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Specialty guides for patient management during the coronavirus pandemic

Clinical guide for the use of acute non-invasive ventilation in adult patients hospitalised with suspected or confirmed coronavirus during the coronavirus pandemic

19 March 2020 Version 1

"…and there are no more surgeons, urologists, orthopaedists, we are only doctors who suddenly become part of a single team to face this tsunami that has overwhelmed us…"
Dr Daniele Macchine, Bergamo, Italy. 9 March 2020

As doctors we all have general responsibilities in relation to coronavirus and for these we should seek and act on national and local guidelines. As respiratory physicians we will have a key role in treating people with coronavirus. We must engage with those planning our local response. We may also need to work outside our specific areas of training and expertise and the General Medical Council has already indicated its support for this in the exceptional circumstances we may face: www.gmc-uk.org/news/news-archive/how-we-will-continue-to-regulate-in-light-of-novel-coronavirus

In preparation for the peak in demand for acute non-invasive ventilation (NIV), this document outlines both strategic and operational guidance **DELAY PHASE.** This guidance is relevant to all clinicians involved in delivering acute NIV services, including ward-based care. Please work in teams and support your colleagues through this challenging period.

Clinical aspects

Indications:

- Indications for the use of NIV should be based on clinical need.

- There are no grounds for an indiscriminate ban on the use of NIV.
- If invasive mechanical ventilation (IMV) is appropriate, then early use of IMV is preferred over NIV.

Siting of patient:

- Patients on NIV should be managed according to the appropriate infection prevention and control (IPC) recommendations from Public Health England (PHE).
- Patients on NIV should be managed in side-rooms (negative or neutral pressure) whenever possible.
- Air exchanges in side-rooms should be checked and adhere to standard IPC guidelines.
- Under exceptional circumstances, patients on NIV may be managed in a cohort bay where all cohorted patients have **confirmed** coronavirus infection.
- Factors to take into account include: access to toilet facilities, thoroughfare for other patients/relatives/staff, air flow and air exchanges.

High flow nasal oxygen (HFNO):

- NIV is preferred over high flow nasal oxygen (HFNO)
- HFNO consumes higher volumes of oxygen.
- HFNO may pose a higher risk for the transmission of infection compared to NIV (especially if NIV is used with full-face or helmet masks, or with double-limbed circuits ± filters over expiratory vents/ports).

Technical aspects

Masks:

- Well-fitting oronasal facemasks, masks over the whole face or helmets should produce the least droplet dissemination.
- Vented masks could worsen contamination of the environment.
- Any patient on acute NIV should be managed with a non-vented mask and an exhalation port in the circuit.
- Ensure that the ventilator mode employed supports the use of non-vented masks and exhalation ports.
- Sequence of actions: NIV mask on → ventilator on; ventilator off → NIV mask off.

Filters:

- A viral/bacterial filter should be placed in the circuit between the mask and the exhalation port (Figure 1 below).
- This viral/bacterial filter can replace any filter at the machine end of the circuit.
- Viral/bacterial filters should ideally be changed every 24 hours or sooner. (There is a risk that they will become wet from exhaled gas and this may increase resistance to flow.)
- An external humidifier must not be used.
- Blocked filters can be mistaken for clinical deterioration; this issue is remedied by changing filters.

Oxygen:

- Oxygen can be entrained into the circuit and this should be done at the patient end (Figure 1 below).

Figure 1: Example of acute NIV set-up with non-vented mask and viral filter

Well-fitting full face mask

Filter

Exhalation port

Full NIV set up

For patients already managed under home ventilation services who are admitted to hospital with suspected or confirmed coronavirus infection:

- Check if their usual mask is a vented or non-vented mask.
  - Vented masks should be changed for a non-vented mask and an exhalation port put into the circuit.
- A viral/bacterial filter should be placed in between the mask and the exhalation port in exactly the same way as for acute NIV.
- For any patient who has a humidifier in the community, the humidifier should be removed from the circuit.
- Patients remaining at home should continue with their usual method of ventilation.
- Contact home ventilation service for further advice as needed.