

Non-invasive ventilation device settings: a brief guide



This guide is to assist ED staff in setting initial device parameters and does not replace formal training and education in the use of Non Invasive Ventilation (NIV). The manufacturers guide should be referred to when practicable, and senior clinician advice and assistance sought.

Equipment set up:

- Turn on the NIV machine and air should cycle through the tubing.
- Each setup should have an exhalation port either in the mask itself or as an attachment to the tubing.
- *Ensure that the exhalation port is not blocked otherwise CO₂ cannot escape.*
- Supplement oxygen as required
- Titrate O₂ supplementation using lowest concentration of O₂.
- Aim for a SaO₂ >90% - 1-2 litres of O₂ should be sufficient, as greater concentration may dampen hypoxic drive and lead to CO₂ retention.

Commencing CPAP (continuous Positive Airway Pressure)

- Initial settings in all modes enable the patient to acclimatise to the treatment and permit subsequent increased pressures if required.
- Place the machine in the CPAP mode.
- Set at the prescribed pressure (ie based on previous CPAP treatment or as per treating doctor).
- If pressure is not prescribed set 1cm H₂O per 10kg of body weight e.g.: 7cm H₂O for a 70kg patient (range 7-15cm H₂O).
- This should be increased until oxygen saturation is maintained above 90% and other respiratory and haemodynamic endpoints are achieved.
- Indicators of improved respiratory function may be increased tidal volumes seen on machine graphics, increased comfort for patient, and increased breath sounds on examination, monitor these closely when titrating pressures.

Developed by the ECI based on information provided by Bowral & District Hospital. With thanks to Dr Matthew Bragg, ED Director.

Commencing Bilevel Positive Airway Pressure

- If appropriate, based on the individual machine, set the machine in the spontaneous mode.
- Set the prescribed pressures for both expiratory (EPAP) and inspiratory (IPAP) positive airway pressures.
- If a prescribed pressure is unavailable, set initial EPAP pressures according to the patient's weight which is 1cm H₂O per 10kg of body weight (e.g.: 70kg= 7cm).
- Commence with a pressure support of 5cm H₂O. Pressure support (PS) is the difference between IPAP and EPAP. Therefore IPAP setting will be 5cm above the EPAP setting eg: 70kg patient will have an EPAP of 7cm and an IPAP of 12cm.
- Higher subsequent pressures will often be required and should be adjusted in response to oxygen and carbon dioxide saturations and the patient's effort of breathing with supplementary O₂ to keep SaO₂ >90%.
- If RR is >24 or PaCO₂ remains above 45mmHg or > 5 mmHg above normal for patient (added)increase IPAP by 2cm H₂O incrementally to a maximum of 20cm H₂O.
- Increasing IPAP will reduce the work of breathing, improve tidal volume and eliminate snoring (average required setting is 12-16 cm H₂O).
- The amount of pressure support (i.e. difference between IPAP and EPAP) reduces CO₂ retention and decreases PaCO₂.
- Increasing EPAP by 2cm H₂O at a time will recruit alveoli and improve O₂ saturation (average required setting is 6-10cmH₂O) i.e. for pulmonary oedema, obesity, chronic airflow limitation, persisting hypoxemia or variable upper airway obstruction.

Ongoing Management

The use of NIV can help your patients in a number of clinical situations. Although the application is relatively simple, the physiology can be complex and there are respiratory and cardiovascular implications of using these modalities.

This guide is on the initial setup and you must consult senior clinicians for ongoing management and disposition considerations.

Always closely monitor patients' respiratory and cardiovascular parameters and develop a plan if your strategies are not working.

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