

The Vital Importance of the Extracorporeal Membrane Oxygenation (ECMO) Device on COVID-19 Patients

Cemil Koyunoğlu

Energy Systems Engineering Department, Center Campus, Yalova, Turkey

***Corresponding author:** Cemil Koyunoğlu, Energy Systems Engineering Department, Engineering Faculty, Cinarcik Road 5th km, 77200 Center Campus, Yalova, Turkey; E-mail: cemil.koyunoglu@yalova.edu.tr

Abstract

The ECMO device actually gives COVID-19 patients whose vital functions are threatened by the intensity of the virus, a chance to gain some time to respond to drug treatment. I have explained how important the ECMO device, which has a mechanism that clears oxygen by replacing the lung in body functions, where positive COVID-19 patients whose lungs have gone bankrupt has been in a desperate time since the last pandemic in the world.

Keywords: *COVID-19; ECMO device; C-reactive protein; Viral pneumonia; Respiratory failure*

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Introduction

In cases of lung complications that develop suddenly after positive diagnosis of COVID-19 patients, invasive mechanical ventilation is required until the lungs heal. If the patient's condition suddenly worsens, extracorporeal membrane oxygenation (ECMO) systems can perform the role of the artificial lung for weeks (Figure 1). During this period, it increases the chance of the patient to respond positively to interventions such as drug therapy and vitamin supplements. Unlike other viral diseases, the patient diagnosed with COVID-19 can sometimes experience shock and/or multiple organ failure (Panel 1). However, although the true course of the disease is not clearly defined, those who recover are more likely to have particularly high C-reactive protein or low lymphocyte counts or D-dimer levels. Actual death information in COVID-19, such as reactions to second bacteria, is not fully known [1].

Patients diagnosed with treatment have a high course of mild disease, while other patients may experience hypoxemic respiratory failure, venous, viral pneumonia, or arteriovenous symptoms. For this reason, the importance of the ECMO device that provides respiratory support appears here again. It is recommended by the relevant health organizations that adolescents and adults should be connected directly to these devices in case of sudden adverse complications of breathing. There are various guides on when to connect the ECMO device to the patient. The presence of insufficient ECMO devices worldwide pushes healthcare professionals under very difficult decisions during emergency response. The most fearful of these is that the doctor has to choose between two people to connect to the ECMO device. Perhaps no profession group would want to be under such an election. For this reason, it is important to remind the doctors about the critical duties and responsibilities [2].

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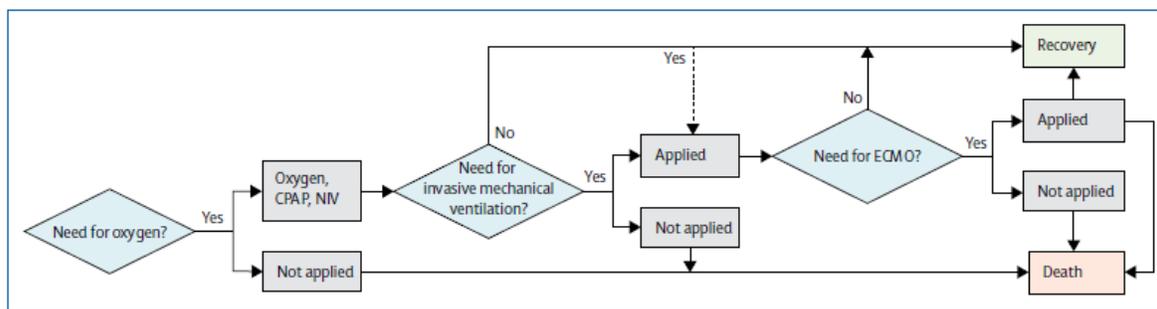


Figure 1: Possible paths to recovery and death for patients required respiratory support [1].

Panel: Three possible characteristics of the dying process in COVID-19

Predominant terminal organ failure

- Terminal respiratory failure: mechanical ventilation and ECMO used
- Terminal respiratory failure: mechanical ventilation used, ECMO available but not used
- Terminal respiratory failure: mechanical ventilation used, ECMO not available
- Respiratory failure: mechanical ventilation available but not used
- Respiratory failure: mechanical ventilation hardly or not available
- Septic shock, multiple organ failure
- Cardiogenic shock (acute myocardial injury or myocarditis)
- Other

Proportionality of care in the dying process

- Withholding life support: life support available but considered to be disproportionate; life support hardly available (significant constraints)
- Withdrawing life support
- Full care but no cardiopulmonary resuscitation
- Full care including cardiopulmonary resuscitation

Involvement of COVID-19 in the dying process

- Death attributed only to COVID-19 (previously healthy, predicted long life expectancy)
- Death primarily due to old age, frailty, or advanced disease (COVID-19 is an epiphenomenon)
- Death due to COVID-19 in an individual with limited life expectancy

COVID-19=coronavirus disease 2019. ECMO=extracorporeal membrane oxygenation.

Panel 1: Dying process in COVID-19 [1].

Conclusion

The extracorporeal life support organization provides information on when the ECMO-device should be applied to the patient. Device training and details can be viewed at elso.org. There are also important reviews regarding the perioperative anesthesia management [3-6].

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