Right-sided heart failure (RHF) is one of the most feared and life-threatening complications of left ventricular assist device implantation in severe cases requiring biventricular mechanical support or orthotopic heart transplantation.1 Much of the research to date has focused on honing our ability to predict and to preemptively mitigate its development because earlier recognition and intervention have been associated with favorable clinical outcomes.2

RHF is a complex, dynamic mechanical issue predicated on cardiovascular geometry and physiology. Thus, although numerous risk factors and prediction models have been proposed, our search for the perfect risk score has been humbling and elusive.3-5 Most recently, Soliman and colleagues5 presented the European Registry for Patients with Mechanical Circulatory Support RHF risk score, which was derived from a pool of approximately 3000 patients and took into account the patients’ Interagency Registry for Mechanically Assisted Circulatory Support profile, inotropic requirement, severity of existing right ventricular dysfunction, right atrial pressure to pulmonary capillary wedge pressure ratio, and hemoglobin. However, the model did not incorporate novel hemodynamic measures, such as those evaluated in this issue of the Journal by Amsallem and colleagues,6 which may improve its clinical potential. One of the major strengths of this study is the precise, meticulous collection and analysis of both invasive and noninvasive right heart metrics, which render their interpretation highly reliable. Their discussion of the various load-adaptability indices are also thorough and fair. One of the striking observations from this study was that although these indices, especially Dandel’s,7 were strongly correlated with RHF, they only added marginal utility to simpler, less-invasive metrics such as end-systolic ventricular dimension. Moreover, the right atrial pressure/pulmonary capillary wedge pressure ratio only provided a similar prognostic value as the right atrial or central venous pressure in their analysis. Altogether, these findings highlight the perpetual fine line between the promise of ever increasingly sophisticated metrics and their clinical utility.

One limitation of not only this study but also of all studies using the approach of prognosticating based on preoperative metrics, is that preoperative data can only provide a snapshot of the patient. At present, our tools can only estimate, not encapsulate, a patient’s complex, ever-changing hemodynamic status. Absent from the analysis are perioperative interventions aimed at further optimization or adverse factors that can cause hypoxemia or significant volume shifts. Postoperative management of various complications and their potential impact were not included.

Nonetheless, Amsallem and colleagues6 have contributed significantly to our understanding of the utility of right heart metrics in predicting this serious condition. They are to be congratulated for their precise and excellent analysis. As the field continues to fine-tune prediction models and to simultaneously hone the use of temporary right ventricular support platforms,8 our ability to better diagnose and preemptively mitigate the development RHF will only improve, ensuring a safer outcome among all patients requiring durable mechanical support.

References


