ECLS in Covid-19: Patient selection

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• I have no relevant disclosures

Patient selection

- Refer to ELSO COVID-19 guidelines
- Badulak et al, Extracorporeal Membrane Oxygenation for COVID-19: Updated 2021 Guidelines from the Extracorporeal Life Support Organization, ASAIO Journal: May 2021 - Volume 67 - Issue 5 - p 485-495

The End



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Case

- 26 year male
- PMH Asthma
- Smoker
- Covid +
- Morbid obesity (BMI > 50, weight 170kgs)
- Using neighbors oxygen and nebulizers before coming to ER at OSH
- H/O mental health disorders not compliant with meds
- BIPAP for 7 days
- Intubated and shifted to our MICU (inability to prone)
- Now intubated for 5 days
- ECMO consult for persistent respiratory acidosis, hypoxia

ELSO GUIDELINES

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Indications (ELSO)

- Indications for ECMO initiation should remain unchanged during a pandemic, and we refer to ELSO guidelines and established literature outlining these indications
- Conventional therapies for ARDS should be applied according to the standard algorithm, leading to the use of ECMO after other measures have been attempted, especially prone positioning, unless contraindicated. It should be emphasized that low-pressure and low-volume ventilation should be adhered to, with consideration of ECMO if unable to safely mechanically ventilate the patient, even if oxygenation is relatively intact.
- While it may be tempting to stretch the use of conventional therapy to avoid placing patients on ECMO due to resource constraints, there is no evidence to support delaying ECMO initiation when it is indicated. Outcomes with delayed ECMO initiation may be worse and run duration may be longer, offsetting any potential benefit from attempted conservation of resources.

- Patients who are deteriorating in non-ECMO centers should be referred early for ECMO consideration to allow for safe transport or time to organize mobile ECMO rescue in appropriate patients.
- Survival with V-V ECMO for COVID-19–related pneumonia and ARDS is similar to historical survival data for other causes of acute severe respiratory failure meeting V-V indications in the ELSO Registry. This suggests that COVID-19 could be considered similarly to other causes of reversible infectious pulmonary disease, with awareness that COVID-19 patients may require longer run times. However, mortality in this population may be increasing over time and updated data should be considered in decision-making
- It is currently unknown if COVID-19 patients requiring V-A ECMO have similar survival compared with historical data.

Indications (ELSO lite)

- Do what you always did !
- Don't do what you would never do !
- Covid ECLS outcomes are as good as other pathologies
- Refer early
- Survival with V-V ECMO for COVID-19-related pneumonia and ARDS⁶⁻⁸ is similar to historical survival data for other causes of acute severe respiratory failure meeting U-V indications in the ELSO Registry.⁹ This suggests that und estamend ECMO patient selection as in Figure 1. Outcomes 4,15,37-40 with delayed ECMO initiation may be worse and run duration may be longer, offsetting any potential benefit
 Image: Market and Market and the selection of resources.⁴²⁻⁴⁴

Contraindications (ELSO)

- We recommend that ECMO centers establish descriptions for levels of diminishing ECMO capacity, and capacity should be tightly linked to exclusion criteria, that is, when capacity diminishes, exclusion criteria become more stringent based on characteristics associated with increased mortality and longer run duration.Of note, there is survival and run-time variability depending on the indication for ECMO and individual patient characteristics, and thus each ECMO referral should be considered on a case-bycase basis.
- Mortality increases with prolonged exposure to mechanical ventilation before ECMO; the additional impact of prolonged exposure to highflow nasal cannula or noninvasive positivepressure ventilation before mechanical ventilation is currently unknown.
- COVID-19 patients receiving ECMO may consume more resources to meet personal protective equipment (PPE) requirements, and this may be a factor in patient selection by necessity when PPE is limited
- Risks and benefits of providing ECPR for patients who have COVID-19 or whose status is unknown, for example, out-of-hospital cardiac arrest, should be carefully considered given the increased potential for PPE breach and lower historical survival with ECPR compared with most other uses of ECMO. However, ECPR outcomes also vary considerably according to patient population based on factors that include witnessed or unwitnessed arrest, in-hospital versus out-of-hospital arrest, duration, and etiology of arrest. Thus, context matters in the decision of whether or not to proceed with ECPR, and centers should a priori determine whether or not they will provide ECPR for patients with COVID-19 and patients with unknown COVID-19 status.
- Systems should be prepared to rapidly identify changes in capacity and communicate resultant changes in exclusion criteria to their ECMO teams and regional networks to continually optimize the benefit-to-resource utilization ratio.

Contraindications (ELSO *lite*)

- Resources dictate exclusion criteria
- Prolonged ventilation prior to ECLS is bad
- E-CPR....bleh
- Resources are now regional
 - ani- Systems should be prepared to rapidly identify changes ct of in capacity and communicate resultant changes in exclusion criteria to their ECMO teams and regional netionworks to continually optimize the benefit-to-resource iical utilization ratio.

run duration.^{50,51} Of note, there is survival and run-time of Cardiothoracic Surgery

Exclusion

- Age >70 years (Special care >65)
- Morbid obesity (BMI>45)
- Baseline CKD stage 3 or more
- Liver cirrhosis
- Severe COPD (DLCO<40, FEV1<1L, Home O2)
- Active malignancy
- Frailty
- Prior Cardiomyopathy
- Ph<7.0
- Severe peripheral vascular disease



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