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Algorithm: Respiratory support for suspected or confirmed COVID-19

(for use on all medical wards)

University Hospitals of Derby and Burton NHS Foundation Trust

Before starting any patient on CPAP you MUST establish whether they are suitable for full escalation to ICU and MUST also discuss with the on call Respiratory Consultant

Acute hypoxaemic RF due to SARI* (pO_2 <8Kpa)

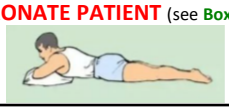
*Severe acute respiratory infection

Titrate O_2 therapy (nasal specs if ≤6 L/min)

Stable → Continue to monitor

Unstable →

Unstable if;
RR ≥20 **AND** sats <92% on FiO2 ≥ 28%
(≥2 L/min via nasal specs or 28% Venturi mask)
PRONATE PATIENT (see **Box 1**)



Acute hypoxaemic RF → 92-94%
Risk of hypercapnia → 88-92%
Use nasal specs not Venturi mask if ≤6 L/min O2 required

Is patient for full escalation?
Discuss with ICU / Respiratory medicine if unsure

No → **Is patient suitable for CPAP as ceiling of care?** (see **Box 3**)
ST3+ to DISCUSS WITH RESP CONSULTANT

Yes → Reassess patient stability after proning

CRITICALLY UNSTABLE
Clinical signs of significant respiratory distress:
Agitation / Anxiety
Increased work of breathing / 'Tiring'
Increased RR (>30)
MOST patients will require oxygen via a reservoir bag (15 L/min) and may not maintain sats above 92%
Need for urgent intubation is a clinical judgment
Do not base solely on any single criterion

→ **Refer ICU**

UNSTABLE (NON-CRITICAL)
RR ≥20 **AND/OR** sats <92% on FiO2 ≥ 40% (or ≥6
→ Transfer to Resp Ward

STABLE
RR ≤20 **AND** sats ≥92% on FiO2 ≤40% (or ≤6 L/min)
→ Transfer to Resp Ward → Continue to monitor

Not for ICU

Accepted to ICU?
CPAP may be used as a bridge to intubation if agreed between ICU and Resp medicine

Yes, for CPAP bridging

Yes → **Transfer to ICU**

Trial of CPAP
1) **ST3+ to DISCUSS WITH RESP CONSULTANT**
2) **CPAP should be started ONLY on the respiratory cohort ward**
3) Use CPAP safely (see **Box 2**)
4) **Starting pressures**
CPAP: 10 cmH2O + 60% oxygen

CPAP bridging

Successful CPAP set-up → Reassess patient stability after 1 hour of CPAP

Stable → **Continue CPAP and monitor**

Unstable → **Refer ICU**

Failed CPAP set-up

Yes → Transfer to Resp Ward for trial of CPAP or O_2 therapy depending on clinical stability (see above)

No → Continue pronation and conventional oxygen therapy
Target sats 92-94%
May accept lower sats in some patients (eg. 88-92% if COPD/ILD or 85-90% if End of life)

→ Admit to non-respiratory cohort ward

Stable → Continue to monitor

If remains unstable, or clearly deteriorating

Options: 1) Continue conventional oxygen therapy or 2) Planned withdrawal of care

Have you completed the following?

- Document the ceiling of care (Controlled O2 / CPAP / ICU)
- Complete RESPECT form
- Discuss above with patient / relatives / NOK

Box 1. Awake proning for acute hypoxaemic respiratory failure in COVID-19

- Indication
  - Consider if O2 requirement ≥28% via Venturi mask or ≥2 L/min via nasal specs
- Contraindications
  - Clinically unstable patient: Sats <93% **with** RR>40 on 80% O_2 **or** RR>30 on 90% O_2
  - Hypercapnia, agitation, need for immediate intubation
  - Altered mental status
  - Unstable spine, recent thoracic/abdominal surgery
  - Haemodynamic stability (SBP <90 mmHg) or arrhythmia
  - High BMI (eg. >50)
- Procedure
  - Self proning if able (supervised)
  - Proning with assistance of nurse / physiotherapy
  - Change position every 1-2 hours.
  - Aim to achieve a prone time as long as possible.
  - Aim for at least 2-3 episodes a day (total 6-12 hours)
  - Aim to sleep in the prone position if comfortable
  - Be alert for mask displacement or circuit disconnection during proning manoeuvre if on CPAP.
- Monitoring
  - Monitor sats and RR during proning (hourly)
  - Record frequency and length of proning episodes

Intensive care Society: Guidance for conscious proning.
https://www.ics.ac.uk/ICS/ICS/GuidelinesAndStandards/COVID19_Guidance.aspx

Box 2. Minimising viral spread with aerosol generating interventions (CPAP, NIV)

- Isolate patient in CPAP bay on respiratory ward
- Minimise mask leak if CPAP
  - Ensure appropriate mask size and fit
  - Apply mask **before** turning ventilator on
  - Remove mask **after** turning ventilator off
  - Use a non-vented mask
  - Use filter on exhalation port
  - Change filter every 24 hours
  - Avoid humidification
- Wear full PPE if entering side room – visor, FFP3 mask, long sleeved gown, gloves, theatre cap.
- Patient comfort/tolerability of CPAP/NIV may reduce risk of viral transmission;
  - Small doses of opiates / benzodiazepines may facilitate patient comfort

Box 3. Potential exclusions to trial of CPAP/NIV for patients with hypoxaemic RF due to SARI*

(Do not apply if using CPAP in patients accepted for full escalation to ICU)

- Significant respiratory disease leading to poor physiological reserve;
  - Home oxygen
  - Housebound or bedbound
  - Home NIV
  - Poor exercise tolerance (<200m)
- Significant non-respiratory comorbidities leading to poor physiological reserve;
  - Ischaemic heart disease, Cardiac failure
  - CKD 4+
  - Severe liver disease
  - Metastatic or palliative malignancy
  - Rapidly progressive neurological / neuromuscular disorder
  - Dementia
  - Any medical diagnosis with a predicted life expectancy of <12 months
  - Clinical frailty scale 6 or more (use CFS only if age 65+)**

**See below

Clinical Frailty Scale*

1 Very Fit – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.

2 Well – People who have **no active disease symptoms** but are less fit than category 1. Often, they exercise or are very **active occasionally**, e.g. seasonally.

3 Managing Well – People whose **medical problems are well controlled,** but are **not regularly active** beyond routine walking.

4 Vulnerable – While **not dependent** on others for daily help, often **symptoms limit activities.** A common complaint is being "slowed up", and/or being tired during the day.

5 Mildly Frail – These people often have **more evident slowing,** and need help in **high order IADLs** (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.

6 Moderately Frail – People need help with **all outside activities** and with **keeping house.** Inside, they often have problems with stairs and need **help with bathing** and might need minimal assistance (cuing, standby) with dressing.

7 Severely Frail – Completely dependent for personal care, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).

8 Very Severely Frail – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.

9 Terminally Ill - Approaching the end of life. This category applies to people with **a life expectancy <6 months,** who are **not otherwise evidently frail.**

Scoring frailty in people with dementia

The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In **moderate dementia,** recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In **severe dementia,** they cannot do personal care without help.

* 1. Canadian Study on Health & Aging, Revised 2008.
2. K. Rockwood et al. A global clinical measure of fitness and frailty in elderly people. CMAJ 2005;173:489-495.