

Non-Invasive Ventilation (NIV) for Adult Patients

Key Points

- This guideline sets out the expected standards of care for adult patients receiving acute non-invasive ventilation (NIV).
- NIV will be provided in specific areas of Frimley Health NHS Foundation Trust.
- Staff that provide acute NIV to patients will be trained and competent.
- Acute NIV will be offered to all patients who meet evidence-based criteria on presentation.
- Acute NIV will start within 60 minutes of the confirming arterial blood gas.

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Abbreviations

ABG	Arterial Blood gas
AGP	Aerosol generating procedure
AHRF	Acute Hypercapnic Respiratory Failure
AVAPS	Average Volume Assured Pressure Support and (AVAPS-AE) with Auto Expiratory pressure
BiPAP	Bi level Positive Airway Pressure
CPAP	Continuous Positive Airway Pressure:
EPAP	EPAP: Expiratory Positive Airway Pressure
IPAP	Inspiratory Positive Airway Pressure
NIV	Non-Invasive Ventilation

Definitions

ABG - Arterial Blood gas: This is the sampling of blood from an artery used to determine the arterial partial pressure of gases (paO₂ and paCO₂) as well as pH, HCO₃, BE, lactate and electrolytes.

AGP - Aerosol generating procedure. An aerosol generating procedure (AGP) is a medical procedure that can result in the release of airborne particles (aerosols) from the respiratory tract when treating someone who is suspected or known to be suffering from an infectious agent transmitted wholly or partly by the airborne or droplet route.

AHRF - Acute Hypercapnic Respiratory Failure: Hypercapnic respiratory failure is diagnosed based on measurements of a patient's arterial blood carbon dioxide > 6.5kpa and pH <7.35.

AVAPS - Average Volume Assured Pressure Support and (AVAPS-AE) with Auto Expiratory pressure: integrates the characteristics of both volume and pressure-controlled non-invasive ventilation. A tidal volume is set and there is a set range of IPAP. The ventilator selects an initial pressure for the first breath then titrates to archive the tidal volume between the set IPAP pressures. In AVAPS AE both the IPAP and EPAP and a variable range.

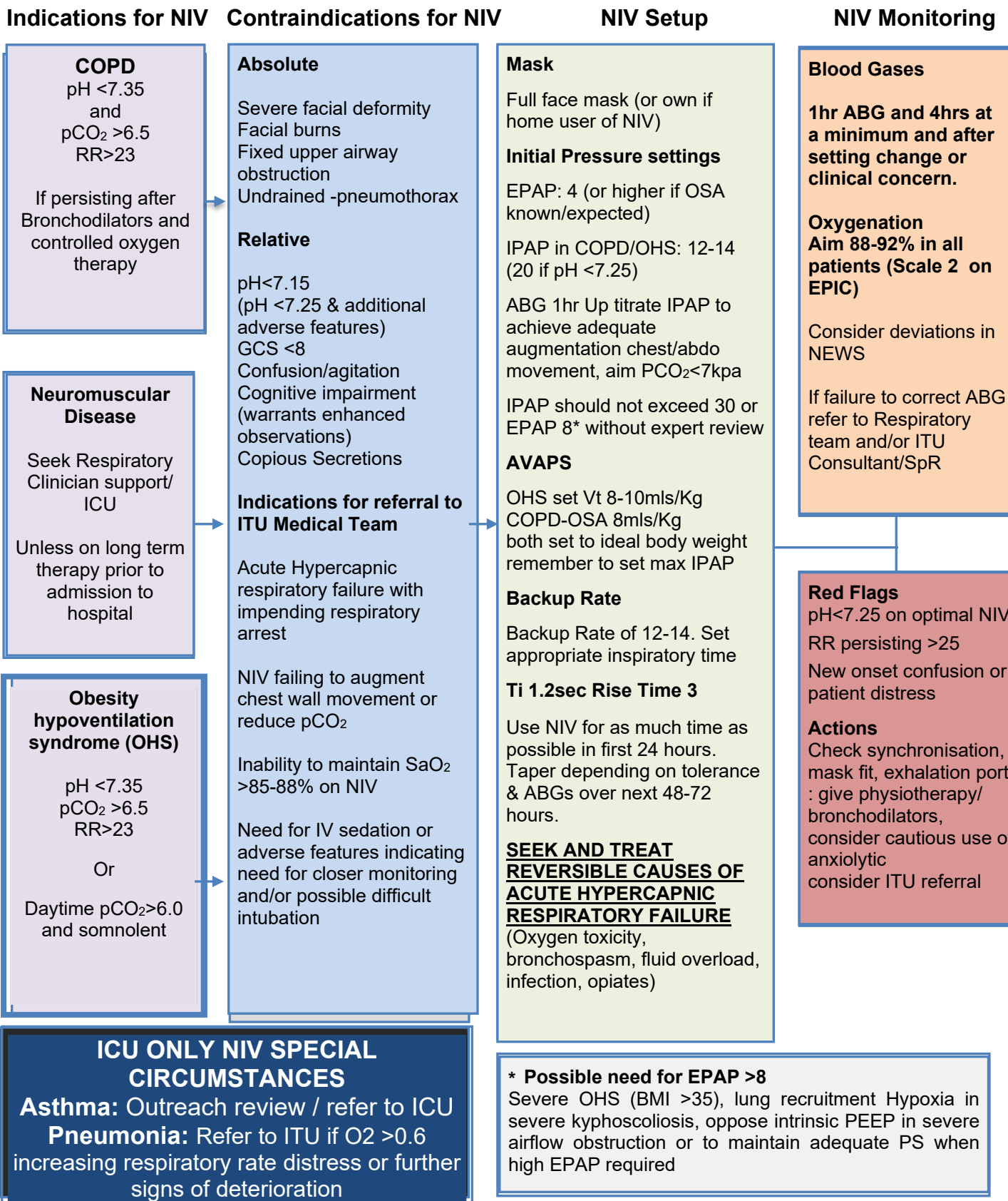
BiPAP - Bi level Positive Airway Pressure: is NIV using two alternating pressures.

CPAP - Continuous Positive Airway Pressure: This is a device delivering continuous air pressure either at a predetermined setting or on an auto titrating device.

NIV - Non-Invasive Ventilation: Ventilation using a mask on the face to deliver a set flow of air/O₂ under pressure. An inspiratory and expiratory pressure is set +/- tidal volumes to support a patient's respiratory cycle.

Summary

Escalation Plan / DNAR Status must be established for all patients commencing NIV



Cardiogenic Pulmonary Oedema - Continuous Positive Airway Pressure (CPAP)

Has been shown to be effective in patients with cardiogenic pulmonary oedema who remain hypoxic despite maximal medical treatment. (Normocapnic)

Caution required in Right Ventricular Failure, cardiogenic shock, agitated patients

Commence CPAP with PEEP at 5-7.5cm H₂O and increase to 10cm as tolerated, following the above guidance.
Continue for 30-60min/Hr until reduction in dyspnoea and saturations are maintained of NIV

Introduction

This guideline applies to all healthcare professionals working within the Trust who provide acute NIV to patients.

Acute NIV will only be carried out in specified clinical areas designated for the delivery of NIV.

- Emergency department
- Medical Acute Dependency Unit
- Intensive Care Unit
- Coronary Care Unit

Outside of these areas, NIV will only be commenced as a temporary measure to stabilise a patient prior to transfer to a designated area. If NIV is started outside of the main areas shown above, an NIV practitioner must stay with the patient at all times. Consider ceilings of care / escalation plan and patient placement at the earliest opportunity,

Local Infection control policies must be followed when using NIV (IPCO2, 2024).

All staff who prescribe, initiate, or make changes to acute NIV treatment must have evidence of training and maintenance of competencies appropriate for their role.

Acute NIV will be offered to all patients where this is appropriate who meet evidence-based criteria on presentation. The Trust must ensure that adequate systems, staffing, and capacity are in place to provide NIV to all eligible patients.

Patients who are in AHRF on admission must start NIV within 60 minutes of the confirming ABG (NCEPOD, 2017). In patients who develop AHRF after admission, NIV must be commenced within 60 minutes of the first ABG showing AHRF.

All patients treated with acute NIV will have ABG analysis performed at one hour, and when NIV titrated at 30-60mins and minimum four hours after initiation; failure of these ABG measurements to improve will trigger specialist review within 30 minutes. A specialist is a healthcare professional with the necessary responsibility and NIV competence to make clinical decisions, including ST3+ doctor/specialist respiratory nurse practitioner / physiotherapist.

All patients treated with acute NIV must have a timely and on-going Respiratory review and a documented escalation plan on the electronic patient record (EPR).

All patients started on NIV will have an NIV treatment plan and recorded NIV observations set out in the electronic patient record system (EPR: EPIC). If there is failure of the EPR system, then a paper chart can be used.

As a basic standard there will be a yearly audit of patients treated with acute NIV.

The Procedure

Patients who may need NIV will have:

- Rapid clinical assessment to establish presence of respiratory distress or requirement for supplemental oxygen.
- An ABG measurement within one hour of arrival to the emergency department, or if already an in-patient with new onset acute respiratory distress.
- NIV within 60 minutes of ABG confirmation that NIV is clinically indicated and on a clinical expert's advice (with skills in respiratory failure and NIV management) in those patients meeting evidence-based criteria (NCEPOD, 2017).

Patients treated with NIV will have a routine ABG performed at a minimum of one hour, and when NIV titrated at 30-60mins and minimum four hours to establish their response to therapy (NCEPOD, 2017).

Failure of these ABG results to improve (pH the same or worse / or PaCO₂ the same or worse) will trigger specialist review within 30 minutes. A specialist is a healthcare professional with the necessary responsibility and NIV competence to make clinical decisions, including ST3+ doctor/specialist respiratory nurse practitioner / physiotherapist.

Patients requiring acute NIV will be cared for in an appropriate location as indicated on page 4 of this guideline. Patients commenced on the ward areas must be managed by an expert in NIV until placement or alternative decisions are made. Patients must be managed by an experienced NIV specialist in every location. Local Infection control policies must be followed when using NIV (IPCO₂, 2024).

All patients considered for NIV will have a documented escalation plan encompassing appropriateness of invasive ventilation, ceiling of treatment, and CPR status before starting NIV.

All patients considered for NIV will have a discussion with a specialist competent in the management of acute NIV at the time treatment is started or at the earliest opportunity afterwards.

All discussion with patients and their carers will be documented in the patient record.

All patients commenced on NIV will have a Specialist* review within four hours of initiation of NIV.

All patients commenced on NIV will have a Consultant clinical review including escalation status within 14 hours of starting NIV.

All patients must have an NIV treatment plan and documented NIV observations. Observations will be documented hourly until the patients ABG is normal.

*A specialist is a healthcare professional with the responsibility and necessary NIV competence to make clinical decisions, including ST3+ doctor/specialist respiratory nurse practitioner / physiotherapist.

Infection Prevention and Control Roles and Monitoring Policy

Local Infection Control policies must be followed when using NIV (Infection Prevention and Control Roles and Monitoring Policy, 2024).

NIV and CPAP are AGPs and therefore consideration must be given to local infection control procedures. Filters may be placed on the machine expiratory port and before the mask/hose ventilation port to reduce the risk of aerosol spread.

Staff providing the care to patients using CPAP and NIV must adhere to the current infection prevention and control guidance. Patients may be cared for in a side room if this is advised by the Infection prevention and control guidance.

Guidance Related to Clinical Decision Making

Mental Capacity and Decision Making

The Mental Capacity Act (MCA) 2005 and amended 2019 provides a legal framework for making decisions on behalf of adult patients who lack the capacity to make the decisions for themselves. The Trust's Shared decision Making and Informed Consent policy has further information and some guidance checklists for capacity and 'best interests' assessments.

The MCA has introduced a number of terms that may affect decisions; these include Advance Decisions and Lasting Powers of Attorney.

References

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Full version control record

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This guideline has been registered with the Trust. However, clinical guidelines are guidelines only. The interpretation and application of clinical guidelines will remain the responsibility of the individual clinician. If in doubt, contact a senior colleague or expert. Caution is advised when using guidelines after the review date.

This guideline is for use in Frimley Health NHS Foundation Trust hospitals only. Any use outside this location will not be supported by the Trust and will be at the risk of the individual using it.

Version History

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1.0	August 2024	Iain Wheatley	Final	

Related Documents

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