The AbioCor Implantable Replacement Heart

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The AbioCor Implantable Replacement is an advanced medical system that has been developed in order to extend and improve the lives of patients who would otherwise die of heart failure. It is intended to serve as an alternative to heart transplantation. It is equipped with an internal motor and is able to move blood through the lungs and to the rest of the body simulating the rhythm of a heartbeat. It consists of an internal thoracic unit, an internal rechargeable battery, an internal miniaturized electronics package and an external battery pack. The thoracic unit weighs about 2 pounds and consists of 2 artificial ventricles with their corresponding valves and a motor-driven pumping system. The implantable electronics package monitors and controls the pumping speed of the heart, based on the physiological needs of the patient. The internal batteries are sized for a one-half hour operation at implant, allowing patients to conduct activities

such as taking a shower, without an external power source or battery pack. External packs can be used for many hours depending on the number of battery packs carried. The internal batteries are re-charged from the external battery pack. This is performed with an energy transfer device called TET (transcutaneous energy transmission) which transmits power across the skin without piercing the surface. It is primarily made of titanium and Angioflex. Angioflex is specifically engineered to reduce the likelihood of damage to blood cells and to prevent clotting.

The first implant of AbioCor took place on July 4, 2001 in the Jewish Hospital in Louisville, KY. It was a successful transplant and the patient Robert Tools was recovering nicely, however he died four months later due to internal abdominal bleeding which was unrelated to the operation. The second implant patient is also recovering nicely and can now do activities such as jogging and hiking that he was unable to do before the implant. The main advantage of the AbioCor over heart transplantation is its availability in the face of the constant shortage of donor hearts and it costs less because it does not require immunosuppression therapy since it's an inert object.