

Intra-aortic balloon pump:

Technical aspect: 1. A flexible catheter with one lumen that allows for either distal aspiration/flushing or pressure monitoring and a second that permits the periodic delivery and removal of helium gas to a closed balloon. The balloons are manufactured in sizes between 20 and 50 cc. 2. A mobile console that contains the system for helium transfer as well as computer control of the inflation and deflation cycle.

Hemodynamics effects: Blood is displaced to the proximal aorta by inflation during diastole. Aortic volume (and thus afterload) is reduced during systole through a vacuum effect created by rapid balloon deflation. ↓ systolic pressure by 20% ↑ aortic diastolic pressure by 30%, ↑ MAP, ↓ HR, ↓ HR by 20%, ↓ PCWP by 20%, ↑ CO by 20%

Indications:

- Cardiogenic shock (left ventricular failure or mechanical complications of an acute myocardial infarction)
- Intractable angina
- Low cardiac output after cardiopulmonary bypass
- Adjunctive therapy in high risk or complicated angioplasty
- Prophylaxis in patients with severe left main coronary arterial stenosis in whom surgery is pending
- Intractable myocardial ischemia awaiting further therapy
- Refractory heart failure as a bridge to further therapy
- Intractable ventricular arrhythmias as a bridge to further therapy

Contraindications: Significant (more than mild) aortic regurgitation, Aortic dissection, significant aortic aneurysm, sepsis, bleeding disorder, significant peripheral vascular disease