Venovenous Extracorporeal Membrane Oxygenation

Flow, Pressure, Hematology, and Emergencies

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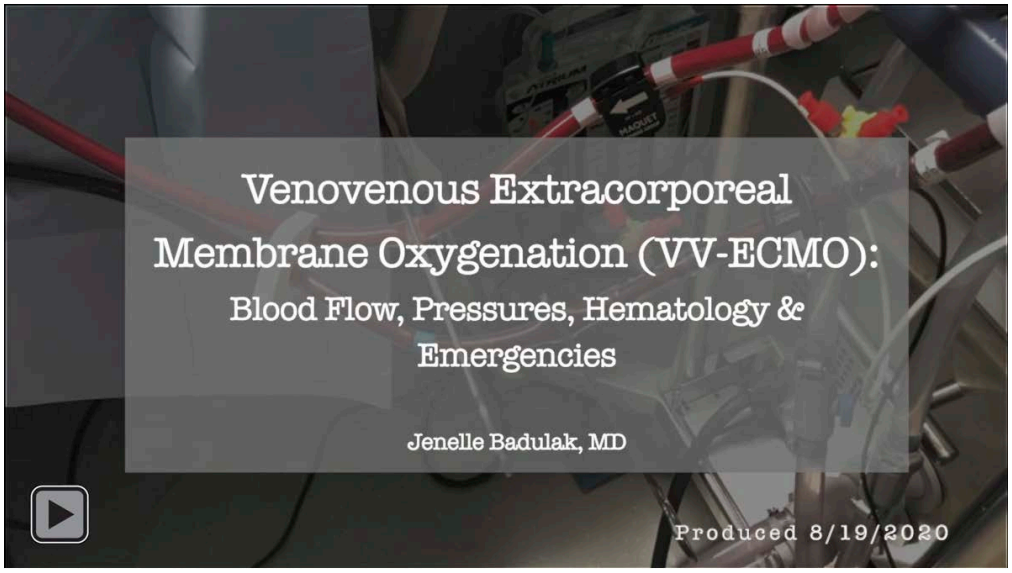
This video serves as a resource for novice venovenous extracorporeal membrane oxygenation (ECMO) providers to understand the fundamentals of blood flow, circuit pressures, hemolysis and anticoagulation, circuit emergencies, and cardiac arrest. Low blood flow is due to inadequate pump preload or increased pump afterload, and both lead to increased resistance in the circuit. Chatter, the extreme form of inadequate pump preload, should be addressed with speed reduction and assessment for causes including hypovolemia and tension physiology in the thorax. Monitor for hemolysis using free hemoglobin, lactate dehydrogenase, and



Video 1. Instructional video for venovenous extracorporeal membrane oxygenation (ECMO) including blood flow, pressures, hematology, and emergencies. Image(s) used with permission from CollectedMed, LLC.

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urine color. Causes of hemolysis include circuit pressure extremes, clot in the circuit, and disseminated intravascular coagulation. During a mechanical circuit emergency, such as air entrainment, circuit rupture, pump failure, accidental decannulation, or catastrophic clot, the ECMO team immediately clamps the circuit and works to quickly fix the circuit. Meanwhile, a separate team resuscitates the patient focusing on increasing gas exchange through the native lung with rescue (increased) ventilator settings or bag ventilation. Most centers use low-intensity anticoagulation to prevent circuit thrombosis. Venovenous ECMO provides no cardiac support; thus, advanced cardiac life support is performed in the usual fashion.

Author disclosures are available with the text of this article at www.atsjournals.org.

RECOMMENDED READING

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