There are several areas related to native heart management in patients with LVADs that warrant further investigation. First, concurrent management of surgical valvular heart disease in patients undergoing durable LVAD implantation requires more study and understanding. Aortic valve insufficiency is known to progress more rapidly in LVAD-supported patients; as many as 25% of patients who have been supported for multiple years will manifest significant aortic valve insufficiency. This progression of aortic insufficiency is clinically important and may limit functional outcomes. A variety of surgical treatment options have been used, either at the time of the LVAD implant or after, but consensus on when and how to intervene on the aortic valve is not well defined and requires more study. Furthermore, these patients with advanced heart failure exhibit significant functional insufficiency of the mitral and tricuspid valves. While remodeling following LVAD support may eliminate some of the insufficiency, there are important subsets of patients who remain with significant mitral and tricuspid insufficiency. A better understanding of when and how to intervene on mitral and tricuspid insufficiency could potentially reduce right dysfunction and improve functional outcomes. There are no randomized studies in this area.

Medical management of right heart dysfunction in patients with LVADs is also an important frontier. Long-term oral pulmonary vasodilators may be beneficial, but studies that define these benefits are lacking. Simple questions such as whether beta-blockers remain beneficial in regarding progression of RV failure are unanswered.

Finally, LVAD support does not eliminate the ventricular dysrhythmia problems. Proper application of medical therapy for ventricular dysrhythmias as well as catheter ablative therapies remains ill defined. Even indications and settings for internal defibrillators are not well understood. Therefore, better knowledge regarding prevention and management of ventricular dysrhythmias during LVAD support could help improve survival.

References

CENTRAL MESSAGE
The time is now for a randomized trial to prove that LVADs can provide survival and quality of life benefit to patients with preinotrope ambulatory advanced heart failure.
therapy for advanced heart failure. The authors review major recent advancements in the field, including recent trial data, improvements in device design and surgical technique, and efforts to use newer technology including wearable devices and implantable monitors to optimize timing of support. One certainty in healthcare domains such as LVAD therapy that rely heavily on technology is constant change and evolution. A major breakthrough on the horizon is the totally implantable LVAD. This will likely improve the quality of life of patients supported with LVADs, allowing them to engage in activities limited by their driveline and eliminate the risk of driveline infections, which can be problematic. Temporary ventricular assist devices that are sternal-sparing and provide as much flow as durable LVADs are already broadly used. We will likely see the development of similar devices but with the advantage of being durable and dischargeable in coming years.

The elephant in the room remains expansion of LVAD use to less sick patients. Less than 3000 durable LVADs are implanted in patients in the United States each year despite a heart failure prevalence of 6.5 million and upwards of 250,000 patients with advanced heart failure who have low quality of life and heart failure readmissions, or low quality of life.

Perhaps the most effective way to convince referring physicians and the community at-large that LVADs can be beneficial for ambulatory patients with preinotrope heart failure who have low quality of life and heart failure readmissions and could potentially benefit from implantation. The latest annual report from the Interagency Registry for Mechanically Assisted Circulatory Support demonstrates that less than 15% of LVADs currently implanted are done so in patients with preinotrope Interagency Registry for Mechanically Assisted Circulatory Support profile 4 to 7.

This is an exciting time for LVAD therapy. Devices are better, our surgical technique is better, and our understanding and ability to manage patients on LVAD support are better. The time is now to randomize LVADs to optimal medical management and extend this lifesaving modality to a larger population of patients with advanced heart failure.

References