Commentary: Going to war with the army you have

Ashish S. Shah, MD

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, 1215 21st Ave S, Nashville, TN 37232 (E-mail: Ashish.s.shah@vanderbilt.edu).

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Ashish S. Shah, MD

Central Message

Is this the army we need for heart failure?

See Article page 167.

You go to war with the army you have, not the army you might want or wish to have at a later time.
—Donald Rumsfeld, US Secretary of Defense
December 8, 2004[1]

Although left ventricular assist devices have unquestionably saved the lives of many patients, this technology has reached an important moment. As the surgical challenges have receded, the more complex problems of patient selection and device-related complications have now collided. This conflict is centered on using these devices in the seemingly less sick patient with heart failure. This cohort is of great interests to clinicians managing this large population. It is also central to the corporate strategy of the 2 companies that dominate this market. It is true that LVAD implantation exceeds heart transplantation, but certainly neither come even close to offering solutions for the millions of patients with heart failure. In their article in this issue of the *Journal*, Mitter and Pinnery[2] have nicely reviewed the problem.

They succinctly review the challenges with adverse events and the studies looking at the various ''less sick'' cohorts. The recent results with the HeartMate 3 (Abbott Laboratories, Abbott Park, Ill) suggest that lower pump thrombosis rates get us closer not only to a safer, more durable pump but also to one that is cheaper in the long run. They go on to suggest, appropriately, that drivelines remain a persist barrier for wider adoption. What Mitter and Pinnery[2] perhaps do not directly acknowledge is a more fundamental problem. Is this the technology with which we will go to war?

Current devices require significant surgical intervention, are plagued by short- and long-term right ventricular problems, and do not restore normal exercise capacity. Importantly, the idea that univentricular support should be the universal solution to heart failure is absurd. The device companies are uninterested in major device changes or even software solutions because of the complexity of US regulatory pressures and the need to generate revenue with their existing inventory.

We, as clinicians and engineers, certainly need to innovate more aggressively to address these limitations. Even basic literature searches for ways to eliminate drivelines, software to help integrate 2 pumps, and better physiologic feedback to adjust pump speed are lacking or nonexistent.

If clinicians and patients hope to save lives and eliminate the suffering associated with heart failure, do they do so with the current technology, or do they wait? Do we go to war with the devices we have, or the pumps we wish to have?

Reference

1. Schmitt E. Iraq-bound troops confront Rumsfeld over lack of armor. *New York Times*. December 8, 2004. Available at: https://www.nytimes.com/2004/12/08/international/middleeast/iraqbound-troops-confront-rumsfeld-over-lack-of.html. Accessed February 8, 2019.
2. Mitter N, Pinney S. Left ventricular assist devices for less-sick patients: a roadmap for the future or a fork in the road? *J Thorac Cardiovasc Surg*. 2019;158:167-9.