

## Letters to the Editor

## Renal Failure Following Ventricular Assist Device Placement

We read with interest the paper by Hasin et al. (1), which reported improvement in renal function after left ventricular assist device (LVAD) implantation. Although the investigators demonstrated significant improvement in most patients, renal failure after LVAD implantation is associated with significant complications (2). In this study, 8 patients (10%) required long-term dialysis after LVAD—4 of whom died after implantation; the remaining 4 had prolonged hospitalizations ( $51 \pm 17$  days). Although renal failure is infrequent, it is associated with significant morbidity and mortality. For this reason, patients with advanced renal failure are typically not considered for LVAD implantation. Renal failure, even if infrequent, can significantly increase resource utilization at a time when health care expenditures are being scrutinized. Several studies have questioned the cost-effectiveness of LVAD therapy (3,4). Nevertheless, with appropriate patient selection, longer term benefits, such as improved renal function, can outweigh short-term morbidity.

Another concern is the reluctance of outpatient dialysis centers to accept LVAD patients. In our experience, this leads to prolonged length of stay and is detrimental to patient quality of life. There are limited data regarding the safety of hemodialysis in LVAD patients (5). Similar to the investigators, we supported several patients with intermittent hemodialysis until renal recovery without significant complications. Concerns among nephrologists stem from unfamiliarity with LVADs and perceived difficulties in measuring blood pressure on continuous flow support. Further data are needed to demonstrate the safety of hemodialysis and to alleviate the concerns of nephrologists.

Hasin et al. (1) observed a slight decrease in renal function at 6 months post-implantation compared with 1 month. For some patients on long-term LVAD support, eventual renal failure will result and, depending upon patient age and other comorbidities, transplantation may not be an option. Although some patients may live near their implantation centers and receive dialysis there, others will require the care of community dialysis centers. Outpatient dialysis centers must care for these patients, so they continue to experience the quality-of-life benefit seen with LVAD support.

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## Reply

We thank Drs. Rajagopalan and Hoopes for their letter discussing our recent publication (1), and agree with their main observations. They chose to highlight the adverse outcomes of patients succumbing to renal failure after left ventricular assist device (LVAD) implantation and the current limitations of administering long-term renal support for patients assisted with such a device. In our experience, a minority of patients experience an unfavorable post-operative course, including end organ dysfunction. This can be reversible at times; however, renal damage may persist despite general clinical improvement. Unfortunately, it remains difficult to predict which patients will have this complicated post-operative course. Currently used predictors include careful assessment of right ventricular function as well as various risk scores, some of which are outdated or not validated for the current population (2). In our current publication, we advocate that temporary end organ improvement under monitored treatment may be a novel way for predicting post-operative outcomes.

Accurate prediction of outcomes in all patients is not feasible; therefore, we agree with the authors on the need to be prepared for the option of renal replacement, if needed. We have also encountered difficulties with reluctance of some dialysis centers to treat patients on LVAD support. Continued education and understanding is needed to improve the treatment of this rapidly growing patient population.

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