

Adult Nasal High Flow Therapy Guideline (AIRVO)

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Purpose

To ensure the appropriate and safe use of Nasal High Flow therapy with or without oxygen via Airvo 2™.

Applicability

This document will be used by all Medical Practitioners, Nurse Practitioners, Registered Nurses and Midwives, Physiotherapists, Enrolled Nurses and Student Nurses/Midwives (as per Students Responsibility Policy) working in the CDHB Christchurch hospital campus.

Definitions

Airvo™ : A humidifier with integrated flow generator that delivers warmed and humidified respiratory gases to spontaneously breathing patients through a variety of patient interfaces. All machines in use are the Fisher & Paykel AIRVO 2.

FiO₂: Fraction of inspired oxygen.

NZEWS: New Zealand Early Warning Score as per CDHB policy.

SpO₂: Peripheral capillary oxygen saturation.

Education and training

All staff should be competent with standard oxygen therapy prior to using nasal high flow oxygen – An oxygen therapy health learn package is available.

Specific high flow nasal therapy training will be given in your area as needed, please contact your relevant Clinical Nurse Specialist or Nurse Educator.

When to Consider Nasal High Flow Therapy

- Requiring prolonged nasal oxygen therapy >4Lpm
- High PaCo₂ or known COPD/Chronic Respiratory Disease
- Low SpO₂/PaO₂ with increased work of breathing or respiratory rate
- Airway hydration and maintenance of secretion clearance
- Patients at risk of atelectasis, pneumonia or pleural effusion
- Trauma patients with rib fractures or pneumothorax

Rationale for use

- High flow delivery of oxygen enables maintenance of SpO₂ using an accurate prescribed FiO₂.
- Flushes anatomical dead space to reduce re-breathing of CO₂.
- Humidified oxygen maintains optimal mucocilliary clearance of secretions
- Can make high flow oxygenation more comfortable.
- Higher flow rates can decrease resistance, which may reduce work of breathing, respiratory rate and expelling of PaCo₂.

Nasal High Flow Therapy Settings

Nasal High Flow therapy via the AIRVO 2 available settings:

FiO₂: 21%-60%. Only up to 50% recommended for ward based care.

- Supplemental oxygen can be administered to maintain an accurate prescribed FiO₂ and meet target oxygen saturations.
- Any **oxygen therapy needs to be prescribed** with a FiO₂ range and target saturations.
- The FiO₂ as a default is set at room air (21%).
- To titrate the FiO₂:%: Attach to oxygen supply and adjust the litres of oxygen delivered via the oxygen wall outlet. The FiO₂ percentage delivered, will automatically appear/change on the AIRVO 2 display screen.

Temperature/Humidification: 31-37 Degrees Celsius.

- The temperature as a default is set at 37 degrees for optimum humidification for comfort, airway hydration and secretion clearance.
- This can be adjusted as needed for patient tolerance using clinical judgement.

Flow Rate: 10Lpm-60Lpm. 20-50Lpm recommended for ward based care.

- **The flow rate needs to be prescribed.**
- The flow rate can be increased as needed to reduce work of breathing, respiratory rates and reduce PaCO₂.
 - Maintenance flow rate (Normal adult tidal volume) 30-35L
 - Higher flow rate (40-60L) – Reduces work of breathing, respiratory rate and reduce PaCo₂ level.
- Adjusting the flow rate will change the FiO₂ percentage delivered due to the change in dilution of air. Wall oxygen adjustments may need to be made to maintain the same FiO₂ percentage delivered in this situation. Titrate accordingly using the FiO₂ percentage displayed on the AIRVO 2 screen as a guide.

Using Nasal High Flow Oxygen

- Check nasal high flow oxygen is prescribed by an authorised prescriber (usually medical staff) on Med Chart or the CDHB oxygen and infusions chart: including delivery device, flow rate, FiO₂ range and target saturations for titration.
- The patient should be informed of why they are requiring nasal high flow oxygen and given education on how to manage the delivery device and when to ask for assistance.
- An assessment of the patient's tolerance to nasal high flow oxygen should be made at the prescribed settings and requires discussion with the prescriber if the patient isn't tolerating it.
 - The temperature can be lowered if needed to increase comfort/tolerance.
- Medically unstable patients and/or patients who require oxygen above 35% FiO₂ whilst being transited between areas/departments should be accompanied by a Registered Nurse/Midwife. When specific FiO₂ is required it is recommended to transfer the patient using a Venturi Mask.
 - See CDHB Oxygen Therapy Guidelines for more about transiting patients on oxygen therapy.
- Monitor and document oxygen saturations and the FiO₂ required to meet these saturations as frequently as per the hospital NZEWS pathway or as otherwise outlined by medical staff.
- Assess the patient's respiratory status in response to the treatment as frequently as determined by the NZEWS pathway or outlined by medical team. This includes respiratory rate, work of breathing, accessory muscle use, colour, heart rate and the presence of diaphoresis.

- Escalate any deterioration in NZEWS, clinical concern or if the patient requires a higher level FiO₂ percentage or flow rate delivery above the documented prescription to maintain the target oxygen saturations.
- **ICU outreach must be contacted as per NZEWS score pathway or if requiring a FiO₂ ≥ 50%** to maintain target oxygen saturations unless the patient has been clearly documented as not for escalation of care to ICU.
- Oxygen should be weaned/ stopped if the oxygen saturation is above the target range. When weaning oxygen the sPO₂ should be monitored continuously for at least 5 minutes to ensure the patient maintains the desired saturation range unless otherwise stated in the clinical notes e.g. formal oxygen weaning plan.


Other Considerations

- Use of nasal high flow therapy does not limit a patient's ability to mobilise. Patients can be changed to portable oxygen bottles with nasal cannula or venturi mask for mobilisation, toileting and showering.
- Assess if the patient requires a referral to physiotherapy:
 - Physiotherapy is indicated in patients who require management of airways secretions, which are not cleared by mobilisation/positioning
- The use of any nasal cannula presents a risk of pressure injury to a patient face, head and ears. This risk can be mitigated by;
 - Ensuring the face straps are comfortable
 - Use of the clothing clip to reduce pulling
 - Regular skin checks – focus on nose, cheeks and above ears

Equipment

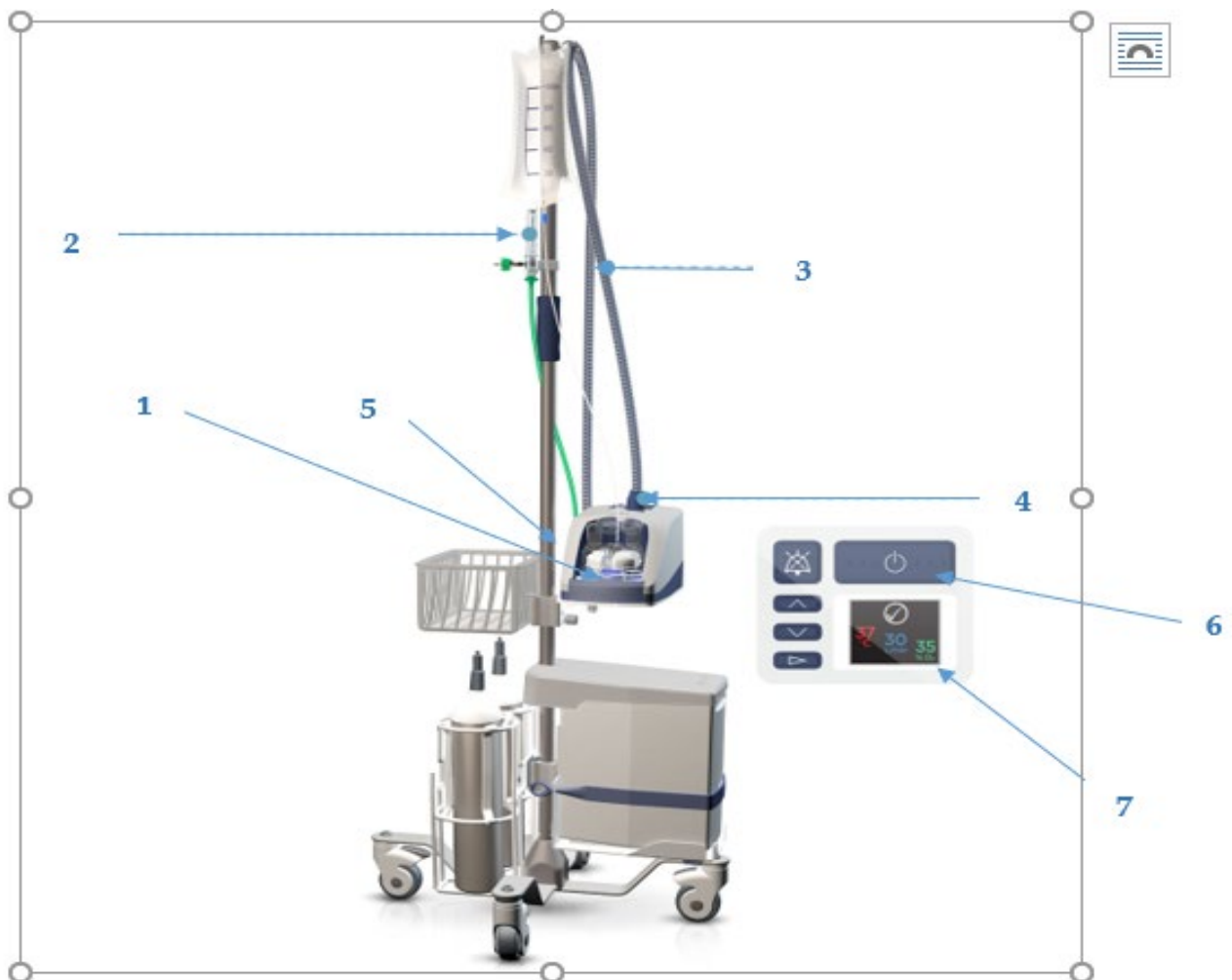
- Oxygen Prescription – Including prescribed target saturations, FiO2 range + Flow rate documented by authorised prescriber.
- Oxygen **extension** tubing
- Fisher & Paykel Optiflow nasal cannula (Adults)
- Heated breathing tube
- Water chamber kit
- AIRVO 2 machine
- Sterile Water for irrigation (3000ml)
- Pulse Oximeter
- IPAD – (Document patient observations)

Setting Up the Airvo *See Airvo 2 Plus User User Manual for more details/picture guide*

- Ensure Airvo machine is secured to a pole securely
- Open and install water chamber:
 - Pull the blue ring to remove clear covers of the chamber
 - Attach the clear plastic connector using the two holes on the top of the chamber
 - With the two hole openings of the plastic connector facing in line with the two blue hole opening's on the Airvo machine insert the chamber into the machine – Ensure the blue lip makes a click when sliding the chamber into place (Arrow 1).
- Hang the bag of water and connect it to the tubing attached to the water chamber and ensure the water begins to fill the chamber (Arrow 2)
- Install the heated breathing tube by clicking the blue connector on to the top of the machine (Arrow 3&4)
- Connect oxygen tubing to the oxygen wall outlet and AIRVO oxygen port on the left-hand side of the machine (Arrow 5).
- Connect the high flow nasal cannula to the other end of the heated breathing tube
- Switch on the unit by holding down the power button (Arrow 6)
- Ensure the Airvo has been decontaminated (This will display on the screen when turning on).
- The unit will warm up and the display screen will show the default settings including the temperature, flow rate and FiO2 percentage (Arrow 7).
- Adjust the setting's accordingly as per the prescription and patient's needs.
- Wait until the screen is ready for use and confirm all the settings are correct before finally connecting the high flow nasal cannula to the patient.
- **To adjust the temperature or flow rate:** use this button  to scroll through the settings and select which one you want to adjust and once its displayed on screen hold down both the up

^ and down v buttons for three seconds to unlock the screen and then use these same keys to make your adjustments accordingly.

- Airvo components (Chamber and tubing) need to be changed weekly with use and the Airvo 2 machine itself **must be cleaned and disinfected between patients** – See Airvo 2 Plus User Manual for step by step guide (Found on PRISM).



Associated material

Controlled documents

- [Oxygen and Infusion Chart](#)
- [CDHB Oxygen Therapy Guidelines](#)
- [CDHB Early Warning Score \(EWS\) Policy](#)
- [Prescribing Oxygen on Medchart](#)

Supporting material

- [Oxygen Therapy](#) – Health Learn package
- [AIRVO 2 Quick user guide](#) (Available on PRISM)
- [AIRVO 2 Plus User Manual. Fisher and Paykel](#) (Available on PRISM)
- [AIRVO Disinfection Guide](#) (Found on PRISM)
- [Application of AIRVO in cardiology wards](#)