

Background

Continuous flow ventricular assist devices (VADs) are revolutionizing the treatment of end-stage heart failure. Idiopathic Cardiomyopathy (CMP) is the predominant cause for heart failure.

Medical management remains the first line of therapy but mechanical circulatory support becomes necessary when the extent of failure progresses beyond pharmacotherapy options.

Successful device implantation and intraoperative care of a VAD patient is a multidisciplinary effort.

What is a VAD?

The VAD (Ventricular Assist Device) is an implantable pump used to enhance cardiac output from the left ventricle to the ascending aorta. There are two main systems on the market. The pumps function by centrifugal flow and axial flow powered by external battery supply.

Indications:

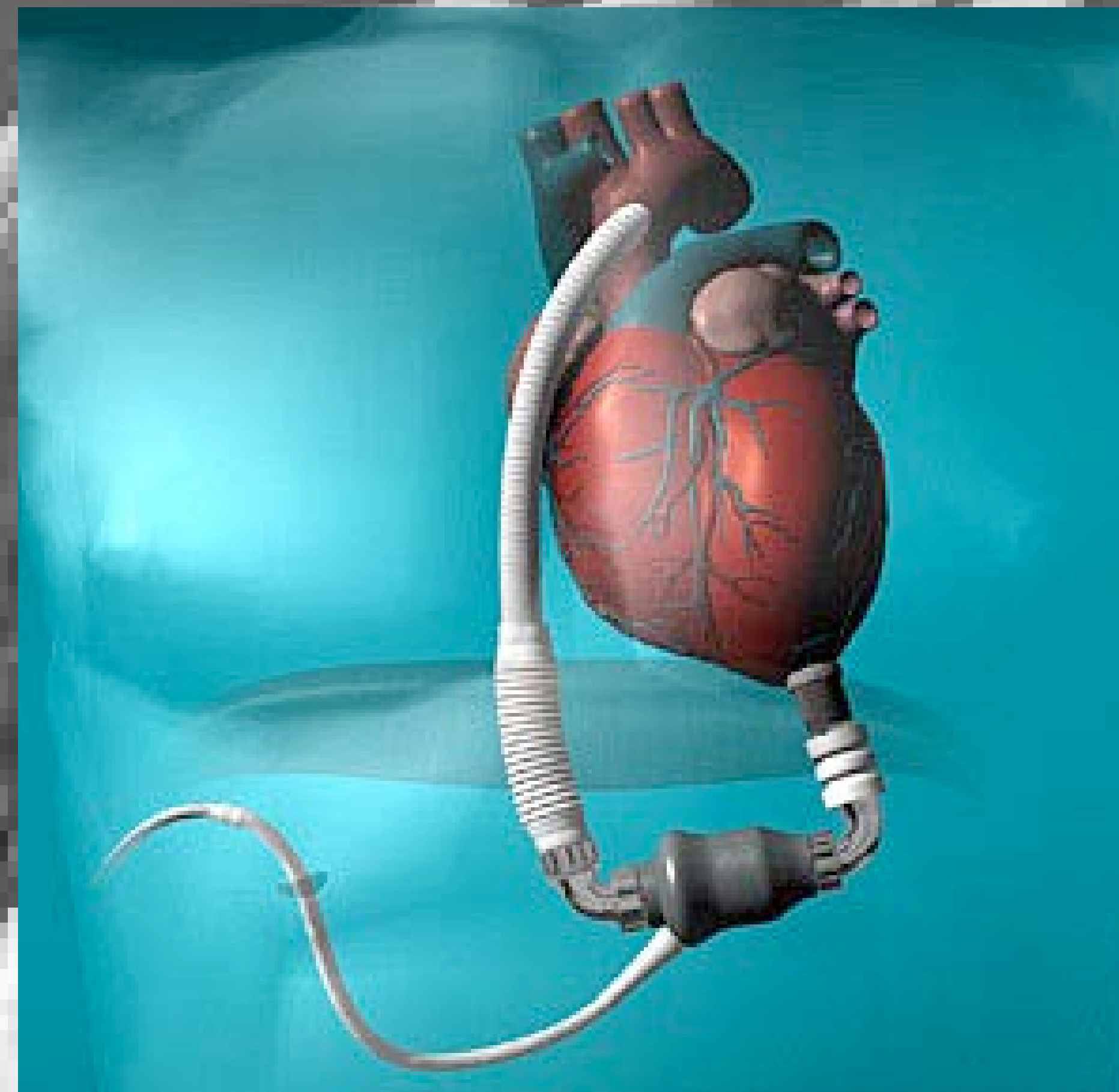
- Have failed to respond to optimal medical management for at least 45 of the last 60 days, or have been balloon pump dependent for 7 days, or IV inotrope dependent for 14 days
- Have a left ventricular ejection fraction of less than 25%
- Have demonstrated functional limitation with peak oxygen consumption of < 14 ml/kg/min unless balloon pump or inotrope dependent

Special Considerations

Implantable components in both systems include the pump, an outflow graft and a driveline. The centrifugal LVAD also has an inflow graft, as the pump is housed in an abdominal pocket vs. the pericardium. The driveline (which exits the abdomen and is connected to the power source) is a potential source of infection. This becomes a concern if care is not taken to prevent shearing at the driveline exit site. The centrifugal LVAD is FDA approved for destination therapy (for patients who are not eligible for heart transplantation) and bridge-to-transplantation. The axial LVAD is housed in the ventricle and only has an outflow graft, not requiring the abdominal pocket. It is FDA approved for bridge-to-transplantation.

Centrifugal LVAD

Destination Therapy & Bridge-to-Transplantation

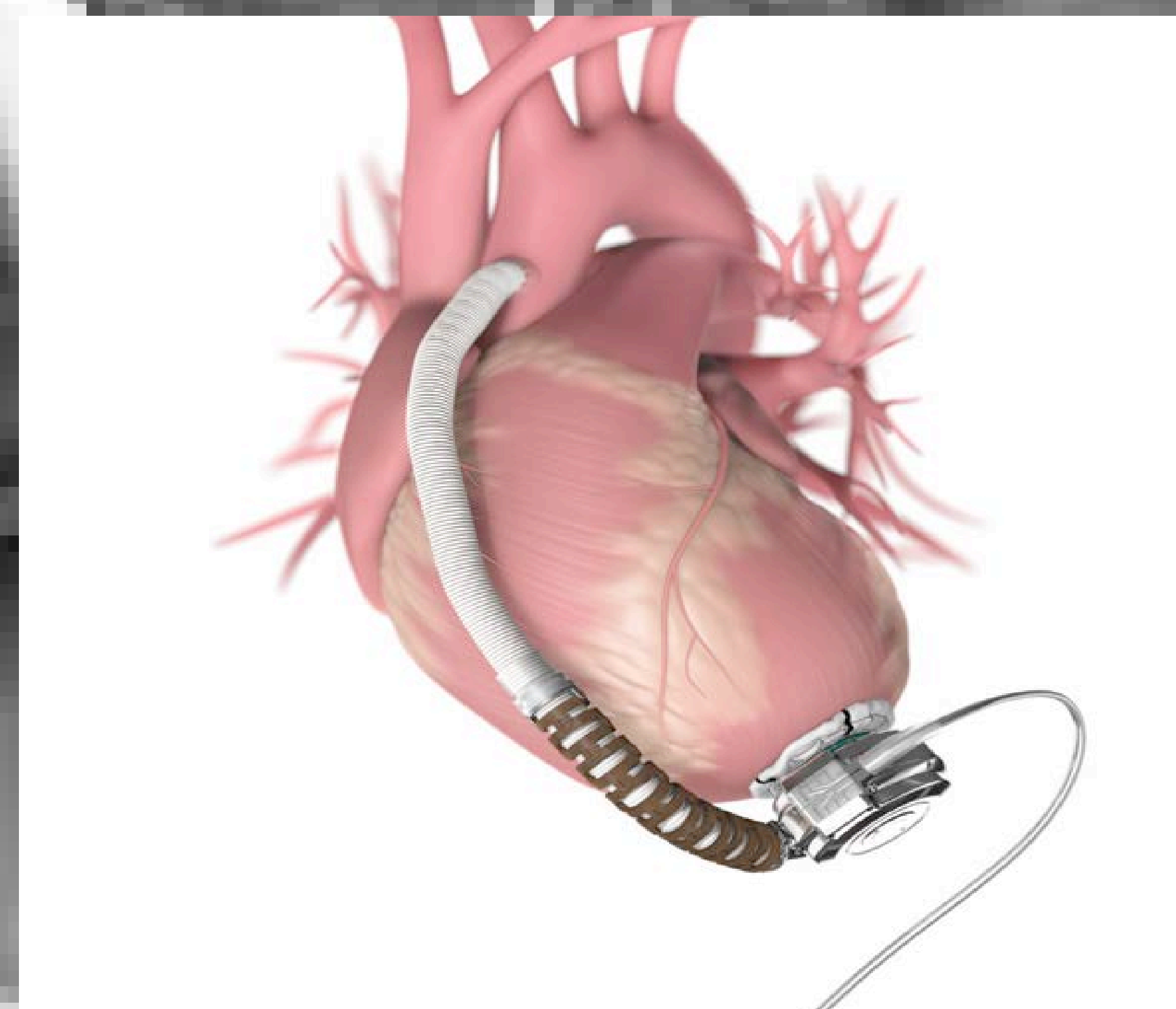


FUN VAD FACTS:

- Hospital Cost > \$100,000/system
- Via Sternotomy or Modified Left Thoracotomy
- On and Off Pump Techniques

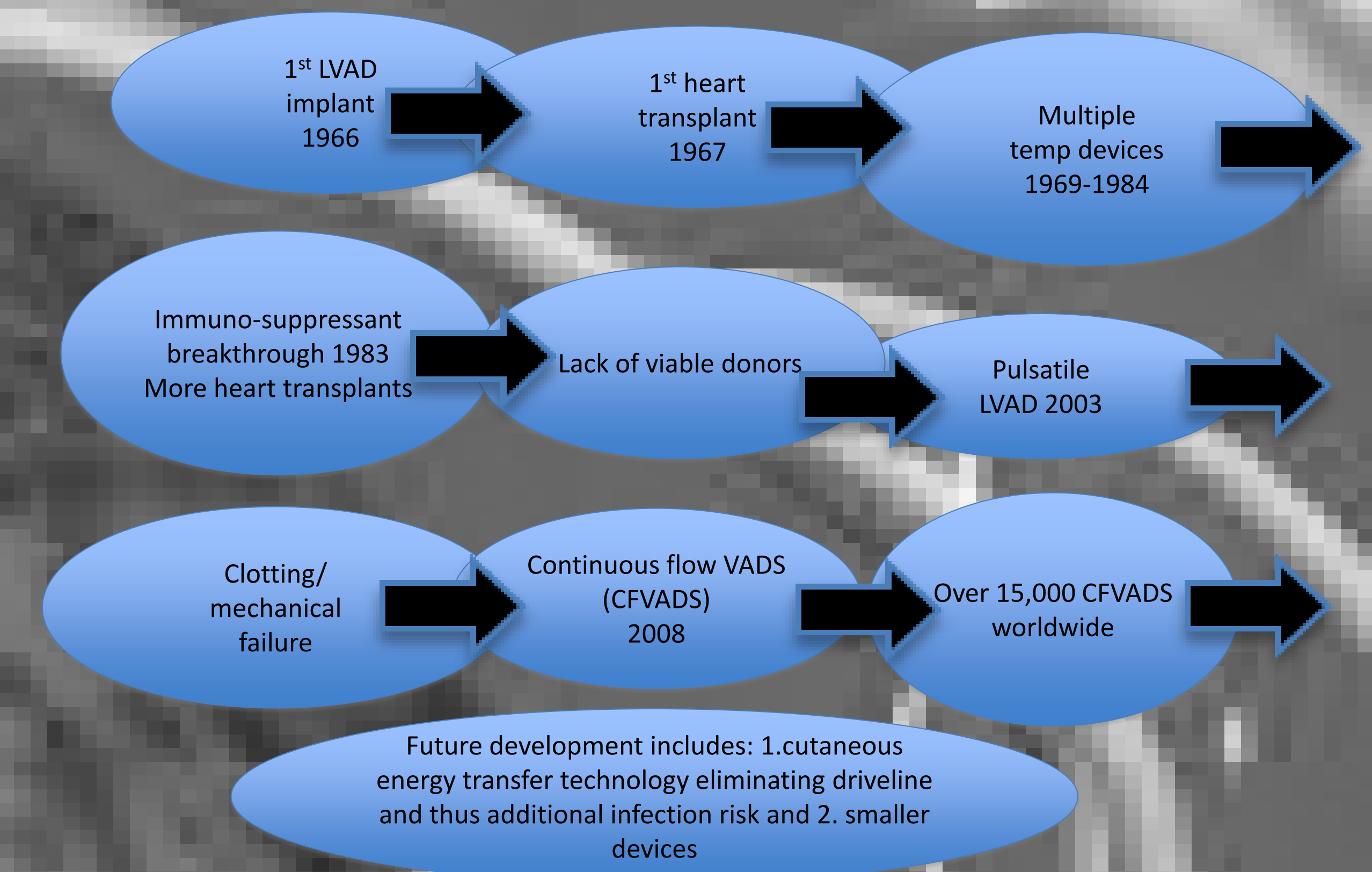
Axial Flow LVAD

Bridge-to-Transplantation



References Available Upon Request

Advances in VAD Technology



Intraoperative Nursing Care

- Positioning:** Standard supine with arms tucked/padded at side, bilateral legs frogged and padded.
- Pressure Ulcer Prevention:** Multilayered silicone sacral pad, smooth transfers.
- Skin Care:** Preoperative head-to-toe skin assessment, pre-op shower(s) and chlorhexidine wipes, intraoperative skin prep: chlorhexidine scrub, alcohol, chloraprep.
- Infection Control:** Strict aseptic/sterile technique, limiting traffic in/out of O.R., IV and topical antibiotics, incisional wound vac application, driveline site care.
- Hemostasis:** Ensure blood product availability (PRBC, Platelets, FFP, Cryoprecipitate), topical hemostatic agents, maintain patient's core body temperature between 20-24 degrees Celsius, monitoring suction and chest tube output.
- Communication:** Patient and family teaching, collaborate with surgical team, anesthesia, perfusion, industry representatives (VAD and ICD companies), ancillary staff, ICU staff.
- Implant Availability:** Locked storage areas, custom implant tracking sheets for multiple components per system, device tracking forms, collaborate with inventory staff, complete company tracking forms.