

Administering nebuliser for infant on ventilator or CPAP in Newborn Intensive Care Unit (NICU)

Procedure Responsibilities and Authorisation

Department Responsible for Procedure	Newborn Intensive Care Unit
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Target Audience	Nurses
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Procedure Review History

Version	Updated by	Date Updated	Summary of Changes
2	Christine Woolerton	Oct 2012	Due for review
3	Joyce Mok	Mar 2015	Due for review
4	Richard Pagdanganan	Sep 2019	

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1 Overview

1.1 Purpose

To deliver aerosol treatment by a nebuliser for infants on mechanical ventilation or CPAP. This procedure is based on the best practice guidelines according to Lippincott Procedures.

1.2 Scope

Waikato District Health Board (DHB) staff working in Newborn Intensive Care Unit (NICU)

1.3 Patient / client group

Neonates and infants in NICU

1.4 Definitions

Aerosol Treatment	Delivers medication directly into the lungs. When gas from the nebuliser is pushed through the tubing into the medicine chamber, the medicine breaks into small particles, creating a fine mist that infant inhales via the ventilator or CPAP. It allows rapid achievement of high concentration of therapeutic agents in the pulmonary epithelial lining and bronchial field.
CPAP	Continuous Positive Airway Pressure
Nebulisation	A method of converting a medicine or solution into an aerosol which is inhaled directly into the lungs.

2 Clinical Management

2.1 Competency required

- Registered Nurse who has completed Level 3 orientation and obtained competency.

2.2 Equipment

- Nebuliser circuit (In the Equipment Room in a yellow tray above the CPAP circuits) as appropriate (ventilator/CPAP)
- Prescribed medication
- Syringes
- Flow meter (for ventilated infant)
- Gloves

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Note:

- For some medications, e.g. antibiotics, special mask and nebuliser and filter may be provided by Respiratory Nurse Specialist (Waikids Clinic): send referral and call her to request her support and instructions for administration.
- Precautionary measure with nebulised antibiotics includes the need to filter the exhaled gas to prevent the nebulised antibiotic circulating in the room air to avoid antibiotic resistance developing.

2.3 Procedure

2.3.1 Prepare equipment

- Collect the nebuliser and set up the circuit as per the instruction inside the pack and as picture shown below.
- Ensure all connections are secure.



2.3.2 Gas supply for nebuliser

- Ensure gas flow is delivering the same oxygen percentage as the infant's oxygen requirement to prevent the danger of tissue hypoxia and oxygen toxicity.
- Manufacturers' guidance should be adhered to, but generally the gas flow rate should be 6-8 L/ minute to produce sufficiently small particles throughout the 5 to 10 minutes of a typical administration.

2.3.3 Preparations

- Perform hand hygiene.
- Put on gloves to prevent exposure to aerosols, medications, and patient-generated droplets.

Doc ID:	3227	Version:	04	Issue Date:	7 OCT 2019	Review Date:	7 OCT 2022
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2.3.4 Nebuliser for ventilated patients

- Check, administer and document the medication according to the Waikato DHB Medicine Management policy Ref 01388.
- Attach the in line nebuliser kit on both ends of the nebuliser self-sealing piece.
- Fill the nebuliser with medication, using a syringe to measure the amount of prescribed medication and isotonic diluent, e.g. sodium chloride 0.9%.
- Close the chamber.
- Attach the flow meter on the pendent to the nebuliser with the self-sealing piece + clear O₂ tubing.
- Replace the ventilator flow sensor self-sealing T-piece of the nebuliser adapter.
- Set gas flow at 6-8 L/min, and at same inhaled oxygen percentage.



Note:

Ensure that the gas flow is delivering the same oxygen percentage as the infant's oxygen requirement. If the pressure delivered by the ventilator increases during nebulisation, inform the medical team.

- Remove sensor during administration of nebuliser.
- Hold the nebuliser upright and observe infant at all times.
- When the aerosol treatment has finished, restore the ventilator circuit to its original configuration.
- Recalibrate flow sensor.
- Wash the nebuliser with warm running water, rinse the equipment with sterile water, shake off excess water and dry it by oxygen or air.
- Store the equipment in a clean tray, covered by paper guard.
- The nebuliser circuit may be reused for the same patient. It must be cleaned, dried and covered between uses.
- The nebuliser circuit must be changed weekly or earlier if nebuliser performance declines.

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2.3.5 Nebuliser for patients on CPAP

- Assemble the nebuliser circuit following instruction inside the nebuliser circuit for infant on CPAP.
- Attach the in line nebuliser kit on both ends of the nebuliser self-sealing piece.
- Get a spare blender and plug it into the medical and oxygen supply on the pendent.
- Check, administer and document the medication according to the Waikato DHB Medicine Management policy Ref 01388.
- Fill the nebuliser with medication, using a syringe to measure the amount of prescribed medication and isotonic diluent, e.g. sodium chloride 0.9%.
- Close the chamber.
- Connect the clear plastic tubing to the oxygen flow meter of the spare blender and turn the gas flow rate to 6-8L.

Note:

Ensure that the gas flow is delivering the same oxygen percentage as the infant's oxygen requirement.

- Disconnect the CPAP circuit at the site of the patient temperature probe and the blue tubing and connect the nebuliser circuit on the inspiratory arm of the trunk.



Note:

Do not disconnect the nasal prong/mask.

- Hold the nebuliser upright and observe infant at all times.
- When the aerosol treatment has finished, restore the CPAP circuit to its original configuration.
- Wash the nebuliser in warm running water, rinse the equipment with sterile water and dry it by oxygen or air.
- Store the equipment in a clean tray, covered by paper guard.

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- The nebuliser circuit may be reused for the same patient. It must be cleaned, dried and covered between uses.
- The nebuliser circuit must be changed weekly or earlier if nebuliser performance declines.

3 Audit

3.1 Indicators

- Gas flow is delivering the same oxygen percentage as the infant's oxygen requirement
- The infection control of all nebulisers aligns with 2.3.4 / 2.3.5
- All aerosol medication is documented as per the Waikato DHB [Medicines Management](#) policy

4 Evidence base

4.1 References

- Gardenhire, D. S., et al. (2017). A guide to aerosol delivery devices for respiratory therapists (4th ed.). Irving, TX: American Association for Respiratory Therapists. Retrieved from <https://www.aarc.org/wp-content/uploads/2018/03/aersol-guides-for-rts.pdf>
- Leonard E. & Hatler H. (2013). Nebulisation administration. Great Osmond St. Hospital for Children. Retrieved from www.gosh.nhs.uk
- Wolters Kluwer (2018). Nebulized drug administration, pediatric. Lippincott Procedures. Retrieved from <https://procedures.lww.com/lnp/view.do?pld=729420&disciplineId=493>

4.2 Associated Waikato DHB Documents

- Waikato DHB NICU Drug Manual
- Waikato DHB [Medicines Management](#) policy (0138)
- Waikato DHB NICU Nursing Procedure: [Care of Ventilated Infant](#) (0432)
- Waikato DHB NICU Nursing Procedure: [Practical application of nasal bi-prong continuous positive airway pressure \(NPCPAP\)](#) (4939).

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