

What's New in MCS

JUNE 2014 MCS JOURNAL REVIEW



Jose Nativi-Nicolau, MD
Assistant Professor of Medicine
University of Utah
Salt Lake City, Utah, USA

JOURNAL OF HEART AND LUNG TRANSPLANTATION

1. Kirklin JK, Naftel DC, Pagani FD, Kormos RL, Stevenson LW, Blume ED, Miller MA, Timothy Baldwin J, Young JB. Sixth INTERMACS annual report: a 10,000-patient database. *J Heart Lung Transplant.* 2014 Jun;33(6):555-64
<http://www.ncbi.nlm.nih.gov/pubmed/?term=PMID%3A+24856259>
 - The sixth annual report of the Interagency Registry of Mechanically Assisted Circulatory Support (INTERMACS) summarized 8 years of enrollment between June 23, 2006 and December 31, 2013 on a total of 10,542 primary implants. The report includes the analysis of pediatric patients in a separate database called Pediatric Mechanical Circulatory Support (PEDIMACS). It also added the comparison between two eras of continuous-flow durable devices 2008 to 2010 vs 2011 to 2013.
 - Continuous-flow technology is dominant accounting for 100% of patients receiving destination therapy since 2010 and >95% of all patients receiving primary mechanical circulatory support.
 - Destination therapy continues to increase accounting for 19.6% of implants from 2008 to 2010, compared to 41.6% from 2011 to 2013.
 - For continuous-flow technology the actuarial survival at 1 and 2 years has reached 80% and 70%, respectively and has remained unchanged in the last two eras. Risk factors for mortality remain the same including age >65 years, INTERMACS Level 1 and 2, renal failure and right ventricular dysfunction.
 - The total burden of adverse events appears to have decreased in the last era. However, the freedom from pump exchange decreased between eras from 96% (2008-2010) to 91% (2011 to 2013), probably from a slight increase in pump thrombosis in the last era. The one year survival after pump exchange decreased to 65% after second implant and 50% after a third implant.
 - Quality of life continues to improve after 1 and 2 years of implantation in both eras.
 - PEDIMACS data collection from September 1, 2012 to December 31, 2013 includes 99 patients with durable device and 19 patients with temporary devices (excluding ECMO). Paracorporeal pulsatile devices are dominant in infants and children compared to continuous-flow intracorporeal devices which are more common in adolescents probably reflecting anatomic limitations.

2. Robertson JO, Grau-Sepulveda MV, Okada S, O'Brien SM, Matthew Brennan J, Shah AS, Itoh A, Damiano RJ, Prasad S, Silvestry SC. Concomitant tricuspid valve surgery during implantation of continuous-flow left ventricular assist devices: a Society of Thoracic Surgeons database analysis. *J Heart Lung Transplant*. 2014 Jun;33(6):609-17.
<http://www.ncbi.nlm.nih.gov/pubmed/?term=24661682>
 - Robertson et al. examined a cohort of continuous-flow LVAD patients with preoperative moderate to severe tricuspid valve (TV) regurgitation and compared the outcomes with patients who underwent implantation of an LVAD alone with those who had combined LVAD and TV procedures.
 - The cohort consisted of 2,196 patients from the Society of Thoracic Surgeons National Database between January 2006 and September 2012. TV procedures were performed in 588 (27%) patients. Annuloplasty was performed in 81% of these patients. Patients with TV procedures had higher incidence of pre-implant renal failure not requiring dialysis (15% vs 10.7%, $p = 0.0280$) and an average increase in perfusion time of 36 min (125 vs 89 min; $p < 0.0001$) during implantation.
 - Concomitant TV procedure failed to reduce early mortality or subsequent RVAD insertion. However TV procedure was associated with increased risk for prolonged ventilation, prolonged ICU and hospital stays, post-operative renal failure/dialysis, transfusion, and reoperation.
 - Some limitations included the lack of parameters of the TV morphology, right ventricular geometry, or pre-operative hemodynamics describing loading and pressure conditions.
 - The results of the analysis of this large database suggest that the practice of performing TV procedures utilizing only the preoperative degree of TV regurgitation should be re-considered.
3. Estep JD, Vivo RP, Cordero-Reyes AM, Bhimaraj A, Trachtenberg BH, Torre-Amione G, Chang SM, Elias B, Bruckner BA, Suarez EE, Loebe M. A simplified echocardiographic technique for detecting continuous-flow left ventricular assist device malfunction due to pump thrombosis. *J Heart Lung Transplant*. 2014 Jun;33(6):575-86
<http://www.ncbi.nlm.nih.gov/pubmed/?term=PMID%3A+24656286>
4. Hollander SA, Hollander AJ, Rizzuto S, Reinhartz O, Maeda K, Rosenthal DN. An inpatient rehabilitation program utilizing standardized care pathways after paracorporeal ventricular assist device placement in children. *J Heart Lung Transplant*. 2014 Jun;33(6):587-92.
<http://www.ncbi.nlm.nih.gov/pubmed/?term=24468119>
5. Saito S, Yamazaki K, Nishinaka T, Ichihara Y, Ono M, Kyo S, Nishimura T, Nakatani T, Toda K, Sawa Y, Tominaga R, Tanoue T, Saiki Y, Matsui Y, Takemura T, Niinami H, Matsumiya G; J-MACS Research Group. Post-approval EVA study of a highly pulsed, low-shear-rate, continuous-flow, left ventricular assist device, EVAHEART: a Japanese multicenter study using J-MACS. *J Heart Lung Transplant*. 2014 Jun;33(6):599-608
<http://www.ncbi.nlm.nih.gov/pubmed/?term=24746637>

ANNALS OF THORACIC SURGERY

1. Whitson BA, Eckman P, Kamdar F, Lacey A, Shumway SJ, Liao KK, John R. Hemolysis, pump thrombus, and neurologic events in continuous-flow left ventricular assist device recipients. *Ann Thorac Surg.* 2014 Jun;97(6):2097-103.
<http://www.ncbi.nlm.nih.gov/pubmed/?term=24775803>
2. Riebandt J, Haberl T, Mahr S, Rajek A, Laufer G, Schima H, Zimpfer D. Off-pump HeartWare ventricular assist device implantation with outflow graft anastomosis to the left subclavian artery. *Ann Thorac Surg.* 2014 Jun;97(6):2214-6.
<http://www.ncbi.nlm.nih.gov/pubmed/?term=24882317>

EUROPEAN HEART JOURNAL

1. Ong BH, Chiam PT, Sim DK, Tan TE. Post-implantation transcatheter aortic valve migration in a left ventricular assist device patient with severe aortic insufficiency. *Eur Heart J.* 2014 Jun 21;35(24):1616
<http://www.ncbi.nlm.nih.gov/pubmed/?term=24334716>

JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY – HEART FAILURE

CIRCULATION

JOURNAL OF CARDIAC SURGERY