

Course: Sunrise Educational Course: Cardiac MR

Session: The Forgotten Right Ventricle

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Title: Techniques for Evaluating the Right Ventricle and Pulmonary Arteries

Target Audience:

- Practicing clinical cardiologists and radiologists who want to know more technical information about the techniques used for evaluating the right ventricle and pulmonary arteries
- Engineers and MR Physicists who want to gain a clinical perspective on the clinical use of techniques for evaluating the right ventricle and pulmonary arteries
- CMR technicians who want to learn more about evaluation of the right ventricle and pulmonary arteries
- Graduate students and medical residents who want to learn more about the evaluation of right ventricular structure and function and pulmonary artery anatomy

Objective: To describe the techniques for and demonstrate the clinical utility of the techniques used for evaluating right ventricular structure and function and pulmonary vein anatomy and physiology

Learning Objectives:

Upon completion of this talk the learner should be able to:

- Understand the anatomy and physiology of the right ventricle, right sided heart valves and the pulmonary arteries
- Describe and understand the techniques used for evaluation and quantification of right ventricular structure and function including the use of cine SSFP, cine GRE and strain imaging techniques for measuring RV volumes, RV ejection fraction and mechanical function.
- Describe and understand the techniques used to evaluate and quantify the severity of pulmonic and tricuspid valvular dysfunction including the use of cine imaging and phase-contrast velocity imaging to quantify regurgitation and degree of stenosis.
- Describe and understand the techniques used to evaluate the pulmonary arteries including cine imaging, phase contrast velocity imaging, magnetic resonance angiography and time-resolved MR angiography to quantify pulmonary artery dilatation, stenosis, and differential flow.

Outline

1. Anatomy and Physiology of the Right Ventricle
 - a. Anatomy of the right ventricular cavity
 - b. Anatomy and Physiology of the tricuspid and pulmonic valves
 - c. Anatomy of the pulmonary arteries
2. Techniques for evaluating the right ventricular structure and function
 - a. Cine imaging with SSFP and GRE
 - b. Quantification of right ventricular volumes and function
 - c. Strain imaging and advanced techniques
3. Techniques for evaluating the tricuspid and pulmonary valves
 - a. Cine imaging of the valves
 - b. Phase contrast velocity imaging
 - c. Quantification of pulmonic valve insufficiency and stenosis
 - d. Quantification of tricuspid valve function
4. Techniques for evaluating the pulmonary arteries
 - a. Cine imaging of the pulmonary arteries
 - b. Phase contrast velocity imaging of pulmonary artery stenosis and differential flow
 - c. Time resolved magnetic resonance angiography
 - d. Magnetic resonance angiography of the pulmonary arteries