

Derby Hospitals NHS Foundation Trust

Guidelines for Non Invasive Ventilation of ICU Patients

Reference No: CG-T/2014/225

Introduction

Good evidence supports the use of NIV in the following conditions:

COPD
Chest wall deformity
Neuromuscular Disorder
Decompensated obstructive sleep apnoea

NIV has also been used successfully in an ICU setting in other conditions:

Pulmonary oedema (if CPAP/Optiflow has failed)
Pneumonia
Trauma
ARDS
Respiratory failure in neutropenia

By avoiding intubation the incidence of nosocomial infection is certainly reduced with clear evidence of non-invasive ventilation reducing mortality in certain groups of patients.

Aim and Scope

To ensure that patients who undergo non-invasive ventilation are managed optimally in the intensive care unit.

Abbreviations

NIV	Non-invasive ventilation
ASB	Airway Support Pressure
PEEP	Positive End Expired Pressure
CPAP	Continuous Positive Airways Pressure
BIPAP	Bilevel positive airway pressure

Objectives

Personnel will be able to: -

- Identify suitable patients (see below).
- Assemble and apply equipment for each individual patient.
- Set up ventilator for non-invasive ventilation and be confident to judge its effectiveness.

Indications

NIV can play a role in Intensive Care for the following group of patients;

- Patients requiring ventilatory support post extubation.
- Morbid obesity / decompensated obstructive sleep apnoea.
- Neutropenic sepsis.
- Hypercapnic respiratory failure secondary to chest wall deformity (scoliosis) or neuromuscular disease.
- Cardiogenic pulmonary oedema unresponsive to CPAP.
- COPD patients where appropriate.

We would consider NIV in COPD patients with respiratory acidosis (Ph 7.25-7.35) who are otherwise considered for tracheal intubation.

Contraindications

- Patients with severe COPD who would not appropriate for intubation and ventilation in ICU.
- Impaired consciousness.
- Copious secretions.
- Severe hypoxemia for which intubation is imminent.
- Facial burns/trauma
- Vomiting
- Fixed upper airway obstruction
- We would not recommend NIV for severe asthma

Clinical State

- Not moribund
- Able to protect their own airway
- Conscious and co-operative
- Haemodynamically stable
- No excessive respiratory secretions

- No facial burns or facial trauma

How to set up

The decision to start NIV should be after medical consultation.

Prior to commencing NIV perform a blood gas.

- Explain to patient.
- Select a mask to fit patient and hold in place to familiarise patient.
- Commence saturation monitoring.
- **Setting up Evita 4 :-**
- After device check, put into standby mode
- From the menu button , select mask- press control wheel to confirm
- The background status of ventilator changes to green and you may then mode and parameters as normal
- Put on standby.
- Press menu button and choose Tube mask, select mask and press confirm. The background status of the machine will change to green.

Setting up Evita 4XL:

- After device check, put into standby mode
- From standby tabs select Tube/mask tab, select mask and confirm
- No change to screen background colour will be noted(mask ventilation graphic in top right hand corner will be present to signify ventilation mode)
- **Setting up Infinity C500**
- After device check, on standby screen, press start/standby button
- Press Tube/NIV tabs
- Press NIV button and confirm
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Setting vent parameters on start up

- Select Bi level pressure support (most commonly used ASB/CPAP).
- ASB inspiratory pressure. A reasonable inspiratory pressure should be selected. 12 cm H₂O is a suitable starting point. This may be increased as tolerated up to 20 cm H₂O
- PEEP 5cm H₂O.
- Trigger should be set on 5 litres per minute and adjusted according to leaks
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- For large leaks or poor respiratory effort a ventilation mode of BIPAP should be used with a mandatory rate of 15.
- Oxygen should be titrated to maintain oxygen saturation at acceptable levels.
- Commence NIV ,holding the mask in place for the first few minutes then secure mask with straps/headgear
- Ensure that you and the patient know how to remove the mask quickly if required (eg vomiting)

When using Mask mode of ventilation the following alarm levels should be adjusted to avoid problems with persistent air leakage alarms:

MV lower alarm limit.
Vti upper limit inspiratory.
Tapnoea upper limit.

Evaluation of NIV

In most cases where NIV is successful patients respond quickly. This can be seen within 1-2 hours of initiation. If there are no clear benefits after 6 hours, the ongoing need for NIV should be reviewed.

References

Non-Invasive ventilation in acute respiratory failure, British Thoracic Society Standards of Care Committee. Thorax 2002; 57: 192-211

Documentation Control

Development of Guideline:

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