

# Cardiac Magnetic Resonance Imaging (CMR) Important Applications



## Heart Failure

- Assessment of LV and RV size, morphology, systolic and diastolic function and characterization of myocardial tissue to understand the etiology of LV systolic or diastolic dysfunction.
- For confirmation of presence of iron overload in heart and liver.
- Evaluation of LV function in CHF patients with technically limited echocardiograms.

## Coronary Artery Disease and Coronary Anomalies

- Useful for identification of coronary artery anomalies and aneurysms.

## Myocardial Infarction/Scar Assessment

- Late gadolinium enhancement CMR is useful for identifying the extent and location of myocardial scar in individuals suspected of having chronic or acute ischemic heart disease.
  - Assessing patients post myocardial infarction AND viability prior to revascularization
  - Establishing likelihood of recovery of function with coronary artery revascularization

## Non-Ischemic Cardiomyopathy/Myocarditis

- Assessment of patients with LV dysfunction or hypertrophy, or suspected forms of cardiac injury not related to ischemic heart disease.
- CHF of unclear etiology:
  - Evaluation of dilated cardiomyopathy in setting of normal coronary arteries
  - Positive cardiac enzymes without obstructive atherosclerosis on angiography
  - Suspected amyloidosis or other infiltrative diseases
  - Syncope or ventricular arrhythmia: HCM, ARVC/Dysplasia

## Assessment of Valvular Heart Disease

- Assessment of valvular stenosis, regurgitation, para or peri valvular masses, perivalvular complications of infectious processes, or prosthetic valve diseases.
  - Applies to the following: Any regurgitant or stenotic lesions
  - Particularly useful in identifying serial changes in LV volumes or mass in patients with valvular dysfunction.

## Cardiac Masses

- Evaluation of cardiac masses, extracardiac structures, tumors or thrombi.

## Pericardial Disease

- Comprehensive structural and functional assessment of the pericardium, evaluate the physiological consequences of pericardial constriction or suspected pericarditis and pericardial masses.

## Congenital Heart Disease

- Assessing cardiac structure and function, blood flow, shunt flow, and cardiac and extracardiac conduits in individuals with simple and complex congenital heart disease.
  - Common congenital conditions CMR can be utilized in:
    - Atrial septal defects
    - Ventricular septal defects
    - Patent ductus arteriosus
    - Coarctation of aorta
    - Certain complex congenital heart disease