Acute Continuous Positive Airway Pressure Guideline

Approved By: Policy and Guidelines Committee

Date of Original Approval: 2002


Version:

Supersedes: April 2017

Trust Lead: Clair Sandy Senior DART Nurse Carrie Hayhurst DART Matron

Board Director Lead: Andrew Furlong Medical Director

Date of Latest Approval: 16th October 2020

Next Review Date: October 2023
REVIEW DATES AND DETAILS OF CHANGES MADE DURING THE REVIEW

Owing to the current COVID-19 pandemic, a lot of information has been included as the way CPAP is used in this cohort of patients is different from usual practice. This has needed to be reflected in this policy. This policy will also be specific to acute CPAP only- there will need to be a separate policy to cover chronic CPAP patients.

Also due to the unpredictable COVID-19 situation, this policy will be reviewed on a 3 month rolling basis so as to reflect changes in practice and include most current evidence base.

KEY WORDS

CPAP

1 INTRODUCTION AND OVERVIEW
1a) This document provides guidance for Healthcare Professionals in identifying patients who require Acute Continuous Positive Airway Pressure (CPAP), initiating the treatment and then the on-going management for patients requiring CPAP.

1b) CPAP will be delivered via either the Maxtec system or NIPPY 3+

1c) CPAP therapy is used for patients who are suffering from an acute type 1 respiratory failure (PaO2 <8kPa with a normal or low PacO2).

1d) CPAP is a form of positive airway pressure. It applies a pre-set positive pressure- PEEP, throughout the respiratory cycle whilst breathing spontaneously and increases functional residual capacity by a pneumatic splinting effect on the airways, therefore:
   • Reduces work of breathing
   • Improves atelectic lung
   • Improves ventilation and oxygenation.

1e) CPAP also improves cardiovascular and pulmonary function in acute pulmonary oedema.

2  **POLICY SCOPE –WHO THE POLICY APPLIES TO AND ANY SPECIFIC EXCLUSIONS**

2a) This guideline applies to all UHL staff authorised and competent to care for patients requiring CPAP therapy.

2b) There are designated non-ITU areas within the trust that can provide care for patients requiring CPAP therapy. These areas have received specific training and have practitioners who are competent in the initiation and ongoing management of patients with CPAP.

DART can inform the referring clinician of these areas on request.  
LRI site: ACB, ED Resus & Infectious Diseases Unit.  
GH site: CCU, Ward 20, 26 HDU & Ward 35  
LGH site: 15 Acute & ITU HDU

2c) Patients who require CPAP at the LGH site will be commenced on CPAP by DART or the OOHRT team and if required long term (greater than six hours) will require transfer to an appropriate non-ITU area competent in CPAP (unless ITU admission is indicated).

2d) CPAP must only be prescribed by Medics/Intensivist at SpR level and above, DART practitioner or other competent staff member. It is also accepted that in areas of specialist skill ie. In RRCV, CPAP may be prescribed and utilised outside of this policy

2e) CPAP can be commenced by DART, OOHRT or the ward nursing/medical team if competent. If staff on the ward are not competent in caring for patients on CPAP, the therapy will not be delayed. The patient will be managed by DART or OOHRT until they can be transferred to an appropriate clinical area. DART currently provide a 24 hour seven day a week service at all three hospital sites.

3  **ROLES AND RESPONSIBILITIES – WHO DOES WHAT**
3a) DART will review and commence CPAP therapy on patients that require CPAP where needed in collaboration with the patients’ parent team. Specific roles and responsibilities of DART include:

- The maintenance, storage and servicing of CPAP equipment. Also the respiratory physiotherapy service and Acute Respiratory Response Team have a centralised stock of equipment and consumables at the GH

- Setting up the CPAP equipment and commencing it on the patient. It is acknowledged that local procedures may be in place for those non-ITU areas that regularly commence and manage CPAP. These patients will still require referral to DART for follow up and ongoing support

- DART will ensure that designated nursing staff are competent and educated on issues such as trouble shooting alarms, achieving the correct oxygen delivery, risks and complications of CPAP therapy and completing the correct documentation (See appendix ? for CPAP monitoring chart.)

- STARTED care bundle sticker (appendix 3) to be completed and inserted into patients notes on commencement of CPAP for management of COVID-19. Review of actions minimum 12 hourly.

- Setting oxygen parameters according to the clinical need based on oxygen saturations and arterial blood gas results.

- The continuous monitoring of the patient receiving CPAP whilst under the care of DART until the treatment is no longer required.

3b) Responsibilities within UHL:

- Guideline Lead- Deteriorating Adult Response Team Matron
- Trust Lead – Medical Director
- Input from Deteriorating Patient Board

4 GUIDELINE STANDARDS & PROCEDURES

4a) Inclusion criteria (if any present in non-COVID-19 Suspected):

- Remains hypoxic after treatment with the appropriate supplementary 02. (Pa02 <8kpa & Sp02 <94%).

- Respiratory rate >28 breaths per minute, with associated type 1 respiratory failure

- Cardiogenic pulmonary oedema with hypoxia. (Sp02 <94%) – Diuretics and/or Nitrates should be considered at the same time.
• Atelectasis.
• Upper abdominal surgery causing post-operative restrictive defect in pulmonary function.

4b) Inclusion criteria- COVID-19 suspected or swab positive

• Respiratory tract infections causing hypoxia ie. COVID-19. Failure to maintain sats >92% on 10l oxygen for COVID-19 patients for escalation to ITU/intubation and sats<88% or increased work of breathing on 10L oxygen if not for escalation to ITU and COVID-19

All COVID-19 suspected or confirmed positive patients being considered for CPAP should have a documented Clinical Frailty Score and the parent team/clinician should refer to the NICE COVID-19 Rapid Guideline (Appendix 4)

• Please also see attached Escalation of Respiratory Support Decision Aid (Appendix 5) for guidance when deciding whether escalation to CPAP is appropriate in this instance.

NHS England guidance for the role and use of non-invasive respiratory support in adult patients with COVID-19 (confirmed or suspected) can be found here-


4c) Special infection prevention precautions should be taken for any patients requiring CPAP due to the risk of aerosol generation through the procedure (AGP). Current requirements stipulate the patient must be in a negative or neutral pressure side room and all staff interacting with the patient require level three PPE.

❖ This is in accordance with Public Health England guidance to be found here- https://www.gov.uk/government/publications/wuhan-novel-coronavirus-infection-prevention-and-control#ppe-guidance-by-healthcare-context

❖ The CPAP circuit must be set up as shown in Appendix 6 with viral filter changed a minimum of every 24hrs. This circuitry includes a non-vented full face mask, hood or welder’s style mask (nasal CPAP is not acceptable due to AGP risk), tubing complete with viral filter and expiratory port. All non-vented masks will also have an anti-asphyxiation device in the elbow as a safety feature.

4e) Contraindications to CPAP (Absolute)

• Patient refusal.
• Respiratory or Cardiac arrest.
• Agonal respirations.
• Major trauma (i.e. head injury with increased intra cranial pressure)
• Inability to maintain airway patency due to reduced GCS
• Broncho-pleural fistula.
• Surgical anastomosis involving intra thoracic procedures, including but not limited to oesophagus/stomach/trachea and larynx (i.e. oesophagectomy/gastrectomy/Ivor Lewis procedure).
In these cases, it is essential to refer these patients to an appropriate specialist, ITU or DART to discuss the patient’s requirements and possible alternative therapies. These patients should be managed within the ITU or an appropriate ceiling of care put in place by way of Respect form.

4f) Contraindications to CPAP (Relative)

The following patients are considered high risk or inappropriate for CPAP in non-ITU areas.

ITU or DART must be contacted before commencing CPAP for patients with one or more of the following:

- Patients with respiratory failure that may be due to hypoventilation (i.e. patients with elevated PC02 levels and/or respiratory acidosis- e.g. asthma/COPD).
- Respiratory muscle failure.
- Kyphoscoliosis.
- Hypoventilation.
- Reduction in GCS or a risk of aspirating.
- Acute asthma and bronchospasm
- Facial abnormalities or trauma (burns, fractures).
- Vomiting.
- Lung bullae.
- Emphysema.

Caution applying CPAP

Caution must be taken in the following circumstances.

- Acute myocardial infarction
- Hypotension (BP <80mmHG systolic) or unstable CVS.
- Intermittent CPAP can be used in patients who have excess secretions. (Two hours on, two hours off).

In these cases, the benefits may outweigh the risk.

Once CPAP therapy has been agreed by the parent team, Intensivist and/or DART, this decision must be documented in the patient’s medical notes and CPAP prescription completed.

4g) Commencing CPAP

- DART can commence CPAP on patients (when the decision for CPAP has been deemed appropriate and proportionate by the parent team/senior clinician responsible for the patient) and can provide all equipment required for this, if the non-ITU area does not stock these items. Equipment, consumables and support can also be accessed via the respiratory physiotherapy team.

- If a patient requires transfer to another area whilst on CPAP therapy, a discussion by the accepting area at SpR level should take place and with inclusion of DART also.

- The Adult Intensive Care Consultant must be informed of any patients on CPAP therapy if the patient would be a candidate for Intensive Care admission. This should be by way of formal referral to ITU following local processes for referral.

- The Adult Intensive Care Consultant will decide if the patient is to be admitted to the Intensive Care Unit if the patient does not respond to the CPAP therapy.

- On commencement of CPAP it is imperative that a discussion around escalation happens (wherever possible with the patient themselves). A documented plan for escalation (or non-
escalation) must be entered into the notes and completion of a ReSPECT form expressing patients’ wishes should be completed.

5) Specific management and care whilst using CPAP

- Baseline observations pre CPAP therapy must be taken and entered into NerveCentre via eobs
- Continuous Sp02 monitoring.
- Observations recorded as per NEWS2 criteria but a minimum of 4hrly when stabilised on CPAP
- An ABG should be performed before commencing CPAP therapy and repeated one hour post commencement and considered if suggested by DART, respiratory physiotherapy or the parent team thereafter.
- Conscious level, either using GCS or AVPU prior to treatment and continuously during therapy as documented on NerveCentre eobs.
- Hourly checks on flow of gas into the system, temperature and water level of humidifier (if using Maxtec system) If using NIPPY 3+ system ensure correct PEEP, ventilation mode, check integrity of the circuit and ensure viral filter is not soiled/wet.
- Assessment of pressure areas on face/ears and head/mask fit. (The use of siltape to prevent pressure sores).
- A record of CPAP observations and safety checks must be maintained and recorded on the CPAP prescription and monitoring chart.
- Completion of STARTED CPAP care bundle sticker and recorded in notes (Appendix 3)
- Ensure correct mode of oxygen delivery is recorded onto NerveCentre (for surveillance purposes) and accurately documented amount of oxygen delivered.
- Accurate recording of level of respiratory support on patient's NerveCentre handover profile.
- Maintain accurate fluid balance chart.

6) Common issues

<table>
<thead>
<tr>
<th>2.3.2 Potential Complications</th>
<th>Cause</th>
<th>How to Avoid/ Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemodynamic Instability</td>
<td>Increased intra-thoracic pressure and decreased venous return.</td>
<td>Do not give CPAP to patients with systolic &lt;90mmHg unless benefit outweighs the risk. Optimise fluid balance- consider IV fluid challenge if appropriate</td>
</tr>
<tr>
<td>Risk of Aspiration</td>
<td>Gastric distension and vomiting.</td>
<td>Patients who develop gastric distension or are nauseas should have a NG tube (wide bore if required for gastric decompression) inserted and put on free drainage. Regular anti-emetics should be prescribed for nausea.</td>
</tr>
</tbody>
</table>
Ensure patient is alert and able to remove mask if needed.

Anxiety and Confusion.  Claustrophobia, unpleasant feeling and may feel it is more difficult to breath.  Reassurance and encouragement. Reinforce the benefits of the therapy. Careful consideration of pharmacological therapies to aid treatment compliance- low dose opiates or benzodiazepines may provide management of symptoms such as dyspnoea or anxiety. Extra care must be taken with patients entered into COVID-19 trials for eg, lopinavir-ritonavir increases benzodiazepine uptake.

Pressure Sores  Mask fits very tightly with elastic straps.  Slitape around areas where mask is sitting.  Check areas hourly. Consider the use of CPAP hood (extra caution to be taken in COVID-19 pts)

Acidosis  CPAP may worsen respiratory or uncompensated metabolic acidosis, due to the continuous positive pressure impairing elimination of C02.  CPAP may not be suitable. Consider carefully whether this is the patients' ceiling of therapy or not.

Drying of Conjunctiva  Due to where mask sits.  Reassess type, size and fit of mask. Consider eye drops/artificial tears

Drying of oral and nasal mucosa  Due to high flow 02.  Perform regular mouth care and consider nasal drops.

7 Education and Training Requirements

- Attendance of a DART CPAP study day with achieved competence
- Evidence of documented competence from a level 2 or 3 area
- Demonstrate an understanding of Arterial Blood Gas analysis
- Demonstrate an understanding of Respiratory physiology
- Only develop practice in relation to the appropriate part of their registration
- Accept accountability for their practice
- If staff cannot show competence in caring for CPAP then they should not be solely responsible for caring for the CPAP patient.
- These competencies apply to all registered staff working in the before mentioned areas deemed able to accept and care for CPAP patients.

8 Process for Monitoring Compliance

9 Equality Impact Assessment

9a) The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs.

9b) As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.
10 SUPPORTING REFERENCES, EVIDENCE BASE AND RELATED POLICIES

- Dr Sonya Craig and Dr Sophie West (2020) Guidance regarding coronavirus (COVID-19) and Obstructive Sleep Apnoea (OSA): for people who routinely use continuous positive airway pressure (CPAP), their families and health care workers.

- A Craig Davidson,1 Stephen Banham,1 Mark Elliott,2 Daniel Kennedy,3 Colin Gelder,4 Alastair Glossop,5 Alistair Colin Church,6 Ben Creagh-Brown,7 James William Dodd,8,9 Tim Felton,10 Bernard Foêx,11 Leigh Mansfield,12 Lynn McDonnell,13 Robert Parker,14 Caroline Marie Patterson,15 Milind Sovani,16 Lynn Thomas,17 (2016) BTS/ICS guideline for the ventilatory management of acute hypercapnic respiratory failure in adults BTS Standards of Care Committee Member, British Thoracic Society/Intensive Care Society Acute Hypercapnic Respiratory Failure Guideline Development Group, On behalf of the British Thoracic Society Standards of Care Committee

- COVID-19 and Palliative, End of Life and Bereavement Care in Secondary Care. Role of the specialty and guidance to aid care V1.0. Association of Palliative Medicine, Northern Care Alliance NHS Group. (https://apmonline.org/ - online version evolving with time)

- Withdrawal of Assisted Ventilation at the request of a patient with MND. Association of Palliative Medicine, 2015.


11 PROCESS FOR VERSION CONTROL, DOCUMENT ARCHIVING AND REVIEW

10a) This document will be uploaded onto the Policy and Guideline Library and available for access by Staff through INsite. It will be stored and archived through this system.

10b) This policy will be reviewed on a rolling 3 month basis.

12 LEGAL LIABILITY

The Trust will generally assume vicarious liability for the acts of its staff, including those on honorary contract. However, it is incumbent on staff to ensure that they:

- Have undergone any suitable training identified as necessary under the terms of this policy otherwise.
- Have been fully authorised by their line manager and their CMG’s to undertake the activity.
- Fully comply with the terms of any relevant Trust policies and/or procedures at all times.
- Only depart from any relevant Trust guidelines providing always that such departure is confined to the specific needs of individual circumstances. In healthcare delivery such
departure shall only be undertaken where, in the judgement of the responsible clinician it is
fully appropriate and justifiable - such decision to be fully recorded in the patient's notes.

It is recommended that staff have Professional Indemnity Insurance cover in place for their own
protection in respect of those circumstances where the Trust does not automatically assume
vicarious liability and where Trust support is not generally available. Such circumstances will include
Samaritan acts and criminal investigations against the staff member concerned.
Suitable Professional Indemnity Insurance Cover is generally available from the various Royal
Colleges and Professional Institutions and Bodies. For further advice contact: Head of Legal
Services on 0116 258 8960.
### CPAP PRESCRIPTION AND MONITORING CHART

<table>
<thead>
<tr>
<th>Ward:</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Prescribed Start Date:</td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td></td>
</tr>
<tr>
<td>Infection Prevention Status:</td>
<td></td>
</tr>
<tr>
<td>Please request Medical Review if:</td>
<td></td>
</tr>
<tr>
<td>Resp Rate:</td>
<td></td>
</tr>
<tr>
<td>NEWS2 score:</td>
<td></td>
</tr>
<tr>
<td>SpO2:</td>
<td></td>
</tr>
<tr>
<td>ACVPU:</td>
<td></td>
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<tr>
<td>Patient ID Label:</td>
<td></td>
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</table>

**Device Used to Deliver CPAP:**

Please Review Hourly for the First 4 hours and request a senior review.

**Target SpO2:**

DART Nurse informed: Yes / No / N/A

**Prescribed PEEP:**

Prescribers Signature / Print:

**Escalation Plan:**

Site: LRI / LGH / GH / ED

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Oxygen % Or Flow Rate</th>
<th>SpO2</th>
<th>Resp Rate</th>
<th>HR</th>
<th>BP (↑PEEP can cause Hypotension)</th>
<th>PEEP (Check the valve is working)</th>
<th>Safety Valve &amp; Viral Filter Insitu</th>
<th>Siltape Insitu/Facial PA’S Checked</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>02/03/16 Example</td>
<td>18:00</td>
<td>60</td>
<td>94%</td>
<td>26</td>
<td>89</td>
<td>110/65</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>J. Bloggs</td>
</tr>
</tbody>
</table>

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**Appendix One**
<table>
<thead>
<tr>
<th>Skin</th>
<th>Completed: Y/N</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>&gt; Assess skin integrity minimum every 4hrs especially under CPAP mask</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(use alabage if needed)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; Ensure BESTSHOT is completed as per UHL guidelines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; Eye care [Alabage cleaning consider artificial tears]</td>
</tr>
<tr>
<td>Thrombo-prophylaxis</td>
<td></td>
<td>&gt; Assess all pts for appropriate VTE prophylaxis</td>
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<tr>
<td></td>
<td></td>
<td>&gt; Ensure VTE assessment is completed</td>
</tr>
<tr>
<td>Analgesia/Anxiety</td>
<td></td>
<td>&gt; Are symptoms being managed adequately?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; Contact palliative care for input if needed via switchboard</td>
</tr>
<tr>
<td>Renal Care/Feeding</td>
<td></td>
<td>&gt; Monitor bloods for signs of AKI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; Catheterise whenever possible</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; Insert NG tube and refer to dietician for feeding regime. If out of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>hours please prescribe supplements to be given as a bolus via NG tube</td>
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<tr>
<td></td>
<td></td>
<td>&gt; Ensure adequate IV/NG fluid prescribed</td>
</tr>
<tr>
<td>Therapy Aims</td>
<td>Palliation</td>
<td>&gt; Clearly document target SPO2 range and frequency of observations</td>
</tr>
<tr>
<td></td>
<td>Active Treatment</td>
<td>&gt; Please tick aim for CPAP therapy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; Consider possibility of awake proning (contact DART/structure)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; Liaise with physio/DART for weaning plan if appropriate</td>
</tr>
<tr>
<td>Escalation Plan Review</td>
<td></td>
<td>&gt; Is there a valid and up to date RESPECT form in place?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; Have NOK been updated (minimum every 24hrs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; Is CPAP ceiling of care?</td>
</tr>
<tr>
<td>Discussion</td>
<td></td>
<td>&gt; Ensure a senior review minimum of every 24 hours to discuss benefit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>or continuing current therapy.</td>
</tr>
</tbody>
</table>

For support with any CPAP needs please bleep DART on 5293 IRL 2808 (GH) 3457 LGH

If the patient is for ITU escalation then referral to on call ITU consultant should be made as early as possible.

DART CPAP Care Bundle: Version 1
COVID-19 rapid guideline: critical care
(Last update: 27 March 2020)

Assess frailty

Patient aged over 65, without stable long-term disabilities (for example, cerebral palsy), learning disabilities or autism: use Clinical Frailty Scale (CFS) score as part of a holistic assessment.

Any patient aged under 65, or patient of any age with stable long-term disabilities (for example, cerebral palsy), learning disabilities or autism: do an individualised assessment of frailty. Do not use CFS score.

Consider comorbidities and underlying health conditions in all cases.

Adult admitted to hospital

More frail based on assessment:
- for example, CFS score of 5 or more

Critical care considered appropriate

Initial management outside of critical care

Condition improves

Ward-level care safe currently: continue to review

Condition deteriorates

Refer to critical care

Critical care not considered appropriate

Initial management outside of critical care

Condition improves

Ward-level care safe currently: continue to review

Condition deteriorates

End-of-life care

Less frail based on assessment:
- for example, CFS score under 5, AND would like critical care treatment

Initial management

Ward-level care safe currently: continue to review

Care detail

This is a summary of the advice in the NICE COVID-19 rapid guidelines. For full information, please refer to the guideline.

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Appendix Five
Use of oxygen therapy for adult inpatients during COVID-19 pandemic

This is clinical guidance to help ensure efficient usage of oxygen

Candidate for Escalation to ICU?

NO

Titrate O₂ therapy to target saturations of 88-92%

YES

Titrate O₂ therapy to target saturations of 92-94%

Refer ICU if SpO₂<92% and RR>20 (or significant tiring) and O₂ flow>8L/min

1. Face mask (4-10L/min)

O₂ therapy should be the lowest required to achieve targets and escalated/de-escalated as follows:

1. Nasal cannula (0.5-4L/min)
2. Non-rebreath mask (10-15L/min)

Avoid venturi devices if possible

If CPAP indicated, consider using NIV to deliver therapy as this permits lower oxygen flow rates

If using CPAP re-assess early (see over) to determine effectiveness and consider whether treatment should continue
CPAP Via Facemask with Humidifier

20 cmH₂O Safety Valve

Tubing to Bag of Sterile Water

Flow Meter

FiO₂ Calibrator

Flow and FiO₂ Knobs

Flow Guard Anti-Viral Filter

Heated Humidifier

Tubing from Humidifier

Resuscitation Mask

Slot for Temperature Probe

PEEP Valve

Straps

Flow Guard Anti-Viral Filter
CPAP Weaning guidance in Non-COVID patients

Is the patient receiving CPAP stable? Is the BP, conscious level, resp rate, sats, heart rate consistently stable?

Yes

Is the PEEP >5cm H2O?

Yes

Reduce PEEP by 2.5cm H2O until PEEP 5cm H2O is reached

No

Trial off CPAP onto high flow at the same fIO2

Have the observations/NEWS2 remained stable?

Yes

No

Continue to wean fIO2 to achieve target sats

Return to CPAP as previously