

INTELLiVENT[®]-ASV[®]

Your bedside assistant in the fight against COVID-19

Authors: Kaouther Saihi, Caroline Brown; Reviewers: Bernhard Schmitt, Munir Karjaghli, Alexandra Gerlach

The coronavirus pandemic is proving to be a global disaster of unprecedented magnitude, not only in terms of health, but also from a social and economic point of view. Particularly in those countries most badly affected, caregivers are stretched to the limit. Two of the major challenges currently being faced are:

- A shortage of mechanical ventilators in many countries
- Having enough trained caregivers to operate the ventilators available in this highly infectious environment

The number of patients admitted simultaneously to the ICU is in some cases extremely high, and caregivers are at risk of being contaminated or suffering from burnout or other psychosocial problems [1]. In China, an estimated 3,000 healthcare workers have been infected [2], while the International Council of Nurses puts worldwide estimates at around 90,000 (May, 2020) [3]. Special hospital protocols to protect the caregivers include measures such as limiting the number of times the caregiver enters the patient's room.



In this fight to save lives, our most advanced ventilation mode can help save time, manpower and contamination.

Exactly how can INTELLiVENT-ASV help?

- By reducing the caregiver's interaction with the ventilator and thus the risk of contamination
- By continuously monitoring the patient's lung condition, and adjusting settings to support the application of individualized lung-protective strategies
- By autonomously ventilating patients within the predefined ventilation zone to spare the caregiver
- By serving as one mode of ventilation for both passive and active patients
- By keeping an eye on both hypoxemia and hyperoxemia and adjusting settings to avoid both risks
- By promoting early weaning with the Quick Wean function that includes manual and automatic Spontaneous Breathing Trials

How does INTELLiVENT-ASV work?

INTELLiVENT-ASV acts as your personal assistant at the bedside, using physiologic data from the patient and clinician-set targets and limits to automatically and continuously regulate CO₂ elimination and oxygenation for both passive and active patients.

[Several clinical studies](#) have proved both its safety and efficacy in treating mechanically ventilated patients with different conditions and levels of severity, from a normal lung to COPD, brain injury and ARDS (mild, moderate and severe). A [recent study](#) [4] on 255 passive ICU patients with normal lungs, COPD, and ARDS showed that INTELLiVENT-ASV selected driving pressure, mechanical power and VT considered to be in the safe ranges for lung protection.

How do COVID-19 patients present?

SARS-CoV-2, the causative agent of COVID-19, is a coronavirus severely affecting the respiratory system of a growing number of people. Although COVID-19 has been shown to meet the ARDS Berlin definition [5], COVID-19 pneumonia is a specific disease with particular phenotypes. Its main characteristic is the dissociation between the severity of the hypoxemia and the maintenance of relatively good respiratory mechanics. There are two types of patients, depending on the severity of the pneumonia [6-8].

Type 1: Near normal pulmonary compliance with isolated viral pneumonia

Type 2: Decreased pulmonary compliance

How do you treat them with INTELLiVENT-ASV?

INTELLiVENT-ASV selects VT according to three parameters:

- Minute volume required to reach the PETCO₂ set by the user
- Anatomical dead space
- Respiratory mechanics

For any given minute volume and dead space, the selected VT depends on the resistance and the compliance. If the resistance remains stable, a decrease in compliance will result in a lower VT and higher rate, whereas an increase in compliance will result in a higher VT and lower rate.

Type 1 corresponds with **normal lung compliance**:

- %MinVol, FiO₂ and PEEP can be regulated automatically
- Maximum PEEP setting might be limited to 8–10 cmH₂O depending on the clinical setting

Type 2 corresponds with **low lung compliance (ARDS)**:

- %MinVol, FiO₂ and PEEP can be regulated automatically
- Maximum PEEP setting limited to 15 cmH₂O depending on the clinical setting

So with INTELLiVENT-ASV, you can select your patient's lung condition and your clinical targets and limits, define your weaning strategy, and then start lung-protective ventilation!

For more information on how to set INTELLiVENT-ASV for a COVID-19 ARDS patient, read our corresponding [Knowledge Base entry](#).

[Click here](#) to see the range training materials and video tutorials on the use of INTELLiVENT-ASV.

INTELLiVENT-ASV can support you in many ways during this stressful and exhausting time. To find out more about purchasing INTELLiVENT-ASV, please contact the Hamilton Medical representative in your country.

1. Zhang W, Wang K, Yin L, et al. Mental Health and Psychosocial Problems of Medical Health Workers during the COVID-19 Epidemic in China. *Psychother Psychosom* 2020. doi: 10.1159/000507639.
2. Adams JG, Walls RM. Supporting the Health Care Workforce During the COVID-19 Global Epidemic. *JAMA*. 2020;323(15):1439–1440. doi:10.1001/jama.2020.3972.
3. <https://www.icn.ch/news/icn-calls-data-healthcare-worker-infection-rates-and-deaths>
4. Arnal, J.M., M. Saoli, and A. Garnero, Airway and transpulmonary driving pressures and mechanical powers selected by INTELLiVENT-ASV in passive, mechanically ventilated ICU patients. *Heart Lung*, 2019.
5. Ranieri, V.M., et al., Acute respiratory distress syndrome: the Berlin Definition. *Jama*, 2012. 307(23): p. 2526-33.
6. Gattinoni, L., et al., COVID-19 pneumonia: different respiratory treatments for different phenotypes? *Intensive Care Med*, 2020.
7. Gattinoni, L., D. Chiumello, and S. Rossi, COVID-19 pneumonia: ARDS or not? *Critical Care*, 2020. 24(1): p. 154.
8. Marini, J.J. and L. Gattinoni, Management of COVID-19 Respiratory Distress. *JAMA*, 2020.

Hamilton Medical AG
Via Crusch 8, 7402 Bonaduz, Switzerland
☎ +41 58 610 10 20
info@hamilton-medical.com
www.hamilton-medical.com