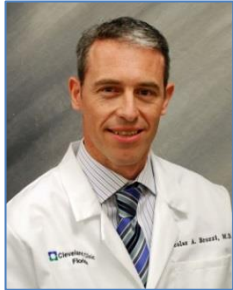


What's New in MCS

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Reviews:

★★ **Resource use trends in extracorporeal membrane oxygenation in adults:
An analysis of the Nationwide Inpatient Sample 1998-2009**

<http://www.sciencedirect.com/science/article/pii/S002252231301129X>

Bryan G. Maxwell, Andrew J. Powers, Ahmad Y. Sheikh, Peter H. U. Lee,
Robert L. Lobato, and Jim K. Wong. J Thorac Cardiovasc Surg 2014;148:416-21

Extracorporeal membrane oxygenation (ECMO) is a well-established, but complex and resource-intensive life-support intervention for critically ill patients with cardiac or respiratory failure. Although adult patients represent a minority (12.5%) of all ECMO records in ELSO registry, they are a rapidly growing group.

This study included all adult admissions involving ECMO from the Nationwide Inpatient Sample database (years 1998-2009), which represents around 20% of all US nonfederal, nonrehabilitation hospitals.

An estimated total of 8753 admissions involved ECMO support over the study period. Overall length of stay was 18.3 ± 1.3 days. Total hospital charges averaged $\$344,009 \pm \$30,707$ per admission, with average charges per day of $\$40,588 \pm \3099 . Cumulative national charges for extracorporeal membrane oxygenation admissions increased significantly from \$109.0 million in 1998 to \$764.7 million in 2009 ($P = .0016$). Charges per patient and length of stay also increased significantly ($P = .0032$ and $.0321$, respectively). The increasing trend in the number of extracorporeal membrane oxygenation admissions during the study period was not statistically significant ($P = .19$). The post-cardiotomy group had more favorable outcomes and lower resource use. A shift was observed in the relative case-mix of extracorporeal membrane oxygenation admissions over the study period, with a relative decrease in the post-cardiotomy group and increases in the cardiogenic shock, respiratory failure, and lung transplant groups.

Analysis:

Dramatic increases in ECMO support associated hospital charges over a decade have not resulted in improved outcomes. A shift toward ECMO use in patient groups (other than in the post-cardiotomy setting) with greater resource use and worse outcomes highlight the need to identify prognostic indicators which may help determine benefits, and futility of this therapy, and optimize resource utilization.

★★ Outcomes after prolonged extracorporeal membrane oxygenation support in children with cardiac disease—Extracorporeal Life Support Organization registry study

<http://www.sciencedirect.com/science/article/pii/S0022522313011355>

Eric Dean Merrill, Laura Schoeneberg, Pratik Sandesara, Erica Molitor-Kirsch, James O'Brien, Jr, Hongying Dai, and Geetha Raghuvver. J Thorac Cardiovasc Surg 2014;148:582-8

ECMO remains the mainstay of mechanical circulatory support in children with cardiac insufficiency, but outcomes after prolonged ECMO support remain ill defined. This study sought to determine the outcomes after prolonged ECMO for cardiac insufficiency in children.

A total of 777 children aged <18 years required ECMO support for ≥ 14 days. Of these, 176 (23%) survived to hospital discharge. Compared with the nonsurvivors, the survivors were older (median age, 0.64 vs 0.10 years; $P < .01$), weighed more (median weight, 7.0 kg; range, 2-90; vs median, 4.0; range, 1.4-100 kg; $P < .01$), had a shorter duration of support (mean, 20 ± 6 vs 22 ± 9 days; $P < .01$), and a fewer number of organ system complications (mean, 2.8 ± 1.7 vs 3.6 ± 1.6 , $P < .01$). Children with congenital heart disease had worse survival than those with cardiomyopathy and myocarditis (15% vs 42% and 52%, respectively; $P < .01$), and those with 1-ventricle physiology had worse survival than those with 2-ventricle physiology (10% vs 18%, $P = .01$). Seven percent ($n = 56$) reached cardiac transplantation, with 66% surviving to hospital discharge versus 19% of those not transplanted ($P < .01$).

Analysis:

Outcomes continue to be poor for prolonged ECMO support in children and cardiac transplantation was associated with high mortality compared with benchmarks for cardiac transplantation survival. The authors identified factors associated with improved survival, and suggest that earlier redirection of care or conversion to other modes of mechanical support as a bridge to transplantation should be considered.

★ **Extracorporeal life support for cardiogenic shock: influence of concomitant intra-aortic balloon counterpulsation**

<http://0-ejcts.oxfordjournals.org.library.ccf.org/content/46/2/186.full.pdf+html>

Sun Kyun Ro, Joon Bum Kim, Sung Ho Jung, Suk Jung Choo, Cheol Hyun Chung, and Jae Won Lee. Eur J Cardiothorac Surg (2014) 46 (2): 186-192

Intra-aortic balloon counterpulsation (IABP) during extracorporeal life support (ECLS) for cardiogenic shock may improve pulsatility and coronary perfusion, thereby promoting recovery of cardiac function. However, the risks and benefits of IABP during ECLS in real clinical settings have not been evaluated. This study aims to evaluate the effect of IABP on the early outcome of ECLS for cardiogenic shock.

The authors evaluated 253 adult patients undergoing ECLS for cardiogenic shock from January 2005 to August 2012. Of them, 60 patients underwent concomitant IABP (IABP group) and 193 underwent ECLS only (control group).

RESULTS: The indications for ECLS were low cardiac output after cardiac surgery in 118 patients (46.6%), heart failure in 71 (28.1%), acute myocardial infarction in 49 (19.4%) and others in 15 (5.9%). Successful ECLS weaning rate was higher in the IABP group than in the control group (61.7 vs 42.0%, $P = 0.008$); however, there was no significant difference in in-hospital mortality between the two groups (68.6 vs 72.0%, $P = 0.58$).

Analysis:

The use of IABP during ECLS improved successful weaning of ECLS, but did not reduce hospital mortality. The impact of concomitant IABP during ECLS continues to be matter of debate, with arguments weighting in favor of both the theoretical benefit of additional support with IABP, and potential complications associated with prolonged use of IABP, and should be clarified in future studies.

Articles:

ASAIO Journal:

Thrombus Formation Patterns in HeartMate II Continuous-Flow Left Ventricular Assist Devices: A Multifactorial Phenomenon Involving Kounis Syndrome? ★

Nicholas G. Kounis, George D. Soufras, Periklis Davlouros, Grigorios Tsigkas, and George Hahalis

ASAIO Journal 2014; 60:369–371, July / August 2014.

Will the Influential Diagnosis Please Stand Up: Managing the LVAD Patient with Cancer

Antolin S. Flores and Mark A. Gerhardt

ASAIO Journal 2014; 60:498–501, July / August 2014.

Acoustic Spectral Analysis for Determining Pump Thrombosis in Rotary Blood Pumps
Friedrich Kaufmann, Christoph Hörmandinger, Alexander Stepanenko, Alexandra Kretzschmar, Sajjad Soltani, Thomas Krabatsch, Evgenij Potapov, and Roland Hetzer
ASAIO Journal 2014; 60:502–507, July / August 2014. ★

Insensible Water Loss Through Adult Extracorporeal Membrane Oxygenation Circuit: An In Vitro Study

Chang Li Li, Tam Oi Yan, Kwan Ming Chit Arthur, Shum Hoi Ping, Chan King Chung Kenny, and Yan Wing Wa

ASAIO Journal 2014; 60:508–512, July / August 2014.

Association of HeartMate II Left Ventricular Assist Device Flow Estimate with hermodilution Cardiac Output

Tal Hasin, Marianne Huebner, Zhuo Li, Daniel Brown, John M. Stulak, Barry A. Boilson, Lyle Joyce, Naveen L. Pereira, Sudhir S. Kushwaha , and Soon J. Park

ASAIO Journal 2014; 60:513–518, July / August 2014.

Baseline Red Blood Cell Osmotic Fragility Does Not Predict the Degree of Post-LVAD Hemolysis

Jesse L. Madden, Stavros G. Drakos, Josef Stehlik, Stephen H. McKellar, Matthew T. Rondina , Andrew S. Weyrich, and Craig H. Selzman

ASAIO Journal 2014; 60:524–528, July / August 2014.

Perioperative Use of TandemHeart Percutaneous Ventricular Assist Device in Surgical Repair of Postinfarction Ventricular Septal Defect.

Igor D. Gregoric, Biswajit Kar, Tomaz Mesar, Sriram Nathan , Rajko Radovancevic , Manish Patel , and Pranav Loyalka

ASAIO Journal 2014; 60:529–532, July / August 2014.

Six-Year In-Vitro Reliability Results of the HeartWare HVAD Pump

Carlos Reyes, Katherine Chorpensing, Jeffrey A. LaRose, Ramiro Gomez, and Daniel Tamez

ASAIO Journal 2014; 60:541–544, July / August 2014.

Administration of Antithrombin Concentrate in Infants and Children on Extracorporeal Life Support Improves Anticoagulation Efficacy

Lindsay M. Ryerson, Aisha K. Bruce, Laura nce Lequier, Stefan Kuhle, M. Patti Massicotte , and Mary E. Bauman.

ASAIO Journal 2014; 60:559–563, July / August 2014.

Clinical Indications for Implantation of the Total Artificial Heart ★

Kristin L. Thanavaro, Daniel G. Tang, Vigneshwar Kasirajan, and Keyur B. Shah

ASAIO Journal 2014; 60:594–596, July / August 2014.

Prolonged Use of Extracorporeal Membrane Oxygenation as a Rescue Modality Following Traumatic Brain Injury

Jonathan A. Messing, Ritesh V. Agnihotri, Rachel Van Dusen, Farzad Najam, James R. Dunne, Jacqueline R. Honig, and Babak Sarani
ASAIO Journal 2014; 60:597–599, July / August 2014.

The Presence of Air Bubbles in the Aorta of a Patient with a HeartMate II Left Ventricular Assist Device: A Novel Sign of Outflow Graft Obstruction

Margot K. Davis, Richard Ha, and Dipanjan Banerjee
ASAIO Journal 2014; 60:600–602, July / August 2014.

Double Lumen Catheter Placement during VV ECMO in an Infant with Persistent Left Superior Vena Cava—Important Considerations

L. Mikael Broman and Jan Hultman
ASAIO Journal 2014; 60:603–605, July / August 2014.

The Use of ECMO in HIV/AIDS with Pneumocystis jirovecii Pneumonia: A Case Report and Review of the Literature

Kelly Cawcutt, Alice Gallo De Moraes, Sarah J. Lee, John G. Park, Gregory J. Schears, and Michael E. Nemergut
ASAIO Journal 2014; 60:606–608, July / August 2014.

Cancer in End-Stage Heart Failure Patients Supported by Left Ventricular Assist Devices

Renzo Y. Loyaga-Rendon, Chakradhari Inampudi, Jose A. Tallaj, Deepak Acharya, and Salpy V. Pamboukian
ASAIO Journal 2014; 60:609–612, July / August 2014.

Journal of Thoracic and Cardiovascular Surgery:

Resource use trends in extracorporeal membrane oxygenation in adults: An analysis of the Nationwide Inpatient Sample 1998-2009 ★★

Bryan G. Maxwell, Andrew J. Powers, Ahmad Y. Sheikh, Peter H. U. Lee, Robert L. Lobato, and Jim K. Wong.
J Thorac Cardiovasc Surg 2014;148:416-21

Outcomes after prolonged extracorporeal membrane oxygenation support in children with cardiac disease—Extracorporeal Life Support Organization registry study ★★

Eric Dean Merrill, Laura Schoeneberg, Pratik Sandesara, Erica Molitor-Kirsch, James O'Brien, Jr, Hongying Dai, and Geetha Raghuvver.
J Thorac Cardiovasc Surg 2014;148:582-8

Alternation of left ventricular load by a continuous-flow left ventricular assist device with a native heart load control system in a chronic heart failure model

Mamoru Arakawa, Takashi Nishimura, MD, Yoshiaki Takewa, Akihide Umeki, Masahiko Ando, Hideo Adachi, and Eisuke Tatsumi.

J Thorac Cardiovasc Surg 2014;148:698-704.

Blood lactate level during extracorporeal life support as a surrogate marker for survival

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Sung Jun Park, Sang-pil Kim, Joon Bum Kim, Sung-Ho Jung, Suk Jung Choo, Cheol Hyun Chung, and Jae Won Lee.

J Thorac Cardiovasc Surg 2014;148:714-20

Use of polytetrafluoroethylene vascular graft to cover the kinking protector of left ventricular assist device facilitates later pump exchange

Evgenij V. Potapov, Roland Hetzer, and Thomas Krabatsch.

J Thorac Cardiovasc Surg 2014;148:745-6

European Journal of Cardiothoracic Surgery:

Development of ventricular assist devices in China: present status, opportunities and challenges

Kaiyun Gu, Yu Chang, Bin Gao, Feng Wan, Daniel Loisanca, and Yi Zeng

Eur J Cardiothorac Surg (2014) 46 (2): 179-185

Extracorporeal life support for cardiogenic shock: influence of concomitant intra-aortic balloon counterpulsation ★

Sun Kyun Ro, Joon Bum Kim, Sung Ho Jung, Suk Jung Choo, Cheol Hyun Chung, and Jae Won Lee

Eur J Cardiothorac Surg (2014) 46 (2): 186-192

Pathological analysis of the aortic valve after long-term left ventricular assist device support

Hiroki Hata, Tomoyuki Fujita, Hatsue Ishibashi-Ueda, Takeshi Nakatani, and Junjiro Kobayashi

Eur J Cardiothorac Surg (2014) 46 (2): 193-197

Journal of the American College of Cardiology Heart Failure:

Body Position and Activity, But Not Heart Rate, Affect Pump Flows in Patients With Continuous-Flow Left Ventricular Assist Devices ★

Kavitha Muthiah, Sunil Gupta, James Otton, Desiree Robson, Robyn Walker, Andre Tay, Peter Macdonald, Anne Keogh, Eugene Kotlyar, Emily Granger, Kumud Dhital, Phillip Spratt, Paul Jansz, Christopher S. Hayward.

J Am Coll Cardiol HF 2014;2(4):323-30

Factors Influencing the Rate of Flow Through Continuous-Flow Left Ventricular Assist Devices at Rest and With Exercise

Benjamin D. Levine, William K. Cornwell, and Mark H. Drazner.

J Am Coll Cardiol HF 2014;2(4):331-334

Journal of Cardiac Failure:

Changes in Cardiopulmonary Exercise Testing Parameters Following Continuous Flow Left Ventricular Assist Device Implantation and Heart Transplantation

Shannon M. Dunlay, Thomas G. Allison, Naveen L. Pereira

Journal of Cardiac Failure. 2014; 20(8):548–554

Circulation Heart Failure:

Bi monthly edition. No publication in August 2014.

European Journal of Heart Failure:

No MCS related articles in August 2014.