These updated recommendations represent ‘lessons learned’ from both Advocate Aurora Health clinicians and the experience of national and international caregivers dealing with COVID-19 patients. Furthermore, these guidelines reflect previously established research results as well as the growing body of investigation on COVID-19 patients cared for in the hospital setting.

While these guidelines address issues of oxygenation, clinicians must remember that increasing work of breathing (e.g., increasing RR, accessory muscle use) may present subtly but is nevertheless a key determinant of declining respiratory function and impending respiratory failure in these patients.

**Supplemental Oxygen**
The use of a non-humidified oxygen delivery device to achieve target SpO2 92-96% is recommended:

1. If a patient requires > 6 LPM via nasal cannula, initiation of an oxygen device (depending on site availability) such as:
   - Venturi mask
   - Nasal cannula capable of achieving 6-15LPM
   - Oxymask
   - Non-rebreather
2. Notify a physician of increasing oxygen requirements or clinical signs of increased work of breathing, including:
   - Increase in oxygen requirements greater than 4LPM or > 50% FiO2
   - Increased work of breathing may be manifested by
     - Increased respiratory rate
     - Use of accessory muscles such as flaring of nostrils, sternocleidomastoid retraction and use of abdominal muscles to breathe
     - Appearance of being uncomfortable or having difficulty in breathing

**Heated Humidified High Flow Therapy:**
1. The use of high flow therapy may prevent the need for intubation.
   - Heated humidified high flow therapy refers to flows greater than 15LPM (IE optiflow, airvo, & vapotherm)
   - Consider when patients are unable to maintain oxygenation or adequate work of breathing with oxygen intervention of 15LPM or less.
   - An intact high flow therapy system may not intensify exhaled aerosol dispersion distance and should not increase risk of transmission. However, disconnections in the high flow therapy system may cause risk of aerosol generation.
2. Steps can be taken to further mitigate aerosol generation exposure, including:
ADULT COVID 19 POSITIVE OR PATIENT UNDER INVESTIGATION

RESPIRATORY MANAGEMENT

- A procedural mask worn over the cannula set up
- Use of a negative pressure room, when available.
- Follow PPE guidelines on resource center for aerosol generating procedures.
  - Keep the door closed.

Non-invasive ventilation:
The use of non-invasive ventilation (BiPAP/CPAP) has been demonstrated as a valuable option for patients with underlying chronic obstructive pulmonary disease (COPD) and patients with pulmonary edema. There is evolving evidence that this can be a valuable treatment option for COVID 19 patients experiencing hypoxic respiratory failure:

1. Steps that can be taken to further mitigate aerosol generating exposure:
   - Use of appropriate viral and HEPA filters on exhalation ports.
   - Use of helmet device, if available.
   - Vigilance on monitoring for and immediately correcting sites of leakage (e.g. mask/tubing connections).
   - Follow PPE guidelines on resource center for aerosol generating procedures.
   - Use of a negative pressure room, when available.
   - Use caution when manipulating the interface. It is the spray of accumulated condensation that may increase risk of aerosolization.

Nocturnal BiPAP/CPAP
Suggestions for patients on home nocturnal CPAP or BiPAP for severe sleep apnea
1. If not using CPAP or BiPAP, a physician order is required to utilize supplemental oxygen during periods of sleep (napping and nocturnal).
   - Utilize CO2 monitoring, with guided parameters, per physician order during periods of sleep (napping and nocturnal).
2. Follow PPE guidelines on resource center for aerosol generating procedures.
3. If patient is placed on BiPAP or CPAP use of negative pressure room should be recommended, if available, or HEPA filter should be utilized.
4. Discourage the use of home devices in patients who are PUI or COVID 19 positive.

DNR/DNI patients not eligible for intubation:
1. The modalities noted above may be suitable to maintain acceptable oxygenation in patients with a DNR/DNI status.
2. Dyspnea or ‘air hunger’ can also be treated pharmacologically (e.g. Morphine sulfate).
Intubation

1. Intubation is a high-risk procedure for nosocomial virus transmission.
2. Use of non-invasive and heated humidified high flow nasal cannula should be attempted to avoid intubation.
3. As intubation represents a high-risk procedure in COVID 19 patients, the most skilled operator should perform this procedure. See the COVID information center link: HIGH RISK INTUBATION PROCESS regarding additional important details.

These guidelines were constructed and revised to reflect evolving information regarding the optimal treatment of COVID 19 patients with hypoxemia and respiratory failure. The safety of all involved caregivers was an additional strong consideration in their development.

References:


Kotoda et al. Assessment of the potential for pathogen dispersal during high-flow nasal therapy. Journal of Hospital Infection (2019); doi.org/10.1016/j.jhin.2019.11.010

WEBINAR Gattinoni Luciano - COVID-19: Global Disease Dynamics and Hands-on Treatment Best Practices https://www.youtube.com/watch?v=bm7HF-Kkpnc