

Cardiac MRI Hypertrophic Cardiomyopathy Studies Template

This template is designed to provide a structured framework for reporting cardiac MRI hypertrophic cardiomyopathy studies, based on the SCMR Reporting guidelines (2022)

Section I: General Information:

Administrative:

Site ID: ()

Site of Service: inpatient hospital, outpatient facility, free standing imaging center, ambulatory care office, or mobile unit, other (drop down)

Scanner: Manufacturer, Field strength (Drop down and free text)

Demographics:

Patient Identifiers:

Patient's full name,

Date of birth,

Medical record number

Scheduling and performance of study

1. Date of procedure ()

2. Primary indication for test ()

3. Study quality ()

History and risk factors – (pulled directly from EMR)

1. Height

2. Weight

3. **Clinical Indication for the Study:** Hypertrophic cardiomyopathy/ Other

Optional: Other Relevant Investigations: Relevant cardiac investigations, such as electrocardiogram (ECG), echocardiography reports, or nuclear imaging results

Non-imaging findings associated with examinations:

1. Contrast agent

a. Name,

b. Dose, and

c. Administrative route (default to IV)

Section II: General Techniques:

Listing of sequences used (drop down to pick and choose)

i. Cine

ii. Tagged and other strain-encoding cine



- iii. T1- and T2-weighted imaging (T1w; T2w)
- iv. Quantitative T1 and T2 mapping
- v. T2* mapping
- vi. Early gadolinium enhancement
- vii. Late gadolinium enhancement
- viii. Velocity-encoded / phase contrast cine
- ix. MR angiography
- x. Myocardial perfusion

Method of acquisition: Study was performed using above listed sequences with imaging in short axis, long axis planes using 2D/ 3D data sets.

Software used to analyze the study:

Section III: Findings:

Left Ventricle:

Size: Small, Normal, Dilated - (drop down to pick and choose)

Wall thickness: Thin, Normal, Hypertrophied - (drop down to pick and choose)

If hypertrophied selected

1. Pattern of hypertrophy: Concentric/ Eccentric/ Mixed

i. Predominant regional distribution of hypertrophy (apical, septal, mid-cavity), if asymmetric

ii. Reverse septal curvature - present or absent

iii. Mid-cavity or LV outflow tract (LVOT) obstruction - present or absent

iv. Clefts or crypts – present or absent. Location if present

v. RV Involvement - present or absent

2. Severity of hypertrophy (measurement on short axis balanced steady state free precession (bSSFP) cine)

i. Maximal wall thickness is .. mm in .. segments

ii. Thickness of non-hypertrophied segments is .. mm

3. Papillary muscle anatomy

i. Hypertrophied/ Not hypertrophied

ii. Apical displacement is present/ absent

4. Apical aneurysm, is present/ absent

Systolic function: Normal, Decreased, Mildly decreased, Moderately decreased, Severely decreased. (drop down to pick and choose)

Regional wall motion: described according to the 17-segment model. It is recommended that each segment be classified qualitatively as normal, hyperkinetic, hypokinetic, akinetic, dyskinetic, dyssynchronous, not evaluable due to artifact, or not assessed. Can consider including Bulls eye or table for 17 segment model if reporting software allows.



Perfusion (optional) if performed: Vasodilator stress perfusion reveals normal myocardial perfusion/ decreased perfusion in ... segments suggestive of...

Quantitative Assessment of Left Ventricle:

- LV end-diastolic volume (LVEDV):
- LV end-systolic volume (LVESV):
- LV stroke volume (LVSV):
- LV ejection fraction (LVEF):
- LV cardiac output (LVCO):
- Indexed LV volumes
- $LVEDV \text{ index} = LVEDV / \text{body surface area (BSA)}$:
- $LVESV \text{ index} = LVESV / BSA$:
- $LVSV \text{ index} = LVSV / BSA$:
- $LVCO \text{ index} = LVCO / BSA$:
- $LVM \text{ index} = LVM / BSA$:

Right ventricle:

Size: Small, Normal, Dilated - (drop down to pick and choose)

Wall thickness: Thin, Normal, Hypertrophied

Systolic function: Normal, Decreased, Mildly decreased, Moderately decreased, Severely decreased. (drop down to pick and choose)

Regional wall motion: described qualitatively at the apex, septal and anterior wall and midventricular levels of the RV free wall. Regions should be identified as normokinetic, hyperkinetic, akinetic, dyskinetic, dyssynchronous, not evaluable, or not assessed

Aneurysms: If present, should be defined as true or false and described further

Quantitative Assessment of Right Ventricle:

- RV end-diastolic volume (RVEDV):
- RV end-systolic volume (RVESV):
- RV stroke volume (RVSV):
- RV ejection fraction (RVEF):
- RV cardiac output (RVCO):
- Indexed LV volumes
- $RVEDV \text{ index} = RVEDV / \text{body surface area (BSA)}$:
- $RVESV \text{ index} = RVESV / BSA$:
- $RVSV \text{ index} = RVSV / BSA$:
- $RVCO \text{ index} = RVCO / BSA$:

Atria: (drop down to pick and choose)

Left atrium: Size (normal/ dilated) based on (area/ indexed volume), Measurement (cm²/



ml/m²)

Right atrium: Size (normal/ dilated) based on (area/ indexed volume), Measurement (cm²/ ml/m²)

Interatrial septum if visualized: Intact, aneurysmal, septal defect, patent foramen ovale, lipomatous hypertrophy or other

Valves: - (drop down to pick and choose)

Mitral Valve: Normal/increased thickness, Normal/decreased mobility, No stenosis visually No/mild/moderate/ severe regurgitation visually.

Systolic anterior motion (SAM) of the mitral valve leaflets/ chordae is present/absent with eccentric jet directed posteriorly.

Regurgitant volume and fraction by quantification are .. (if performed)

Turbulence in LVOT is present/ absent with Peak systolic LVOT velocity/gradient of..

Peak gradient may be underestimated on CMR compared to Doppler echocardiography due to technical reasons.

Aortic Valve: Tricuspid/ Bicuspid/ functionally bicuspid/ other, Normal/increased thickness, Normal/decreased mobility, No/mild/moderate/ severe regurgitation visually. No stenosis visually

Tricuspid Valve: Normal/increased thickness, Normal/decreased mobility, No/mild/moderate/ severe regurgitation visually. No stenosis visually

Pulmonic Valve: Normal/increased thickness, Normal/decreased mobility, No/mild/moderate/ severe regurgitation visually. No stenosis visually

Valvular flow quantification if performed

Velocity encoding, or VENC setting meters/sec.

Flow measurements: milliliters or liters, per heartbeat or per minute

Peak and mean velocities m/sec

Corresponding estimates of peak and mean pressure gradients.

Masses/ Thrombus: None/ Present

If present,

1. Location
2. Size
3. Relationship with adjacent structures
4. First-pass perfusion and LGE, if performed
 - a. Present or absent
 - b. Pattern (homogenous or heterogeneous)



Pericardium: (drop down to pick and choose)

Thickness – normal/ increased

Effusion – None/ trivial/ small/ moderate/ large

Pleural effusion: (drop down to pick and choose)

Present/ Absent

If Present,

Size: Trivial/ Small/ Moderate/ Large

Location: Right/ Left

Late gadolinium enhancement (LGE): (drop down to pick and choose)

Late gadolinium enhancement imaging of the myocardium is normal. No evidence of scar, infiltration or infarction.

(Or)

Late gadolinium enhancement imaging of the myocardium is abnormal.

Subepicardial/ mid-wall/ subendocardial/ transmural enhancement is present, involving (i. $\leq 25\%$ ii. 26% to $\leq 50\%$ iii. 51% to $\leq 75\%$ iv. 76% to 100%) of the transmural thickness in the (segments) in Location: Reference location of segments for LV and RV.

Total mass of LGE tissue (optional): grams (g) and (%) percentage relative to the total myocardial mass.

Pattern of involvement is:

Subendocardial/ Transmural and is indicative of Ischemic injury (myocardial infarction)

Subepicardial/ mid-wall and is indicative of Non ischemic injury or infiltration (myocarditis, hypertrophic cardiomyopathy, sarcoidosis, etc.)

Advanced tissue characterization if performed: Optional (drop down)

i. Global or regional native myocardial T1: increased/ decreased/ normal value, absolute value (%) - optional measured in the mid septum/ global/ other, normal ranges

ii. Global or regional native myocardial T2: increased/ decreased/ normal value, absolute value (%) - optional measured in the mid septum/ other, normal ranges

iii. Global or regional ECV (extra cellular volume fraction): increased/ normal value, absolute value (%) - optional, normal ranges

Findings are within normal limits, suggestive of myocardial iron overload, myocardial edema, infiltrative cardiomyopathy, other - (drop down to pick and choose)

Extra-cardiac findings: None/ Other

Section IV: Impression:



1. LV assessment: (Normal/mildly increased/moderately increased/ severely increased) LV size with (Normal/mildly decreased, moderately decreased/severely decreased LV function (with/without) regional dysfunction. Include segmental information if regional dysfunction is present.
2. (Normal/mildly increased/moderately increased/ severely increased) RV size with (normal/mildly reduced/moderately reduced/severely reduced) RV function (with/without) presence of regional dysfunction.
3. No evidence/ Evidence of Hypertrophic cardiomyopathy based on pattern of hypertrophy, maximal wall thickness of , systolic anterior motion of the mitral valve with eccentric .. mitral regurgitation, late gadolinium pattern of ...