Three practices to speed patient recovery after VAD implantation.

Today, ventricular assist devices (VAD) are routinely used to partially or completely replace the function of a failing heart.[1] While this quantum leap forward is good news for patients with advanced heart failure, there are still significant risks involved—particularly short-term complications that continue to threaten major morbidity. Yet by implementing a few simple but crucial protocols, you can greatly speed recovery, lower the costs of care, and ensure optimal outcomes for your patient.

One of the most prevalent and persistent events hindering recovery in many patients is early postoperative bleeding. The take back rates for bleeding and washouts tell the story. In large multi-center prospective trials, 1/3 of patients consistently require a take back for bleeding during early post-op.[2,3] In fact, the postoperative bleeding is so routinely severe that many programs utilize Delayed Sternal Closure (DSC) after LVAD placement as a tactic to minimize potential for retained blood leading to tamponade and to prevent organ injury.[4,5] In DSC the surgeon places chest tubes around the heart and suture sites for drainage, but leaves the sternum open, covered by a surgical dressing or the skin. The patient is then taken back to the operating room in subsequent days, often more than once, to wash out the chest and then eventually close.

Chest tubes are used to remove blood around the heart and lungs while patients are bleeding. If the chest tubes clog, the patient can have Retained Blood Syndrome (RBS) which may require take backs and washouts to remedy.

Here are three tactics being utilized to reduce Retained Blood Syndrome after VAD implantation and speed patient recovery.

1 Take into account that chest tubes frequently clog.

Recent prospective observational studies demonstrate that over one in three conventional chest tubes clog after heart surgery. This increases the need for take backs and washouts.[6]

2 Do not rely on drainage manipulation like stripping or milking.

Recent best evidence reviews conclude that due to possible tissue damage and lack of demonstrable benefit in most patients, these old-school practices should not be performed.

3 Proactively "ACT" to maximize evacuation of shed blood by preventing chest tube occlusion while the patient is still bleeding.

New advancements in technology now offer a more effectively way to manage bleeding after VAD placement. PleuraFlow® Active Clearance Technology® (ACT™) keeps chest tubes clear, and promotes superior blood evacuation to prevent retained blood complications.[7,8,9] Keeping chest tubes open while the bleeding continues, and the coagulation defect is corrected, may result in less retained blood, fewer take backs, and even allow programs to rely less on practices such as DSC.[8,9]

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References

1. Givertz MM.Ventricular Assist Devices: Important Information for Patients and Families. *Circulation.* 2011;124:e305-e311
2. Miller LW, Pagani FD, Russell SD, John R, Boyle AJ, Aaronson KD, Conte JV, Naka Y, Mancini D, Delgado RM, MacGillivray TE, Farrar DJ, Frazier OH. HeartMate II Clinical Investigators. Use of a continuous-flow device in patients awaiting heart transplantation. *N Engl J Med.* 2007;357:885–896.
3. Slaughter MS, Rogers JG, Milano CA, Russell SD, Conte JV, Feldman D, Sun B, Tatooles AJ, Delgado RM, Long JW, Wozniak TC, Ghumman W, Farrar DJ, Frazier OH. HeartMate II Investigators. Advanced heart failure treated with continuous-flow left ventricular assist device. *N Engl J Med.* 2009;361:2241–2251.
4. Schaffer JM, Arnaoutakis GJ, Allen JG, Weiss ES, Patel ND, Russell SD, Shah AS, Conte JV. Bleeding complications and blood product utilization with left ventricular assist device implantation. *Ann Thorac Surg.* 2011;91:740–747.
5. Eckman PM, John R. Bleeding and Thrombosis in Patients With Continuous-Flow Ventricular Assist Devices. *Circulation.* 2012;125:3038-3047.
6. Karimov JH, Gillinov A M, Schenck L, Cook M, Kosty Sweeney D, Boyle EM, Fukamachi K. Incidence of chest tube clogging after cardiac surgery: a single-centre prospective observational study. *Eur J Cardiothorac Surg.* 2013;44(6):1029-36.
7. Shiose, A.; Takaseya, T.; Fumoto, H.; Arakawa, Y.; Horai, T.; Boyle, E. M.; Gillinov, A. M.; Fukamachi, K. "Improved drainage with active chest tube clearance." *Interactive CardioVascular and Thoracic Surgery* 10 (5): 685–688.
8. Arakawa, Yoko; Shiose, Akira; Takaseya, Tohru; Fumoto, Hideyuki; Kim, Hyun-Il; Boyle, Edward M.; Gillinov, A. Marc; Fukamachi, Kiyotaka. "Superior Chest Drainage With an Active Tube Clearance System: Evaluation of a Downsized Chest Tube." *The Annals of Thoracic Surgery* 91 (2): 580–583
9. Perrault, Louis, Michel Pellerin, Michel Carrier, Raymond Cartier, Denis Bouchard, Philippe Demers, Edward M. Boyle. The PleuraFlow Active Chest Tube Clearance System: Initial Clinical Experience in Adult Cardiac Surgery. *Innovations.* 2012;7:354-358.

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