New guidelines for treating the sickest COVID-19 patients

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As the number of coronavirus cases continues to rise and the deaths mount, the American Society for Artificial Internal Organs (ASAIO) has drafted a set of recommendations for health care workers on the front lines, to help them make decisions on how to treat the most critical patients, those with severe lung or heart failure

"An urgent need exists to enhance our understanding of the roles of extracorporeal membrane oxygenation (ECMO) and other types of artificial lung and heart support in the management of severely ill patients with COVID-19 who develop acute respiratory, and less commonly cardiac, compromise untreatable by conventional therapy," reports lead author Dr. Keshava Rajagopal, professor of clinical sciences at the University of Houston College of Medicine, in both *Circulation: Heart Failure* and *ASAIO Journal*. Dr. Faisal Cheema, associate professor of clinical sciences, is a co-author on the paper.

ECMO circuits contain a pump and a gas exchanger and can be used to support the lungs and/or heart, depending upon the way in which the circuitry is connected to a patient.

Because the coronavirus pandemic emerged and spread so quickly, clinical unknowns exist of when to apply such drastic measures.

"It is not known when it is clinically appropriate to use the most advanced forms of lung and heart support for COVID-related respiratory and heart failure and so we discuss this in terms of non-COVID usage," said Rajagopal, who said these decisions are critical in a resource-scarce environment.

The more advanced the therapy, generally the less of it exists in supply. How to deploy the scarcest of resources under pandemic circumstances is not well defined. The new guidelines recommend that a critical consideration in deciding when to deploy ECMO and other types of artificial lung/heart support, and even lesser therapies such as mechanical ventilation, is to assess whether the patient has a good likelihood of recovery.

"In a pandemic we have to decide how to allocate limited resources, and the first two questions that need to be asked are: One, is the patient sick enough to warrant the therapy, and two, is the patient well enough to tolerate the risks of the therapy? Next, we have to determine if the supply of the resource sufficient at the given time," said Rajagopal, who compares what could happen with the most advanced therapies, supply wise, to what has already happened with ventilators in some hospitals.

The recommendations call for non-invasive therapies first, such as continuous positive airway pressure (CPAP) and bilevel positive airway pressure (BiPAP) for short durations. Once a patient fails these and requires invasive mechanical ventilation (MV), then other recommendations are:

- Whenever feasible, all patients with severe

hypoxemic respiratory failure with COVID-19 ARDS should undergo either manual or artificial prone-positioning, depending upon the resources available.

- Lung-protective mechanical ventilation (MV) should be used in patients with COVID-19-related acute hypoxemic respiratory failure.
- The decision to implement ECMO should follow a clear failure of invasive MV, paralytic agents and prone positioning.

Because little has been written about the protocol doctors must take when treating the serious or critical COVID-19 patients, the recommendations will be updated.

"We call this a living, working document because we are still getting information and we intend to republish a final version and second paper once we have more experience from around the world," said Rajagopal.

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