Focus: Cardiovascular MRI in Pulmonary Hypertension

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Current mission:

Use of cardiovascular MRI for
• follow-up of pulmonary hypertension (PH) patients,
• improved understanding of pathophysiology in PH
Search for early MRI imaging biomarkers of PH in carriers of associated gene mutations (bmpr2)

RV diastolic function, Vena cava flow superior, inferior

Yellow lines indicate imaging planes for flow measurement
Current:
Focus on RV diastolic function, right atrial function and vena cava flow. With pressures from right heart catheterisation.

Right heart during atrial contraction

Numbers are pressures in mmHg

Normal: compliant RV

PH: stiff RV, backflow
Future plans

Short term (1-2 year) plan

Implementing advanced MRI techniques in Pulmonary Hypertension:
• Improved imaging of the Right Ventricle, high spatial resolution, ...
• 3-dimensional flow over time (4D flow) in the RV and pulmonary arteries

Machine learning applied on MRI images of the RV.
Aim: early recognition of PH signs in mutation carriers, versus healthy controls.

Necessary infrastructure, MRI scanners (2019):
Siemens Magnetom 1.5T Sola
2x Siemens Magnetom 3T Vida
+ pulse programming environment
+ phased array coils

Collaboration in ACS: MRI physics and postprocessing