Heart disease claims more than 700,000 lives annually in the United States. Death resulting from acute events is nearly 10 times that due to chronic heart failure. A variety of cardiac assist devices with design features specific to the clinical applications should be available to address the spectrum of clinical needs, including the protection of the heart during very high risk percutaneous procedures, the recovery of the heart following acute insults, such as acute myocardial infarction, post-cardiotomy shock, myocarditis, and other acute failure conditions, and destination therapy such as implantable LVADs for congestive heart failure or the fully implantable replacement heart for chronic biventricular failure. The IMPELLA 2.5 (2.5 L/min flow) has a 12 Fr pump head mounted on a 9 Fr catheter is designed specifically for percutaneous access to achieve hemodynamic stabilization. The IMPELLA 5.0 model (5.0 L/min) can be introduced via a surgical cut down and can provide full left ventricular support and unloading for up to 7 days. These devices can be readily introduced resulting in the immediate reduction of myocardial O2 consumption and help arrest or slow the infarct evolution process. Cardiac recovery following acute insult has been shown in many cases, through the use of the AB5000 extracorporeal VAD (6 L/min), to require as much as one month or more of hemodynamic support, an interval consistent with time needed to develop collaterization in the myocardium. For those patients whose hearts failed to recover, having been given sufficient time to recover, if eligible, transplantation is an option, if not, destination therapy can be considered. In chronic heart failure patients not eligible for transplantation, destination therapy should be considered with the use of approved implantable LVAD. For those patients requiring biventricular support, use of a fully implantable replacement heart should be evaluated. The status of the AbioCor (8 L/min), a fully implantable total artificial heart, will be reviewed. Fourteen patients were implanted with the AbioCor in the initial clinical trial. Development efforts on the next generation AbioCor designed to fit a broader patient population will be discussed.