

# Artificial Hearts

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Earlier artificial hearts date to mid – 1950's. However, the first artificial heart the Jarvik-7 was not used until the early 1980's. The Jarvik-7 was named after its designer Robert K. Jarvik, an American physician.

Earlier forms of artificial hearts were tested on animal such as cows to identify problems. In 1969 Denton Cooley of the Texas Heart Institute successfully kept a man alive for 60 days with their model. In 1982, William DeVries of the University of Utah implanted the Jarvik –7 into a patient.

There were three big challenges to over come in obtaining a more successful artificial heart than the Jarvik7. One, they needed a surface material that would allow blood flow without a high clotting incident; two, they needed a mechanism for having the blood be ejected from one chamber without needing a big compliance chamber within the chest; third, they needed a battery system that could power this device without risk of infection.

Due to the fact that implantable hearts were not such a great success so far tens of thousands of people a year died waiting for donors. Until Abiomed a company located in Danvers, Massachusetts was willing to try and overcome the problems with past artificial hearts. They invented what is known as the AbioCor, the first artificial heart to be used in two decades. On July 2, 2001 the AbioCor was implanted in a patient at the Jewish Hospital in Louisville, Kentucky.

The AbioCor is about the size of a human heart. The core of the device is the hydraulic pump that shuttles hydraulic fluid from one side to the other. The various components are: Hydraulic pump, Porting valves, Wireless energy transfer system, Internal battery, External battery, and Controller. The AbioCor is mainly composed of titanium and plastic, connects to four locations: Right Atrium, Left Atrium, Aorta, and the Pulmonary Artery.

The surgery to implant an AbioCor artificial heart takes about seven hours and is a very delicate procedure.

In the beginning not enough was known about the human heart to properly replicate it and after the downfall of the Jarvik7 not a lot of people wanted to touch the subject. But now due to new findings and the fixing of old problems the AbioCor has the potential to benefit tens of thousands of people a year.



**Above:** The Original JARVIK Artificial Heart