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Transitioning ECMO First-Assist Model: From Operating Room to Bedside

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Abstract

Background: While preparing to expand into an Extracorporeal Cardiopulmonary Resuscitation (ECPR) facility for out-of-hospital cardiac arrest (OHCA), it was paramount to maintain our rapid ECMO cannulation process. To ensure rapid Extracorporeal Membrane Oxygenation (ECMO) initiation at any time in any portion of our hospital, we transitioned from a traditional operating room (OR) team model to utilizing cardiovascular intensive care unit (CVICU) nurses and ECMO Specialists to assist with ECMO cannulations.

Methods: Since the OR team is not in house 24/7 at our institution, our ECMO physicians and leadership educated and trained the CVICU nursing and ECMO staff through didactic classes, hands-on training, simulations, and competencies. The planning and order of the curriculum was determined by ECMO leadership. Quarterly assessments and refresher classes were done to maintain knowledge and competency. ECPR survival-to-discharge and bedside-to-ECMO initiation were tracked for evaluation.

Results: Utilizing didactic, simulation, and hands-on education CVICU nurses and ECMO specialists were trained in proper sterile technique, preparing cannulae for insertion, proper guidewire technique, sterile equipment and room set up, and lastly insertion technique. The staff who underwent the training had to undergo the didactic classes and perform a hands-on competency to be deemed proficient in performing as a first-assist for ECMO cannulations. At a one-year evaluation of the ECPR program, survival-to-discharge results were higher than the initial goal, and average bedside-to-ECMO initiation results also exceeded the goal.

Conclusion: With patience, planning and education bedside staff can be proficiently trained to assist with ECMO cannulations while maintaining a high standard of care.

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An Ambulation Protocol for Patients with VA-ECMO and Femoral IABP Support

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Abstract

Background: The ambulation of patients with cardiogenic shock supported with veno-arterial extracorporeal membrane oxygenation and concomitant femoral intra-aortic balloon pump support is not well-described. Our institution developed a protocol to allow for safe ambulation of this patient population to prevent deconditioning and intensive care unit acquired weakness.

Methods: A protocol for ambulation of VA-ECMO patients with concomitant femoral IABP was developed in December 2022 via multidisciplinary collaboration between critical care providers, cardiac rehabilitation, respiratory therapy, nursing staff, and perfusionists. To initiate ambulation, patients were initially placed in a vertical position utilizing the VitalGo Total Lift Bed (VitalGo Systems, Miramar, FL). Once stable in a full vertical stance, patients would be ambulated off the bed utilizing a wheeled walker for stability.

Results: After initiation of this protocol, 22 out of 112 ECMO patients were ambulated while on support. Of these 22 patients, 4 patients with VA-ECMO and concomitant femoral IABP support were ambulated for a total of 11 sessions. Patients participating in this therapy ambulated an average of 200 feet per session without any adverse events, including cannula and balloon pump migration or displacement. Three of the four patients were either bridged to an advanced therapy including orthotopic heart transplant or durable left ventricular assist device or were discharged. One patient sustained a cerebral vascular accident during support with eventual withdrawal of life-sustaining therapies.

Conclusion: A protocol for ambulation of patients with veno-arterial ECMO support and concomitant femoral IABP support is feasible and can facilitate bridging toward advanced therapies or recovery.