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## Commentary: The waiting is the hardest part

Ashish S. Shah, MD

Mechanical support has rejuvenated resuscitation science. As the result of acute extracorporeal life support and durable left ventricular assist devices, patients who would otherwise die go on to survive, and over time seemingly lost hearts show signs of repair and potential for recovery. But that destination—that dream—has been elusive and all too uncommon. The current expert review nicely summarizes our understanding of recovery biology as well as surgical approaches to device removal or decommissioning. The authors have put together a thorough document.<sup>1</sup> The road to myocardial recovery will be paved with a fundamental understanding of biology, innovative research on potential therapeutics, and the utility of chronic mechanical unloading.

Certainly, all heart failure is not the same. The different forms of nonischemic cardiomyopathies require unique and tailored approaches. So, we wait. Ischemic cardiomyopathy patients with significant fibrosis will likely need a cellular strategy to restore functional cells or reprogram scar tissue. How much time do we need to expect recovery? Perhaps real recovery will take years not months.

There also remains the unsettling reality that there are more unknowns here that prevent recovery as the ultimate destination. What are the real molecular targets for recovery therapeutics, what is the optimal LVAD management to promote recovery, and when will stem cells ever actually be useful? These questions remain unanswered and leave us all a bit skeptical of the recovery pathway dream. So, we

From the Department of Cardiac Surgery, Vanderbilt University Medical Center, Nashville, Tenn.

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Address for reprints: Ashish S. Shah, MD, Department of Cardiac Surgery, Vanderbilt University Medical Center, Vanderbilt Medical Center East, 1215 21st Ave, S, Suite 5025, Nashville, TN 37232 (E-mail: [ashish.s.shah@vanderbilt.edu](mailto:ashish.s.shah@vanderbilt.edu)).

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Ashish S. Shah, MD

### CENTRAL MESSAGE

Myocardial recovery following left ventricular assist device placement has been an elusive dream. This review summarizes our current state. But for the real goal, we will just have to wait.

wait. We wait for credible discovery, credible research strategies, and a fundamental understanding on how to repair hearts. Perhaps we are waiting for the right teams to tackle this problem.

There is no doubt that the transplantation of whole organs remains among the greatest human achievements of the 20th century. The notion of repairing and reconditioning organs rather than replacement will surely be a 21st-century achievement. So, with faith in science, we take heart. Knowing that it's the waiting that's the hardest part.

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