Empire BlueCross BlueShield Clinical UM Guideline

Subject: CT/MRI of the Thoracic Cavity
Guideline #: CG-RAD-15 **Current Effective Date:** 03/09/2007
Status: Revised **Last Review Date:** 12/07/2006

Description

This guideline addresses the use of computed tomography (CT) and magnetic resonance imaging (MRI) for evaluation, diagnosis, and management of conditions of the thoracic cavity, including the heart, lungs, mediastinum, and great vessels. This guideline applies to the use of these studies in the outpatient setting.

NOTE:
The use of CT for the assessment of coronary artery disease is addressed in the following documents:

- Computed Tomography to Detect Coronary Artery Calcification (RAD.00001)
- Contrast-Enhanced Cardiac Computed Tomography Angiography (CTA) (RAD.00035)

The use of CT for lung cancer screening is addressed in the following document:

- CT Scans with or without Computer Assisted Detection (CAD) for Lung Cancer Screening (RAD.00043)

Clinical Indications

Medical Necessity: In most clinical settings, a CT or MRI is not the initial imaging study. These studies are most often performed after a chest X-ray (CXR) or echocardiogram have identified some abnormality and the additional information obtained will be used in clinical decision making.

I. **Heart**

The use of *either* computed tomography (CT) or magnetic resonance imaging (MRI) of the heart is considered **medically necessary** for any of the following indications:

- For suspected constrictive pericarditis, when transthoracic echocardiography (TTE) is non-diagnostic.
- For cardiac and paracardiac masses including bronchogenic cysts, vascular lesions metastases or thrombus.
- For surveillance, dependent on specific malignancy or cell type.
- Cardiac aneurysm or pseudoaneurysm.
- Congenital heart disease
- Ventricular arrhythmias, when an echocardiogram is insufficient for technical reasons to accurately assess left ventricular or right ventricular function.

The use of magnetic resonance imaging (MRI) of the heart is considered **medically necessary** for any of the following indications:

- For suspected cardiomyopathies (e.g., right ventricular dysplasia, sarcoidosis, hemochromatosis) as follow-up to echocardiography or when echocardiography is inconclusive.
- For intracardiac mass including thrombus when suspected by TTE and TEE (transesophageal echocardiography) is non-diagnostic or not feasible.

- For assessment of congenital heart disease including the great vessels.
- Pediatric cardiac abnormalities of all types including congenital anatomic and functional anomalies.

The use of computed tomography (CT) of the heart is considered **medically necessary** for non-invasive coronary arterial mapping, including internal mammary prior to repeat surgical revascularization.

II. **Chest**

The use of *either* computed tomography (CT) or magnetic resonance imaging (MRI) of the chest is considered **medically necessary** when any of the following are present:

- Suspected thoracic/aortic dissection.
- Suspected thoracic, thoracoabdominal aneurysm.
- Other abnormalities of the aorta or other thoracic vessels (for example vasculitis).
- Suspected thymoma or a history of myasthenia gravis.
- Thoracic outlet syndrome.
- For surveillance, dependent on specific malignancy or cell type.

The use of computed tomography (CT) of the chest is considered **medically necessary** when any of the following are present:

- Chest trauma.
- Mediastinal widening or mass or hilar enlargement when identified by CXR.
- Superior Vena Cava Syndrome.
- Asbestos related lesions of the lung and pleura.
- Persistent, undiagnosed pleural effusion.
- Structural abnormalities including mass of or within the chest, chest wall or pleura as evidenced by CXR.
- Pulmonary nodules, with a suspicion of cancer.
- Undiagnosed systemic illness presenting as fever of unknown origin or significant unexplained weight loss after initial evaluation for other causes.
- Evaluation of known or suspected congenital thoracic anomalies.
- Evaluation of pulmonary vein anatomy prior to radiofrequency ablation for atrial fibrillation.
- Noninvasive pulmonary mappings prior to biventricular pacemaker placement.

The use of magnetic resonance imaging (MRI) of the chest is considered **medically necessary** when any of the following are present:

- Posterior mediastinal mass.
- Trachobronchial tree prior to endobronchial laser photoresection.

III. **Lung**

The use of *either* computed tomography (CT) or magnetic resonance imaging (MRI) of the lung is considered **medically necessary** when any of the following are present:

- Staging lung cancer.
- For surveillance of previously diagnosed cancer, dependent upon specific malignancy. *Note*: 2005 American Society of Clinical Oncology recommendation: Patients who are at higher risk of recurrence (stages II and III), and who could be candidates for curative-intent surgery, should undergo annual CT of the chest and abdomen for 3 years after primary therapy for colon and rectal cancer. For other malignancies, follow-up examination is appropriate when there are new significant signs and/or symptoms and the results of the examination will effect treatment decisions.

- Worsening or undiagnosed splenomegaly or hepatomegaly.

The use of *computed* tomography (CT) of the lung is considered **medically necessary** when any of the following are present:

- Bullous emphysema, infiltrates, bronchiectasis, interstitial disease, and pleural changes after CXR and with unexplained clinical findings.
- Hemoptysis of suspected bronchopulmonary etiology and normal CXR.
- Suspected pulmonary embolism.
- Complications of acute respiratory infection e.g., lung abscess or emphysema after CXR.
- Evaluation patients with chest infections/inflammatory processes which are not complications of acute respiratory infections, including:
  - Mediastinitis.
  - Mediastinal abscess.
  - Sternal infections (a known complication of cardiac surgery).
- Sarcoidosis, after CXR and with unexplained clinical findings.
- Cancer, primary and/or extra thoracic metastases (e.g., bone, sarcoma, melanoma, ENT).
- Sputum cytology positive for malignancy with normal CXR.
- As imaging guidance for interventional procedures including pulmonary vein ablation for atrial fibrillation.
- Pneumothorax, prior to repair.
- Chronic cough with normal CXR unresponsive to medical treatment and after evaluation for other causes (post nasal drainage, cough asthma, gastroesophageal reflux and medication effects).
- Pneumonia refractory to medical treatment of adequate duration (at least 4 weeks) or suspected to be secondary to obstruction.

The use of *magnetic* resonance imaging (MRI) of the lung is considered **medically necessary** when any of the following are present:

- Suspected sulcus (Pancoast) tumor after CXR.
- Brachial plexus injury or plexopathy.
- Need to differentiate mediastinal and hilar mass lesions from vascular structures, particularly in patients with a history of allergy to iodinated CT contrast material or at risk for other complications from contrast media.

Clinical Considerations:

- The CT scan is frequently used for guidance for invasive procedures such as biopsy, implant or repair.
- Clinical situations may influence whether CT or MRI is suitable for pregnant women and children.
- Immunosuppressed individuals require a higher level of suspicion.
- Relative and absolute contraindications for scans requiring administration of intravascular contrast material may include individuals:
  - Who have a documented allergy from prior contrast administration or a history of atopy.
  - Who have impaired renal function, when considering an enhanced CT with intravascular iodinated contrast agents.
  - Multiple myeloma.
- Contraindications for MRI imaging include individuals:
  - Who have a pacemaker or implantable cardioverter-defibrillator (ICD).
  - Who have intracranial surgical clips, that are not compatible with the use of MRI, placed for an aneurysm.
  - Who have had placement of other non-MRI compatible devices within the body.
- Additional considerations and possible contraindications for MRI may also include individuals:

- Who have had placement of metal devices within the body however, for those who have small amounts of implanted metal not located in the imaging area, an open MRI may be appropriate.
- For whose condition requires external devices for care (e.g., portable O2 tank).
- For individuals who are claustrophobic, an open MRI may be appropriate.

- MRI of the thoracic cavity is not appropriate as a screening tool (i.e., asymptomatic patients without a previous diagnosis or specific clinical indication).

Place of Service

Ambulatory, Outpatient Facility **OR** Inpatient. Note, this guideline was intended to address the use of these studies in the outpatient setting.

Place of Service:

Coding

The following codes for treatments and procedures applicable to this guideline 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 policy. 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

71250-71270	Computed tomography, thorax
71550-71552	Magnetic resonance (e.g., proton) imaging, chest (e.g., for evaluation of hilar and mediastinal lymphadenopathy)
75552-75553	Cardiac magnetic resonance imaging for morphology
75554-75555	Cardiac magnetic resonance imaging for function, with or without morphology
75556	Cardiac magnetic resonance imaging for velocity flow mapping

ICD-9 Procedure

87.41	Computerized axial tomography of thorax
88.92	Magnetic resonance imaging of chest and myocardium for evaluation of hilar and mediastinal lymphadenopathy

REV

359	Computed tomographic (CT) scan, other
614	Magnetic resonance imaging, other

ICD-9 Diagnosis

All indicated diagnoses

Discussion/General Information

Computed tomography (CT), sometimes called CAT scan, is a diagnostic tool that uses special x-ray equipment to obtain image data from different angles around the body, then uses computer processing of the information to show a cross-section of body tissues and organs. The CT requires less time and can be performed in acute settings where advanced monitoring and life support is needed for an unstable patient.

Magnetic resonance imaging (MRI) is a diagnostic technique that uses a cylindrical magnet and radio waves to produce high quality multiplanar images of organs and structures within the body without x-rays or radiation. The body's

hydrogen atoms react to the magnetic field and pulses of radio waves. This reaction is changed to an image by a computer. CT and MRI are valuable imaging techniques most often used when preliminary diagnostics or symptoms suggest an abnormal condition requiring further analysis.

References

Peer Reviewed Publications:

1. Erasmus JJ, McAdams HP, Donnelly LF, Spritzer CE. MR imaging of mediastinal masses. Magn Reson Imaging Clin N Am. 2000; 8(1):59-89.
2. Gutierrez FR, Siegel MJ, Fallah JH, Poustchi-Amin M. Magnetic resonance imaging of cyanotic and noncyanotic congenital heart disease. Magn Reson Imaging Clin N Am. 2002; 10(2):209-235.
3. Haramati LB, White CS. MR imaging of lung cancer. Magn Reson Imaging Clin N Am. 2000; 8(1):43-57.
4. Kearon C. Diagnosis of pulmonary embolism. CMAJ. 2003; 168(2):183-194.
5. Kimura F, Sakai F, Sakomura Y, et al. Helical CT features of arrhythmogenic right ventricular cardiomyopathy. Radiographics. 2002; 22(5):1111-1124.
6. Kuhlman JE. Thoracic imaging in heart transplantation. J Thorac Imaging. 2002; 17(2):113-21.

Government Agency, Medical Society, and Other Authoritative Publications:

1. American College of Radiology. ACR Appropriateness Criteria : Expert Panel on Thoracic Imaging documents. 2005. Available at: http://www.acr.org/s_acr/sec.asp?CID=1203&DID=15044. Accessed: September 11, 2006.
2. American College of Radiology. ACR Appropriateness Criteria : Follow-Up Examinations for Bone Tumors, Soft Tissue Tumors and Suspected Metastases. 2005. Available at: http://www.acr.org/s_acr/bin.asp?CID=1206&DID=11793&DOC=FILE.PDF. Accessed September 11, 2006.
3. American College of Radiology. ACR Appropriateness Criteria : Metastatic Bone Disease. 2005. Available at: http://www.acr.org/s_acr/bin.asp?CID=1206&DID=11781&DOC=FILE.PDF. Accessed September 11, 2006.
4. Centers for Medicare and Medicaid Services. National Coverage Determination for Magnetic Resonance Imaging (MRI). NCD #220.2. Effective March 22, 1994. http://www.cms.hhs.gov/mcd/index_list.asp?list_type=ncd. Accessed on September 11, 2006.
5. Desch CE, Benson AB, Somerfield MR, et al. Colorectal Cancer Surveillance: 2005 Update of an American Society of Clinical Oncology Practice Guideline. J Clin Oncol. 2005; 23(33): 8512-9
6. Hendel RC, Patel Mr, Kramer CM, Poon M. ACCF/ACR/SCCT/SCMR/ ASNC/NASCI/SCAI/SIR Appropriateness Criteria for Cardiac Computed Tomography and Cardiac Magnetic Resonance Imaging: A Report of the American College of Cardiology Foundation Quality Strategic Directions Committee Appropriateness Criteria Working Group, American College of Radiology, Society of Cardiovascular Computed Tomography, Society for Cardiovascular Magnetic Resonance, American Society of Nuclear Cardiology, North American Society for Cardiac Imaging, Society for Cardiovascular Angiography and Interventions, and Society of Interventional Radiology. J Am Coll Cardiol. 2006; 48(7):1-23.
7. Zipes DP, Camm AJ, Borggrefe M, et al ACC/AHA/ESC 2006 guidelines for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death: a report of the American College of Cardiology/ American Heart Association Task Force and the European Society of Cardiology Committee for Practice Guidelines (Writing Committee to Develop Guidelines for Management of Patients With Ventricular Arrhythmias and the Prevention of Sudden Cardiac Death). J Am Coll Cardiol 2006;48:e247 e346.

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Thoracic/Aortic Dissection
Thoracoabdominal Aneurysm
Vena Cava Syndrome

History

Status	Date	Action
Revised	12/07/2006	Medical Policy & Technology Assessment Committee (MPTAC) review. Added Ventricular arrhythmias, when an echocardiogram is insufficient for technical reasons to accurately assess left ventricular or right ventricular function. as medically necessary for MRI or CT of the heart. Added non-invasive coronary arterial mapping, including internal mammary prior to repeat surgical revascularization as medically necessary indication for CT of the heart. Added Evaluation of pulmonary vein anatomy prior to radiofrequency ablation for atrial fibrillation and Noninvasive pulmonary mappings prior to biventricular pacemaker placement as medically necessary indications for CT of the chest. Revised Reference section. Published on web 03/09/2007.
Revised	03/23/2006	MPTAC review. Revision based on policy harmonization: Pre-merger Anthem and Pre-merger WellPoint.

Pre-Merger Organizations	Last Review Date	Policy/Guideline Number	Title
Anthem Virginia	07/20/2005		CT/MRI Thoracic Cavity
WellPoint Health Networks, Inc.	07/14/2005	Clinical Guideline	CT/MRI Thoracic Cavity