

SUPPLEMENTAL APPENDIX

Supplementary Appendix Table 1: LVAD Explantation Criteria for Cardiac Recovery¹⁻⁵

Structure, Function and Hemodynamics

- **Echocardiogram (Minimal LVAD support)**
 - LVEDd <60mm
 - LVESd <50mm
 - LVEF >45%
- **Right heart catheterization (Minimal LVAD support)**
 - PCWP <15 mm Hg
 - CI >2.4 L/min/m²
- **Cardiopulmonary exercise test (Minimal LVAD Support and Peak Exercise)**
 - VO₂ Max >16 ml/kg/min
 - VE/VCO₂ <40

CI: Cardiac Index, LVEDd: Left ventricular end diastolic diameter, LVEF: left ventricular ejection fraction, LVESd: left ventricular end systolic diameter, PCWP: Pulmonary capillary wedge pressure, LVAD: left ventricular assist device

References for Supplementary Appendix Table 1:

1. Maybaum S, Mancini D, Xydas S, Starling RC, Aaronson K, Pagani FD, Miller LW, Margulies K, McRee S, Frazier OH, Torre-Amione G. Cardiac improvement during mechanical circulatory support: a prospective multicenter study of the LVAD working group. *Circulation* 2007;115:2497–2505.
2. Dandel M, Weng Y, Siniawski H, Stepanenko A, Krabatsch T, Potapov E, Lehmkuhl HB, Knosalla C, Hetzer R. Heart failure reversal by ventricular unloading in patients with chronic cardiomyopathy: criteria for weaning from ventricular assist devices. *Eur Heart J*. 2011;32:1148-1160
3. Birks EJ, Tansley PD, Hardy J, George RS, Bowles CT, Burke M, Banner NR, Khaghani A, Yacoub MH. Left ventricular assist device and drug therapy for the reversal of heart failure. *N Engl J Med*. 2006;355:1873-1884.
4. Birks EJ, George RS, Hedger M, Bahrami T, Wilton P, Bowles CT, Webb C, Bougard R, Amrani M, Yacoub MH, Dreyfus G, Khaghani A. Reversal of Severe Heart Failure

With a Continuous-Flow Left Ventricular Assist Device and Pharmacological Therapy: A Prospective Study. *Circulation* 2011;123:381-390.

5. Drakos SG, Terrovitis JV, Anastasiou-Nana MI, Nanas JN. Reverse remodeling during long-term mechanical unloading of the left ventricle. *J Mol Cell Cardiol*. 2007;43:231-242.

Supplementary Appendix Table 2: Additional Key References Pertinent to the Field of Myocardial Recovery with Mechanical Circulatory Support

Engineering

1. Melnykowycz M, Tschudin M, Clemens F. Piezoresistive Soft Condensed Matter Sensor for Body-Mounted Vital Function Applications. *Sensors (Basel)*. 2016; 16(3).
2. Grymyr OJ, Nguyen AT, Tjulkins F, Espinoza A, Remme EW, Skulstad H, Fosse E, Imenes K, Halvorsen PS. Continuous monitoring of cardiac function by 3-dimensional accelerometers in a closed-chest pig model. *Interact Cardiovasc Thorac Surg*. 2015; 21(5): 573-82.

Biology

3. Hadad I, Veithen A, Springael JY, Sotiropoulou PA, Mendes Da Costa A, Miot F, Naeije R, De Deken X, Entee KM. Stroma cell-derived factor-1 α signaling enhances calcium transients and beating frequency in rat neonatal cardiomyocytes. *PLoS One*. 2013; 8(2): e56007
4. Jennifer A. Dixon, Francis G. Spinale. Large animal models of heart failure: A critical link in the translation of basic science to clinical practice. *Circulation: Heart Fail* 2009; 2: 262-271

Physiology

5. Kato TS, Chokshi A, Singh P, et al. Effects of continuous-flow versus pulsatile-flow left ventricular assist devices on myocardial unloading and remodeling. *Circ Heart Fail* 2011; 4: 546-53.
6. Gupta DK, Skali H, Rivero J, et al. Assessment of myocardial viability and left ventricular function in patients supported by a left ventricular assist device. *J Heart Lung Transplant* 2014; 33: 372-81.

Role of Pulsatility

7. Witman MA, Garten RS, Gifford JR, et al. Further Peripheral Vascular Dysfunction in Heart Failure Patients With a Continuous-Flow Left Ventricular Assist Device: The Role of Pulsatility. *JACC Heart Fail*. 2015; 3(9): 703-11.

8. Moazami N, Dembitsky WP, Adamson R, et al. Does pulsatility matter in the era of continuous-flow blood pumps? *J Heart Lung Transplant*. 2015; 34(8): 999-1004.
9. Krabatsch T, Schweiger M, Danel M, et al. Is bridge to recovery more likely with pulsatile left ventricular assist devices than with nonpulsatile-flow systems? *Ann Thorac Surg* 2011; 91: 1335-1340.

Mechanical Circulatory Support Outcomes

10. Strueber M, Larbalestier R, Jansz P, et al. Results of the post-market Registry to Evaluate the HeartWare Left Ventricular Assist System (ReVOLVE). *J Heart Lung Transplant* 2014; 33: 486-91.
11. Gregoric ID, Cohn WE, Frazier OH. Diaphragmatic implantation of the HeartWare ventricular assist device. *J Heart Lung Transplant*. 2011; 30(4): 467-70.