

Type 2 Respiratory Failure - V60 BiPAP Guidelines

Initial BiPAP settings

ST Mode

IPAP - 10cm

EPAP - 4cm

Back up rate - 10breaths/min

Select Correct Mask Number (On Pack)¹

Set RISE TIME² at 2 (0.2)

CONSULT WITH MEDICAL STAFF AND
ESTABLISH TARGETS AND PARAMETERS OF
THERAPY

ABG within 15-
30 minutes

Improved?

Yes

No

Adjust Settings

Continue with
current settings

Repeat ABGs as clinically indicated
and after every change

Once ABGs normalised for patient consider
weaning – see suggestions overleaf

Escalation plan

Must be discussed with
ITU as appropriate and
clearly documented in the
notes prior or upon
initiation of treatment

Monitor SaO₂ continuously and check ABGs frequently.
Consult medical staff if patient condition does not
improve or if patient deteriorates.

Management Tips

PaO₂ low but PaCO₂ improved

- CHECK ALL O₂ CONNECTIONS
- increase FiO₂
- increase EPAP (MAX 5cm. NB: 8cm for obese patients only)

PaCO₂ remains elevated

- reduce FiO₂ if P_{O₂} high
- patient/machine asynchrony – check circuit, check for leakage, check mask fit
- ? rebreathing – check exhalation port, consider increasing EPAP (MAX 5cm)
- ? inadequate ventilation – consider increasing IPAP (by 2cm increments - MAX 20-22cm)

PaCO₂ low

- ? is minute volume too high – consider decreasing IPAP
- ? is ventilation still required

Asynchrony

- check rise time² is fast enough for resp rate 1 = 0.1 (fastest) 5 = 0.5 (slowest)
- if tachypnoeic consider increasing IPAP

¹Different mask elbows
available-

Blue for ICU dual limb
ventilators only such as Draeger
V500

Clear for single limb ventilators
such as V60.

Orange for increased leak
allowance such as full face visor

²RISE TIME - speed at which insp pressure rises to set (target) pressure. Acts as a comfort control. Set to the fastest rise time tolerated. 1 = 0.1 (fastest) 5 = 0.5 (slowest)
If RISE TIME is too slow for the resp. rate, target pressure will not be achieved on each breath cycle – Monitor TV and peak pressure.

If the patient has infective respiratory conditions, a filter should be attached to the expiratory flow valve on the tubing.

Critical Care Guidelines FOR CRITICAL CARE USE ONLY

Troubleshooting

Persistently elevated PaCO₂:

Is there excessive leak? **Check mask fit.** Consider total face mask.
Is the system set up correctly? **Check connections** and identify leaks.
Is there re-breathing? **Is the expiratory port patent?**
Consider **increase in IPAP**
Is the patient spending sufficient time on the ventilator? Encourage **longer periods of use.** Address compliance.
Consider **decrease in EPAP** (if very high set level > 8cm H₂O)

Persistent hypoxaemia:

Check **correct O₂** into the circuit
If there is OSA or atelectasis consider **increase in EPAP** (need to **increase IPAP too**, to maintain pressure support)
Deteriorating clinical condition with hypoxaemia should lead to **urgent re-evaluation** with reference to the agreed **escalation plan**
Turn off Ramp as patient may not have reached peak pressures.

Mask Leak:

Large leaks can cause inefficient ventilation, eye irritation, noise, dry mouth and nasal symptoms. Consider trying **different masks** and **headgear**, and customised **foam or granuflex** for comfort

Asynchrony between patient and the machine:

Check **correct tubing** is being used
If the patient is **very tachypnoeic increase in IPAP** may help
Ensure the **IPAP rise time** is appropriate for respiratory rate²

Difficulty inflating the chest:

Maybe due to bronchospasm, mucus plugging, pneumothorax, atelectasis/collapse, consolidation, pulmonary oedema: **Clinical examination** is necessary and possible **CXR**
Rarely is due to **circuit tube obstruction/kinking**: Check the circuit

Nasal problems:

Is there nasal soreness/redness/nasal bridge sores? Appropriate **padding or change of mask** is required
Is there **rhinitis/nasal crusting/bleeding**?

Gastric distension:

Try to reduce IPAP if possible and consider nasogastric tube (accepting a small leak)

Patient position:

Patient should be positioned sitting upright with head up
Consider additional support (soft collar/rolled up towel) if necessary
When using the Fischer and Paykel humidifier, if you need to remove the mask from the patient this **device should always be put on standby. This will stop water from back trapping up the tubing.**

Non cooperative/aggressive behaviour:

Maybe due to **hypoxaemia and/or hypercapnia**, consider holding the mask. Relatives may help. Adjust settings as necessary.
Look at RISE TIME – could it be increased for more comfort and better tolerance?

Sedation must be discussed ONLY with Senior Medical Staff:

Haloperidol might reduce agitation and increase NIV tolerance. Or consider oramorph.

Weaning Considerations

Patients who appear to benefit from NIV during the first few hours of treatment should receive NIV for as long as possible (min 6 hours). In patients who have clinically improved (i.e. improved respiratory rate, heart rate, PaO₂ and PCO₂ with target range and are no longer acidotic), it is appropriate to start a weaning plan. The gradual reduction of the duration of the treatment should be determined by clinical improvement.

Recommendations

- Ideally during the day
- Trial extended periods off NIV for meals, physio and nebuliser therapy first
- DO NOT decrease IPAP/EPAP during weaning
- Focus on extending the time off NIV
- After successful weaning during the day some patients will require an additional night on NIV

Always closely monitor patients during periods of weaning and if condition worsens consider restarting NIV as soon as possible and inform medical staff. Always consider the indications (see Critical Care

**Critical Care Guidelines
FOR CRITICAL CARE USE ONLY**

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