Our unique design incorporates a contractile left ventricle (LV) with mitral and aortic valves that mimic realistic valve motion patterns and ejection fraction. This programmable phantom provides user control over; heart beat rates, LV contractile patterns, LV ejection fractions, and mitral valve pathologies. Contraction patterns, contraction rates and ejection fraction are controlled by a programmable micro-controller that actuates six individual pneumatic cylinders and a system of flow control valves.

**Applications**

This phantom is to be used with a Transesophageal echocardiography (TEE) probe for system development & validation studies for;

**Image guided surgery simulation:**
- Mitral valve repair or replacement
- Aortic valve replacement (TAVR)
- LV apical or retrograde aortic access

**Image processing:**
- Transesophageal Echocardiography training
- Ejection fraction measurement
- Image based valve tracking
- Flow analysis
- LV wall motion studies
- Mitral valve segmentation
**Ultrasound & Endoscopy**

- **Diastole:**
  - Mitral Valve
  - Aortic Valve
  - Apical endoscopic view, MV & AV

- **Systole:**
  - Mitral Valve

**Specifications**

**Heart Properties:**
- Ejection fraction: up to 51%,
- Diastolic volume 157mL
- Systolic volume 76mL
- Anterior-posterior MV 23mm
- Medial-lateral MV 37mm
- Ventricle height 130mm
- Silicone or PVA-C materials

**Actuator System:**
- Programmable micro-controller
- Six independent pneumatic cylinders for activation
- Individual flow control valves for each cylinder
- User-friendly interface
- 120V adapter (12V DC)
- 40 PSI input required
- NOTE: valves do not function at realistic human cardiac pressures

**Customizable Design**

- Micro-controller allows custom code development for control of heart rate and LV activation patterns to mimic mitral valve flail pathology
- Can be configured for trans-vascular access of the aortic valve or right/left atria

Manufactured by

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