ICU

MANAGEMENT & PRACTICE

INTENSIVE CARE - EMERGENCY MEDICINE - ANAESTHESIOLOGY

VOLUME 20 - ISSUE 1 -2020

# COVID-19 Challenges



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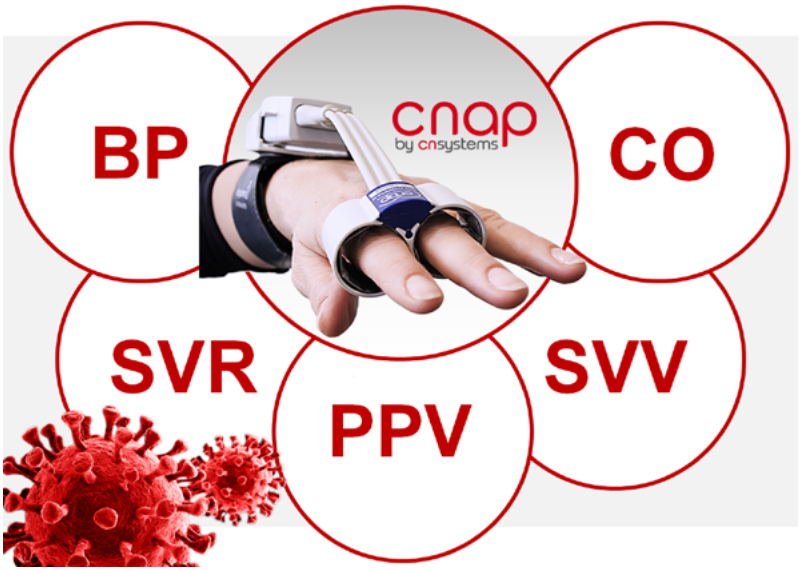
# Noninvasive Hemodynamic Check to Guide Educated Decisions in the Management of COVID-19 Patients




The rapid global distribution of COVID-19 is challenging healthcare systems worldwide. In many countries hospitals and ICU departments are overloaded or fear a potential collapse - the optimal allocation of healthcare resources is required. Healthcare professionals are forced to treat severely ill patients with limited access to ventilation equipment, qualified intensive care personnel or protective patient monitoring devices. The effort to prevent COVID-19 patients from deterioration and ICU admission is huge.

The World Health Organization (WHO)[1] identified challenges and summarized recommended measures in the different disease stages.

During the initial screening phase, when patients present to emergency services, the early recognition of patients at risk for severe disease or mortality due to cardiovascular comorbidities is very important. In older patients even mild symptoms can exhibit a high risk of deterioration, therefore these patients should be sent to designated units for close and continuous cardiovascular monitoring.[1]

In order to avoid deterioration and progression of symptoms in severely ill patients, a regular monitoring of vital signs utilizing early warning scores is considered essential. Conservative fluid management may help at an early stage as fluid overload may lead to insufficient oxygenation and respiratory complications that would require mechanical ventilation and admission to an ICU. For the critically ill patients in the ICU, among other measures, the monitoring of dynamic indices of fluid responsiveness remains an indispensable tool to guide life-saving volume administration in order to fight fluid overload, Severe Acute Respiratory Infection (SARI) or septic shock, as well as acute kidney/cardiac injury or organ failure due to hypovolemia[2].

Further, the WHO clearly states the need for "*the application of timely, effective and safe supportive therapies*" as the cornerstone of therapy for COVID-19 patients[1] with severe manifestations in order to support the course of recovery from the virus.

To date, blood pressure, cardiac output and other hemodynamic parameters can easily and noninvasively be measured using the patient's fingers to support educated decision making in the management of COVID-19 patients. The cardiovascular status can be monitored more completely than with blood pressure monitoring alone. This enables a better control of fluid management in situations in which the methods of classic advanced hemodynamic monitoring either cannot be used due to limited resources of time, equipment or qualified personnel or are simply not indicated. A quick and simple non-invasive monitor is comfortable for patients, saves valuable time, and allows for better allocation of personnel.

In addition to oxygenation the immediate and accurate feedback on cardiovascular status can help to maintain adequate blood pressure levels (MAP > 65 mmHg). Identifying patients with impaired cardiac output to direct fluid management from the emergency departments to intensive care units is important especially when invasive monitoring is not applicable or time and resources are limited.

Noninvasive technologies have been established as reliable and accurate tools for Fluid Optimization in surgical patients.[3,4] To date, they also demonstrate a high value in the time-efficient cardiovascular management of COVID-19 patients. ■

## References

For full references, please email editorial@icu-management.or or visit https://iii.hm/12u3