Title: Cardiovascular Magnetic Resonance (CMR)

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
      l. 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:
   1. 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
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<th>Description</th>
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<tr>
<td>C49.3</td>
<td>Malignant neoplasm of connective and soft tissue of thorax</td>
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<td>C78.01</td>
<td>Secondary malignant neoplasm of right lung</td>
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<td>C78.02</td>
<td>Secondary malignant neoplasm of left lung</td>
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<td>Secondary malignant neoplasm of mediastinum</td>
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<td>Secondary malignant neoplasm of pleura</td>
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<td>Benign neoplasm of right bronchus and lung</td>
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<td>D14.32</td>
<td>Benign neoplasm of left bronchus and lung</td>
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<td>Benign neoplasm of thymus</td>
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<td>Benign neoplasm of heart</td>
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<td>D15.2</td>
<td>Benign neoplasm of mediastinum</td>
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<td>D17.4</td>
<td>Benign lipomatous neoplasm of intrathoracic organs</td>
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<td>D19.0</td>
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<td>D21.3</td>
<td>Benign neoplasm of connective and other soft tissue of thorax</td>
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<td>Neoplasm of uncertain behavior of trachea, bronchus and lung</td>
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<td>D38.2</td>
<td>Neoplasm of uncertain behavior of pleura</td>
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<td>Neoplasm of uncertain behavior of thymus</td>
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<td>I00</td>
<td>Rheumatic fever without heart involvement</td>
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<td>Rheumatic chorea without heart involvement</td>
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<td>Rheumatic tricuspid insufficiency</td>
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<td>Rheumatic tricuspid stenosis and insufficiency</td>
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<td>I07.8</td>
<td>Other rheumatic tricuspid valve diseases</td>
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<td>Rheumatic disorders of both mitral and aortic valves</td>
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<td>Rheumatic disorders of both mitral and tricuspid valves</td>
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<td>I08.2</td>
<td>Rheumatic disorders of both aortic and tricuspid valves</td>
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<td>Combined rheumatic disorders of mitral, aortic and tricuspid valves</td>
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<td>I08.8</td>
<td>Other rheumatic multiple valve diseases</td>
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<td>Rheumatic myocarditis</td>
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<td>Rheumatic diseases of endocardium, valve unspecified</td>
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<td>I09.81</td>
<td>Rheumatic heart failure</td>
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<td>I09.89</td>
<td>Other specified rheumatic heart diseases</td>
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<td>I20.0</td>
<td>Unstable angina</td>
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<td>I24.0</td>
<td>Acute coronary thrombosis not resulting in myocardial infarction</td>
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</table>
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 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 bypass graft of coronary artery of transplanted heart with 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
I79.0  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 plaque 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 atroventricular 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
Q23.8 Other congenital malformations of aortic and mitral valves
Q24.0 Dextrocardia
Q24.1 Levocardia
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
<table>
<thead>
<tr>
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<th>Description</th>
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<tr>
<td>R09.1</td>
<td>Pleurisy</td>
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<tr>
<td>R22.2</td>
<td>Localized swelling, mass and lump, trunk</td>
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<tr>
<td>R93.1</td>
<td>Abnormal findings on diagnostic imaging of heart and coronary circulation</td>
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<tr>
<td>R93.89</td>
<td>Abnormal findings on diagnostic imaging of other specified body structures</td>
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<tr>
<td>R94.30</td>
<td>Abnormal result of cardiovascular function study, unspecified</td>
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<tr>
<td>R94.31</td>
<td>Abnormal electrocardiogram [ECG] [EKG]</td>
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<td>T80.0xxA</td>
<td>Air embolism following infusion, transfusion and therapeutic injection, initial encounter</td>
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<tr>
<td>T81.718A</td>
<td>Complication of other artery following a procedure, not elsewhere classified, initial encounter</td>
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<td>T81.72xA</td>
<td>Complication of vein following a procedure, not elsewhere classified, initial encounter</td>
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<tr>
<td>T82.817A</td>
<td>Embolism of cardiac prosthetic devices, implants and grafts, initial encounter</td>
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<tr>
<td>T82.818A</td>
<td>Embolism of vascular prosthetic devices, implants and grafts, initial encounter</td>
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<td>Z95.5</td>
<td>Presence of coronary angioplasty implant and graft</td>
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<td>Z98.61</td>
<td>Coronary angioplasty status</td>
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**REVISIONS**

<table>
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<tr>
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<th>Changes</th>
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<tbody>
<tr>
<td>Effective</td>
<td>• The Medical Director added to the Policy section &quot;of the coronary arteries&quot;, removed &quot;as a screening test&quot; from CV MRI and removed &quot;for diagnosis and screening&quot; from CV MRA for clarification.</td>
</tr>
<tr>
<td>07-01-2006</td>
<td>• Policy section was revised to combine information from item F. to B11. Item F. was deleted and stated, &quot;Pulmonary venous assessment in association with atrial fibrillation dysfunctions prior to electro physiology ablation.&quot; Item B11 was modified from, &quot;Assessment of pulmonary veins&quot; to its current verbiage.</td>
</tr>
<tr>
<td></td>
<td>• The following paragraph was deleted to remove the definition of class I classification of cardiovascular conditions: &quot;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.&quot;</td>
</tr>
<tr>
<td></td>
<td>• Under &quot;Experimental/investigational indications:&quot; added to number 2, &quot;for diagnosis and screening&quot;.</td>
</tr>
<tr>
<td></td>
<td>• Under &quot;Subject to review for medical necessity:&quot; added to number 1, &quot;...indications that are not listed above.&quot; and deleted, &quot;...all indications. Medical records should clearly document medical necessity.&quot;</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td>• Revision section was added.</td>
</tr>
<tr>
<td></td>
<td>• References were updated.</td>
</tr>
<tr>
<td>Effective</td>
<td>• In Coding section:</td>
</tr>
<tr>
<td>11-01-2007</td>
<td>• Removed CPT Codes: 75552, 75553, 75554, 75555 (effective January 1, 2008)</td>
</tr>
<tr>
<td></td>
<td>• Removed CPT Codes: 75558, 75560, 75562, 75564 (effective January 2, 2010)</td>
</tr>
<tr>
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<td>• Added CPT Codes: 75557, 75558, 75559, 75560, 75561, 75562, 75563, 75564 (effective January 1, 2008)</td>
</tr>
<tr>
<td></td>
<td>• Added CPT Code: 75565 (effective January 1, 2010)</td>
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<td></td>
<td>• Removed Diagnosis Code: 794.30</td>
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<tr>
<td></td>
<td>• Added Diagnosis Codes: 411.0-410.9, 415.12, 423.3, 794.31</td>
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</table>
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:
- Added ICD-10 Diagnosis codes *(Effective October 1, 2014)*

Updated Reference section.

04-15-2014 In Policy section:
- In Item B 2 removed "diagnosis and" to read, "Coronary MRA for screening of 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"
- In Item A 5 b added "or stenosis" to read "Quantification of regurgitation or stenosis"

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
- Termined 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.

**REFERENCES**


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.