Alberta Health Services

Date question received: March 30, 2020
Date of response: April 3, 2020
Last updated: April 3, 2020

Disclaimer: Information changes frequently; we will update as required.

Title: Essential COVID-19 information for physicians, respiratory therapy, and nurses on the use of oxygen therapy.

Question: 1) What is the risk for COVID-19 transmission associated with oxygen therapy (conventional and humidified high flow (HHFO)) and when is oxygen therapy considered an AGMP?

2) When is it appropriate to use conventional oxygen delivery vs humidified high flow oxygen therapy in the healthcare setting?

Context:

- Questions have arisen from the respiratory and emergency department health care professional community regarding the use of conventional oxygen therapy, high flow nasal oxygen therapy (HFNO), and humidified high flow oxygen therapy (HHFO) in patients with COVID-19 and the potential risk to health care workers (HCWs). HHFO can refer to heated humidified oxygen delivery systems (such as Optiflow™/AIRVO™) or cold nebulization via facemask.
- Media reports suggest that NIV and HHFO are being used extensively in the COVID-19 patient group[6]
- This information brief does not address mask oxygen delivery (including non-rebreather and Venturi mask) nor oxygen therapy in the home setting.

Glossary of Terms:

- AGMP: Aerosol generating medical procedure
- Conventional oxygen therapy: nasal prongs, high flow nasal prongs
- HHHFO: Heated, humidified, high flow oxygen (any system that adds humidity to the delivered oxygen, such as the heated high flow oxygen delivery systems- AIRVO™ and Optiflow™
- HFNO: High flow nasal oxygen
- HCW: Health care worker
- LPM: liters per minute

Recommendations – Provided by: AHS COVID-19 Scientific Advisory Group

Question 1: What is the risk for COVID-19 transmission associated with oxygen therapy (conventional and humidified high flow (HHFO)) and when is oxygen therapy considered an AGMP?

1. Oxygen delivery by nasal prongs (from 1-5LPM) is not associated with an increased risk of COVID-19 transmission beyond droplet and contact risk.

2. There is no strong evidence to support that HFNO (ie 6 LPM to 15 LPM) is an AGMP.

3. HHHFO (via Optiflow™ or Airvo™) is AGMP and requires PPE plus N95 and private room.

Question 2*: When is it appropriate to use conventional oxygen delivery vs humidified high flow oxygen therapy in the healthcare setting?*

1. When oxygen requirements exceed oxygen delivery by simple nasal prongs (ie >5 LPM), clinical judgement must be used; first line therapy should continue to be conventional oxygen with high flow nasal prongs up to 15 LPM rather than HHHFO.
2. HHHFO is an AGMP and thus requires increased resources (N95 and isolation rooms) compared to non-humidified oxygen delivery; both Optiflow and Airvo are extremely limited resources in the current AHS environment. In a patient whose goals of care include possible intubation, involvement of critical care in decision making when oxygen requirements exceed 6 LPM or if there is rapid clinical deterioration is advised.

Summary of evidence:

- HHHFO is an AGMP, which has an increased risk of viral transmission and therefore requires expanded personal protection equipment (PPE) precautions.
- Standard oxygen therapy delivers cold and dry gas via a nasal cannula or another device; patients expend a significant amount of energy to both warm and humidify gas during normal breathing. Cold, dry gas may lead to airway inflammation, increase airway resistance, and impaired mucociliary function – including secretion clearance.
- COVID-19 can be transmitted by contact and droplets: HCW, especially those providing respiratory care, should strictly adhere to hand hygiene protocol and ensure they use optimal donning and doffing technique of all PPE to reduce transmission risk.
- The World Health Organization (WHO) guidelines endorse giving conventional oxygen therapy immediately to patients who require respiratory support; the WHO does not have evidence-based guidelines pertaining to HHHFO.
- Conventional oxygen therapy does not increase risk of COVID-19 transmission beyond droplet and contact risk
- Given that HHHFO is a very limited resource, is an AGMP which carries greater risk and requires more resources to deliver with little evidence of clinical benefit, the use of HHHFO over conventional oxygen delivery is not recommended in routine practice.
- Application of clinical judgement in the context of resource availability and patient goals of care will remain essential.

Key messages:

- Alberta Health Services is working proactively to support staff and patients during COVID-19.
- Alberta Health Services is connecting with clinicians, operations, researchers and other experts to review emerging evidence and guidance of national and international bodies to provide information for focused areas of health care.
- Current evidence and clinical guidelines recommend conventional oxygen therapy for suspect/confirmed COVID-19 individuals that require respiratory support.

- Conventional oxygen therapy is a preferable respiratory support compared to HHHFO because it is not an AGMP, therefore it has a lower transmission risk and requires less health resources than HHHFO.
- HCW, especially those providing respiratory care, should strictly adhere to hand hygiene protocol and ensure they use optimal donning and doffing technique of all PPE to reduce transmission risk.

Background

- When using AGMP for any patients during a pandemic, including HHHFO, careful considerations and expanded PPE are required.
- HHHFO (Optiflow™ and Airvo™) are extremely limited resources in the current AHS environment. Critical Care ought to be advised in decision making when oxygen requirements exceed 6 LPM or if there is rapid clinical deterioration.