

**Johns Hopkins University School of Medicine**  
**Appropriate Use Criteria**  
**Priority Clinical Area: Lung Cancer**  
**Setting: Ambulatory and Emergency Department**

## **INTRODUCTION**

The Centers for Medicare and Medicaid Services (CMS) Appropriate Use Criteria (AUC) program takes effect January 2020 and requires ambulatory and emergency medicine providers to consult AUC using a CMS approved clinical decision support mechanism when ordering advanced imaging (CT, MRI or nuclear medicine) in eight priority clinical areas (PCAs). Lung cancer is included in the PCAs. This evidentiary review identified the highest-grade evidence in the literature pertaining to the utility of CT, MRI and nuclear medicine for patients with the following scenarios:

- Initial diagnosis and staging of lung cancer: AUCs detailed below
- Lung cancer screening (AUCs to be developed)
- Lung nodule surveillance (AUCs to be developed)
- Surveillance after treatment (AUCs to be developed)

## **LITERATURE REVIEW**

### **Broad search Jan. 26, 2019**

("lung cancer"[mh] OR "lung carcinoma"[mh] OR "cancer of the lung[mh]" OR "NSCLC"[tiab] OR "lung cancer"[tiab]) AND ("tomography, x-ray computed"[mh] OR "computed tomography"[mh] OR "computed tomography"[tiab] OR "magnetic resonance imaging"[mh] OR "magnetic resonance"[mh] OR "MRI" [tiab] OR "nuclear medicine"[mh]) AND ("clinical study"[Pt] OR "clinical trial"[Pt] OR "clinical trial protocol"[Pt] OR "controlled clinical trial"[Pt] OR "meta analysis"[Pt] OR "multicenter study"[Pt] OR "practice guideline"[Pt] OR "randomized controlled trial"[Pt] OR "systematic review"[Pt]) AND (1990:3000[dp] AND eng[la])

### **PRISMA**

- 1,105 references imported for screening as 1,105 studies
  - Zero duplicates removed
- 1,104 studies screened against title and abstract
  - 826 studies excluded
- 278 studies pulled and subdivided by topic
  - Lung cancer screening

*Published December 2019*

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- Clinical practice guidelines
- Lung cancer diagnosis and staging
- Positron emission tomography (PET)/CT for lung cancer
- Miscellaneous
- Three publications focused on initial chest CT for diagnosis

Publication type

- One meta-analysis
- Two systematic reviews

Oxford grade

- Three studies Oxford Grade 1

**Clinical practice guideline (CPG) search July 15, 2019**

(lung cancer[MeSH Major Topic]) AND (diagnosis [MeSH Major Topic]) AND “guideline”[Publication Type]

PRISMA

- 55 references imported
  - Zero duplicates removed
- 55 studies screened against title and abstract
  - 48 studies excluded
- Seven studies assessed for full-text eligibility
  - Zero studies excluded
- Seven guidelines included and supplemented by 11 related (same society and NCCN (National Comprehensive Cancer Network) guideline)

Oxford Grade: *See evidence table for grading of CPG rules.*

Evidence tables are found separately on the Johns Hopkins Medicine’s Appropriate Use Criteria [website](#).

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**APPROPRIATE USE CRITERIA**

<b>Title</b>	<b>Clinical scenario 1: Suspicion of lung cancer clinically</b>	<b>Clinical scenario 2: Suspicion of lung cancer radiographically, no neurologic or musculoskeletal symptoms</b>	<b>Clinical scenario 3: Known lung cancer and suspicion of cerebral metastases</b>	<b>Clinical scenario 4: Known lung cancer and suspicion of spine metastases</b>	<b>Clinical scenario 5: Known lung cancer and bone metastases</b>
<b>Definition</b>	Suspect lung cancer, no other concerns and no radiograph	Radiograph positive for cancer but no brain, spine or bone symptoms	Lung cancer diagnosis and signs or symptoms of brain pathology	Lung cancer diagnosis and signs or symptoms of spine pathology	Lung cancer diagnosis and signs or symptoms of bone pathology
<b>AUC Rules</b>					
Consistent with AUC	No advanced imaging is consistent with AUC for this clinical presentation.	Chest CT	Brain CT or MRI	Spine CT or MRI	Bone scan
Allowable by AUC		Brain CT or MRI in Small Cell Lung Cancer only			
Does not meet AUC	Chest CT or MRI, brain CT or MRI, spine CT or MRI, bone scan, PET/CT	Chest MRI, spine CT or MRI, bone scan, PET/CT	Chest CT or MRI, spine CT or MRI, bone scan, PET/CT	Chest CT or MRI, brain CT or MRI, bone scan, PET/CT	Chest CT or MRI, brain CT or MRI, spine CT or MRI, PET/CT
No AUC available					
Evidentiary vs Consensus	Consensus	Evidentiary	Evidentiary	Evidentiary	Evidentiary

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**MULTIDISCIPLINARY TEAM**

The Johns Hopkins University School of Medicine requires that all practicing physicians participating in the development of AUC disclose any conflicts of interest using the International Committee of Medical Journal Editors (ICMJE) form. This information is publically available in a timely fashion upon request, for not less than five years after the most recent published update of the relevant appropriate use criteria. Members of the shoulder pain AUC development team are:

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*Disclosure:* AUC developers may receive future royalties from licensure of AUC to CMS-approved clinical decision support mechanisms (CDSMs).