

Classic Pages of the *Journal of ExtraCorporeal Technology*

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Cardiac Assist Devices

Kantrowitz, A. Cardiac assist devices. J Extra Corpor Technol. 1972;4(3):15–20.

Our classic article for this issue is a now historic 1972 report by Dr. Kantrowitz summarizing his research team's success to demonstrate ventricular assist with artificial devices, diaphragms, aortic balloons, and orthotopic donor hearts (1). He weaves remarkable case reports into the article to illustrate what are now most certainly pioneering endeavors. Dr. Kantrowitz discusses the evolution of the mechanical cardiac assist (MCA) and counterpulsation prior to 1972. It is appropriate that we reflect on Dr. Kantrowitz' contributions to our *Journal* since there are two articles regarding IABP in this issue.

Our classic article is one of three interesting contributions that the Kantrowitz team made to *JECT* in the 1970s (1–3). A keyword search of *JECT* for intra-aortic balloon pumping yielded only six articles, so the current IABP articles are welcomed and relevant to the newly updated perfusionist Scope of Practice Section 2.1.2. <<http://www.amsect.org/general/scope.html>>. The use of the IABP for MCA is an important aspect in the care of heart failure patients with which perfusionists should be familiar (4).

Building on the work of Mouloupoulos, et al. (5) and working at the same time as many other international researchers in the 1960s, Adrian Kantrowitz came to be referred to as the “father of intra-aortic balloon pumping”, probably because of his early success to help commercialize a pumping device and to form a 1970s Who's-Who in cardiac surgery, multi-institutional research, and information-sharing group. The on-line Sixth Edition Columbia Encyclopedia lists Dr. Kantrowitz's accomplishments as a physician and inventor (multiple patent holder) of a plastic heart valve, a heart lung machine, an internal pacemaker, and an auxiliary left ventricle. As well, Dr. Kantrowitz performed the first implantation of a partial mechanical heart in a human, the second human cardiac transplant, and pioneered motion pictures of the inside of the human heart.

On a personal note, 1972 was the year I entered perfusion school and during my research class work, my classmates and I had the opportunity to visit Dr. Kantrowitz's

lab in Detroit. Dr. Kantrowitz, his research staff and his administrator-wife spent a great deal of time with us and gave us a lasting memory by allowing us to use the drive system (Kantrowitz Phase-Shift Balloon Pump) pictured in this issue's classic article.

In the 1950–1960s, Kantrowitz referred to diastolic augmentation as “arterial pressure delay” or “phase-shift pumping” while others coined the term “counterpulsation”. Not only is Dr. Kantrowitz a pioneer, surgeon, and inventor, but he is a motivating and effective teacher. Today, Dr. Kantrowitz continues to influence the ventricular-assist industry with his Dynamic Aortic Patch <<http://www.lvadtech.com/>>.

The third article contributed to *JECT* from the Kantrowitz team (3) is an interesting piece of research (a classic in its own right) that documents that counterpulsation prepares the myocardium to protect it from a forthcoming infarct, which is the early evidence for preoperative IAB use in patients at risk for perioperative myocardial infarct during cardiac surgery. While the preoperative use of IAB is still being debated (6–8), one piece of evidence helping to explain why counterpulsation may be protective prior to myocardial ischemia was published in our *Journal* in 1973 by the Kantrowitz team (3).

Reflecting on the influence of the IABP on the evolution of our cardiac assist equipment, let's not forget the late 1970s creative method to create pulsatile blood flow during CPB using a balloon-pump-like arterial line pumping chamber (9). If you remember the Shiley Inc., Tamari-Kaplitt Pulsator®, consider yourself a seasoned perfusionist (10).

As a profession and clinicians, we owe a great deal of our knowledge of mechanical cardiac assist and balloon pump physiology, and our MCA practice to Dr. Kantrowitz and his collaborators.

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