

**Hong Kong College of Radiologists**  
**Position Statement on**  
**Role of Radiological Investigations and Radiologists**  
**In the Management of Patients with Clinically Suspected Lung Cancer**

In response to the possible concern of medical professionals and the public on the role of radiological investigations, in particular chest radiographs, in the management of patients with suspected lung cancer, the Council of Hong Kong College of Radiologists issued this Position Statement after full deliberation to elucidate the limitations of radiological imaging, appropriateness of referral to different imaging options and the role of radiologists in the care pathway of patient with suspected lung cancer.

### **Introduction**

Lung cancer is one of the leading causes of cancer death in Hong Kong. Patients with lung cancer may present with various symptoms such as cough, hemoptysis, chest pain, hoarseness, dyspnea, weight loss or they may even be asymptomatic. The diagnosis of lung cancer requires combination of information from clinical history, physical examination, radiological investigations and pathological investigations such as sputum cytology and tissue biopsies.

### **Role of Radiological Investigations**

Radiology is one of the many facets in the management of patients with clinically suspected lung cancer. The roles of radiological investigations include detection of lesions, characterization of lesions, providing guidance for the site and method of pathological confirmation, assessing the extent of disease and monitoring of disease progress.

In the detection and diagnosis of lung cancer, chest radiograph (CXR) is often the first line radiological investigation. Comparison with old CXR is helpful when it is available. Computed Tomography (CT) scan is often used for characterization of lesions detected on CXR, for further investigation when CXR is negative despite high clinical suspicion of lung cancer, for evaluation of suspicious lung lesions that are incidentally detected in other radiological investigations, and for staging of lung cancer. Low dose CT thorax is used for screening lung cancers in asymptomatic high risk patients in some countries (1,2).

There are on-going researches on issues such as how to best select screening participants, how to reduce the number of false positives, and how to minimize the radiation dose in the use of low dose CT scan as a screening tool. On the other hand, large scale study on the role of low dose CT thorax as first line investigation in symptomatic patients with clinically suspected lung cancer is still not yet available. In usual circumstances, symptomatic patients with clinical suspicion of lung cancer would require standard dose CT scan for workup.

Various imaging techniques including CT and ultrasound are useful to guide biopsies in the workup of suspected lung cancer. In patients without conclusive diagnosis, the baseline radiological investigations will be useful as references for comparison in follow up imaging. PET-CT is useful in staging of lung cancer and it can also facilitate the detection of lung cancer in patients with metastasis from unknown primary.

After the diagnosis of lung cancer is confirmed, radiological investigations would play an important role in the monitoring of subsequent treatment response.

### **Limitation of Radiological Investigations**

Radiological investigations are essential components in the management of patients with clinically suspected lung cancer. Nevertheless, they are not without limitations.

There are often differential diagnoses for radiological findings. Tuberculosis, pneumonia due to various causes, benign masses such as hamartomas, metastasis from other malignancies etc. are common differential diagnoses of lung cancer. Lung cancer may also develop from a pre-existing lesion or arise in close proximity of a pre-existing lesion, which cause difficulty for the analysis of radiological investigations. Therefore, clinical information must be taken into account during the interpretation of radiological findings and further investigations including tissue biopsies are usually needed to confirm the diagnosis of lung cancers.

Like all other investigation methods in medicine, every radiological investigation has limited sensitivity and specificity, which vary between different studies. In one of the recent large scale studies, the sensitivity and specificity of CXR in detection of lung cancer are reported as 73.5% and 91.3% (3) respectively. The interpretation of CXR can be limited by overlapping of structures, such as, hilar vessels, cardiac shadow, diaphragms and bones. In the same study, the sensitivity and specificity of CT scan in detection of lung cancer are reported as 93.8% and 73.4% (3) respectively. Despite imperfect

sensitivity and specificity, CXR remains a very valuable first line investigation in patients with clinically suspected lung cancer because of its wide availability, low radiation dose and relatively low cost.

Considering its limitations, a negative CXR should not stop further investigations, such as follow up CXR, CT scan, sputum cytology and bronchoscopy etc. in patients with strong clinical suspicion of lung cancer. The need and choice of further investigations would depend on the clinical status of the patient and require the assembly of all the relevant information from clinical history, physical examination, radiological investigations and pathological investigations, including recommendations from radiologists. The referring clinician and clinical team should assimilate all these essential information to discuss with patient for management plan.

### **Role of Radiologists**

Like all medical doctors, radiologists owe a duty of care to their patients and to those working with them. It is the responsibility of radiologists to protect patients from unnecessary radiation. The choice of the appropriate modality for radiological investigation should be balanced against the benefits and risks to the patient. The actual radiation dose to individual patient caused by various radiological investigations may vary substantially according to patient factors and technical factors. As reference, radiation dose to adults from common imaging examination can be found in below links: <https://www.acr.org/~media/ACR/Documents/PDF/QualitySafety/Radiation-Safety/Dose-Reference-Card.pdf> and <https://www.radiologyinfo.org/en/info.cfm?pg=safety-xray>

Radiologists should provide professional interpretation of the radiological investigations with the clinical history provided by the requesting clinician. Radiology reports are medical reports and should be properly signed. Relevant medical information should be communicated in time to the relevant parties for medical care of patients and recommendations on further management should be documented where appropriate.

### **Conclusion**

Radiological investigations play an important role in the management of patients with clinically suspected lung cancer. There are limitations in all radiological investigations. Understanding that the sensitivity and specificity of all radiological investigation are not

100%, the clinical information pertinent to individual patient should be considered during the interpretation of radiology reports. Radiologists have the responsibility to protect patients from unnecessary radiation and advise on the appropriate radiological investigation for patients. Radiologists should provide professional interpretation of the radiological investigations with the clinical history provided by the requesting clinician. Relevant radiological information should be communicated in time to the related parties for patient care and recommendations on further management should be documented where appropriate. The clinician and clinical team should take all relevant information into account and a negative CXR alone should not stop a patient with high clinical suspicion of lung cancer from further investigations.

## **References**

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