

## American College of Radiology ACR Appropriateness Criteria®

**Clinical Condition:**                   Dyspnea

**Variant 1:**                               Any age, positive physical examination.

Radiologic Procedure	Rating	Comments	<a href="#">RRL*</a>
X-ray chest	9		Min
<b>Rating Scale:</b> 1=Least appropriate, 9=Most appropriate			<b>*Relative Radiation Level</b>

**Variant 2:**                               Older than age 40, negative physical examination.

Radiologic Procedure	Rating	Comments	<a href="#">RRL*</a>
X-ray chest	8		Min
<b>Rating Scale:</b> 1=Least appropriate, 9=Most appropriate			<b>*Relative Radiation Level</b>

**Variant 3:**                               Younger than age 40, negative physical exam. Positive with other symptom, severe dyspnea, or other risk factors.

Radiologic Procedure	Rating	Comments	<a href="#">RRL*</a>
X-ray chest	8		Min
<b>Rating Scale:</b> 1=Least appropriate, 9=Most appropriate			<b>*Relative Radiation Level</b>

**Variant 4:**                               Younger than age 40, negative physical examination.

Radiologic Procedure	Rating	Comments	<a href="#">RRL*</a>
X-ray chest	No Consensus	The appropriateness of chest radiography varies and is influenced by several factors including the severity and duration of dyspnea, the presence of other symptoms, and the presence of other risk factors (cardiovascular, pulmonary, and neoplastic diseases).	Min
<b>Rating Scale:</b> 1=Least appropriate, 9=Most appropriate			<b>*Relative Radiation Level</b>

**Variant 5:**                               Any age, nonrevealing or nondiagnostic clinical, standard radiography, and laboratory studies.

Radiologic Procedure	Rating	Comments	<a href="#">RRL*</a>
CT chest	7	Consider radiation exposure risk from CT in young patients (below the age of 20 years), particularly in women.	Med
<b>Rating Scale:</b> 1=Least appropriate, 9=Most appropriate			<b>*Relative Radiation Level</b>

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## DYSPNEA

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### **Summary of Literature Review**

The literature is sparse on whether a chest radiograph is justified in patients with acute or chronic dyspnea. Most studies pertain to dyspnea in combination with other respiratory symptoms rather than as an isolated event. These studies are included under the ACR Appropriateness Criteria<sup>®</sup> [Acute Respiratory Illness](#) topic. This section does not include two of the most serious causes of dyspnea (congestive heart failure [CHF] and pulmonary thromboembolism) because they are dealt with elsewhere (see ACR Appropriateness Criteria<sup>®</sup> cardiac imaging and thoracic imaging sections).

Two studies [1,2] suggest that the chest radiograph adds enough additional useful information to recommend its routine use in patients with chronic and acute dyspnea. Another study [3] found that acute dyspnea was a strong predictor of radiographic abnormality in patients older than age 40 (only 14% had normal chest radiographs). In dyspneic patients younger than age 40, chest radiographs were normal in 68% and revealed acute and chronic findings in 13% and 18%, respectively. Of the patients with acute findings, the vast majority had either a positive physical examination or hemoptysis. The authors concluded that the chest radiograph was not warranted in patients younger than age 40 unless the physical examination was positive or the patient had hemoptysis.

It is recognized that the decision-making process in the individual patient is affected by factors other than just the presence or absence of dyspnea, including the severity of dyspnea and the presence or absence of other symptoms and other risk factors (cardiovascular, pulmonary, and neoplastic diseases). In clinical

practice, chest radiography is usually performed as part of the initial evaluation of dyspnea. A review by Morgan and Hodge [4] stated that the most useful methods for evaluating dyspnea are the electrocardiogram (ECG) and chest radiograph. In another study, the chest radiographs were helpful in making a diagnosis in 66% of the hospitalized patients admitted for other reasons and referred to respiratory physicians for breathlessness [5].

Although computed tomography (CT) is not recommended for the initial evaluation of patients with dyspnea (except for patients with suspected pulmonary embolism), it is frequently appropriate in patients when the results of the clinical, radiographic, and laboratory studies are either nonrevealing or nondiagnostic. Many diseases, including bronchiectasis, sarcoidosis, emphysema, pneumoconiosis, idiopathic pulmonary fibrosis, Langerhans cell histiocytosis, hypersensitivity pneumonitis, bronchiolitis obliterans, and lymphangitic cancer, have features characteristic enough to enable experienced radiologists to make a confident, probable, or limited differential diagnosis in most cases [6-14]. Biopsy and additional diagnostic testing are often unnecessary. CT and high-resolution CT (HRCT) may reveal an abnormality even when the chest radiograph is normal.

### **Recommendation**

Based on a limited number of studies, chest radiography seems indicated when dyspnea is chronic or severe or when there are associated risk factors (older than age 40, cardiovascular, pulmonary, or neoplastic disease), other signs or symptoms, or positive findings on the physical examination. The rationale for performing chest radiography in acutely dyspneic patients younger than age 40 is less compelling, and there does not appear to be strong support in the literature for either performing or not performing chest radiography when there are no other symptoms or risk factors and when the physical examination is normal.

CT and HRCT should be considered when the initial evaluation of the dyspneic patient is nonrevealing or when it reveals abnormality but no definitive diagnosis.

### **Relative Radiation Level Information**

Potential adverse health effects associated with radiation exposure are an important factor to consider when selecting the appropriate imaging procedure. Because there is a wide range of radiation exposures associated with different diagnostic procedures, a relative radiation level (RRL) indication has been included for each imaging examination. The RRLs are

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based on effective dose, which is a radiation dose quantity that is used to estimate population total radiation risk associated with an imaging procedure. Additional information regarding radiation dose assessment for imaging examinations can be found in the ACR Appropriateness Criteria® [Radiation Dose Assessment Introduction](#) document.

Relative Radiation Level Designations	
Relative Radiation Level	Effective Dose Estimate Range
None	0
Minimal	< 0.1 mSv
Low	0.1-1 mSv
Medium	1-10 mSv
High	10-100 mSv

## References

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