## **Medical Policy**



## **Title:** Cardiovascular Magnetic Resonance (CMR)

#### **Professional**

Original Effective Date: August 4, 2005
Revision Date(s): February 27, 2006,
May 2, 2007; November 1, 2007;
January 1, 2010; February 15, 2013;
December 11, 2013; April 15, 2014;
July 15, 2014; June 10, 2015; June 8, 2016;
October 1, 2016; May 10, 2017;
April 25, 2018; October 1, 2018
Current Effective Date: July 15, 2014
Archived Date: July 3, 2019

#### **Institutional**

Original Effective Date: July 1, 2006
Revision Date(s): May 2, 2007;
November 1, 2007; January 1, 2010;
February 15, 2013; December 11, 2013;
April 15, 2014; July 15, 2014; June 10, 2015;
June 8, 2016; October 1, 2016;
May 10, 2017; April 25, 2018;
October 1, 2018

Current Effective Date: July 15, 2014

**Archived Date: July 3, 2019** 

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#### **DESCRIPTION**

Cardiovascular magnetic resonance (CMR) is established in clinical practice for the diagnosis and management of disorders of the cardiovascular system.

CMR has several advantages over other imaging modalities:

- Non-invasive
- No ionizing radiation
- No known clinical side effects
- Soft tissue imaging is superior
- No imaging artifact from bone
- Equal clarity in any view: axial, sagittal, coronal, or oblique
- Ability to acquire two, three, and four-dimensional data

#### Disadvantages of CMR include:

- Requires more patient cooperation
- Longer imaging times
- Incompatibility with various medical and life support devices
- Attraction of ferromagnetic objects
- Cost (When applied appropriately with state of the art MRI technology and expertise, initial test cost may be offset by a reduction in downstream utilization of other redundant imaging tests. CMR has the potential to provide a comprehensive examination in one setting at considerably less risk and cost to the patient.)

#### **POLICY**

## A. **Medically necessary** indications for CMR include:

- 1. Congenital heart disease
  - a. Assessment of shunt size
  - b. Situs anomalies with complex congenital heart disease
  - c. Anomalous pulmonary venous return, especially in complex anomalies and cor triatriatum
  - d. Anomalous systemic venous return
  - e. Systemic or pulmonary venous obstruction
  - f. Ventricular Septal Defect (VSD) associated with complex anomalies
  - g. Supracristal VSD
  - h. Evaluation of right and left ventricular volumes, mass and function
  - i. Pulmonary regurgitation
  - j. Supravalvular aortic stenosis
  - k. Post-operative follow-up of shunts
  - I. Aortic (sinus Valsalva) aneurysm

- m. Aortic coarctation
- n. Vascular rings
- o. Aortopulmonary window
- p. Anomalous origin of coronary arteries
- q. Pulmonary atresia
- r. Central pulmonary stenosis
- s. Systemic to pulmonary collaterals

#### 2. Acquired diseases of the vessels

- a. Diagnosis and follow-up of thoracic and abdominal aortic aneurysm including Marfan syndrome
- b. Diagnosis and follow-up of chronic aortic dissection
- c. Diagnosis of aortic intramural hemorrhage
- d. Diagnosis of penetrating ulcers of the aorta
- e. Pulmonary artery anatomy and flow
- f. Assessment of thoracic, abdominal and pelvic veins
- g. Assessment of renal arteries
- h. Assessment of iliac, femoral and lower leg arteries
- i. Assessment of thoracic great vessel origins
- j. Assessment of cervical carotid arteries
- k. Assessment of pulmonary veins including one in association with an electrophysiology ablation for atrial fibrillation

#### 3. Coronary artery disease

- a. Assessment of global ventricular (left and right) function and mass
- b. Coronary anomalies
- c. Acute and chronic myocardial infarction detection and assessment; myocardial viability
- 4. Pericardial disease, cardiac tumors, cardiomyopathies and cardiac transplants
  - a. Detection and characterization of cardiac and pericardiac tumors
  - b. Hypertrophic cardiomyopathy
  - c. Dilated cardiomyopathy differentiation from dysfunction related to coronary artery disease
  - d. Arrhythmogenic right ventricular cardiomyopathy (dysplasia)
  - e. Siderotic cardiomyopathy (in particular thalassemia)
  - f. Restrictive cardiomyopathy

#### 5. Valvular heart disease

a. Cardiac chamber anatomy and function

b. Quantification of regurgitation or stenosis

## B. **Experimental / investigational** indications:

- 1. CMR as a screening test
- 2. Coronary MRA for screening of coronary artery disease
- C. Subject to review for medical necessity:
  - CMR for indications that are not listed above
  - 2. Duplication of services such as CT scan, radionuclide studies, ultrasound, and MRI

#### **CODING**

The following codes for treatment and procedures applicable to this policy are included below for informational purposes. Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

## CPT/HCPCS

75557	Cardiac magnetic resonance imaging for morphology and function without contrast material;
75559	Cardiac magnetic resonance imaging for morphology and function without contrast material; with stress imaging
75561	Cardiac magnetic resonance imaging for morphology and function without contrast material(s), followed by contrast material(s) and further sequences;
75563	Cardiac magnetic resonance imaging for morphology and function without contrast material(s), followed by contrast material(s) and further sequences; with stress imaging
75565	Cardiac magnetic resonance imaging for velocity flow mapping (List separately in addition to code for primary procedure)

# ICD-10 Diagnoses

A18.84	Tuberculosis of heart
A52.00	Cardiovascular syphilis, unspecified
A52.01	Syphilitic aneurysm of aorta
A52.02	Syphilitic aortitis
A52.03	Syphilitic endocarditis
A52.04	Syphilitic cerebral arteritis
A52.06	Other syphilitic heart involvement
A52.09	Other cardiovascular syphilis
C34.01	Malignant neoplasm of right main bronchus
C34.02	Malignant neoplasm of left main bronchus

C34.11	Malignant neoplasm of upper lobe, right bronchus or lung
C34.12	Malignant neoplasm of upper lobe, left bronchus or lung
C34.2	Malignant neoplasm of middle lobe, bronchus or lung
C34.31	Malignant neoplasm of lower lobe, right bronchus or lung
C34.32	Malignant neoplasm of lower lobe, left bronchus or lung
C34.80	Malignant neoplasm of overlapping sites of unspecified bronchus and lung
C34.81	Malignant neoplasm of overlapping sites of right bronchus and lung
C34.82	Malignant neoplasm of overlapping sites of left bronchus and lung
C38.0	Malignant neoplasm of heart
C38.1	Malignant neoplasm of anterior mediastinum
C38.2	Malignant neoplasm of posterior mediastinum
C38.3	Malignant neoplasm of mediastinum, part unspecified
C38.4	Malignant neoplasm of pleura
C38.8	Malignant neoplasm of overlapping sites of heart, mediastinum and pleura
C45.0	Mesothelioma of pleura
C45.2	Mesothelioma of pericardium
C47.3	Malignant neoplasm of peripheral nerves of thorax
C49.3	Malignant neoplasm of connective and soft tissue of thorax
C78.01	Secondary malignant neoplasm of right lung
C78.02	Secondary malignant neoplasm of left lung
C78.1	Secondary malignant neoplasm of mediastinum
C78.2	Secondary malignant neoplasm of pleura
D14.31	Benign neoplasm of right bronchus and lung
D14.32	Benign neoplasm of left bronchus and lung
D15.0	Benign neoplasm of thymus
D15.1	Benign neoplasm of heart
D15.2	Benign neoplasm of mediastinum
D17.4	Benign lipomatous neoplasm of intrathoracic organs
D19.0	Benign neoplasm of mesothelial tissue of pleura
D21.3	Benign neoplasm of connective and other soft tissue of thorax
D38.1	Neoplasm of uncertain behavior of trachea, bronchus and lung
D38.2	Neoplasm of uncertain behavior of pleura
D38.3	Neoplasm of uncertain behavior of mediastinum
D38.4	Neoplasm of uncertain behavior of thymus
100	Rheumatic fever without heart involvement
I01.0	Acute rheumatic pericarditis
I01.1	Acute rheumatic endocarditis
I01.2	Acute rheumatic myocarditis
I01.8	Other acute rheumatic heart disease
I02.0	Rheumatic chorea with heart involvement
I02.9	Rheumatic chorea without heart involvement
I05.0	Rheumatic mitral stenosis
I05.1	Rheumatic mitral insufficiency
I05.2	Rheumatic mitral stenosis with insufficiency

I05.8	Other rheumatic mitral valve diseases
I06.0	Rheumatic aortic stenosis
I06.1	Rheumatic aortic insufficiency
I06.2	Rheumatic aortic stenosis with insufficiency
I06.8	Other rheumatic aortic valve diseases
I07.0	Rheumatic tricuspid stenosis
I07.1	Rheumatic tricuspid insufficiency
I07.2	Rheumatic tricuspid stenosis and insufficiency
I07.8	Other rheumatic tricuspid valve diseases
108.0	Rheumatic disorders of both mitral and aortic valves
I08.1	Rheumatic disorders of both mitral and tricuspid valves
I08.2	Rheumatic disorders of both aortic and tricuspid valves
I08.3	Combined rheumatic disorders of mitral, aortic and tricuspid valves
8.80I	Other rheumatic multiple valve diseases
I09.0	Rheumatic myocarditis
I09.1	Rheumatic diseases of endocardium, valve unspecified
I09.2	Chronic rheumatic pericarditis
I09.81	Rheumatic heart failure
I09.89	Other specified rheumatic heart diseases
I20.0	Unstable angina
I24.0	Acute coronary thrombosis not resulting in myocardial infarction
I24.1	Dressler's syndrome
I24.8	Other forms of acute ischemic heart disease
I25.110	Atherosclerotic heart disease of native coronary artery with unstable angina pectoris
I25.710	Atherosclerosis of autologous vein coronary artery bypass graft(s) with unstable
	angina pectoris
I25.720	Atherosclerosis of autologous artery coronary artery bypass graft(s) with unstable
TOF 700	angina pectoris
I25.730	Atherosclerosis of nonautologous biological coronary artery bypass graft(s) with unstable angina pectoris
I25.750	Atherosclerosis of native coronary artery of transplanted heart with unstable angina
I25.760	Atherosclerosis of hadive coronary artery of transplanted heart with
123.700	unstable angina
I25.790	Atherosclerosis of other coronary artery bypass graft(s) with unstable angina
	pectoris
I26.01	Septic pulmonary embolism with acute cor pulmonale
I26.09	Other pulmonary embolism with acute cor pulmonale
I26.90	Septic pulmonary embolism without acute cor pulmonale
I26.99	Other pulmonary embolism without acute cor pulmonale
I28.0	Arteriovenous fistula of pulmonary vessels
I28.1	Aneurysm of pulmonary artery
I28.8	Other diseases of pulmonary vessels
I30.0	Acute nonspecific idiopathic pericarditis
I30.1	Infective pericarditis

I30.8	Other forms of acute pericarditis
I31.0	Chronic adhesive pericarditis
I31.1	Chronic constrictive pericarditis
I31.2	Hemopericardium, not elsewhere classified
I31.3	Pericardial effusion (noninflammatory)
I31.4	Cardiac tamponade
I31.8	Other specified diseases of pericardium
I32	Pericarditis in diseases classified elsewhere
I33.0	Acute and subacute infective endocarditis
I33.9	Acute and subacute endocarditis, unspecified
I34.0	Nonrheumatic mitral (valve) insufficiency
I34.1	Nonrheumatic mitral (valve) prolapse
I34.2	Nonrheumatic mitral (valve) stenosis
I34.8	Other nonrheumatic mitral valve disorders
I35.0	Nonrheumatic aortic (valve) stenosis
I35.1	Nonrheumatic aortic (valve) insufficiency
I35.2	Nonrheumatic aortic (valve) stenosis with insufficiency
I35.8	Other nonrheumatic aortic valve disorders
I36.0	Nonrheumatic tricuspid (valve) stenosis
I36.1	Nonrheumatic tricuspid (valve) insufficiency
I36.2	Nonrheumatic tricuspid (valve) stenosis with insufficiency
I36.8	Other nonrheumatic tricuspid valve disorders
I37.0	Nonrheumatic pulmonary valve stenosis
I37.1	Nonrheumatic pulmonary valve insufficiency
I37.2	Nonrheumatic pulmonary valve stenosis with insufficiency
I37.8	Other nonrheumatic pulmonary valve disorders
I38	Endocarditis, valve unspecified
I39	Endocarditis and heart valve disorders in diseases classified elsewhere
I40.0	Infective myocarditis
I40.1	Isolated myocarditis
I40.8	Other acute myocarditis
I41	Myocarditis in diseases classified elsewhere
I71.01	Dissection of thoracic aorta
I71.02	Dissection of abdominal aorta
I71.03	Dissection of thoracoabdominal aorta
I71.1	Thoracic aortic aneurysm, ruptured
I71.2	Thoracic aortic aneurysm, without rupture
I71.3	Abdominal aortic aneurysm, ruptured
I71.4	Abdominal aortic aneurysm, without rupture
I71.5	Thoracoabdominal aortic aneurysm, ruptured
I71.6	Thoracoabdominal aortic aneurysm, without rupture
I71.9	Aortic aneurysm of unspecified site, without rupture
I74.11	Embolism and thrombosis of thoracic aorta
179.0	Aneurysm of aorta in diseases classified elsewhere

I81	Portal vein thrombosis
I82.0	Budd-Chiari syndrome
I82.220	Acute embolism and thrombosis of inferior vena cava
I82.221	Chronic embolism and thrombosis of inferior vena cava
J86.9	Pyothorax without fistula
J90	Pleural effusion, not elsewhere classified
J92.0	Pleural plaque with presence of asbestos
J92.9	Pleural plague without asbestos
J94.1	Fibrothorax
J94.2	Hemothorax
J94.8	Other specified pleural conditions
K75.1	Phlebitis of portal vein
M32.11	Endocarditis in systemic lupus erythematosus
M32.12	Pericarditis in systemic lupus erythematosus
Q20.0	Common arterial trunk
Q20.1	Double outlet right ventricle
Q20.2	Double outlet left ventricle
Q20.3	Discordant ventriculoarterial connection
Q20.4	Double inlet ventricle
Q20.5	Discordant atrioventricular connection
Q20.6	Isomerism of atrial appendages
Q20.8	Other congenital malformations of cardiac chambers and connections
Q21.0	Ventricular septal defect
Q21.1	Atrial septal defect
Q21.2	Atrioventricular septal defect
Q21.3	Tetralogy of Fallot
Q21.4	Aortopulmonary septal defect
Q21.8	Other congenital malformations of cardiac septa
Q22.0	Pulmonary valve atresia
Q22.1	Congenital pulmonary valve stenosis
Q22.2	Congenital pulmonary valve insufficiency
Q22.3	Other congenital malformations of pulmonary valve
Q22.4	Congenital tricuspid stenosis
Q22.5	Ebstein's anomaly
Q22.6	Hypoplastic right heart syndrome
Q22.8	Other congenital malformations of tricuspid valve
Q23.0	Congenital stenosis of aortic valve
Q23.1	Congenital insufficiency of aortic valve
Q23.2	Congenital mitral stenosis
Q23.3	Congenital mitral insufficiency
Q23.4	Hypoplastic left heart syndrome
Q23.1 Q23.8	Other congenital malformations of aortic and mitral valves
Q23.0 Q24.0	Dextrocardia
Q24.1	Levocardia
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Q24.2	Cor triatriatum
Q24.3	Pulmonary infundibular stenosis
Q24.4	Congenital subaortic stenosis
Q24.5	Malformation of coronary vessels
Q24.6	Congenital heart block
Q24.8	Other specified congenital malformations of heart
Q25.0	Patent ductus arteriosus
Q25.1	Coarctation of aorta
Q25.21	Interruption of aortic arch
Q25.29	Other atresia of aorta
Q25.3	Supravalvular aortic stenosis
Q25.40	Congenital malformation of aorta unspecified
Q25.41	Absence and aplasia of aorta
Q25.42	Hypoplasia of aorta
Q25.43	Congenital aneurysm of aorta
Q25.44	Congenital dilation of aorta
Q25.45	Double aortic arch
Q25.46	Tortuous aortic arch
Q25.47	Right aortic arch
Q25.48	Anomalous origin of subclavian artery
Q25.49	Other congenital malformations of aorta
Q25.8	Other congenital malformations of other great arteries
Q26.0	Congenital stenosis of vena cava
Q26.1	Persistent left superior vena cava
Q26.2	Total anomalous pulmonary venous connection
Q26.3	Partial anomalous pulmonary venous connection
Q26.4	Anomalous pulmonary venous connection, unspecified
Q26.8	Other congenital malformations of great veins
Q87.40	Marfan's syndrome, unspecified
Q87.410	Marfan's syndrome with aortic dilation
Q87.418	Marfan's syndrome with other cardiovascular manifestations
Q87.42	Marfan's syndrome with ocular manifestations
Q87.43	Marfan's syndrome with skeletal manifestation
R09.1	Pleurisy
R22.2	Localized swelling, mass and lump, trunk
R93.1	Abnormal findings on diagnostic imaging of heart and coronary circulation
R93.89	Abnormal findings on diagnostic imaging of other specified body structures
R94.30	Abnormal result of cardiovascular function study, unspecified
R94.31	Abnormal electrocardiogram [ECG] [EKG]
T80.0xxA	Air embolism following infusion, transfusion and therapeutic injection, initial encounter
T81.718A	Complication of other artery following a procedure, not elsewhere classified, initial encounter

T81.72xA	Complication of vein following a procedure, not elsewhere classified, initial
	encounter
T82.817A	Embolism of cardiac prosthetic devices, implants and grafts, initial encounter
T82.818A	Embolism of vascular prosthetic devices, implants and grafts, initial encounter
Z95.5	Presence of coronary angioplasty implant and graft
Z98.61	Coronary angioplasty status

## **REVISIONS**

The Medical Director added to the Policy section "of the coronary arteries", removed "as a screening test" from CV MRI and removed "for diagnosis and screening" from CV MRA for clarification.
<ul> <li>Policy section was revised to combine information from item F. to B11. Item F. was deleted and stated, "Pulmonary venous assessment in association with atrial fibrillation dysfunctions prior to electro physiology ablation." Item B11 was modified from, "Assessment of pulmonary veins" to its current verbiage.</li> <li>The following paragraph was deleted to remove the definition of class I classification of cardiovascular conditions: "CMR is medically necessary for indications that include an expert Consensus panel's class I classification of cardiovascular conditions. A class I classification is defined as: provides clinically relevant information and is usually appropriate; may be used as first line imaging technique; usually supported by substantial literature."</li> <li>Under "Experimental/investigational indications:" added to number 2, "for diagnosis and screening".</li> <li>Under "Subject to review for medical necessity:" added to number 1, "indications that are not listed above." and deleted, "all indications. Medical records should clearly document medical necessity."</li> <li>A Diagnosis section was added to the policy to reflect all the appropriate diagnoses eligible for this procedure. Previously no diagnoses codes were reflected in the policy.</li> </ul>
Revision section was added.
References were updated.
<ul> <li>In Coding section:</li> <li>Removed CPT Codes: 75552, 75553, 75554, 75555 (effective January 1, 2008)</li> <li>Removed CPT Codes: 75558, 75560, 75562, 75564 (effective January 2, 2010)</li> <li>Added CPT Codes: 75557, 75558, 75559, 75560, 75561, 75562, 75563, 75564 (effective January 1, 2008)</li> <li>Added CPT Code: 75565 (effective January 1, 2010)</li> <li>Removed Diagnosis Code: 794.30</li> <li>Added Diagnosis Codes: 411.0-410.9, 415.12, 423.3, 794.31</li> </ul>
Added Medical Policy and Coding Disclaimers.  In the Policy section:  Formatted medical policy language.  In Item B, #2, added "of coronary artery disease" to read "Coronary MRA for diagnosis and screening of coronary artery disease"  In Coding section:  Nomenclature reviewed and updated

12-11-2013	Policy reviewed.
	In Coding section:
	<ul> <li>Added ICD-10 Diagnosis codes (Effective October 1, 2014)</li> </ul>
	Updated Reference section.
04-15-2014	In Policy section:
	<ul> <li>In Item B 2 removed "diagnosis and" to read, "Coronary MRA for screening of</li> </ul>
	coronary artery disease."
07-15-2014	Description section reviewed.
	In Policy section:
	In Item A b 5, removed "apical" to read, "Hypertrophic cardiomyopathy"
	In Item A 4 added a new indication of, "f. Restrictive cardiomyopathy"
	<ul> <li>In Item A 5 b added "or stenosis" to read "Quantification of regurgitation or stenosis"</li> </ul>
	Coding section reviewed
	References updated
06-10-2015	Policy reviewed; no changes made.
06-08-2016	Policy reviewed; no changes made.
10-01-2016	In Coding section:
	Added ICD-10 codes effective 10-01-2016: Q25.21, Q25.29, Q25.40, Q25.41,
	Q25.42, Q25.43, Q25.44, Q25.45, Q25.46, Q25.47, Q25.48, Q25.49
	■ Termed ICD-10 codes effective 09-30-2016: Q25.2, Q25.4
05-10-2017	Policy reviewed; no changes made.
04-25-2018	In Coding section:
	Removed ICD-9 codes.
	Remainder of policy reviewed; no changes made.
10-01-2018	In Coding section:
	Added ICD-10 code: R93.89.
	Removed ICD-10 code: R93.8.
07-03-2019	Policy Archived

#### **REFERENCES**

- 1. Pennell, D.J., Sachem, U.P., Higgins, C.B., et al. (2004). Clinical Indications for Cardiovascular Magnetic Resonance: Consensus Panel Report. Journal of Cardiovascular Magnetic Resonance 6, No.4: 727-765.
- 2. Blue Cross and Blue Shield of Kansas Cardiology Liaison Committee, May 2, 2007; May 2013; May 2014; May 2015.
- 3. Blue Cross and Blue Shield of Kansas Medical Advisory Committee (MAC), August 2, 2007.