Greater Manchester &
Cheshire Cancer Network

# GUIDELINES FOR CANCER IMAGING
# Lung Cancer

## Greater Manchester and Cheshire Cancer Network
## Cancer Imaging Cross-Cutting Group

**April 2010**



**Approved by Lung CSG:** 17/04/12
**Date for review:** June 2013 as part of the Peer Review Programme

## INTRODUCTION

This document is intended as a ready reference for use within radiology departments in the Greater Manchester and Cheshire Cancer Network (GMCCN) to facilitate and standardise high quality cancer imaging and reporting. It includes the protocols for imaging of most of the common cancers as agreed by the Cancer Imaging Cross-Cutting Subgroup and the radiology representatives on the relevant Clinical Sub-Groups. In addition it includes some useful advice about reporting the staging examinations and a summary of the TNM (or FIGO) staging for each cancer site.

It should be read in conjunction with the Royal College of Radiologists booklet *Recommendations for Cross-Sectional Imaging in Cancer Management* which gives useful additional information.

## CONTRIBUTORS

Ian Brett
Hugh Burnett
Maryna Brochwicz-Lewinski
Bernadette Carrington
Sharad Desai
Jane Hawnaur
Chris Keeling-Roberts
Mahesh Kumar
Stephen Lee
Anthony Maxwell (editor)
Sunil Mehta
Elspeth Partridge
Richard Sawyer
Sathi Sukumar
Ben Taylor
Paul Taylor
Salman Zaman



**Approved by Lung CSG:** 17/04/12
**Date for review:** June 2013 as part of the Peer Review Programme

## SOME BASIC PRINCIPLES

State all sites of tumour.

Measure marker lesions at two or three sites:

Bi-dimensional measurements: (a) maximum long axis
(b) largest diameter perpendicular to the long axis

State section number/slice level at which measurements have been made.

Measure lung lesions on lung windows; all other lesions on soft tissue windows.

State all relevant normal findings, e.g. normal liver/lungs/bone/unobstructed kidneys.

Mention any equivocal lesions.

Lymph nodes – see next page.

If appropriate, give TNM (or FIGO) stage as part of conclusion. **This should be the norm for initial staging examinations.**



**Approved by Lung CSG:** 17/04/12
**Date for review:** June 2013 as part of the Peer Review Programme

## LYMPH NODE REPORTING

### Lymph node size (in mm) at various anatomic sites: upper limits of normal for short axis diameter

| | | |
|---|---|---|
| Head and Neck | Facial | Not visible |
| | Cervical | 10 |
| | | (<10 with necrosis) |
| Axilla | | 10 |
| Mediastinum | Subcarinal | 12 |
| | Paracardiac | 8 |
| | Retrocrural | 6 |
| | All other sites | 10 |
| Abdomen | Gastrohepatic ligament | 8 |
| | Porta hepatis | 8 |
| | Portacaval | 10 |
| | Coeliac axis to renal artery | 10 |
| | Renal artery to aortic bifurcation | 12 |
| Pelvis | Common iliac | 9 |
| | External iliac | 10 |
| | Internal iliac | 7 |
| | Obturator | 8 |
| Inguinal | | 10 |

### Notes

State short axis diameters for representative enlarged nodes.

Smaller nodes can contain metastases. Abnormal morphology, necrosis and MR.

Signal intensity similar to the primary may be helpful signs.

Report equivocal nodes and the full extent of nodal involvement.

No nodal disease is **N0**.

Regional nodal disease is **N1-3** (see definitions for individual tumour sites).



**Approved by Lung CSG:** 17/04/12
**Date for review:** June 2013 as part of the Peer Review Programme

Nodal disease beyond the regional lymph nodes is **M1**.



## LUNG CANCER

### DIAGNOSIS

A provisional diagnosis of lung cancer is usually made on the basis of chest radiograph findings. Where possible, CT scanning should be performed prior to bronchoscopy as the results may inform the procedure.

### STAGING

| | |
|---|---|
| **Modality:** | CT |
| **Body area:** | Thorax (including supraclavicular region) |
| | Abdomen (to include lower poles of kidneys) |
| **Oral contrast medium:** | Optional |
| **IV contrast medium:** | Yes – thorax during arterial phase |
| | liver in portal venous phase |

**Notes**

The field of view chosen for general image reconstruction should maximise the size of the lung parenchyma whilst including most soft tissues of the thorax.

TNM staging is not generally used for known small cell lung cancer, which is classified as either ‘limited’ (to one hemithorax) or ‘extensive’ (extends beyond the hemithorax). Patients with pleural disease are considered to have extensive disease.



**Approved by Lung CSG:** 17/04/12
**Date for review:** June 2013 as part of the Peer Review Programme

**REPORTING OF STAGING CT** (non-small cell lung cancer only)
**7th TMN classification**
**Primary tumour**

Site: state left or right; lung / lobe / hilum

| | | |
|---|---|---|
| Tumour surrounded by lung or visceral pleura & | ≤2cm | **T1a** |
| | >2cm and ≤ 3cm | **T1b** |

Any of: involves main bronchus ≥2cm from carina; invades visceral pleura, atelectasis to hilum but not entire lung.
Size >3cm but ≤ 5cm (or tumour with any other T2 descriptors but ≤5cm) **T2a**
Size >5cm but ≤7cm **T2b**

Any of: invades chest wall, diaphragm, mediastinal pleura or pericardium; involves main bronchus <2cm from carina not carina itself; obstructive pneumonitis of entire lung. Additional nodule/s in same lobe as primary tumour.
Size > 7cm. **T3**

Any of: invades mediastinum, heart, great vessels, trachea, oesophagus, vertebral body, carina; separate tumour nodule(s) in another ipsilateral lobe. **T4**

**Nodal status**
*Regional nodes:* intrathoracic; scalene; supraclavicular

Metastasis in ipsilateral peribronchial, hilar or intrapulmonary (inc. direct extension) **N1**



**Approved by Lung CSG:** 17/04/12
**Date for review:** June 2013 as part of the Peer Review Programme

Metastasis in ipsilateral mediastinal or subcarinal **N2**

Metastasis in contralateral mediastinal, contralateral hilar, ipsilateral or contralateral scalene or supraclavicular **N3**

**Metastases**

Separate tumour nodule/s in the contralateral lung.Tunour with pleural nodules or malignant pleural (or pericardial) effusion **M1a**

Distant metastases: state specifically: non-regional nodes, lung, liver, adrenals,
kidneys, bone, other. **M1b**

**Other significant findings**

Including emphysema, pulmonary fibrosis, cardiovascular disease etc.

**State:** level of certainty of lung cancer diagnosis - may need to add proviso about histological confirmation being required final TNM stage
whether appropriate to perform percutaneous or bronchoscopic biopsy

**OTHER INVESTIGATIONS**

PET is indicated preoperatively in non-small cell lung cancer to detect occult metastases in patients otherwise considered suitable for radical surgery or radical radiotherapy. It is also useful for the assessment of the solitary pulmonary nodule but only when biopsy is not safe or practicable.

MR scanning is not recommended for the routine assessment of lung cancer but is of value in superior sulcus tumours and may define the relationship of the tumour to great vessels and the brachial plexus.

## FOLLOW-UP

Routine follow-up after surgery is with chest radiography.

Repeat CT may be required for monitoring of disease response to chemotherapy.

## IMAGING OF RECURRENCE

CT is generally indicated when recurrence is suspected from symptoms, signs or other radiological investigations. This may include assessment of suitability for further resection or radical radiotherapy.



**Approved by Lung CSG:** 17/04/12
**Date for review:** June 2013 as part of the Peer Review Programme

**Approved by Lung CSG:** 17/04/12
**Date for review:** June 2013 as part of the Peer Review Programme