

FREQUENTLY ASKED QUESTIONS

Using the Life2000® Ventilation System During the COVID-19 Pandemic

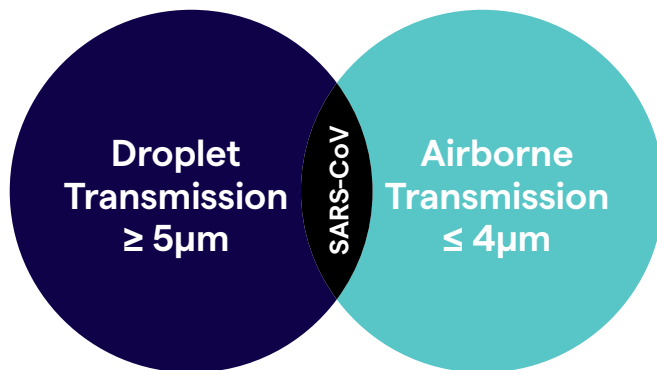
1. What are the respiratory complications related to COVID-19?

Pathology can be described as a respiratory disease that often progressed into pneumonia with bilateral ground-glass opacities. Elderly patients and those with underlying conditions like hypertension, cardiovascular disease or diabetes, are more likely to develop serious complications like pneumonia secondary to COVID-19 including septicemia due to cytokine activity and fluid build-up in the lower lobe. Hospitalized COVID-19 patients are often in need of respiratory support.¹

2. What is the difference between aerosol and droplet transmission?

Droplets are considered particles secreted from a patient's respiratory tract that are no smaller than 5µm in diameter and travel shorter distances (defined as ≤ 3 ft.) because they cannot stay suspended in air for long periods of time. However, SARS-CoV, while still classified as a droplet, is estimated to travel anywhere from 6 ft. to 10 ft. and can be impacted by environmental factors such as velocity and mechanism by which respiratory droplets are propelled from the source, the density of respiratory secretions, environmental factors such as temperature and humidity, and the ability of the pathogen to maintain infectivity over that distance² and therefore has the potential to become an aerosol or airborne.

This presents challenges to the assignment of isolation categories because of conflicting information and uncertainty about possible routes of transmission. Although SARS-CoV is transmitted primarily by contact and/or droplet routes, airborne transmission over a limited distance (e.g., within a room), has been suggested, though not proven.³



Using the Life2000® Ventilation System During the COVID-19 Pandemic

3. How does non-invasive ventilation (NIV) fit into the treatment plan of those in respiratory distress secondary to COVID-19?

A report from the [Imperial College of London](#) anticipates critical care bed capacity, in an unmitigated pandemic, would be exceeded, with an eventual demand that is over 30 times greater than the maximum supply in the U.S.⁴ For this reason, clinicians will likely need to be especially judicious with decisions on when to initiate and wean mechanical ventilation (MV) and look to alternative modes of support, such as NIV that offer similar ventilatory capacity sufficient to meet patient need in order to protect limited resources. NIV's apply end-expiratory positive airway pressure increasing functional residual capacity and opening collapsed alveoli, thereby improving ventilation–perfusion matching and reducing intrapulmonary shunt as well as improving lung compliance, thus reducing respiratory load.

4. What are the challenges using NIV related to aerosolization of infectious particles?

Per the [U.S. National Center for Biotechnology Information \(NCBI\)](#), NIV therapy performed by systems with good interface fitting do not create widespread dispersion of exhaled air, and NIV use can be considered at low risk of airborne transmission.⁴ When using NIV it is critical that care providers select an appropriately sized interface for the NIV device to decrease the risk of transmission. The Breathe Universal Circuit® Connector is an interface used with the Life2000 Ventilator that can be connected to third party masks to help meet this recommendation. Please note, if these recommendations are not followed, the risk for aerosolized particles can increase.

5. How is the Life2000 Ventilator best used given these recommendations?

Non-invasive therapy such as the Life2000 Ventilation System can be used in non-severe forms of respiratory failure. However, if the patient's status does not improve or worsens within a short period of time (1–2 hours) then mechanical ventilation must be preferred. Life2000 Ventilator can also be considered when weaning patients from mechanical ventilation. All appropriate isolation precautions should be taken when using any NIV therapy including the Life2000 Ventilator.



respiratorycare.hill-rom.com/Life2000

¹ Lei, J., Li, J., Li, X., & Qi, X. (2020). CT Imaging of the 2019 Novel Coronavirus (2019-nCoV) Pneumonia. Radiological Society of North America. doi: <https://doi.org/10.1148/radiol.20200236>

² Siegel JD, Rhinehart E, Jackson M, Chiarello L, and the Healthcare Infection Control Practices Advisory Committee, 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings <https://www.cdc.gov/infectioncontrol/guidelines/isolation/index.html>

³ Ferguson, N. M. et. al. (2020). Impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demand. Retrieved from <https://www.imperial.ac.uk/media/imperial-college/medicine/sph/ide/gida-fellowships/Imperial-College-COVID19-NPI-modelling-16-03-2020.pdf>

⁴ Cascella M, Rajnik M, Cuomo A, et al. Features, Evaluation and Treatment Coronavirus (COVID-19) [Updated 2020 Mar 20]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK554776/>

Life2000® and Universal Circuit® are registered trademarks of Breathe Technologies, Inc., a Hill-Rom company.

Hill-Rom reserves the right to make changes without notice in design, specifications and models. The only warranty Hill-Rom makes is the express written warranty extended on the sale or rental of its products.