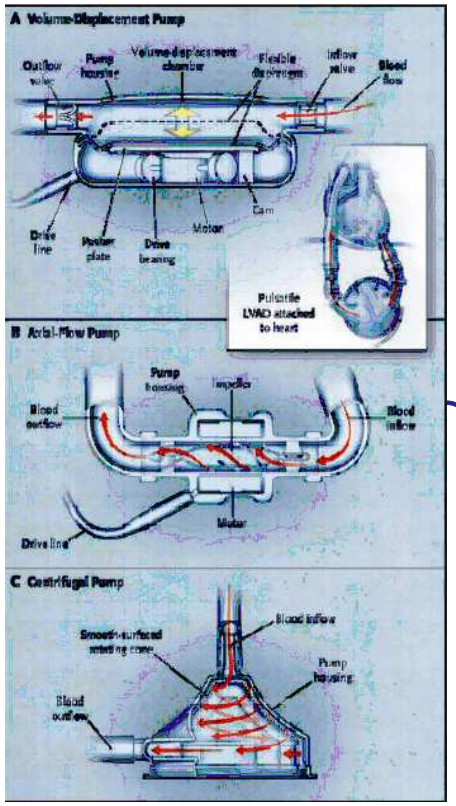
ventricular assist devices [created by Paul Young 16/10/07]

mechanisms of action



complications

1. infection
2. bleeding
3. thromboembolism
4. mobility restrictions
5. device failure

issues with use

1. less familiarity among intensivists than with IABP
2. more difficult to use during transport
3. provides greater control of over cardiac output as well as right & left ventricular output
4. insertion & removal generally requires anaesthesia and surgery

Indications

1. Temporary support is instituted when recovery of native heart function is anticipated (as it is for some patients with acute myocarditis or postcardiotomy cardiogenic shock).
2. Among patients who are candidates for heart transplantation but who may not survive the waiting period for a transplant, a ventricular assist device may be used as a "bridge to transplantation."
3. For patients who are not candidates for transplantation and for whom recovery of cardiac function is not expected, a mechanical device may be used as permanent replacement for the native heart.

clinical factors in device selection

Clinical Factors Involved in the Selection of a Ventricular Assist Device

Clinical Setting	Requirements	Device Options
Cardiac arrest; acute vessel closure in catheterization laboratory	Rapid ventricular support without surgery	Percutaneous device
Myocarditis with potential recovery; post-cardiotomy shock	Short-term support with or without surgery	Percutaneous device; extracorporeal pump
Biventricular failure	Biventricular support	Extracorporeal pump; total artificial heart
Small body habitus	Pump with limited implanted volume	Extracorporeal pump; axial-flow pump
Candidate for heart transplantation	Bridge to transplantation allowing functional recovery with or without hospital discharge	HeartMate; Novacor; axial-flow pump; total artificial heart
Severe heart failure; not a candidate for heart transplantation	Long-term device support ("destination therapy")	HeartMate XVE (electrically powered model of HeartMate)*

* The HeartMate XVE is the only device approved by the Food and Drug Administration for destination therapy. However, approval of other devices for this indication is anticipated.