Evidence Insight Spotlight

Extracorporeal Membrane Oxygenation

Overview

In October 2018, the Center for Medicare & Medicaid Services dramatically reduced reimbursement for peripheral venoarterial and venovenous extracorporeal membrane oxygenation (ECMO), which has led hospitals to reexamine ECMO selection and discontinuation criteria for patients with cardiac or respiratory failure.

When should ECMO be used?

Prolonged use of extracorporeal membrane oxygenation as well as other patient-specific factors, such as age and cause of heart or respiratory failure, are associated with increased mortality. Best practices development should incorporate strict criteria based on guidelines and predictors of mortality for patient selection, duration and discontinuation.

The table below summarizes the clinical recommendations.

	Venoarterial ECMO	Venovenous ECMO
Patient selection for adults	• Patients in cardiac shock or requiring extracorporeal cardiopulmonary resuscitation • Non-responding patients with reversible conditions • Transplant and LVAD candidates with irreversible conditions	• Non-responding patients with reversible conditions due to acute respiratory distress syndrome AND high mortality risk • Transplant candidates with irreversible conditions
Weaning guidelines	ECMO total oxygenation support < 30%	ECMO total oxygenation support < 30%
Maximum recommended duration	5 days	2 weeks
Discontinuation guidelines	• Severe brain damage • No cardiac function after 3-5 days AND not heart transplant/LVAD candidate	• Severe brain damage • No lung function after 2 weeks AND not lung transplant candidate
Predictors of mortality	• Prolonged ECMO duration • Cause of heart failure • Older patient age • Ejection fraction < 30% after 2 days • Development of renal failure or gastrointestinal complications • Rising serum lactate • Diabetes mellitus or obesity	• Prolonged ECMO duration • Cause of respiratory failure • Older patient age • Prolonged pre-ECMO ventilation • Higher pre-ECMO oxygen support • Multiple organ failure • Hypoxemia (PaO_2 < 60 mmHg) • Hyperoxia (PaO_2 of 101-300 mmHg)
Survival prognostication	ENCOURAGE SAVE	PRESERVE RESP

Conclusion

ECMO can be a valuable tool for patients with cardiac or respiratory failure but should not be used without careful consideration of appropriate patient selection, duration and discontinuation.