MECHANICAL ASSIST DEVICES

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Indications for mechanical circulatory support: Left ventricular (LV) or right ventricular (RV) failure in the setting of maximal inotropic support.

Currently available Mechanical assist devices:
- IABP
- Centrifugal Pumps
- Ventricular assist devices
- Total artificial hearts (TAH)

Classification of devices:
Orthotopic vs. heterotopic prosthetic ventricles
Series vs. parallel circulatory support
Pulsatile vs. non pulsatile flow
Extracorporeal vs. implantable devices

Indications for IABP:
- Refractory myocardial Ischemia.
- Support of patients before and after cardiac surgery.
- Support of non cardiac surgical patients

Contraindications for IABP:
- AV incompetence
- Aortic aneurysm or dissection
- Peripheral vascular disease

CardioWest TAH:
Indications; as abridge to cardiac transplant
Contraindications; patients who are not candidates for cardiac transplant

Thoratec VAD System:
Indications:
- Intermediate and long term circulatory support
- Post cardiotomy support LV, RV or both
Contraindications:
- Mechanical AV obstruction
- Significant aortic insufficiency.

Centrifugal pumps:
Indications:
For short and intermediate cardiac support and as a bridge for cardiac transplant
Unique feature is the low potential to pump air to the circulation.

**Anesthetic Management:**
Induction and maintenance of patients with end stage cardiomyopathy and patients before heart transplant.
Risk for bleeding and for blood transfusions.
Management of anticoagulation according to the type.
VADS tend to lower LAP = increased risk for air embolism
VADS tend to increase RT to LT shunts= increased risk for hypoxemia

**Management of Patients with VADS in place:**
Proper management of RV with patients with LVAD, may need inotropic/vasodilator or mechanical assistance.
Effect of LVAD on RV;
- Global impairment of RV systolic function,
- preload augmentation,
- afterload reduction,
- decreased MR,
- increased TR, increased RV output by 20-30%
Anesthetic management depends on knowledge of the type, connections, required anticoagulation and mechanism of action for each type.