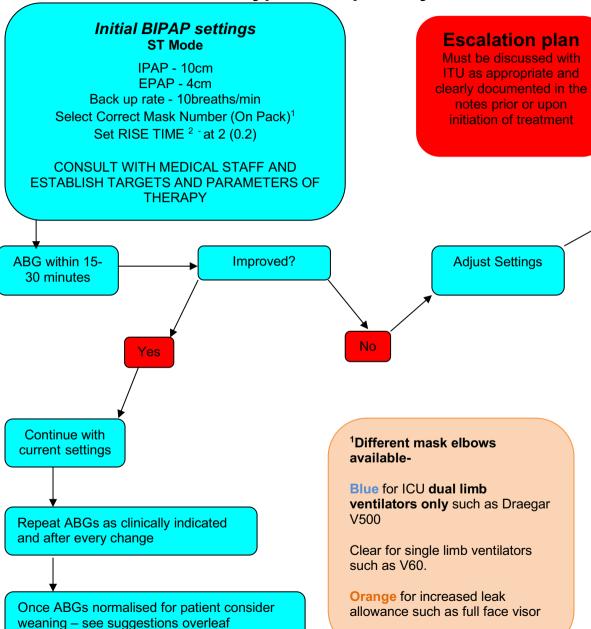
## Critical Care Guidelines FOR CRITICAL CARE USE ONLY



## Type 2 Respiratory Failure - V60 BiPAP Guidelines



Monitor SaO<sub>2</sub> continuously and check ABGs frequently. Consult medical staff if patient condition does not improve or if patient deteriorates.

## **Management Tips**

### Pa0<sub>2</sub> low but PaC0<sub>2</sub> improved

- CHECK ALL 02 CONNECTIONS
- increase Fi0<sub>2</sub>
- increase EPAP (MAX 5cm. NB: 8cm for obese patients only)

#### PaC0<sub>2</sub> remains elevated

- reduce Fi02 if P0<sub>2</sub> 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)

#### PaC0<sub>2</sub> low

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

## Asynchrony

- check rise time<sup>2</sup> is fast enough for resp rate 1 = 0.1 (fastest )5 = 0.5 (slowest)
- if tachypnoeic consider increasing IPAP

<sup>2</sup>RISE 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.

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#### **Troubleshooting**

#### Persistently elevated PaCO<sub>2</sub>:

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 O<sub>2</sub> 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 rate <sup>2</sup>

#### 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,  $PaO_2$  and  $PCO_2$  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

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