

# GIVING NEBULISED ANTIBIOTICS AT HOME

## HOME CARE GUIDELINE<sup>®</sup>

### WHY DO WE NEBULISE ANTIBIOTICS?

A nebuliser can be used to change a liquid antibiotic into a fine mist which can then be inhaled. The benefit of nebulising antibiotics is to deliver the medication directly to infections in the airways where they can most effectively treat infection, when this is the site of the infection.

Nebulised antibiotics are commonly used for the treatment of chest infections caused by bacteria (such as *Pseudomonas aeruginosa*) for which there are few suitable oral antibiotics. They can be used intermittently to treat acute chest infection (a course is usually one month), or continuously in patients with chronic chest infections eg alternate months on treatment.

In order for antibiotics to effectively reach the smaller airways in the lungs to treat infections, an appropriate nebuliser and pump needs to be used. The aim is to produce a very fine mist that will reach deep into the airways. Below is an explanation of the differences between a pump and a nebuliser and some ideas of the types you should be using.

A **pump** is a machine that forces the air out under pressure, whereas the **nebuliser** is the device attached to the pump which delivers the medication.

### Pump

A pump is the machine that drives air in and forces air out under high pressure to produce a mist of medication for inhalation via a nebuliser. There are several pumps available for purchase or hire from local pharmacies, so it is recommended you discuss with your nurse or physiotherapist which ones may be best suited to your needs.

Some of the pumps most commonly used at present at SCHN:

- FLAEM nebule air – available from BOC or from the appliance centre at CHW
- FLAEM Light neb – available from BOC
- Eflow Rapid or Pari Boy SX – by Pari

Note: Nebulisers and pumps change over time so you should discuss with your nurse or the physiotherapist when planning to purchase one.

### Nebuliser

A nebuliser is the device into which the medication is placed, it is connected to the pump and converts the liquid medication into a very fine mist. It will have a bowl to

hold the medication and either a mouthpiece or a mask so the medication can be inhaled. The nebuliser currently recommended is FLAEM RF7 and can be purchased from the CHW appliance centre. Some machines are all in one and do not need a separate nebuliser, e.g. FLAEM light neb.

## WHAT DO YOU NEED?

- The medication you have been prescribed.
- Sodium chloride 0.9% or water for injection in 10 mL ampoules (if using a powdered medication, or dilution is needed)
- The right sized syringe, your nurse will tell you what size you need (if needed)
- 19G blunt end needle (if needed)
- The right nebuliser unit and pump which has been discussed with you by your treating team (see above)
- Filter units can be used at home if the family choose to. The filters and T piece can be purchased from the appliance centre. You will need your treating team to obtain any connectors or mask/mouthpiece suitable for this set up from the inhalation therapy department (see pictures below for more detail).

NB: a filter must be used if administering the antibiotics via a tracheostomy as this is the only way of ensuring an expiratory outlet on this set up (see pictures below).

### Note

- Filters are used to prevent antibiotics escaping into the air. They are necessary in hospital but use at home is optional. If not using a filter you should ensure you have your nebuliser in a well-ventilated room e.g. near a window. The nurses or physiotherapists in your ward will be able to provide you with advice on the correct system to use with your machine.
- Nebulised antibiotics are most effectively administered into the lungs through a mouthpiece. In order to use a mouthpiece, children need to be old enough to remember to breathe through their mouth and may benefit from using a nose peg to help remind them (usually children about 5 years old). If your child is unable to use a mouthpiece, they will need to use a sealed mask (a mask without holes and creates a tight seal around the mouth and nose). This mask is held in place until the mist stops or until there is no medication left in the nebuliser bowl. A mask will be required if the antibiotics are being given for nasal/sinus disease.

Whether you are using a mouthpiece or mask you must ensure your nebuliser system has an expiratory valve/outlet (allows you to breathe out properly during the nebulisation). **See images at the end of this document for different nebuliser set up's that include an expiratory valve.**

## PROCEDURE

1. Get out all of the equipment
    - i. Medication
    - ii. Nebuliser and pump
    - iii. Sodium chloride 0.9% /water for injection ampoules (if needed)
    - iv. Syringe and Blunt end needle (if needed)
  2. Wash your hands for one minute
  3. Open the top of nebuliser and ensure the nebuliser is empty and clean.
  4. Prepare the medication, check you have the correct medication and check the expiry date.
    - a) **If the medication is in a plastic ampoule:** twist off top, if the whole ampoule is needed squeeze contents into nebuliser, if only part of the ampoule is needed, using a syringe with a blunt-end needle attached, draw up the correct amount of medication and then put the solution into the nebuliser.
    - b) **If the medication is a liquid in a glass ampoule:** carefully snap off the top of the ampoule then, using a syringe with a blunt-end needle attached draw up the prescribed amount of medication, and put the solution into the nebuliser.
    - c) **If medication is in a powder form:** using a blunt-end needle and syringe draw up the prescribed amount of water for injection, add it to the powder in the vial, shake until powder is completely dissolved (it should become a clear liquid). Draw up the prescribed amount of medication and put the solution into the nebuliser.
- NB: To ensure the effective operation of the nebuliser most nebulisers will need at least 2 mL of fluid in total in the nebuliser, but not more than 6 – 8 mL (this can vary depending on the nebuliser you are using so refer to the product information included with your nebuliser or talk to your nurse). If the medication is less than 2 mL, add sodium chloride 0.9% to the nebuliser to make up to the total minimum of (medication plus sodium chloride 0.9%) 2 mL.
5. Close the cap/top of the nebuliser.
  6. If using a filter system attach it to the nebuliser unit.

### Inhaling the antibiotic

1. Attach the nebuliser unit to the pump and turn it on. Be careful to keep the nebuliser upright once the medication has been put in it otherwise it may spill out.
2. The child needs to inhale the medication (through mask or mouthpiece) until the medication is finished, which is when the mist has stopped or there is no medication left in the nebuliser bowl, this should take about 10 – 20 minutes (can depend on the nebuliser you are using and volume of medication).

**Note:** When the medication is finished, rinse the child's mouth with water and have them spit out the water (if able). This helps remove any antibiotic which may be coating the mouth and decreases the incidence of oral thrush which is sometimes associated with nebulised antibiotic treatments.

## CLEANING THE EQUIPMENT

1. If you are using a filter system remove it from the nebuliser. The filter pad should be changed with each nebulisation (or as per the product information). (Some filters do not have removable filter pads, be sure to discuss this with your nurse or physiotherapist to ensure you are cleaning/changing your filter appropriately).
2. Take the nebuliser unit apart, separate into pieces and wash in warm soapy water, RINSE WELL and leave apart (in pieces) to air dry (check the cleaning manual for any special cleaning instructions for your nebuliser).

### Note:

- Your nebuliser should be disassembled and washed after every use; if the nebuliser is not cleaned frequently the nebuliser will not last as long as it should.
- It is important to leave the nebuliser in pieces to dry as bacteria, viruses and fungus can thrive in damp places and may grow around and in the joins of a nebuliser unit if it is left together with moisture trapped inside.
- If you are using a needle and syringe, you need to use a new one with each dose. **At CHW:** Needles and syringes can be purchased from the Appliance Centre; you need to get a form from your nurse to be able to purchase these. **At SCH:** please discuss with your nurse.
- Dispose of all equipment appropriately (needles into small sharps bin. **At CHW:** available from the Appliance Centre. **At SCH:** please discuss with your nurse where to purchase).
- If your child is on multiple nebulised medications you need to ensure you have a separate nebuliser for each medication to avoid medications being mixed together in the nebuliser bowl.

## REPLACEMENT OF NEBULISERS

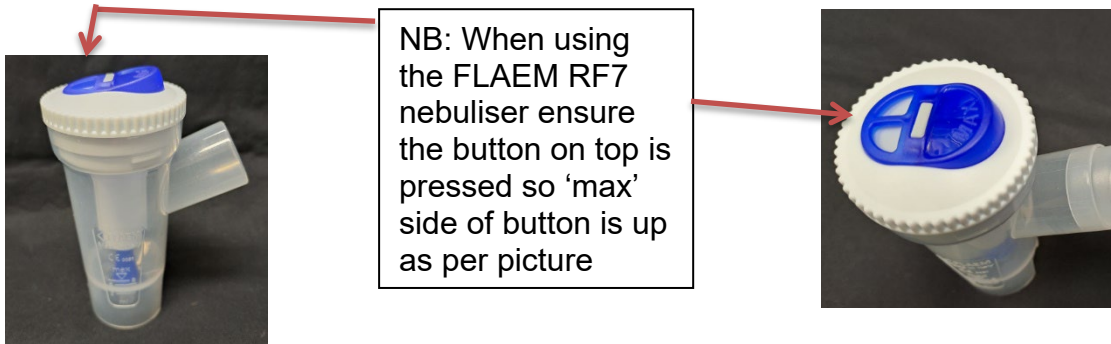
Nebulisers and pumps do not last forever. A nebuliser should be replaced every six to twelve months depending on the brand (refer to the product information or discuss with your nurse or physiotherapist). If they are not replaced frequently the mist will begin to become too dense (heavy) and the medication will be less effective. Pumps generally last a lot longer (several years), depending on the type and frequency of use. Check your warranty or product information guide for details around servicing/replacement of parts.

## PUTTING THE NEBULISER TOGETHER READY FOR USE

NB: If you have a nebuliser that is different to the one pictured below you should discuss this with your nurse to ensure you are using an appropriate nebuliser.

### Using a FLAEM RF7 nebuliser without a filter

(\* CHW – The Children’s Hospital at Westmead)



### Using a mouthpiece



Expiratory valve must be present on mouthpiece

Mouthpiece

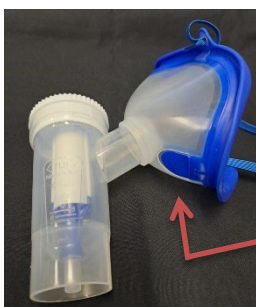
FLAEM RF7 nebuliser pack with mouthpiece available for purchase from the appliance centre at CHW

### Using a mask



FLAEM RF7 nebuliser pack with paediatric or adult size mask is available for purchase from the appliance centre at CHW

FLAEM sealed mask available in size 1 & 2 from appliance centre at CHW



Has a built in expiratory valve – ensure the expiratory ‘flap’ is pushed out

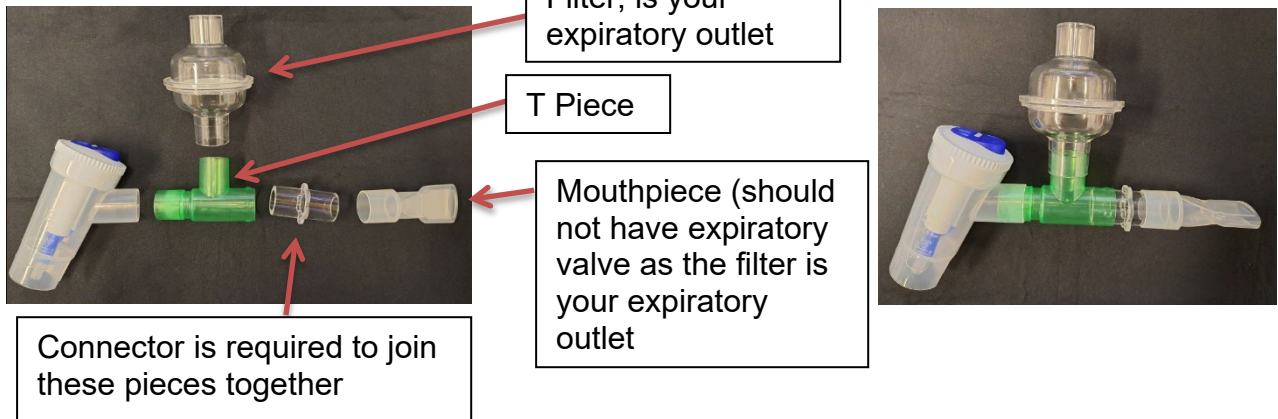
Has a built in expiratory valve in the blue elbow piece



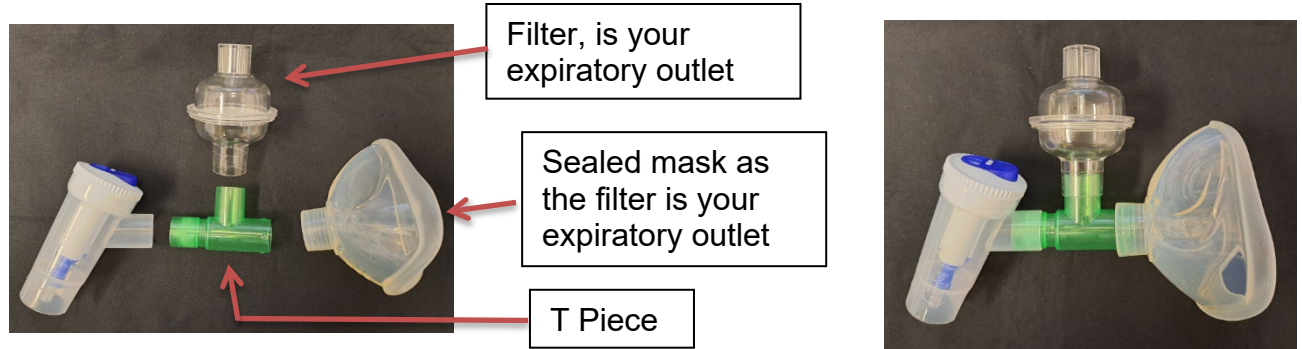


## Using a FLAEM RF7 nebuliser with a filter

### With a mouthpiece



### With a mask



NB: FLAEM neb, T piece and filter available for purchase from appliance centre at CHW. You need a sealed mouthpiece/mask as the filter is your expiratory valve and will need a connector to fit the mouthpiece to the T piece, they are available from inhalation therapy through your treating team.

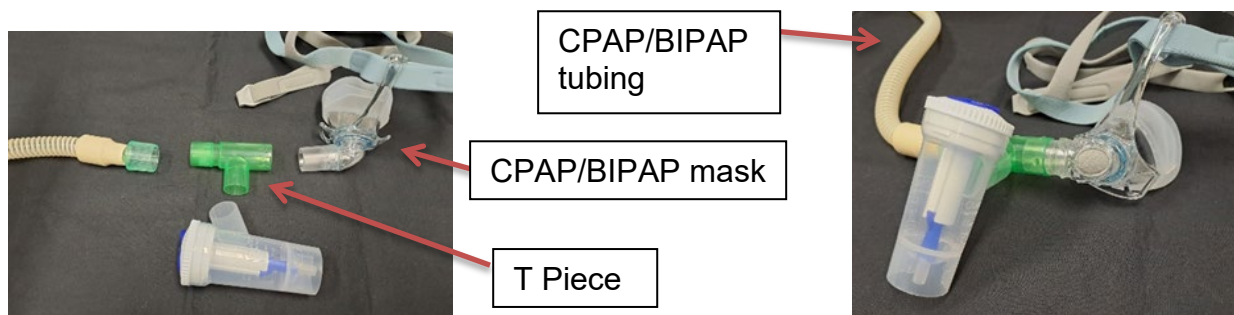
### Using a CIRRUS nebuliser with a filter:



## Patients on non-invasive ventilation (NIV) (BIPAP, CPAP)

It is not possible to filter the antibiotic from the environment in a set up with CPAP/BIPAP as the CPAP/BIPAP mask has its own built in expiratory outlets.

If the patient is able to be removed from the CPAP/BIPAP during nebulisation - but only with consultation and approval from your Doctor, then you can use one of the set ups as pictured above.



NB: FLAEM neb & T piece available for purchase from appliance centre at CHW. Your child should have their own mask, tubing and CPAP/BIPAP machine



**FILTER:** If using a loan BIPAP/CPAP machine there should always be a filter on the circuit to protect the machine. If the machine is owned by the family/carer i.e. not ever used by another person, there only needs to be a filter on the circuit during the time in which an antibiotic is being nebulised.

The filter is best placed where the BIPAP/CPAP tubing connects to the machine and can be purchased from the appliance centre at CHW

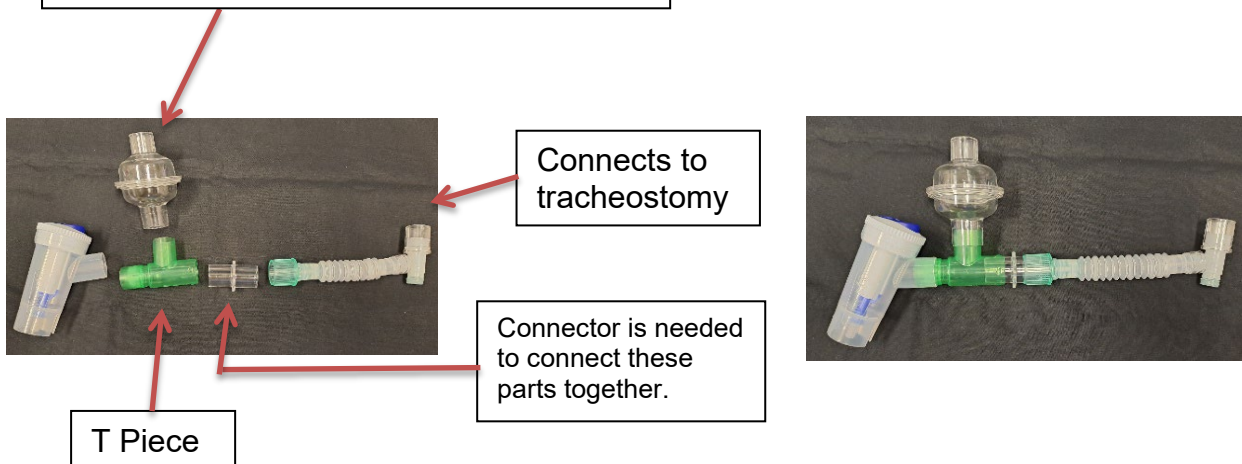
## ADMINISTERING NEBULISED MEDICATION THROUGH A TRACHEOSTOMY

*NB: please discuss with your nurse or physiotherapist where to purchase this equipment from*

### Patients not requiring any ventilator/respiratory support

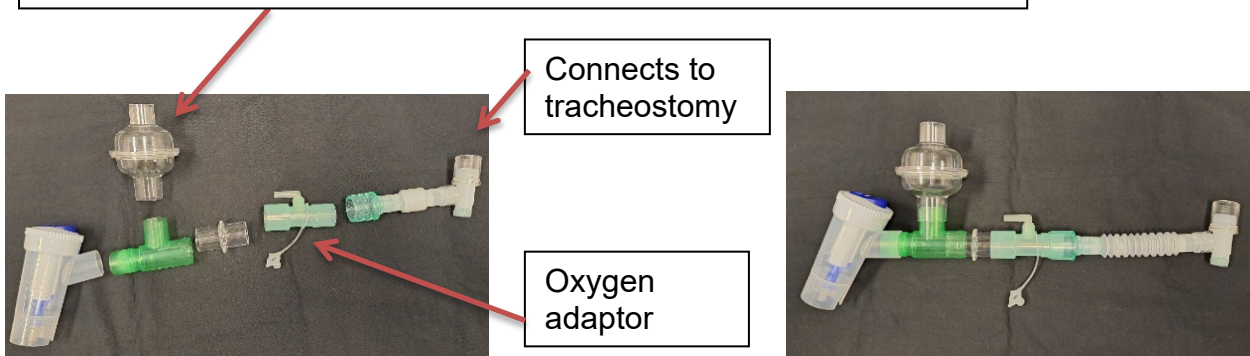
**If your child is not receiving any form of respiratory support or is able to have time off support for administration of medication.**

A filter is required on this set up as it is the only way of ensuring you have an expiratory outlet.  
The filter is your expiratory outlet



If oxygen is required to be given at the same time as the nebulised medication, the oxygen adaptor must be placed in the circuit between the filter and the patient as demonstrated below.

A filter is required on this set up as it is the only way of ensuring you have an expiratory outlet.  
The filter is your expiratory outlet



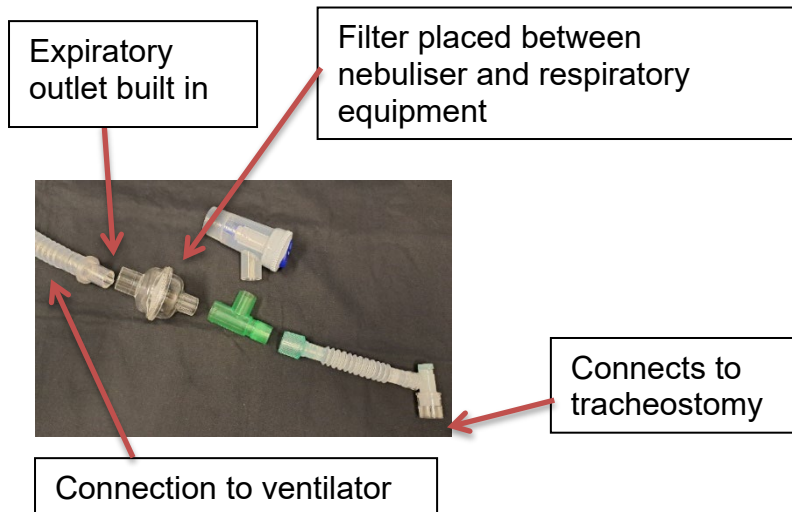


Equipment at SCH is very similar, with only a cirrus nebuliser and t-piece used in place of the Flaem:

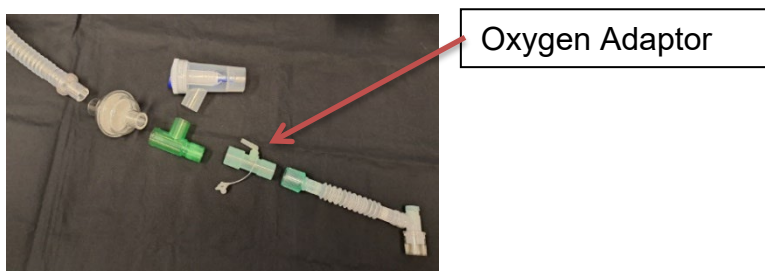


**Patient on ventilator/respiratory support**

**If your child must remain on respiratory support whilst receiving nebulised medication.**



If your child requires oxygen at the same time as the nebulised medication, the oxygen adaptor must be placed between the nebuliser and the patient attachment as below.



**NB: FLAEM neb, T piece and filter available for purchase from appliance centre at CHW. Oxygen adapter available from inhalation centre through your treating team. Your child should already have the respiratory support equipment.**