

BTS/ICS Guidance: Respiratory care in patients with Acute Hypoxaemic Respiratory Failure associated with COVID-19

This guidance refers to the use of Continuous Positive Airway Pressure (CPAP), High-Flow Nasal Oxygen (HFNO) and Non Invasive Ventilation (NIV) therapy for patients with acute hypoxaemic respiratory failure secondary to COVID-19. Patients with COVID-19 may be looked after on general wards, respiratory support units (RSU) or critical care units and this document offers guidance for which patients could be looked after in non-critical care settings and what criteria should be used for escalation to areas with higher acuity treatments. (See Appendix 1 COVID-19 Respiratory Support Pathway Flowchart)

The trigger for consideration for escalation of patients on general wards to an RSU should be the inability to maintain oxygen saturations $\geq 94\%$ on an inspired oxygen $< 40\%$. Careful consideration as to the suitability of escalation to RSU should be made at senior level (ST3+ and after discussion with the consultant overseeing the patient's care) and following consultation with respiratory and/or critical care medicine.

Specifications for Respiratory Support Units will be published by BTS and ICS early in 2021. Units should meet the following criteria.

Structures

- Appropriate Infection Control Precautions should be in place including: Isolation facilities where required, PPE appropriate for AGP, CPAP/NIV circuit set up as per BTS guidance.
- Oxygen utilisation—Liaison with medical gas committee or oxygen engineering team is required before establishing an RSU.
- Multiple open respiratory circuits may increase ambient oxygen concentrations. Consideration should be given to ambient oxygen concentrations, ventilation, humidity and fire risk.

Treatment

A locally developed acute CPAP/HFNO/NIV protocol (based on published best practice guides) should be uniformly applied across all areas.

Patients treated with CPAP/HFNO/NIV will benefit from a team approach using the collective expertise gained by respiratory and critical care multidisciplinary teams during the first wave in March 2020.

Staffing

A clinical lead for each of respiratory medicine, nursing and physiotherapy should be identified.

All staff should have appropriate experience and demonstrable competence in the management of non-invasive respiratory support.

Staffing ratios should reflect the acuity of support required and where patients are dependent upon NIV, staffing should follow BTS guidance for acute NIV delivery.

Equipment

In general terms, units should be equipped with devices/monitoring to meet the [BTS/ICS guidelines](#) and [BTS standards for acute NIV units](#).

NIV/CPAP machine and monitor alarms should be tailored for each patient with disconnect alarms activated.

All patients on CPAP/HFNO/NIV should have continuous oximetry monitoring. Consideration should be given to End Tidal CO₂ (ETCO₂) monitoring to help identify machine disconnection in CPAP/NIV dependent patients but ETCO₂ must not be used to estimate values or trends in arterial CO₂.

Escalation

Establish a treatment escalation plan on admission.

Daily liaison between ward teams and critical care should be normal practice with decisions regarding escalation to critical care being made at senior level (ST3+ and with discussion with consultant overseeing the patient's care) and following consultation with critical care medicine.

Regular assessment of success/failure of non-invasive respiratory support should be undertaken. Signs of CPAP/HFNO/NIV failure include: limited initial response within 6h, lack of improvement within 3 days, unchanged/increasing work of breathing, not tolerating CPAP/NIV breaks.

Bear in mind that days on CPAP and NIV impact on suitability for ECMO support so it is important to consider critical care early when appropriate.

Governance

A robust morbidity and mortality (M&M) process, including rapid case note review of inpatient deaths. Respiratory and critical care medicine should have an aligned process for such patients to ensure shared learning. A process of continuous audit, including participation in national audits should be in place.

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Guidance based on available evidence and expert opinion. Variations to this advice may be required depending on clinical setting and individual patients

BTS/ICS GUIDANCE: COVID-19 RESPIRATORY SUPPORT PATHWAY

Proven or likely COVID-19

Notes:

1. * Aim for target saturations as per NICE guideline for oxygen use during COVID-19 (92-96% or 88-92% in those at risk of hypercapnic respiratory failure)

2. **Consider recruitment to 'RECOVERY-RS' study: CPAP (max 10 cmH₂O) with entrained O₂ to achieve sats target

HFNO = high flow nasal oxygen to achieve sats target

Sats < 94% room air

Oxygen to achieve sats ≥ 94%

Sats ≥ 94% on <40% O₂

Unable to achieve sats ≥ 94% on < 40% (on venturi)

Consider transfer to Respiratory Support Unit

Trial either CPAP or HFNO **

Sats in target range*

No

Yes

May go to non-resp COVID ward
Continue to monitor

Appropriate for escalation to Critical Care?

No

Yes

Consider:
Switch to CPAP or HFNO
↑ O₂
↑ pressure
Prone patient/Side repositioning

Call Critical Care

Continue to monitor

Consider discharge or monitor further 6 hours