profile. who could then receive rapid access to a donor. This assumption is likely flawed, since ECMO is now being offered to many patients who previously would have received a VAD, with physicians working within the revised algorithm in hopes of getting the patient transplanted. These “less-sick” patients may soon dominate the ECMO cohort, fundamentally changing the landscape that is under study.

So, to complement this excellent study, updated analyses are critically needed that focus on the period since implementation of the revised allocation system. We may

uncover a new risk profile that will further inform ways to guide the increasing number of patients receiving ECMO to successful transplantation.

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Commentary: A bridge to somewhere

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Modern outcomes of patients bridged to heart transplant (orthotopic heart transplantation [OHT]) with venoarterial extracorporeal membrane oxygenation (ECMO) continue to be poor.¹ The 2018 update to the heart allocation system places ECMO and temporary ventricular assist device (VAD) support in Status 1 priority. In this modern context, it is increasingly valuable to understand the outcomes of OHT in various subsets of patients bridged with ECMO to guide patient selection in this high-risk population.

In the current issue of the *Journal*, Ivey-Miranda and colleagues² present a novel analysis of the United Network for Organ Sharing registry seeking to further elucidate this important issue. Among patients who underwent OHT, subsets of patients who underwent transplantation on ECMO versus being decannulated before transplant were compared. The decannulated before transplant group,

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CENTRAL MESSAGE

Patient selection and timing of interventions are key considerations in patients being considered for bridge to heart transplantation with VA ECMO.

90% of whom were transitioned to some form of more durable circulatory support, demonstrate survival comparable to that of patients who never required ECMO support. This trend was supported by a propensity score-matched analysis of patients transitioned from ECMO to VAD versus those on ECMO at the time of transplant, with similar outcomes between groups. Further subanalysis showed a sequential increase in hazard after OHT in patients on ECMO with added risk factors, such as mechanical ventilation and renal impairment.

The authors should be commended for performing a sound analysis of a powerful database. The conclusions from this analysis have important implications for the transplant surgeon: Patients bridged to transplant with ECMO are a heterogeneous cohort. As risk factors,

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such as renal impairment and prolonged waitlist time, accumulate, potential survival after OHT decreases drastically. However, patients undergoing transplantation before developing risk factors and those who can transition to durable VAD or other form of mechanical support may undergo transplantation with similar risk as patients who never required ECMO. This conclusion also raises an important discussion about the use of ECMO as a bridge to durable left ventricular assist device (LVAD) as a bridge to eventual OHT (“bridge to bridge”).³ Preoperative ECMO is a known risk factor for impaired survival after LVAD implantation.⁴ However, potential improvement versus continued downtrend in end-organ function while on ECMO has similar implications in this analysis, revealing that outcomes with ECMO as a bridge to LVAD versus OHT are subject to the same patient factors.⁵ A recent landmark analysis by DeFilippis and colleagues⁶ found similar 1-year survival after OHT versus durable LVAD outcomes in patients bridged with ECMO. All of these analyses support the conclusion that patients requiring ECMO for cardiogenic shock are high risk for any advanced therapy, and outcomes are best with any approach before the sequelae of prolonged

ECMO support set in. Shorter wait-list times for patients requiring ECMO driven by the new allocation system, ex vivo perfusion, and donation after cardiac death may shift the trend toward transplantation rather than durable LVAD in the coming years, and further analysis of “bridge-to-bridge” approaches is necessary.

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