



## IMAGING AND DIAGNOSTIC TESTING

### **ECHO-DERIVED ASSESSMENT OF PULSATILITY DIVERGES FROM PUMP-DERIVED ASSESSMENT, AND DEFINES SERIOUS ADVERSE EVENTS LATE AFTER CONTINUOUS FLOW LEFT VENTRICULAR ASSIST DEVICE IMPLANTATION**

ACC Poster Contributions

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Authors: *Jennifer Goerbig, Guha Ashrith, Wassef Karrowni, Frances L. Johnson, Robert M. Weiss, University of Iowa, Iowa City, IA*

**Background:** Left ventricular assist device (VAD) implantation can be an effective bridge to heart transplantation, but requires diagnostic and therapeutic vigilance in the interim. The purpose of this study was to compare VAD reporting of flow pulsatility index (PI) to echocardiographic (ECHO) reporting of same, early and late after VAD implant.

**Methods:** Consecutive patients (N = 17) who underwent axial flow VAD (Heartmate IIR) implantation at our center for bridge to transplant underwent ECHO and VAD interrogation early (Day 7 + 1; x + SE), late (Day 113 + 21), and during putative adverse events. ECHO and VAD PI were each calculated using the vendor-specified formula:  $PI = ((Max\ Flow - Min\ Flow) / Mean\ flow) \times 10$ . VAD flow was estimated internally, using empiric assumptions as surrogates for actual flow. ECHO PI was directly measured using 2D-guided pulse-wave Doppler, noting that angle correction occurs by use of the flow ratio.

**Results:** Early after VAD implant, during clinical quiescence, ECHO PI and VAD PI correlated moderately ( $r=0.5$ ), but VAD PI was systematically lower, possibly representing VAD flow averaging. Late after VAD, there was no correlation between ECHO PI and VAD PI ( $r = 0.01$ ). In 7 patients who experienced dynamic obstruction to VAD inflow, ECHO PI rose precipitously ( $9.1 + 0.8$  to  $14.2 + 1.1$ ;  $p = 0.01$ ), but there was no consistent trend in VAD PI ( $4.5 + 0.2$  vs.  $4.8 + 0.4$ ;  $p = NS$ ). In 2 patients who underwent surgical revision for inflow obstruction, ECHO PI returned to the normal range, whereas 5 patients managed medically had variable responses.

**Conclusions:** As an adjunct to routine assessment, measurement of ECHO PI provides quantitative assessment of flow kinetics at the interface between the heart and VAD. ECHO PI, which is measured directly, diverges from VAD PI, which is reported based on empiric assumptions, and this divergence is more pronounced during VAD inflow obstruction.