



<https://doi.org/10.1016/j.jemermed.2018.06.001>

## **Clinical Reviews**

### **THE SIGNIFICANCE OF INCIDENTAL FINDINGS ON COMPUTED TOMOGRAPHY OF THE CHEST**

Anna L. Waterbrook, MD, Marie A. Manning, MSIV, and James E. Dalen, MD, MPH

The University of Arizona College of Medicine, Tucson, Arizona

Corresponding Address: Anna L. Waterbrook, MD, Department of Emergency Medicine, The University of Arizona, P.O. Box 245057, Tucson, AZ 85724-5057

**□ Abstract—Background:** Computed tomography (CT) of the chest has replaced lung scans and pulmonary angiography as the criterion standard for the diagnosis of pulmonary embolism (PE). Most of these examinations are negative for PE, but they frequently have incidental findings that may require further evaluation. **Objective:** In order to examine common incidental findings and their possible clinical ramifications and required workup, we reviewed data from relevant studies in which chest CTs were performed and incidental findings discovered. **Discussion:** The most common incidental findings on chest CT are pulmonary nodules and lymph nodes. Nodules are significantly more commonly found in smokers and are also more likely to be malignant in smokers. The recently updated 2017 Fleischner Society recommendations provide guidance to clinicians in deciding which nodules should be further evaluated. Enlarged lymph nodes similarly represent potential malignancy and most will need further evaluation with positron emission tomography scans or by transbronchial needle aspiration. **Conclusions:** Enlarged lymph nodes and pulmonary nodules are both common incidental findings on chest CT. Each represents the potential for malignancy, and under certain conditions requires additional workup and further evaluation. The majority will be benign, even in high-risk populations. However, because of the increasing prevalence of the chest CT and the frequency with which incidental findings will be seen, it is important that the emergency physician be aware of common features and recommended

subsequent evaluation. © 2018 Elsevier Inc. All rights reserved.

**□ Keywords—Chest CT; Fleischner Society recommendations; Incidental findings; Lymph nodes; Pulmonary nodules**

#### **INTRODUCTION**

Computed tomography (CT) of the chest has replaced lung scans and pulmonary angiography as the criterion standard for the diagnosis of pulmonary embolism (PE). CT is much faster to perform, has higher sensitivity and higher specificity than pulmonary angiograms or lung scans, and is being used with increasing frequency (1,2). The majority of chest CTs are performed to diagnose or exclude PE, and while most of these examinations are negative for PE, they frequently have incidental findings that may require further evaluation (3–5).

Stein et al. compared the findings by chest CT with chest radiography (CXR) performed within 24 h of CT in 332 patients in whom the CT was negative for PE (4) (Table 1). The 2 incidental findings found on CT but not CXR that might require further evaluation or follow-up were pulmonary nodules (seen in 9.3%) and lymph nodes (seen in 7.8%) (3). Hall et al. also reported the prevalence of incidental CT findings in patients suspected of PE (5). Of 589 patients, 141 (24%) had a new incidental finding that might require additional

Reprints are not available from the authors.

RECEIVED: 28 April 2018;  
 ACCEPTED: 5 June 2018

**Table 1. Abnormalities Present on Computed Tomography but Not Chest Radiography\***

Abnormality	%
Atelectasis	16.6
Nodule	9.3
Emphysema	8.4
Pleural effusion	7.8
Lymph node	7.8
Scarring	7.0

\* Data from Stein et al. (4).

evaluation. The most common findings requiring additional evaluation were pulmonary nodules in 73 cases (13%) and lymph nodes in 51 cases (9%).

To examine common incidental findings and their possible clinical ramifications and required workup, we reviewed data from relevant studies in which chest CTs were performed and incidental findings discovered.

## DISCUSSION

### *Incidence of Pulmonary Nodules Discovered on CXR and Chest CT*

Calcified nodules are considered benign and do not require follow-up (6). Noncalcified pulmonary nodules are frequent incidental findings in patients who have CT to rule out PE. As noted in Table 2, the average incidence of nodules is about 10% (4–6). The incidence in smokers is much higher (20–70%) and varies with the smoking history and the patient's age (6,9). As shown in Table 2, the incidence of nodules is much higher by CT than by CXR (4,5,9). CT can identify nodules as small as 1 mm, whereas nodules <5 mm are rarely detected by CXR. In the series by Henschke et al., only 16% of 136 nodules  $\leq$  5 mm detected by CT were detected by CXR (9).

### *Size of Pulmonary Nodules Detected by Chest CT*

The majority of nodules detected by chest CT are <10 mm in diameter. Henschke et al. reported that of 584 nodules, 58% were less than 5 mm in diameter, and 89% were less

than 10 mm in diameter (9). Swensen et al. reported similar findings in 2832 nodules (8). Sixty-one percent were <4 mm, and 95% were <7 mm in diameter.

### *Incidence of Lung Cancer in Follow-up of Pulmonary Nodules*

The main concern for pulmonary nodules is that they may be early signs of non-small cell lung cancer.

Follow-up studies have reported that in patients with no history of cancer when the nodule is detected, the incidence of cancer is clearly related to the size of the nodule when first detected by CT (6,9). Henschke et al. reported the follow-up of nodules in 2897 smokers (9). The incidence of cancer at follow-up was 0 in 238 patients with nodules <5 mm. With nodules 5–9 mm, the incidence of cancer was 6%. The incidence in 616 patients with nodules <10 mm was 2%. Benjamin et al. reported that the incidence of cancer in a 2-year follow-up of patients without known cancer whose nodule was <10 mm was approximately 1% (6).

### *Which Pulmonary Nodules Need Additional Evaluation?*

The majority of pulmonary nodules are small and not evident on CXR. Fortunately, nearly all small (<10 mm diameter) nodules are benign at follow-up (6,9). The Fleischner Society published updated guidelines for the management of pulmonary nodules detected on CT scans in 2017 (7). Their recommendations are shown in Table 3.

The Fleischner Society also includes recommendations for patients with “subsolid” nodules (7). These nodules are recognized by their ground glass or part solid appearance. Their recommendations are the same for smokers and non-smokers. For single subsolid nodules <6 mm, no follow-up is recommended. For single ground glass subsolid nodules >6 mm, CT at 6–12 months and then every 2 years until 5 years is recommended. For single part solid nodules, CT at 3–6 months and then annually for 5 years is recommended (9). For multiple subsolid nodules, CT at 3–6 months is recommended regardless of size, with subsequent management dependent on findings at that time

**Table 2. Incidence of Noncalcified Pulmonary Nodules**

Author	No. of Patients	Patients	CT (%)	CXR (%)
Stein et al. (4)	322	PE negative	9	1.5
Hall et al. (5)	589	CT for PE	13	9
Benjamin et al. (6)	3446	Nodules <10 mm	9.7	—
MacMahon et al. (7)	—	Smokers >50 years of age	51	—
Swensen et al. (8)	1049	Smokers >50 years of age	69	—
Henschke et al. (9)	1000	Smokers >60 years of age	23	7

CT = computed tomography of the chest; CXR = chest radiography; PE = pulmonary embolism.

Download English Version:

<https://daneshyari.com/en/article/11022287>

Download Persian Version:

<https://daneshyari.com/article/11022287>

[Daneshyari.com](https://daneshyari.com)