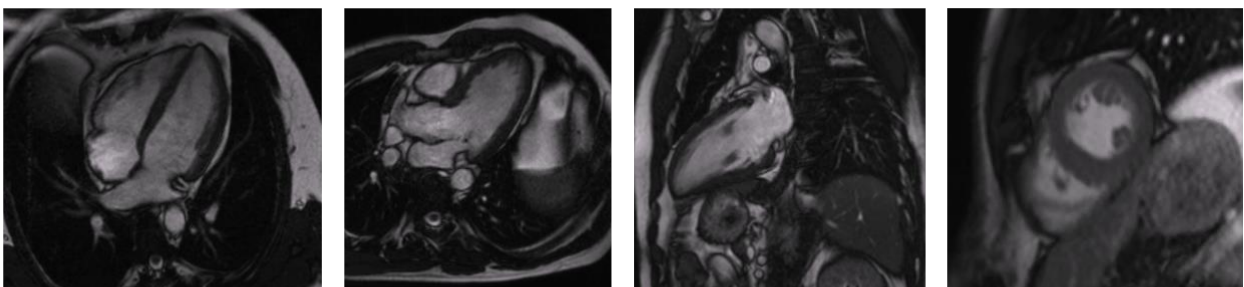


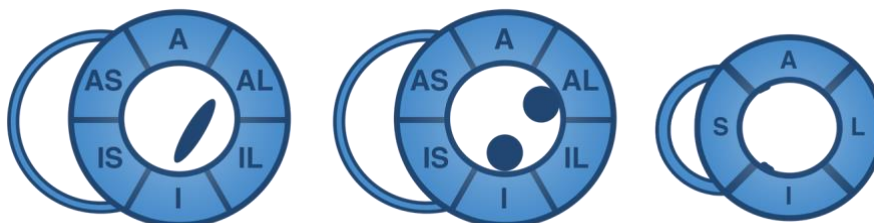
Myocardial infarction

- CMR offers good sensitivity and specificity in the detection of myocardial infarction
- CMR permits the identification of affected territories, extent of infarction, and degree of left ventricular systolic dysfunction
- CMR also offers myocardial viability assessment
 - Late gadolinium enhancement CMR
 - Low-dose dobutamine stress CMR
- CMR can identify left ventricular aneurysm and thrombus

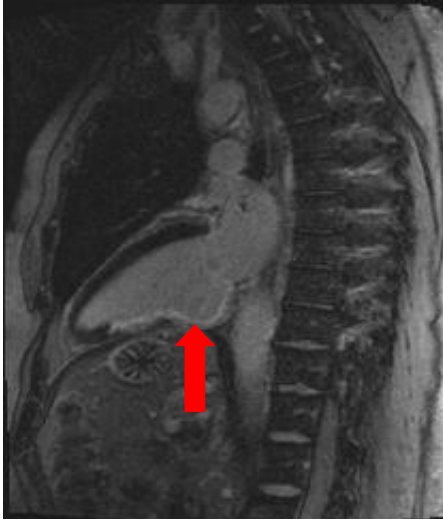
The left ventricle should be assessed for evidence of myocardial infarction in multiple views (4-chamber, 3-chamber, 2-chamber and short axis):



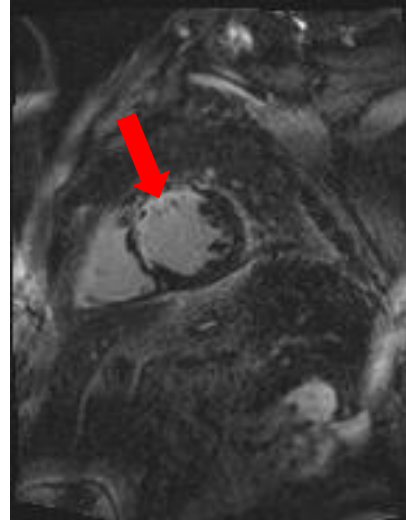
Myocardial infarction may be evidenced by areas of myocardial thinning, regional wall motion and/or late gadolinium enhancement. Any such areas should be described with reference to the standard myocardial segments:



Late gadolinium enhancement (LGE) will show areas of myocardial infarction. Such areas always involve the subendocardium. The infarction may be confined to the subendocardium, or extend throughout the full thickness of the myocardium, but the subendocardial layer is always involved. Areas of LGE confined to the mid-wall or the epicardium only do not indicate myocardial infarction.



Inferior myocardial infarction, with subendocardial LGE in the basal and mid inferior segments (red arrow). The basal segment is aneurysmal.



Anteroseptal myocardial infarction, with subendocardial LGE in the basal anterior and anteroseptal segments (red arrow).

Myocardial viability

Assessment of myocardial viability can be made from the extent of LGE in the myocardium. If the LGE affects <50% of wall thickness, there is a reasonable chance of improvement in function after revascularization. If the LGE affects >50% of wall thickness, there is a low chance of improvement in function after revascularization. Dobutamine stress CMR can also be used to assess viability.

How do we assess myocardial infarction using CMR?

- Assess regional wall motion
 - Two-, three, four-chamber views & short-axis stack
- Assess left ventricular size and systolic function
- Late gadolinium enhancement CMR
 - Location and extent of myocardial infarction
 - Microvascular obstruction
 - Myocardial viability
- Complications of myocardial infarction
 - Aneurysm formation & left ventricular thrombus

Further reading

Cardiovascular magnetic resonance imaging in patients with acute myocardial infarction. *Heart* 2010; **96**: 237-243 [[click here to access online](#)]