



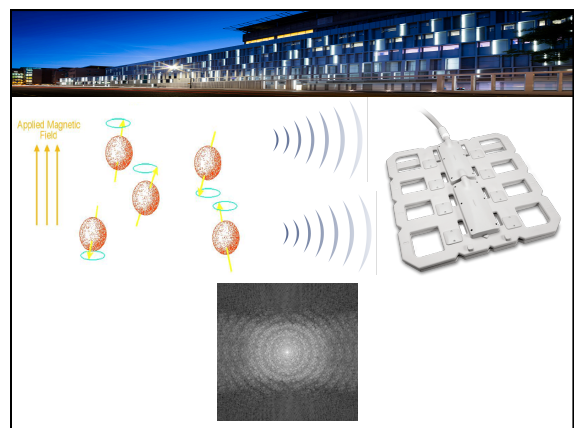
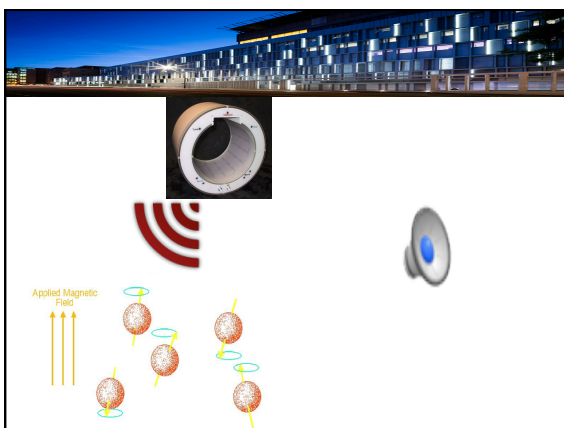
Overview

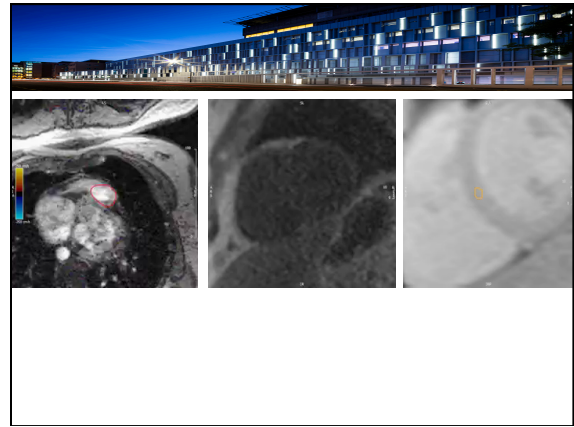
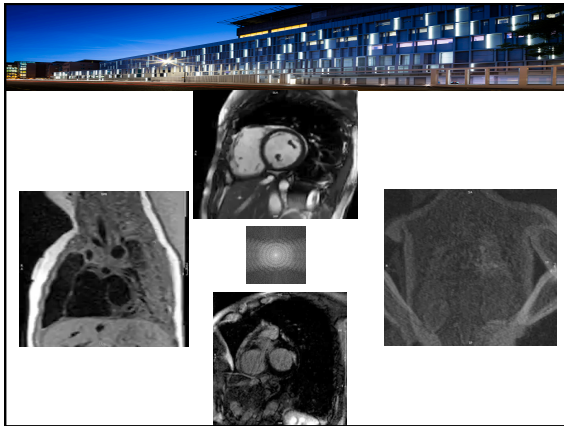
- MRI scanner
- Different cardiac MRI sequences
- Application of cardiac MRI in congenital and acquired heart disease
- Future directions

What is a MRI Scanner

- Scanner that uses magnetic fields and radio frequency waves to generate images
- Various scanner strength - 1.5 Tesla and 3 Tesla are the most common.
- 1 Tesla = 20,000 x earth magnetic force

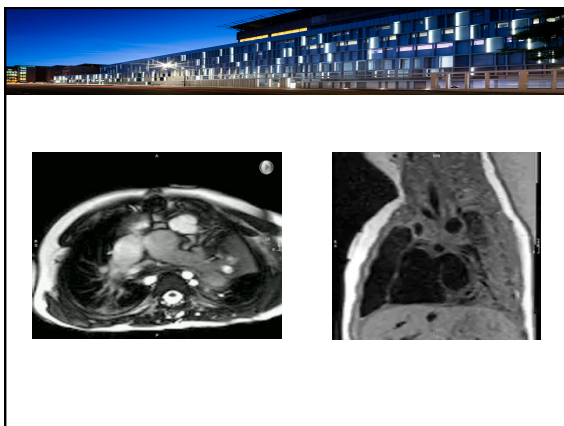
Magnet Gradient Coils RF coil





Congenital Heart Disease	Acquired Heart Disease
<ul style="list-style-type: none"> • Anatomy • Shunt calculation • Valve regurgitation • Timing of intervention • Surgical planning • Cardiac tumours • Cardiomyopathies 	<ul style="list-style-type: none"> • Myocardial oedema • Myocardial ischaemia • Myocardial scarring • Myocardial Iron

Congenital Heart Disease

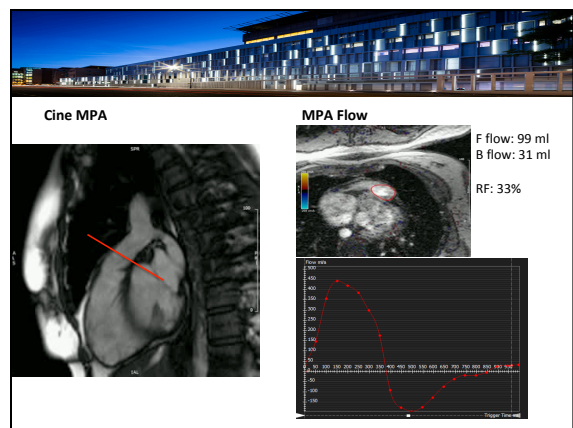
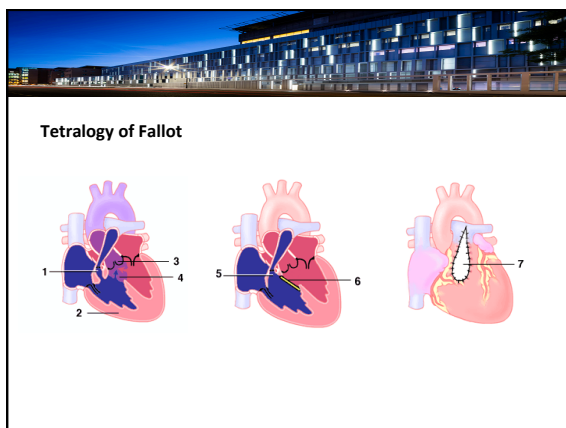
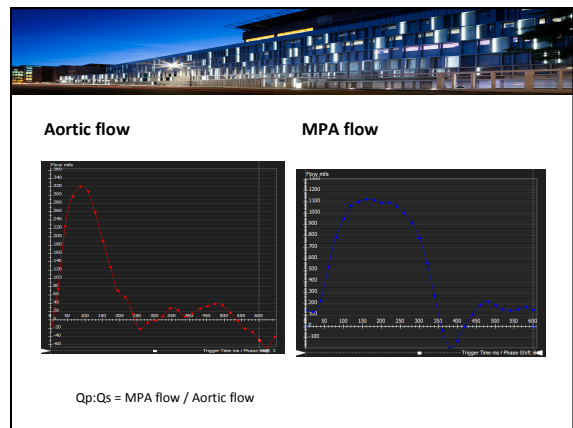
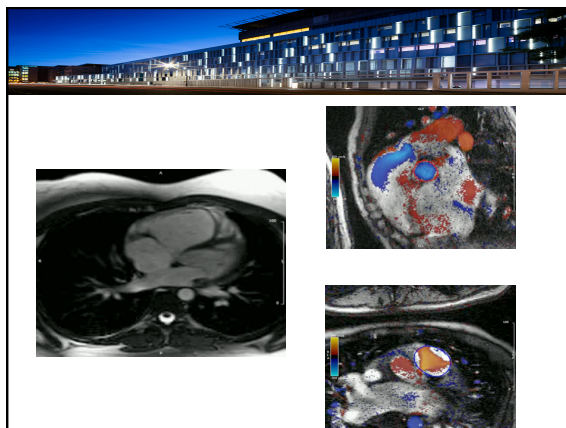
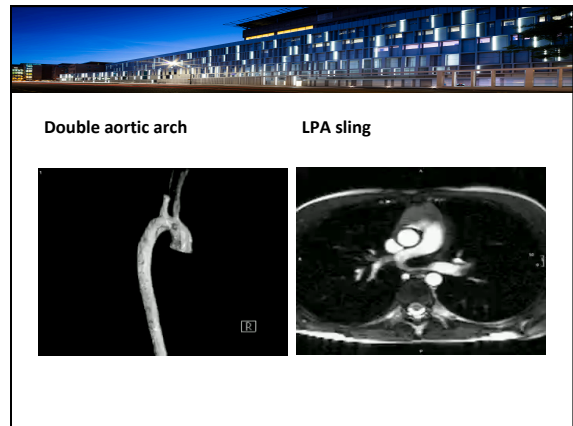
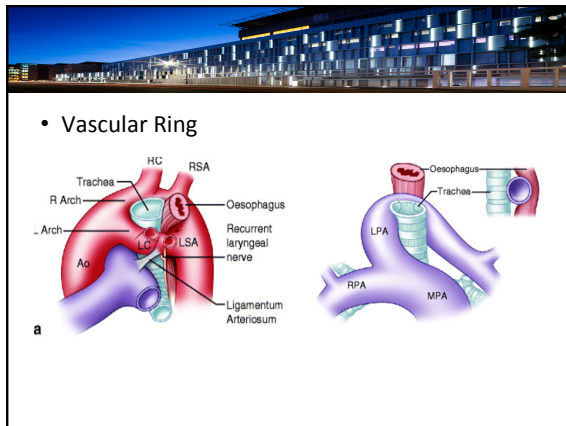


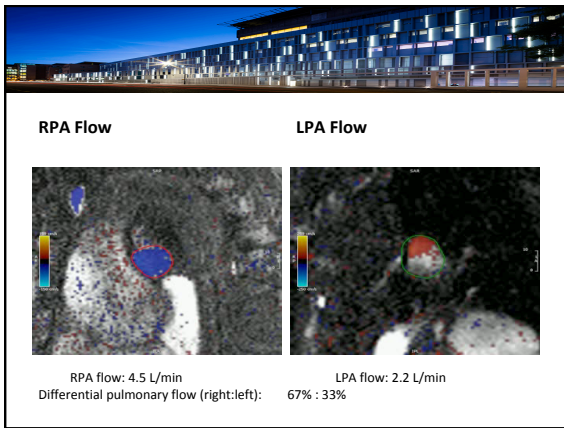
Grosse-Wortmann et al Congenital Heart Disease

Borderline hypoplasia of the left ventricle in neonates: Insights for decision-making from functional assessment with magnetic resonance imaging

LVEDV > 20ml/m²

Aortic flow > 1 L/min/m²

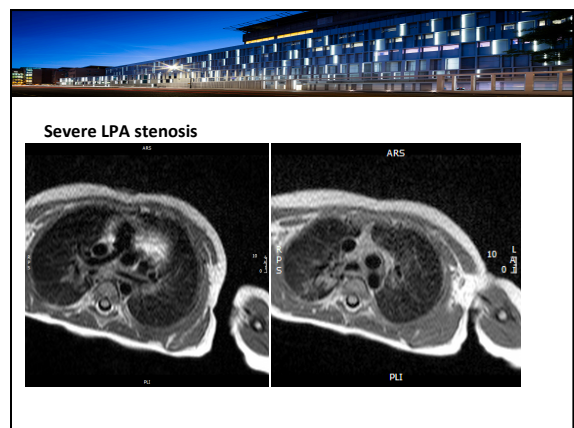
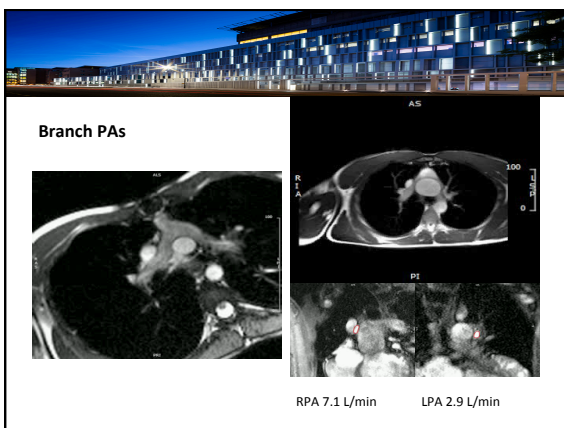
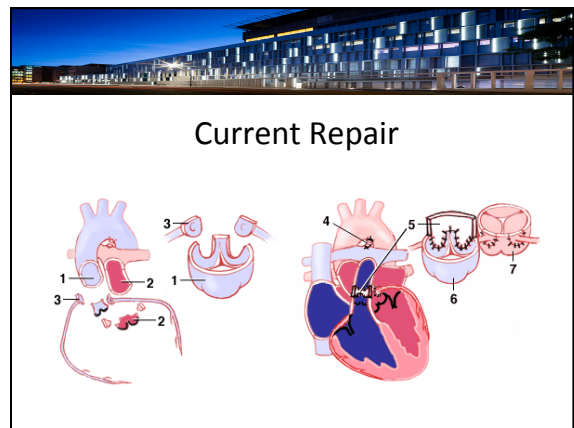
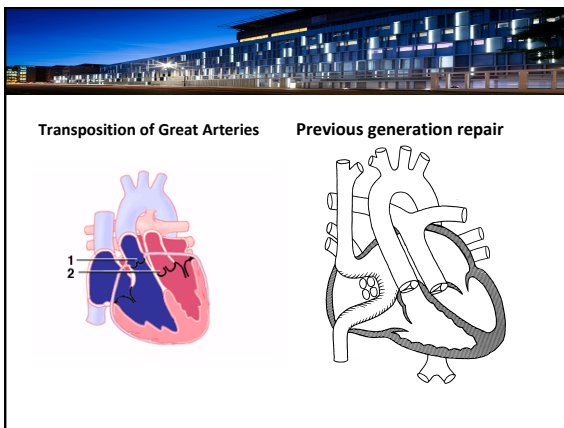


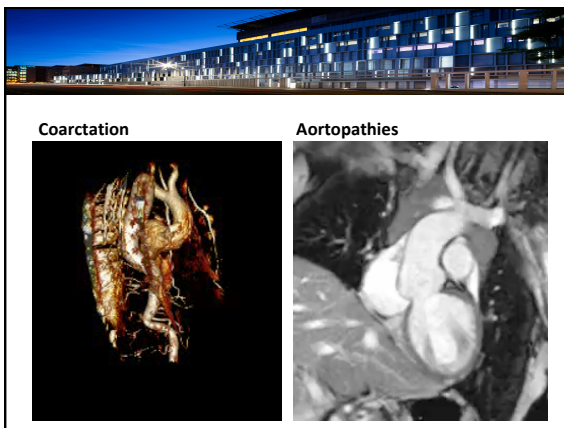
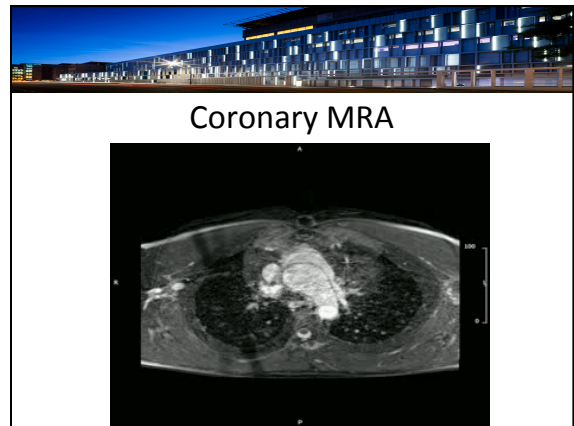
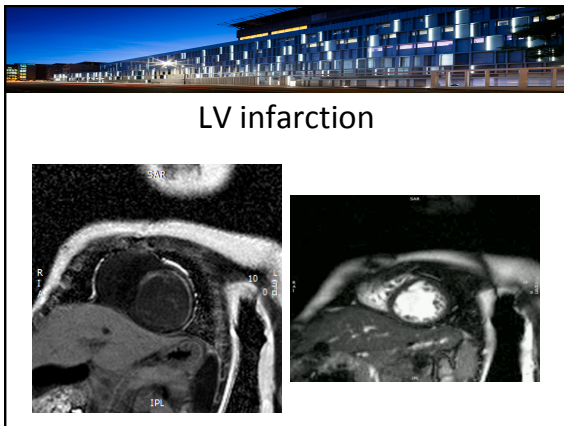


Ventricular Short Axis

Timing of Pulmonary Valve Replacement – MRI Parameters

- Moderate / severe pulmonary regurgitation
- RVEDV > 150 ml/m²
- RV/LV ratio > 2
- RVESV > 80 ml/m²
- RV EF < 47%
- LV EF < 55%
- <30% flow to 1 lung





Anatomical and Functional Single Ventricles

- Hypoplastic left heart syndrome
- Tricuspid atresia
- Pulmonary atresia
- Double inlet LV
- Double inlet RV
- Unbalanced AV canal
- Complex double outlet right ventricle

Stage 1 **Stage 2** **Stage 3**

