and nutritional enhancement, patients requiring veno-arterial ECMO while awaiting H-L TX should be considered a high-risk group.

Perhaps the most important message here is the strong evidence for a potentially good waitlist and transplant outcome for patients whose circulatory performance continues to deteriorate while awaiting multiorgan transplantation. Far from being a hopeless situation, these patients

should be considered for LVAD or total artificial heart support. With expert care at experienced centers, the expectation for survival to and long beyond multiorgan transplantation is surprisingly good.

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See Article page 168.

Commentary: Mechanical bridge over troubled waters

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During daily rounds, we are privileged to make many critical decisions, centered on patient care, focused on the evaluation and management of individuals. However, it is also imperative to consider the societal and global health impact of these decisions. It is this responsibility that permeates the minds and actions of the advanced heart failure practitioner: the responsibility to all of the other patients potentially in need of life-saving organ transplantation, and which helps guide our critical decisions. As stewards of the care of patients through the journey of heart transplantation, we bear responsibility not only for maximizing the potential benefit to the person receiving the organ but also share responsibility for the care of the person who has bestowed the gift of life under the worst of circumstances, the organ donor. We must ensure that the allocation of organs serves the greatest good, and it is this pursuit that serves as the central issue of investigation in this work by Melehy and colleagues.¹

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CENTRAL MESSAGE

Acceptable outcomes across the contemporary era are attainable in the setting of increased use of mechanical circulatory support as a bridge to multiorgan transplantation.

This study serves to delineate the outcomes of multiorgan transplant, all of which included heart transplant, in those patients bridged with mechanical circulatory support (MCS), and highlights the successes of the contemporary era of mechanical support. The changes in the new heart allocation system, which occurred in October of 2018, sought to promote transplantation of the most critically ill, often in those on MCS devices, while attempting to minimize waitlist mortality. We are now seeing the downstream effects of these changes and are able to glean important information about how these changes have affected our patients.

Melehy and colleagues¹ have reviewed the United Network for Organ Sharing database, specifically looking at those patients on the waitlist for multiorgan transplants, and found that there was no significant difference in survival

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after transplantation between those with and without MCS devices and also when stratified by MCS device type. Furthermore, they discovered that multiorgan waitlist survival has improved over time, and that those patients awaiting transplant on extracorporeal membrane oxygenation (ECMO) support have significantly worse survival when compared with others on the waitlist who are not on ECMO.¹

With a heightened prioritization of MCS devices in the modern organ allocation system, it is important that we closely monitor the myriad effects of this paradigm shift. There has been increasing evidence over the past few years that supports the increasing use of temporary or durable MCS devices as a bridge to heart transplant.² There has been, however, limited data regarding its use in multiorgan transplant. A recent paper by Afflu and colleagues³ identified worse outcomes at 1 year post-transplant in combined heart and kidney transplant patients when compared with those transplanted before the allocation prioritization change. This difference in perceived outcomes, when compared with the current paper's findings of similar post-transplant outcomes using a longer period reflective of the modern era, highlights an important challenge in modern advanced heart failure research: acceptable homogeneity in matching cohorts. In other words, can we translate large-scale retrospective data into tangible decision-making for the individual patient?

The current study, like many others in our field, is influenced by survival and selection bias. Those patients who are stable and well enough to make it to transplant listing, whether on MCS or not, will likely have acceptable post-transplant outcomes when compared with those who are never stable enough to list. This provides ample opportunity for ongoing research and analysis in the pursuit of improved risk stratification when considering patients for multiorgan transplantation in the future.

Historically, ECMO bridging to heart transplant has been associated with worsened outcomes after heart transplant.⁴ The improvement over time likely reflects important multifactorial advances in the field, including improved patient selection, changes in management, and a multidisciplinary approach to patient care. A partial contribution to improved outcomes with all MCS bridging

may also be related to the increasing use of newer temporary devices, including percutaneous endovascular devices, which may help stabilize patients for transplant, and may be reflected in some studies within the cohort of patients with ventricular assist devices.

Another important finding in this article was the relatively low number of heart–liver and heart–lung transplants, which limited a robust analysis of these patient groups, leaving the bulk of data representative of heart–kidney transplantation. This confirms the general trend seen in modern transplantation.⁵ This may be related to patients being transplanted later in their course of disease, with accrued comorbidities that have led to concomitant kidney disease. The acceptable outcomes seen in this population in the current study are likely the result of a complex combination of causes, including an evolution of pre- and post-transplant management including induction therapy, calcineurin inhibitor–sparing regimens, and the recognition of improved 5-year outcomes in heart–kidney patients when compared with isolated heart transplant in patients with renal impairment.⁵

Studies such as the one by Melehy and colleagues¹ play a critical role in analyzing the effect of change in the constantly changing fields of multiorgan transplantation and MCS therapies. By showing acceptable outcomes in multiorgan transplant despite the need for MCS, it also allows our field to continue to push boundaries and evolve our care for the individual patient while presenting new opportunities for continued research in the contemporary era.

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