

Frequencer® Acoustic Airway Clearance for Treatment of COVID-19 Patients

COVID-19 is a severe respiratory syndrome caused by a novel coronavirus (SARS-CoV-2). Although data is still being collected, the clinical spectrum of COVID-19 is wide, encompassing asymptomatic infection, mild upper respiratory tract illness, and severe viral pneumonia with respiratory failure.¹

In a considerable number of cases, COVID-19 requires hospitalization, eventually leading to acute respiratory distress syndrome (ARDS) and death. **In a retrospective study of 191 COVID-19 in-patients in China, it was found that 98% of non-survivors had respiratory failure** and 93% had ARDS (compared to 36% of survivors with respiratory failure and 9% with ARDS).² Additionally, researchers have performed autopsies on deceased patients and found large amounts of sticky mucus and hyaline membranes in the deep-seated airways.³ A non-invasive device that is compatible with ventilation that effectively clears airway secretions would be extremely valuable to treat patients with ARDS.

Experience in New-York City with COVID-19 showed benefits from simply repositioning patients to a prone position⁴ suggesting some degree of obstructive/positional mismatch as a culprit. Furthermore, prone position mechanical ventilation also seems to be effective to improve ventilation and oxygenation. The above suggests that a treatment modality used early in the course of the disease to rapidly and effectively clear the airways of mucus and fluid and recruit smaller airways could alter the course and outcome of disease.

Dymedso's Frequencer® is a novel device that promotes bronchial drainage by using acoustic waves at an optimized frequency that easily travels through the chest, causing the lungs to vibrate and the viscosity of mucus to decrease.⁵ It can be positioned selectively on different areas of the chest (front or back), particularly the low lung areas, with no discomfort or pain, and can be used in intubated patients. More than 600 Frequencers® are currently used across the world to assist with airway recruitment and secretion removal. The Frequencer® is effective at clearing airway secretions, reducing infection and decreasing the length of hospitalizations in intubated neonates with artificial airways and in adults with severe chronic pulmonary diseases. Available clinical data indicate that the Frequencer® is successful at improving respiratory condition, allowing patients to be weaned off mechanical ventilation or preventing the need for ventilation.

The Frequencer® is currently being used on patients with COVID-19 in Germany, alongside other treatments. The Frequencer® is simple to incorporate and appears to have relevance in a COVID-19 clinical setting.



“Based on the available evidence, the Frequencer® could be expected to help a significant number of COVID-19 patients potentially alleviating the need for mechanical ventilation and ultimately reducing mortality”.

(Dr. Simon Phaneuf, MD, CMFC (MU) (MSE), MBA)

¹ Huang C, Wang Y, Li X et al: Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet* 2020; 395: 497–506.

² Zhou F, Yu T, Du R, et al: Clinical course and risk factors for mortality of adult in patients with COVID-19 in Wuhan, China: a retrospective cohort study. *Lancet* 2020; 395: 1054–62.

³ <https://www.youtube.com/watch?v=Nw-zXURqWe8>

⁴ <https://www.cnn.com/2020/04/14/health/coronavirus-prone-positioning/index.html>

⁵ Cantin AM, Bacon M, Berthiaume Y: Mechanical airway clearance using the Frequencer electro-acoustical transducer in cystic fibrosis. *Clin Invest Med* 2006; 29 (3): 159–165.