



Louis E Samuels

Lankenau Medical Center, USA

Artificial hearts and ventricular assist devices of the 21st century

Tremendous progress has been made in the field of Mechanical Circulatory Support since year 2000. The landmark REMATCH Trial, published in 2001, launched a concept that was considered to be the Holy Grail of artificial heart technology: that a machine can be reliably and confidently used as an alternative to a heart transplant in patients who are ineligible for a transplant. The first generation LVADs outperformed maximal medical therapy both in terms of long-term survival as well as quality of life in end-stage heart failure patients. Now, more than ten years later, second generation LVADs are implanted more often than transplants annually and third generation products may challenge heart transplantation for patients who are eligible for either therapy.

Simultaneously, the treatment of acute cardiogenic shock as radically changed to solve the problem of delayed resoration of circulatory stability in patients with hemodynamic compromise. The landmark SHOCK trial reported the dismal outcomes of patients hospitalized and treated with AMI-Shock. In the past, bulky technologies offered some hope for this patient population, albeit at the expense of numerous and serious complications. Fortunately, minimally invasive techniques, micro-technologies, and percutaneous methadologies have translated into markedly improved survival of patients overall, a majority of them with their native hearts intact, and with far fewer morbidity. What was once considered a "last ditch effort"--with survival the exception more than the rule--has now reversed: investigators now consistently report over 50% (and sometimes 80%) survival in patients who, historically, would have succumbed to medical and surgical forms of cardiogenic shock in 60%-80% of the cases.

In summary, the last decade has demonstrated more than feasibility for mechanical device therapy for the most advanced forms of acute and chronic heart failure. The standard of care is shifting more toward these technologies than ever before.

Biography

Louis Samuels is a board-certified cardiothoracic surgeon. He graduated from Hahnemann University School of Medicine in 1987 and completed his training in 1995. In 2001, Samuels and his team implanted the world's 5th totally implantable electric artificial heart (AbioCor™). In 2003, he joined the Main Line Health System at Lankenau Hospital. In addition to coronary artery bypass grafting, valve replacement, and LVAD implantation, he is a world expert on mechanical circulatory assist technologies of all kinds. He is Professor of Surgery at Thomas Jefferson School of Medicine, Surgical Director of Heart Failure at the Lankenau Medical Center, and Chief of Cardiothoracic Surgery at Bryn Mawr Hospital. He is a full member of the American Association for Thoracic Surgery (AATS) and the Society of Thoracic Surgeons (STS) and serves as a guest reviewer for cardiac surgery journals. He has published over 100 articles and participated in several landmark clinical trials.

SamuelsL@mlhs.org