a nebuliser assessment completed	100%	Palliative care patients

REFERENCES

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Name	Committee / group
TIPCC	7/10/19

Supporting Document 1 - Equality Impact Assessment Tool

To be completed by the key document author and attached to key document when submitted to the appropriate committee for consideration and approval.

		Yes/No	Comments
1.	**Does the policy/guidance affect one group less or more favourably than another on the basis of:**		
	• Race	No	
	• Ethnic origins (including gypsies and travellers)	No	
	• Nationality	No	
	• Gender	No	
	• Culture	No	
	• Religion or belief	No	
	• Sexual orientation including lesbian, gay and bisexual people	No	
	• Age	No	
2.	**Is there any evidence that some groups are affected differently?**	No	
3.	**If you have identified potential discrimination, are any exceptions valid, legal and/or justifiable?**	No	
4.	**Is the impact of the policy/guidance likely to be negative?**	No	
5.	**If so can the impact be avoided?**	N/A	
6.	**What alternatives are there to achieving the policy/guidance without the impact?**	N/A	
7.	**Can we reduce the impact by taking different action?**	N/A	

If you have identified a potential discriminatory impact of this key document, please refer it to Human Resources, together with any suggestions as to the action required to avoid/reduce this impact.

For advice in respect of answering the above questions, please contact Human Resources.

Supporting Document 2 – Financial Impact Assessment

To be completed by the key document author and attached to key document when submitted to the appropriate committee for consideration and approval.

	Title of document:	Yes/No
1.	Does the implementation of this document require any additional Capital resources	No
2.	Does the implementation of this document require additional revenue	No
3.	Does the implementation of this document require additional manpower	No
4.	Does the implementation of this document release any manpower costs through a change in practice	No
5.	Are there additional staff training costs associated with implementing this document which cannot be delivered through current training programmes or allocated training times for staff	No
	Other comments:	

If the response to any of the above is yes, please complete a business case and which is signed by your Finance Manager and Directorate Manager for consideration by the Accountable Director before progressing to the relevant committee for approval