
LCA Lung Cancer Clinical Guidelines

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Introduction

Lung cancer is the most common cause of death from cancer for males and the second most common cause of death for females (after breast cancer). The annual incidence of lung cancer in South East England is 54.5 per 100,000 among men and 27.8 per 100,000 among women (average standardised incidence rates, 1999–2003, Thames Cancer Registry). Mortality rates are almost as high, at 47.9 per 100,000 for men and 23.4 per 100,000 for women (average standardised mortality rates, 1999–2003, Thames Cancer Registry).

Survival from lung cancer is poor, with less than 10% of patients surviving more than 5 years. The best chance of cure is with early diagnosis and surgery, but as it is so strongly related to smoking, no guidelines can be written without considering prevention and ensuring that all clinicians take the opportunity to give advice on smoking cessation, particularly to patients referred and reassured through the 2 week wait pathway.

The National Lung Cancer Audit has been in place since 2006, and now that most Trusts are reliably entering data, it allows for an earlier comparison of surrogates for survival through data on the proportion of patients receiving potentially curative or active treatment. It is therefore salutary to note that, in 2011, of patients with stages I and II non-small cell lung cancer, the percentage treated surgically varied between 21% and 62% depending on the Trust of diagnosis, for Trusts seeing at least 20 patients in this group.

If the London Cancer Alliance (LCA) were to be able to increase the percentage of these patients treated surgically to that of the best-performing Trust in this audit, then an additional 11% of patients in this group would receive surgical treatment. For small cell lung cancer, there is a similar variation: the proportion of patients treated with chemotherapy according to Trust at presentation varies between 50% and 76%, for Trusts diagnosing at least 20 such patients per annum. While there may be many reasons for these differences, the LCA needs to be assured that all patients are being diagnosed and staged in an agreed timeframe and managed to the same standards – hence the need to have LCA-agreed guidelines for the treatment of lung cancer.

Prior to the establishment of the LCA, the needs of lung cancer patients were managed and supervised by three cancer networks – north west, south west and south east London. The LCA Lung Cancer Clinical Guidelines have combined the best aspects of the guidelines of the three networks, and have been updated to reflect changes and developments in practice.

The LCA guidelines are designed to be used by all healthcare professionals in Trusts within the LCA who are involved in the care of the lung cancer patient. They have been developed to take into account the wide range of clinical experience of the user and the different clinical settings in which they work. The guidelines are intended to assist in the initial assessment, investigation and management of patients. Adoption of the LCA guidelines will allow widespread implementation of up-to-date and evidence-based management of lung cancer patients, and will assist in the provision of a consistently high standard of care across the LCA.

All Trusts are expected to be able to provide the standard of care detailed in these guidelines. These guidelines will be reviewed on an annual basis in line with guidance from the National Institute for Health and Care Excellence, the British Thoracic Society, and other national and international guidance, as well as significant new research publications, to ensure that they continue to reflect best practice.

Please note that this set of guidelines is limited to small cell, non-small cell lung cancer, and carcinoid. Separate clinical guidelines will be developed for mesothelioma and thymoma.

Please also note that treatment for patients from the age of 16 to their 25th birthday should be in line with national guidance regarding the management of teenagers and young adults with cancer. Patients from the age of 16 to the end of their 18th year should be treated in a principal treatment centre (see Appendix 10 for contact details of principal treatment centres). Teenagers and young adults from the age of 19 to their 25th birthday will follow the adult pathway but should be offered choice of treatment in a teenage and young adult (TYA) designated hospital or at the principal treatment centre. Teenagers and young adults in this age group should be treated either in the principal treatment centre or a designated hospital.

I hope these guidelines are helpful. Many specialists both within the LCA Lung Pathway Group and the stakeholder group have contributed. All members of the stakeholder group have had the opportunity to review the guidelines, and their comments have been taken into consideration. I would like to thank them for their contributions.

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Executive Summary

More than 80% of lung cancer deaths are attributable to smoking, and as many of the patients who are seen through the two week wait (2ww) clinics may fortunately not turn out to have cancer, the guidelines would not be complete if they did not deal with the issue of smoking cessation and interventions that could be successful in these patients, which are covered in Chapter 1.

Chapter 2, on early diagnosis, sets challenging improvements in availability of reports by radiologists of all chest X-rays of patients attending emergency departments. This is not current practice in all district general hospitals at the present time. It supports the NICE recommendation of CT scanning for patients referred through the 2 week wait pathway prior to the first clinic appointment, to try to improve the time to diagnosis and treatment.

Early availability of the CT scan enables more accurate radiological diagnosis to be made at the first visit and influences the choice of biopsy site, supporting the implementation of latest NICE guidance which recommends that biopsies should be taken from sites of metastases where this is safer and will provide additional staging information. The role of endo-bronchial ultrasound and biopsy of mediastinal nodes for staging of the disease is discussed in Chapter 3 on referral and diagnosis, and choice of radiological test and biopsy technique are covered in Chapter 4.

The LCA supports the use of the minimum dataset recommendation of the Royal College of Pathologists for all specimens taken to establish or confirm the diagnosis of lung cancer, while the need for judicious use of sampled tissue to ensure that enough remains for molecular testing for gene mutations which influence subsequent choice of treatment is stressed in Chapter 5.

The membership and function of the multidisciplinary team (MDT) which makes decisions on diagnosis, stage and treatment of patients with lung cancer is discussed in Chapter 6. It is essential to have a fully represented team participating in decision making to ensure that state-of-the-art treatment is offered to patients with the best chance of an improved outcome. Furthermore, a fully functioning team is required to meet peer review standards, and this is supported by the LCA.

The need for data collection to measure outcomes is stressed in Chapter 7, and the collection thereof, in particular the clinical data, remains the responsibility of the members of the multidisciplinary team, with support from a data manager.

A summary of key information and guidance for staff dealing with patients and giving diagnoses of cancer is provided in Chapter 8.

In Chapter 9, guidance is given for ways of achieving good communication with patients and professionals in primary care and the community.

The Model of Care made three recommendations for lung cancer: that there should be a thoracic surgeon providing input to all lung cancer MDT patient management decisions, that thoracic surgical centres should serve a population in excess of 2 million, and that these centres should perform a minimum of 60 resections a year including diagnostic and therapeutic lung cancer surgery. These guidelines ensure that the first of these is met by all MDTs. The LCA lung pathway group undertook an extensive review and confirmed that the other two standards are met by all centres as these serve large populations extending beyond the LCA, and as a result exceed the minimum surgical volumes.

Please note that the Model of Care recommended that the number of surgical centres should be reduced to ensure that all centres met these standards. Based on the review it was agreed with the LCA Clinical Board, Members' Board and NHS commissioners that there was no evidence for a reduction. In Chapter 10, recommendations are made regarding requirements of a high-quality surgical service and how these standards can be measured.

Many patients with early lung cancer will not be fit for curative surgery owing to co-morbidities and recommendations are made for the use of stereotactic ablative radiotherapy (SABR) which utilises newly developed imaging and planning techniques to more precisely target treatment with highly ablative doses whilst minimising tissue toxicity. This technique is described in some detail in Chapter 11. For more advanced, but potentially curable disease other radical treatments are described in Chapter 12 using concomitant or sequential chemo-radiotherapy or radiotherapy alone, and recommendations are made for follow-up of this group.

Chapter 13 explains that chemotherapy for metastatic non-small cell lung cancer is recommended in accordance with NICE guidance and therapies recommended by the Cancer Drugs Fund. Palliative radiotherapy is recommended in some situations for symptom control.

The management of small cell lung cancer, Chapter 14, is largely unchanged, though there are recommendations for oral topotecan second line.

Chemotherapy regimes are listed in the appendices.

In Chapters 16 and 17, the guidelines cover the role of the lung cancer specialist nurse in supporting the patient and helping to provide a holistic needs assessment (HNA) at various stages of diagnosis and treatment. The role of the nurse in providing information for patients and carers so that they can cope with the illness, and then deal with the consequences and long term side effects of the treatment as survivors is also discussed.

As the majority of patients with lung cancer present with their disease in an advanced stage, palliative treatment of these patients is important to improve their quality of life, and in Chapter 17 this is considered in some detail, particularly in relation to some advances in specific therapies.

Some of the recommendations in these guidelines will be challenging to implement, but as the role of the LCA is to ensure that world class quality of care is delivered for its patients with cancer, it is anticipated that provider organisations within the LCA will use these guidelines as a tool to support change improvement. During the coming months the clinicians will develop standards and measures against which organisations can be assessed.

1 Prevention

More than 80% of deaths from lung cancer are attributable to smoking. Measures to prevent people from taking up smoking, or helping them to quit, will reduce the number of deaths from lung cancer. In addition, patients with lung cancer undergoing curative treatment who stop smoking pre-treatment reduce the risk of complications from surgery.

1.1 Background information

Adult smoking prevalence is 21% and varies significantly by gender and socio-economic group. Rates are higher in males than females and in more socio-economic deprived groups. People in routine and manual occupations are about twice as likely to smoke as those in managerial or professional occupations (29% compared with 14%) (NHS Information Centre 2010).

Incidence rates of lung cancer closely reflect past smoking prevalence with a time lag of approximately 20 to 30 years. Smoking prevalence has decreased over the past 50 years and this accounts for the decrease in the rates of lung cancer.

Individuals who use NHS Stop Smoking Services have higher quit rates at one year than those receiving no intervention (Bauld et al. 2009; Ferguson et al. 2005). In addition, evidence suggests that brief interventions by healthcare professionals can increase the uptake of smoking cessation (NICE 2006).

The provision of effective smoking cessation services in an acute Trust setting remains highly variable despite evidence that delivering smoking cessation interventions to inpatients in hospital is effective (Rigotti et al. 2008). This is clearly a missed opportunity to deliver stop smoking interventions at a point at which an individual may be more susceptible to health advice and hence more motivated to quit.

The Department of Health (DH) has published a number of guidance documents on the development of smoking cessation services in an acute setting. The key document for acute Trusts is *Stop Smoking Interventions in Secondary Care*. In addition, DH has commissioned NCSCT (National Centre for Smoking Cessation and Training) to support and develop Stop Smoking Services across all healthcare settings.

Work undertaken by NCSCT demonstrates that the majority of inpatients who smoke are not receiving interventions to support them to stop smoking during their hospital stay. The main barriers to successful implementation tend to be administrative elements such as data collection. Lack of support from the Trust was also commonly cited as a barrier to implementing interventions.

1.2 Smoking cessation services

Provision of effective smoking cessation programmes is necessary to reduce the prevalence of smoking.

Smoking cessation interventions must be targeted to reach different population groups and provided across a range of settings. In particular, there has been an increased focus on the need to establish effective smoking cessation services in secondary care (Fiore et al. 2012).

In 2009, DH published *Stop Smoking Interventions in Secondary Care* in an attempt to address the gap in service provision of smoking cessation in the acute setting.

Published evidence suggests that the necessary components for effective smoking cessation in secondary care are:

- a systematic process to identify and record patients who smoke
- staff trained to deliver 'very brief advice'
- prescription of nicotine replacement products – a range of these products must be available in the hospital formulary
- a referral system to local smoking cessation services – best practice is an electronic referral system.

The supporting processes identified to implement a successful smoking cessation programme for inpatients are:

- engaging with key stakeholders in the Trust
- training of staff in brief interventions – the NCSCT provides a free online training module
- developing patient information leaflets
- standardising the process for the identification of smokers
- setting up a referral process
- ensuring that a range of nicotine replacement therapies are available in the hospital formulary
- developing appropriate documentation to support the process
- developing a letter for the patient's GP.

1.3 Implementation of smoking cessation guidance

The implementation of this guidance for clinicians treating patients with lung cancer at the earliest opportunity should improve outcomes (Moller et al. 2002). It is advisable for patients undergoing surgery to have ceased smoking for a month before the operation rather than immediately beforehand, though it is not recommended that surgery is delayed because patients continue to smoke. There are suggestions that other treatments for lung cancer are more effective if patients are no longer smoking, and for patients who have undergone radical treatment it may reduce the risk of a second tumour.

2 Early Diagnosis

2.1 Standards to improve early diagnosis for lung cancer

- GPs should have access to chest X-rays (CXRs) for their patients and receive a report within 5 working days. When sending symptomatic patients for CXR, GPs should stress the importance of attending without delay so that the time to diagnosis for positive cases is kept to the minimum.
- Reports of abnormal CXRs suggestive of lung cancer should also be forwarded to the multidisciplinary team (MDT) to ensure that these patients receive appointments within 2 weeks.
- **All CXRs suspicious of malignancy should be reported by a radiologist, with clear recommendations to the requester for cross-sectional imaging where it is clinically indicated.** Abnormal results suggestive of lung cancer should be forwarded to the GP and an agreed member of the MDT ideally within 24 hours to ensure that the patient receives an appointment.
- High-risk patients having surgery will often have a pre-operative film as part of the assessment. Ideally, such films should also be reported by a radiologist and, if abnormal and suggestive of cancer, forwarded to the GP within 24 hours.
- Radiologists reporting CXRs which are suggestive of lung cancer and which should be followed up by computerised tomography (CT) should be reported as such.
- Patients referred to the 2 week wait (2ww) clinic for lung cancer should have blood tests – full blood count (FBC), urea, electrolytes and creatinine (UEC), liver function tests (LFTs) including gamma-GT and calcium requested by the GP at the same time as the referral.
- CT should be requested by the MDT and carried out so that the result is available for the first appointment.
- Decision on the best route for diagnosis should be made at the clinic and confirmed by MDT members at the diagnostic multidisciplinary meeting (MDM), usually the radiology meeting.
- The cancer MDM should be confined to discussion of cases that have undergone investigation and have the diagnosis and staging confirmed at the meeting.
- Clinicians meeting patients at any stage in this pathway should use the opportunity to discuss smoking cessation.
- GPs should include adequate clinical information, especially smoking history, to enable radiologists to make a satisfactory report on cancer risk.
- Patients with symptoms such as persistent chest infections, coughs, breathlessness and chest or shoulder pain are likely to attempt to self-medicate in the first instance, often via the pharmacy. Pharmacists are also therefore in an ideal position to identify symptoms in at-risk individuals and advise them to visit their GP, contributing to the early detection of lung cancer.

3 Referral and Diagnosis

Treatment for patients from the age of 16 to their 25th birthday should be in line with national guidance regarding the management of teenagers and young adults with cancer. Patients from the age of 16 to the end of their 18th year should be treated in a principal treatment centre (see Appendix 10 for contact details of principal treatment centres). Teenagers and young adults from the age of 19 to their 25th birthday will follow the adult pathway but should be offered choice of treatment in a teenage and young adult (TYA) designated hospital or at the principal treatment centre. Teenagers and young adults in this age group should be treated either in the principal treatment centre or a designated hospital.

3.1 Referral for suspected lung cancer

All patients with a likely diagnosis of lung cancer should be referred to a member of a lung cancer MDT (usually a chest physician) within one week, preferably with a recent CXR (NICE 2005/CG27).

Urgent requests for a CXR should be made when a patient presents with:

- haemoptysis (occurring on more than one occasion and of recent onset, or with clots), OR with persistent or worsening signs and symptoms including:
 - dyspnoea
 - cough
 - weight loss
 - chest/shoulder/arm pain (non-cardiac and unexplained)
 - chest signs
 - hoarseness
 - finger clubbing
 - lymphadenopathy.

Others symptoms/conditions for which a request for CXR should be considered include:

- new diagnosis or being followed up with chronic obstructive pulmonary disease (COPD) with changing symptoms
- symptoms of lower respiratory infection requiring a second course of antibiotics
- non-specific symptoms in a patient who has not previously visited their GP but has now attended on at least two occasions.

All reports of CXRs with abnormalities suggestive of possible lung cancer should be faxed to the GP and directly to the chest physician (a member of the MDT) within 1 week of the CXR being performed, and the patient is seen within 2 weeks in line with NICE guidelines *The diagnosis and treatment of lung cancer* (NICE 2011/CG121) and *Lung cancer: diagnosis and treatment* (NICE 2005/CG24).

Direct referrals from radiology are seen according to each unit's agreed operational policy. The GP is informed that a direct referral has been made and is asked to forward other important information as necessary. The patient is contacted initially by phone and then by letter if telephone contact cannot be made, with an explanation of why they need to be seen urgently.

GPs need to be aware that CXRs on patients attending A&E departments and acute medical units are not always reported by radiologists, but rely on interpretation by the assessing doctor. There is evidence that in

a small number of cases where there have been errors in interpretation, GPs and the patient have been given a false sense of security and this has led to a delayed diagnosis of lung cancer. If symptoms persist, GPs should request a repeat CXR with a radiologist's report.

3.1.1 LCA urgent suspected cancer referral form

Urgent suspected cancer referrals should currently be made using the former cancer network referral forms. These can be located on the LCA website using the following link:

www.londoncanceralliance.nhs.uk/information-for-healthcare-professionals/forms,-protocols-and-guidance/

Copies of the network forms can also be found in Appendix 1.

The LCA Lung Pathway Group would like to introduce an LCA-wide referral form developed to improve the quality of referral from primary care and to support earlier diagnosis. This document can be found in Appendix 1.

This is not yet operational due to issues relating to primary care information systems; however, the implementation of this is a priority for the LCA in 2013/14.

3.1.2 Guidelines for urgent referral

Any of the following should lead to urgent referral:

- CXR suggestive/suspicious of lung cancer (including pleural effusion and slowly resolving consolidation)
- persistent haemoptysis of recent onset in smokers/ex-smokers over 40 years of age
- signs of superior vena cava obstruction (swelling of face/neck with fixed elevation of jugular venous pressure)
- stridor (consider emergency referral).

Best practice suggests that patients should be seen on first visit with their CT result. For this reason, knowledge of patients' estimated glomerular filtration rate (eGFR) and diabetes history is required to enable consultants to order these tests in advance.

3.1.3 Organisation of the 2 week wait service

The 2ww office or MDT coordinator should be informed of all abnormal X-rays that have been reported so that the follow-up is established.

Ideally, patients should be seen with CT chest and abdomen at their first clinic attendance, if their CXR shows an abnormality suggestive of cancer. All CXRs of patients with suspected lung cancer will need to be reviewed for this pathway to work within limited resources. Where locally agreed pathways exist to provide direct access CT for GPs, this should continue. The advice for proceeding to CT should then be given by a member of the MDT (radiologist or chest physician). Wherever possible, a contrast enhanced staging CT should be performed at this stage, and the request should be made for CT chest and abdomen. (Note that a request for CT chest will omit much of the abdominal organs where lung cancer commonly spreads, i.e. liver and adrenal glands.)

3.2 Assessment of patients with possible lung cancer for investigation

3.2.1 Presentation

The following factors are assessed and recorded at the first outpatient appointment in patients presenting with possible lung cancer.

History including:

- age
- previous/current occupation
- smoking history (number of pack years) and attempts to stop
- presenting symptoms of lung cancer
- weight loss
- co-morbidity
- social and family history
- past medical history
- industrial exposure
- drug and allergy history
- performance status (see ECOG/WHO Performance Status table below).

0 – Asymptomatic
1 – Symptomatic but completely ambulant
2 – Symptomatic, <50% in bed during the day
3 – Symptomatic, >50% in bed, but not bed bound
4 – Bed bound

Full examination, including:

- weight and height
- presenting signs of lung cancer
- cardiac assessment
- spirometry (FEV₁/FVC with predicted values).

Blood tests:

- urea, electrolytes and creatinine
- liver function with gamma-GT
- bone profile
- FBC and clotting screen.

The patient should also have an electrocardiogram (ECG) if there is a cardiac history.

3.3 Diagnostic investigations

Histological or in some instances cytological diagnosis should be established in all patients, unless specific circumstances suggest that this might not be possible. Investigations should be selected to offer the most diagnostic information with the least risk of harm. Where there is evidence of distant metastases, then biopsies should be taken from the metastatic site if this can be achieved more easily than from the primary site.

If patients have a previous diagnosis of cancer, this should influence where the biopsy is taken from to distinguish between primary and metastatic lung cancer.

Patients who are on oral anti-coagulants and new anti-platelet agents should be offered a risk assessment of the safety of discontinuing these drugs, and if necessary a second opinion should be obtained, prior to any biopsy. In general, the INR should be within a range that the biopsy can be performed safely, depending on the size and site of the biopsy. In some cases where anti-coagulants need to be continued, low molecular weight heparins can be substituted.

As yet there is no national guidance regarding management of oral anti-platelet agents for lung biopsies. Consideration should be given to stopping clopidogrel and/or aspirin 7 days prior to the procedure.

All patients should be given written information regarding diagnostic tests to enable them to give informed consent.

3.3.1 Diagnostic tests

Diagnostic tests may include the following:

- Bronchoscopy with pathology assessment of appropriate specimens (tissue, bronchial washings, and brushings).
- Transbronchial needle aspiration (TBNA) or endobronchial ultrasound (EBUS) guided needle aspiration (EBUS/TBNA) of enlarged mediastinal lymph nodes for diagnostic/staging purposes. Staging CT scan of chest and abdomen should be performed before bronchoscopy to maximise output from the investigation and to allow TBNA to be performed for staging as well as diagnostic purposes. EBUS/TBNA is indicated for biopsy of paratracheal and peribronchial intraparenchymal lung lesions and should be accessible to all MDTs for diagnosis.
- Endoscopic ultrasound (EUS) with or without node sampling may be indicated for diagnostic purposes and as a staging investigation.
- Percutaneous needle biopsy/fine needle aspiration (FNA)/core biopsy (CT, ultrasound or fluoroscopy guided) – a decision regarding the approach to obtain diagnostic material should be made by a diagnostic MDT with a radiologist and chest physician as a minimum membership. Lung function should be considered. Areas of emphysema should be noted, as needle passes through these areas

will increase the risk of pneumothorax and this should be discussed with the patient, as well as the management of this potential complication (pleural aspiration and drainage).

- Mediastinoscopy/mediastinotomy should be performed early if staging investigations suggest that this is the best method to obtain tissue diagnosis (e.g. mediastinal lymphadenopathy without a primary lesion accessible bronchoscopically or percutaneously).
- FNA of palpable lymph nodes or skin deposits.
- Ultrasound guided FNA of supraclavicular lymph nodes or lymph nodes.
- Pleural fluid aspiration and/or biopsy.
- Biopsy of distant metastases.
- Sputum cytology where the patient is unfit or unwilling to undergo invasive investigations.

3.4 Staging investigations

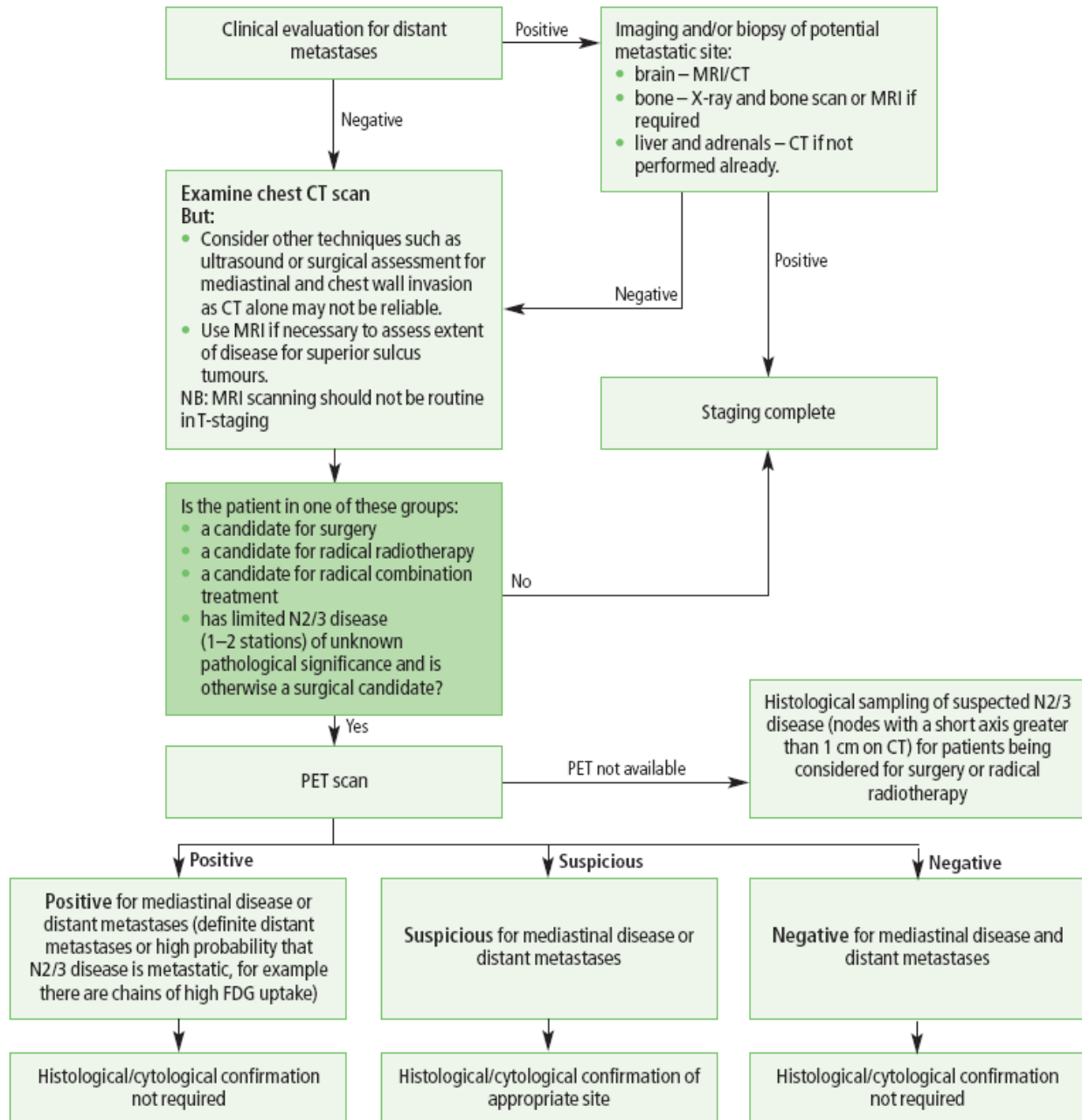
Choose investigations that give the most information about diagnosis and staging with least risk to the patient. Think carefully before performing a test that gives only diagnostic pathology when information on staging is also needed to guide treatment.

Staging investigations should include the following:

- a) Blood tests: FBC, U&E, creatinine, liver function including gamma-GT, bone profile. Further tests will depend on the result (e.g. plasma and urine osmolality in hyponatraemia).
- b) CT scan of the chest and abdomen (to include the liver and adrenals) with contrast enhancement.
- c) Pulmonary function tests – spirometry with reversibility, gas transfer and lung volumes (in patients who are candidates for surgery or other curative therapy, radical radiotherapy or radical chemo-radiotherapy).
- d) Positron emission tomography (PET)/CT scan should be performed in all patients who may be candidates for curative treatment with either surgery, radical radiotherapy or other curative therapy, including patients with limited (1–2 stations) N2/N3 disease on CT of uncertain pathological significance. PET/CT scan should also be considered in the evaluation of isolated pulmonary nodules, particularly when these are larger than 10mm.
- e) EBUS/EUS-FNA in PET/CT-positive mediastinal nodes by mediastinal sampling (except when there is definite distant metastatic disease or a high probability that N2/N3 disease is metastatic, for example, if there is a chain of lymph nodes with high ¹⁸F-deoxyglucose uptake). Consider histological sampling of mediastinum (mediastinoscopy/mediastinotomy) if EBUS/EUS results are negative and there is high clinical suspicion, when ultrasound guided FNA is not indicated and when a large tissue sample is indicated for diagnosis (e.g. for lymphoma).
- f) Pleural cytology and supraclavicular biopsy (ultrasound guided if nodes are not palpable).
- g) Magnetic resonance imaging (MRI) may play a role in the assessment of chest wall, vertebral, brachial plexus or great vessel involvement. Axial T1W, axial T2W should be used, while the use of contrast enhancement is optional. Coronal +/- sagittal T1W views should be taken for suspected brachial plexus involvement. STIR sequences may be helpful. MR angiography should be performed for vessel assessment if required.
- h) Investigation for metastatic disease should be dictated by clinical suspicion. A bone scan should be requested when symptoms or hypercalcaemia suggest the presence of bone metastases, or when alkaline phosphatase is raised, or for staging of small cell lung cancer. Do not perform a bone scan when PET/CT has excluded bone metastases.

- i) Imaging of the brain (MRI or CT pre- and post-contrast; routine technique) should be requested for staging of small cell carcinoma, radically treatable adenocarcinoma, or where there are symptoms or signs suggestive of brain metastases (see Figure 3.1).

Figure 3.1: Investigations to stage lung cancer



3.5 Staging of lung cancer

The TNM Classification of Malignant Tumours, 7th edition, is used to stage lung cancer. Radiological staging should be included in the report on a staging CT scan. Final staging (prior to mediastinal sampling) should be a combined decision made at the MDM.

Table 3.1: TNM classification

TNM classification	
T	<p>T = Extent of primary tumour</p> <p>Tis – Carcinoma in situ</p> <p>TX – Positive cytology</p> <p>T1a – The tumour is contained within the lung and is smaller than 2cm across</p> <p>T1b – The tumour is contained within the lung and is between 2cm and 3cm across</p> <p>T2a – >3cm but ≤5cm (or tumour with any other T2 descriptors – main bronchus, >2cm from carina, invades visceral pleura, partial atelectasis – but ≤5cm)</p> <p>T2b – >5cm but ≤7cm</p> <p>T3 – >7cm or growth into chest wall, diaphragm, pericardium, mediastinal pleura, main bronchus <2cm from carina, total atelectasis, phrenic nerve, more than 1 nodule in same lobe</p> <p>T4 – Growth into mediastinum, heart, great vessels, carina, oesophagus, vertebrae, trachea; nodules in more than 1 lobe of the same lung</p>
N	<p>N = Condition of regional nodes</p> <p>N0 – No regional lymph node metastasis</p> <p>N1 – Ipsilateral peribronchial, ipsilateral hilar</p> <p>N2 – Ipsilateral mediastinal, subcarinal</p> <p>N3 – Contralateral mediastinal or hilar, scalene or suprascapular</p>
M	<p>M = Metastases</p> <p>MX – Distant metastases cannot be assessed</p> <p>M0 – No distant metastases</p> <p>M1a – Separated tumour nodule/s in the contralateral lung: tumour with pleural nodules or malignant pleural effusion/pericardial effusion</p> <p>M1b – Distant metastases</p>

Table 3.2: Stage grouping

Stage grouping			
Occult ca	Tx	N0	M0
Stage 0	Tis	N0	M0
Stage IA	T1a, T1b	N0	M0
Stage IB	T2a	N0	M0
Stage IIA	T1a, T1b	N1	M0
	T2a	N1	M0
	T2b	N0	M0
Stage IIB	T2b	N1	M0
	T3	N0	M0
Stage IIIA	T1, T2	N2	M0
	T3	N1, N2	M0
	T4	N0, N1	M0
Stage IIIB	T4	N2	M0
	Any T	N3	M0
Stage IV	Any T	Any N	M1a, M1b

Patients with small cell lung cancer may also be staged as limited (LS, confined to the thorax) or extensive stage (ES).

CT or MRI of the brain, and bone scan should be performed in cases of limited disease fit for radical treatment.

Additional tests should not delay the start of treatment.

4 Radiology

4.1 Routine indications for imaging

Table 4.1: Routine indications for imaging

	Imaging modality	Indications and notes
Diagnosis	CXR	Haemoptysis, persistent cough for >3 weeks: chest/shoulder pain, dyspnoea, weight loss, chest signs, hoarseness, finger clubbing, features of metastases, cervical/supraclavicular lymphadenopathy Direct referral policy to the lung cancer MDT should be agreed locally
	CT chest and abdomen	Suspected or newly diagnosed lung cancer to evaluate treatment options
	Cerebral CT/MRI	Should be performed in patients with neurological signs or symptoms, or prior to curative/radical therapy as agreed by the MDT. Also patients with adenocarcinoma who are being considered for surgery or radical treatment
	CT or US guided biopsy EBUS/TBNA	As referred by members of the MDT. Ultrasound preferred for peripheral or pleural lesions CT should be performed prior to biopsy and discussed with radiology department
	Adrenal MRI	Referred by the MDT for assessment of equivocal adrenal masses or if indicated by prior CT report
	Chest MRI	Selected cases including superior sulcus tumours and to help differentiate tumour from adjacent normal tissue
	PET/CT	1. Solitary pulmonary nodule/pre-lung biopsy 2. Pre-thoracotomy assessment/curative treatment 3. Candidates for radical (non-surgical) therapy 4. Unknown primary, probably lung
	Bone scan/MRI	Symptoms of bone metastases, or neurological signs and symptoms suggestive of spinal cord or nerve root compression
Surveillance	Post-surgery	Please see Surgery (section 14.2.1)
	Post-radiotherapy +/- chemotherapy	Please Radiotherapy (section 14.3.2)
	Post-ablation	3-monthly CT/MRI with annual PET/CT for 2 years then 6-monthly (alternate CT/MRI and PET/CT) thereafter

4.1.1 Imaging techniques

Chest radiography is the usual initial point for imaging in an undiagnosed patient.

Staging CT scans should always be contrast-enhanced unless there is a contraindication to intravenous contrast, and should ideally be performed before bronchoscopy. A lung cancer staging CT should include the whole chest (ideally starting at the root of the neck to also assess for supraclavicular lymphadenopathy), liver, adrenals and kidneys.

In all candidates for curative or radical therapy, PET/CT should be performed prior to instigating therapy and if possible prior to tissue sampling to help guide biopsy. The minimum coverage should include from base of skull to mid-thigh.

In cases of diagnostic dilemma, MRI may also be used to refine diagnosis (e.g. in and out of phase imaging for adrenals and chest MRI to help differentiate tumour from normal tissue).

Brain imaging is advocated in patients with adenocarcinoma considered for radical therapy owing to the high incidence of metastases. This should ideally be with MRI, but where this is not achievable in a timely fashion pre- and post-contrast-enhanced CT may be used as a substitute.

4.1.2 CT or ultrasound guided percutaneous biopsy

This requires extra planning. The patient should be assessed by a clinician within the MDT and the procedure then needs to be discussed with a consultant radiologist to make sure it is technically feasible.

Percutaneous needle biopsy is indicated in the following groups of patients:

- Patients with undiagnosed pulmonary lesions not diagnosed by other approaches.
- In patients with a diagnosis of a mediastinal mass or lymph nodes, as an alternative to EBUS or transoesophageal guidance.

Guidance is usually by ultrasound for peripheral lesions abutting the pleura or CT.

It is usual to perform core biopsy of at least 20G. A co-axial technique may be used (especially if multiple samples are required). Larger gauge biopsy sampling should be weighed against the risk of complication. Ideally, each core biopsy specimen will be put in a separate pot for individual processing, ensuring that material remains for analysis.

Preparation for a percutaneous needle biopsy includes:

- clinical assessment by a member of the clinical team; the patient should be given an information leaflet about the procedure
- spirometry
- coagulation profile including platelet count
- informed consent
- intravenous (IV) access.

Arrangements should be made for a safe place to recover and monitor the patient post-biopsy. This may be within the department or using day case or ward facilities. Procedures should only be performed if adequate access to on-site emergency medical assistance is available (in case of need).

The radiologist performing the biopsy should explain the procedure to the patient again at the time of the biopsy.

Relative contraindications for a percutaneous needle biopsy:

- poor lung function
- previous occurrence of pneumothorax not well tolerated
- unable to give informed consent for biopsy
- uncooperative/unable to control respiration
- bleeding disorders that cannot be corrected are absolute contraindications
- pulmonary artery hypertension.

The biopsy findings should be discussed at the next MDM, although decisions and referrals may already have been planned, thus pre-empting the results.

5 Pathology Guidelines for the Reporting of Lung Cancer

The LCA follows the minimum dataset recommendations of the Royal College of Pathologists (RCPATH).

5.1 Biopsies for lung cancer

According to local policy, biopsies may or may not be fast tracked. Specimen request forms should therefore be indicated as urgent/fast track for priority processing based on local policy.

Full clinical details should be provided (in particular, history of previous malignancy), and if necessary further data should be obtained from the requesting clinician.

Specimens are processed as indicated in the RCPATH guidelines (Dataset for Lung Cancer Histology Reports www.rcpath.org/publications-media/publications/datasets/lung.htm).

5.2 Lung resection for tumours

These are handled and reported (macro and micro) according to the lung cancer Dataset for Lung Cancer Histology Reports published by RCPATH. (In particular, the macro description should include tumour site, distance from pleura/bronchial/peribronchial resection margin, relationship to lobar bronchi, appearance of overlying pleura and background lung.)

At the time of resection in theatres, samples should be placed in ample sized specimen pots with copious amounts of formalin to ensure adequate fixation. Facility for inflation fix via the airways is optimal.

Once fixed, specimens should be photographed, if possible.

A minimum of three blocks of tumour should be taken, including at least one that incorporates the nearest pleural margin. Elastic-Van Gieson (EVG) staining of blocks including visceral pleura should be undertaken to assess invasion. Any nodes attached to hilum and intraparenchymal lymph nodes should be sampled. Other blocks must include the bronchial and vascular resection margins, as well as the mediastinal margin where appropriate.

At least one, and ideally three, blocks from background lung should be taken, inclusive of sampling any suspected background pathology.

In cases that may be related to asbestos exposure, tissue from the non-tumorous lung is to be retained according to college guidelines.

5.3 Cytology specimens for lung cancer

Increasingly, patients may only have a positive cytological specimen. These should be processed and reported according to local standard operating procedures. Even in those with additional histological specimens, consideration should be given to cyto-spinning positive specimens and fixing cell pellets to retain malignant cells for further analysis, as future treatments may require additional investigations such as mutation status.

We support the recommendations of RCPATH and suggest that there should be no more than three pathologists reviewing cases at MDT meetings.

5.4 Referral of difficult cases

Where a second opinion is required, the relevant slides/blocks should be reviewed locally in the first instance and then sent to the local centre. If diagnosis remains uncertain, the case should be sent to the supra-regional centre.

5.5 Molecular analysis

Clinical teams should have access to molecular testing by an accredited laboratory for gene mutations relevant to patient management (e.g. epidermal growth factor receptor (EGFR)), with results being entered into the pathology record for the tested specimen. Pathologists should therefore handle samples sent for suspected lung cancer judiciously and endeavour to retain enough tissue for testing while making a diagnosis (e.g. multiple blocking of biopsies, avoiding repeated cutting from the block, selective immunochemistry rather than large panels).

6 MDT Membership and Function

The lung cancer MDT should include medical and nursing staff with specialised knowledge of lung cancer diagnosis and treatment, both curative and palliative.

A lead clinician, normally a respiratory physician, should take managerial responsibility for the service.

The team should meet weekly to discuss all patients with a working diagnosis of lung cancer.

The team should include the following:

- a respiratory physician with a special interest in lung cancer
- a radiologist with thoracic expertise
- a pathologist +/- a cytologist
- a lung cancer specialist nurse
- an oncologist, preferably with a specialist interest in lung cancer: either a clinical oncologist or a medical oncologist working closely with a clinical oncologist from the centre to which patients are referred
- a palliative care specialist +/- a palliative care nurse specialist
- a thoracic surgeon.

The diagnosis is usually made with a histological and cytological diagnosis, and staged using CT of the chest and abdomen as a minimum. In cases where the patient is not considered fit to receive any form of radical treatment or palliative chemotherapy for advanced disease, the team may not consider it appropriate to seek more than a clinical diagnosis. This should only apply to a minority of cases.

During the meeting, the staging of each case and treatment plan should be agreed. In some cases additional investigations (e.g. PET scan or molecular testing for genetic mutation) will be requested.

Performance status and stage are recorded along with data required for the National Lung Cancer Audit following discussion with the team, usually by the MDT coordinator. Clinicians will consider the potential entry of each patient into a trial.

A member of the team will have responsibility for ensuring that the GP is informed of the MDT decision within 24 hours of the meeting, preferably after the decision has been communicated to the patient.

It is good practice for patients to be seen by the diagnosing doctor and the specialist nurse after the multidisciplinary team meeting to discuss results and have an opportunity to consider treatment options.

All members of the team who have contact with patients at this point in the pathway should have training

in advanced communication skills.

7 Data Requirements of Lung Cancer Services

Lung cancer services within the LCA are required to submit data to nationally mandated datasets for patients diagnosed with lung cancer.

These are as follows:

7.1 The Cancer Outcomes and Services Dataset (COSD)

The core dataset for all tumour types including lung cancer is mandated from January 2013, and the site-specific dataset is mandated from July 2013. Details of the dataset can be found on the National Cancer Intelligence Network (NCIN) website:

www.ncin.org.uk/collecting_and_using_data/data_collection/cosd.aspx.

The local cancer registry will be collating this dataset using Trust data feeds which should include all these items. The feeds are:

- Trust PAS feed
- Trust pathology feed
- Trust radiology feed
- Trust MDT feed.

In line with the requirements set out in provider Trust contracts this data should be submitted within 25 working days of the end of the month in which the activity took place.

7.2 National Audits – National Clinical Lung Cancer Audit (LUCADA)

The LUCADA audit has been up and running since 2004, and requires Trusts to submit data for patients diagnosed with lung cancer. The details of the dataset can be found on the Health & Social Care Information Centre website at www.hsic.gov.uk/lung.

7.3 Systemic Anti-Cancer Therapy (SACT) chemotherapy dataset

Trusts that provide chemotherapy to patients are required to submit data to the SACT dataset. Details of the audit and the dataset requirements are available at the dataset homepage:

www.chemodataset.nhs.uk/home.aspx.

7.4 National Radiotherapy Dataset (RTDS)

Trusts that provide radiotherapy to patients are required to submit data to the RTDS. Details of the audit and the dataset requirements are available at the dataset homepage: www.canceruk.net/rtservices/rtds/.

7.5 National Cancer Waiting Times Monitoring Data Set

Trusts are required to submit data to the Cancer Waiting Times Monitoring Data Set, which includes details of all patients with a 2ww referral, and of all patients' treatments for cancer. Trusts are required to submit this data within 25 working days of the month in which patients were first seen for the 2ww target, or the month in which the patient was treated.

The Cancer Waiting Times Monitoring Data Set can be found at:

www.datadictionary.nhs.uk/data_dictionary/messages/clinical_data_sets/data_sets/national_cancer_waiting_times_monitoring_data_set_fr.asp.

7.6 Local data requirements

The LCA Lung Pathway Group is developing a suite of metrics (see Appendix 9) to inform the group and services within the LCA about areas of priority and potential service improvements. The LCA is currently collating information from the various sources of data available, though the Lung Pathway Group or LCA Clinical Board may require Trusts to submit additional MDT data to the LCA if additional priority areas are identified.

8 Breaking Bad News

Staff dealing with patients and giving diagnoses of cancer should have received training in advanced communication skills. Bad news should only be given by consultants and experienced trainees. This chapter provides a summary of the key points.

8.1 Advance preparation

- Consider the time available, put pager on silent mode and find a private setting.
- If the patient is an inpatient, consider the setting and ensure that you cannot be overheard by other people on the ward.
- Would it be helpful to have another member of staff present? It is recommended that a clinical nurse specialist (CNS) be present when delivering bad news and should always be available to provide support during that day.
- Before seeing the patient, review relevant clinical information, consider psychological/social issues and mentally rehearse words or phrases to use or avoid.

8.2 Build a therapeutic environment

- Introduce yourself.
- Ask the patient if they would like someone else with them.
- Be aware of your body language.

8.3 Communication

- Ask what the patient already knows.
- Warn the patient that you do not have good news.
- Proceed at the patient's pace.
- Be frank but compassionate.
- Avoid jargon.
- Allow for silence and tears.
- Check the patient's understanding.
- Repeat information if needed.
- Allow time for discussion.
- Outline the next steps in the treatment plan and provide written information. This should include details of any treatments, where appropriate.
- Offer a follow-up meeting.
- Ensure that the patient has details of their key worker and how to contact them should the need arise.

8.4 Dealing with reactions

- Be aware of family/patient reactions and acknowledge their emotional needs.
- Be empathic.

- Offer support from other members of the MDT if needed.
- Do not show any signs of rushing away from the meeting.
- Avoid confrontational scenarios.
- Be aware of your own safety.
- Do not criticise or argue with colleagues.
- Deal with your own emotional needs and the needs of other colleagues.
- Allow time for reflection.

9 Inter-professional Communication between Secondary and Primary Care

9.1 General principles

- Communication needs to be timely and concise.
- Use fax-back route/electronic means for urgent communications (meaning those that need to be with the GP within 24 hours).
- Communications must include:
 - what the patient has been told
 - who told the patient
 - who was there with the patient (e.g. named partner/friend)
 - what written/other information was offered
 - next steps – when the patient is being seen or their treatment started
 - actions for the GP – for information only or suggesting specific GP actions (including information for Macmillan or district nursing colleagues)
 - named care worker in secondary care
 - intent of treatment (curative/palliative)
 - any additional information required from the GP (e.g. co-morbidities status)
 - summary of medication and alterations to medication
 - contact details for further information/discussion.
- Key points of change along the patient journey:
 - referral
 - investigations
 - diagnosis
 - treatment planning at MDT meetings
 - start of treatment(s)
 - end of treatment(s)
 - completion of active management of cancer (Treatment Record Summary (TRS))
 - follow-up(s).

9.2 At diagnosis

The GP is informed, by telephone or fax, within 24 hours of the patient being told the diagnosis, along with the general management plan (further investigations and treatment). The letter must include:

- what the patient has been told (e.g. prognosis)
- who told the patient
- who was there with the patient (e.g. named partner/friend)
- what written/other information was offered
- next steps – when patient is being seen, further investigations or treatment started

- actions for the GP – for information only or suggesting specific GP action
- named care worker in secondary care
- intent of treatment (curative/palliative)
- any additional information required from the GP.

If the patient is told their diagnosis in the joint clinic, information confirming diagnosis should be sent to the GP within 24 hours.

All inpatients who are given a new diagnosis of lung cancer will be given a discharge letter to be taken to their GP. In addition, for some patients, the GP surgery will be contacted by phone or fax.

9.3 MDT discussions and decisions

The decisions made at the MDM are conveyed to the patient verbally by their key worker as appropriate. The patient is also offered a written copy of this information, and a detailed letter summarising the MDT's management plan is dictated for the GP. This letter will be sent to the GP by post or electronically within 24 hours. It will be made clear when the patient is being seen, and by whom, to discuss MDT decisions. Feedback by the GP will be invited as appropriate.

9.4 Letters from clinics

These will be organised to an agreed format with diagnosis and staging information, intent of treatment and medication highlighted as above. The format can be an agreed template with core fields and areas to add free text.

9.5 Treatment Record Summary

A letter detailing the planned meeting between clinician (CNS or doctor) and patient at the end of active treatment, to discuss diagnosis, response to treatment and next steps, will be sent to the GP. The TRS should cover psycho-social aspects, signposting to services, anticipated side effects of treatment and signs of disease progression, with management plans clearly highlighted. Holistic needs assessment (HNA) will be undertaken with an approved instrument and summarised. The letter will be sent within 48 hours of the interview, with the patient's permission.

The LCA Survivorship Group has recommended the adoption of the National Cancer Survivorship Initiative (NCSI) Treatment Summary. A copy of this document can be found at Appendix 8.

10 Surgical Guidelines

10.1 Introduction

The LCA adopts the British Thoracic Society (BTS) guidelines (Lim et al. 2010) on the surgical management of patients with lung cancer.

10.2 Non-small cell lung cancer

10.2.1 Patient selection

The 7th edition of the TNM Classification of Malignant Tumours is used. Surgery should be offered to patients who are medically fit and suitable for treatment with curative intent. This includes:

- Stage Ia (T1aN0M0 and T1bN0M0)
- Stage Ib (T2aN0M0)
- Stage IIa (T2bN0M0 and T1–2aN1M0)
- Stage IIb (T3N0M0 and T2bN1M0)
- Stage IIIa (T3N1M0).

Consider surgery in selected patients with:

- Stage IIIa (T4N0-N1M0).

Consider surgery as part of radical multimodality management in selected patients with:

- Stage IIIa (T1–3N2M0 where N2 is single zone, non-fixed and non-bulky)
- adenocarcinoma in-situ (formerly bronchioloalveolar carcinoma).

Anatomical lung resection should be offered to suitable patients with single-site bronchioloalveolar carcinoma.

Multiple wedge resections may be considered in patients with a limited number of sites of bronchioloalveolar carcinoma.

10.3 Risk assessment for surgery

In assessing the fitness of patients for surgery, consideration should be given specifically to operative mortality, the risk of perioperative myocardial events and the risk of post-operative dyspnoea, indicating whether these risks are low, moderate or high to the patients. Patients should also be given counselling about commonly occurring complications associated with lung resection.

10.3.1 Operative mortality

Thoracoscore, which takes into account nine variables (age, sex, ASA (American Society of Anesthesiologists) score, performance status, dyspnoea score, priority of surgery, extent of surgery, malignant diagnosis and a composite morbidity score), may help to estimate mortality risk when considering patients with lung cancer for surgery.

10.3.2 Cardiovascular morbidity

Baseline cardiac risk assessment should include history and assessment of functional status, physical examination and resting ECG as defined by the American College of Cardiology (ACC) guidelines (Fleisher et al. 2007). Surgery should be avoided within 30 days of myocardial infarction. Patients with a murmur or unexplained dyspnoea should also have an ECG.

A cardiologist should evaluate patients with an active cardiac condition, three or more risk factors or poor cardiac functional capacity, though the pressing need for urgent cancer treatment may sometime preclude a full risk assessment, and a pragmatic approach must be taken. Surgery may be offered without further investigations in patients with two or fewer risk factors and good cardiac functional capacity.

Patients with coronary artery disease should have their medical therapy and secondary prophylaxis optimised as early as possible in the pathway. Anti-ischaemic treatment including aspirin, statins and beta blockers should be continued in the perioperative period. In patients with coronary stents, discuss with a cardiologist perioperative anti-platelet management. Patients with chronic stable angina and conventional ACC/American Heart Association indications for treatment (coronary angioplasty and stent or coronary artery surgery) should be considered for revascularisation prior to thoracic surgery.

10.3.3 Respiratory morbidity

Lung function is used in the pre-operative assessment to estimate the risk of operative mortality and impact of lung resection on quality of life, especially in relation to unacceptable post-resection dyspnoea. FEV₁ has not been shown to be an independent predictive factor for perioperative death, but may be useful as a surrogate for performance status, and may be used as a predictor of post-operative dyspnoea. TLCO is an important predictor of post-operative morbidity despite normal spirometry. Spirometry alone cannot be considered sufficient unless within normal limits in patients who also have good exercise tolerance. BTS guidelines recommend measurement of TLCO in all patients regardless of spirometric values. Surgical resection should be offered to patients with low risk of post-operative dyspnoea. Surgical resection may be offered to patients at moderate to high risk of post-operative dyspnoea and associated complications if it is felt that this is the better treatment option, and the patient is willing to accept the higher risk.

If ventilation or perfusion mismatch is suspected, ventilation scintigraphy or perfusion scintigraphy may be considered to predict post-operative lung function. Quantitative CT or MRI may also be considered, if available.

In patients with moderate to high risk for post-operative dyspnoea, the shuttle walk test may be considered as a functional assessment, using a distance walked of >400m as a cut-off for good function. Cardio-pulmonary exercise testing to measure peak oxygen consumption may also be considered in this group of patients, using >15ml/kg/min as a cut-off for good function.

When pneumonectomy can be avoided but there is the potential for an increased risk of recurrence, this should be explained to the patients so that they can make a choice. Where possible, broncho-angioplastic resection or non-anatomical resection should be performed.

Risk assessment for post-operative dyspnoea should include segment counting to estimate post-operative lung function. Patients with moderate to high risk of post-operative dyspnoea should be considered for lung parenchyma-sparing surgery.

Broncho-angioplastic procedures in suitable patients should be considered to preserve pulmonary function. Sublobar resection may be an acceptable alternative to lobectomy in patients with limited pulmonary reserve. Patients with concomitant lung cancer within severe heterogeneous emphysema should be considered for lung resection based on lung volume reduction surgery criteria.

10.4 Enhanced recovery after surgery (ERAS)

Consideration should be given to implementing the principles of enhanced recovery for surgical patients where all steps of the patient journey from pre-assessment through to follow-up after discharge are being optimised. ERAS has been shown to improve patient outcomes and reduce post-operative complications. It enables patients to recover from surgery and leave hospital sooner by minimising the stress responses on the body during surgery.

10.5 Lymph node management

Systematic nodal dissection should be performed in all patients undergoing lung cancer resection with a minimum of six lymph node stations removed or sampled where possible/present (IASLC 2009). Three of these lymph nodes should be mediastinal (including subcarinal) and three from N1 stations.

10.6 Adjuvant therapy

10.6.1 Pre-operative chemotherapy

Patients with resectable lung cancer should not routinely be offered pre-operative chemotherapy.

10.6.2 Post-operative chemotherapy

Post-operative chemotherapy should be offered to patients with TNM Classification of Malignant Tumours (7th edition) pT1–3N1–2M0 non-small cell lung cancer (NSCLC). It should be considered in patients with pT2–3N0M0 NSCLC with tumours >4cm diameter.

10.6.3 Post-operative radiotherapy

Post-operative radiotherapy is not indicated after R0 complete resection. It should be considered in patients with residual microscopic disease at the resection margin, and timed to be after completion of adjuvant chemotherapy. Post-operative radiotherapy should be considered in patients with pathological N2 lymph nodes.

10.6.4 Percutaneous thermal tumour ablation (PTTA)

For primary lung cancer, PTTA may be considered in any patient as monotherapy (in N0 and M0 disease) or as part of combined curative or palliative therapy (including in higher stage disease). For metastatic lung tumours, PTTA is a useful option for local tumour control. As expertise within the LCA is limited at the present time, referrals should be discussed only with specialist centres with the appropriate expertise.

10.7 Bronchopulmonary carcinoids

All bronchopulmonary carcinoids are classified as malignant because, despite being indolent, they can invade and metastasise. They are classified by pathologic features as typical carcinoid (<2 mitoses/2mm² of viable tumour) or atypical carcinoid (2 to 10 mitoses, necrosis or architectural disruption). The same TNM stage classification is used for carcinoids as for other primary lung cancers.

Apart from clinical evaluation, chest CT with intravenous contrast +/- bronchoscopy for central tumours, routine additional imaging or hormonal assays are unnecessary in the majority of cases. Endobronchial biopsy may be performed, but diagnosis is fraught – biopsy specimens have a high misdiagnosis rate, especially when classifying typical versus atypical carcinoid tumours.

The mainstay of treatment is surgical resection.

- A limited resection (parenchyma-sparing) is appropriate for typical carcinoid tumours, provided the resection is complete.
- With atypical carcinoid tumours, further imaging with PET or octreotide scan +/- mediastinoscopy may be appropriate. Patient selection for surgical resection is as for NSCLC (see section 10.2.1). Anatomical resection and lymph node dissection should be performed, and patients should be considered for adjuvant chemotherapy.

Multimodality treatment should be considered for atypical carcinoid with N2 involvement.

10.7.1 Endobronchial resection for typical carcinoids

Patient selection for endobronchial removal is important – only about 5% to 10% are polyp-like without extension through the cartilaginous wall and might benefit from endobronchial therapies alone. The risk of recurrence is, however, much higher (50% to 87%) when compared with complete surgical resection.

10.8 Small cell lung cancer

Patients with T1–3N0M0 small cell lung cancer may be considered for surgery as part of multimodality management. Surgical management of patients with T1–3N1–2M0 small cell lung cancer should only be considered in the context of a clinical trial.

10.9 Post-operative follow-up

Although there is no conclusive evidence that follow-up of patients after resection to detect early, asymptomatic recurrence alters outcome, we suggest that patients should be reviewed at regular intervals, with initial follow-up by the surgical team. Subsequently, depending on local practice, this may continue at the referring unit unless special circumstances dictate otherwise. Patients should be evaluated clinically and radiologically with CXR as the first line, and CT scan considered annually, or if there are symptoms or signs of recurrence.

The suggested follow-up is:

- 1 month following discharge
- 3-monthly for 12 months
- 6-monthly for the next 2 years, the period when most recurrences occur.

Extending this follow-up to 5 years could be via the GP and influenced by patient choice. Consideration should be given to nurse-led follow-up at this stage, though a CXR is required. Some units have regular 6-monthly CXR with telephone follow-up by the lung CNS.

It is not known whether imaging during follow-up improves outcomes by detecting recurrence or a further primary earlier, and trials should be conducted to look into this.

10.10 LCA high-quality lung cancer surgical service – measures and metrics

The LCA Lung Pathway Group, in conjunction with surgeons from all LCA surgical centres, has developed the following set of measures and metrics. These criteria are considered to be important in delivering a high-quality service and should be the aspiration of all LCA surgical providers. It is acknowledged that financial implications and pathway modelling will need to be considered in implementing these criteria at all surgical sites.

Table 10.1: Quality measures – high-quality lung cancer surgical service

Features of surgery	
1	Future surgical provision by thoracic surgeons
2	Timely access to EBUS for pre-op staging
3	Lung sparing surgery
4	Video-assisted thoracoscopic surgery when appropriate
5	Lymphadenectomy for correct staging data
6	Extended resections should be offered and all MDTs should have access to this
Other features of a high-quality service	
7	Access to cardio-pulmonary exercise testing and lung function testing
8	Timely links with pathology
9	Access to allied health professionals, including pulmonary rehabilitation
10	Access to thoracic/lung cancer CNS support as per guidelines. Feedback should also be given to the referring CNS
11	Good data collection and management
12	Access to alternative technologies, e.g. interventional radiology and ablation
13	Future availability of molecular biology
14	Communication pathways between primary, secondary and tertiary care should be seamless
15	HNA should be delivered to all surgical patients

Table 10.2: Quality metrics – high-quality lung cancer surgical service

	Metric	Data source
1	Weekly attendance by a consultant surgeon at all LCA lung MDTs	Trust submissions /Commissioning for Quality and Innovation (CQUINS)
2	Resection volume per surgeon and centre per annum	Society for Cardiothoracic Surgery (SCTS)/Trusts
3	30-day mortality and in-hospital mortality (to include risk and staging adjustments)	National Cancer Intelligence Network (NCIN)
4	Readmission rate (per centre)	LCA providers
5	Length of stay following surgery	Trust submissions
6	Survival outcomes 1 and 5 years – needs to be stage adjusted	NCIS
7	Trial participation	Trust submissions
8	Research output	Trust submissions
9	Patient experience	National Cancer Patient Experience Survey/LCA-developed tool
10	Communications with other professionals – referring professional and primary care	TBC
11	Thoracoscore	Trust submissions
12	Peer review performance	CQUINS

11 Non-surgical Management of Early Stage Non-small Cell Lung Cancer

11.1 Stereotactic ablative radiotherapy

The LCA is served by four radiotherapy centres that treat patients with lung cancer with radiotherapy and systemic therapy. Three of these centres – Guy’s and St Thomas’ NHS Foundation Trust, The Royal Marsden NHS Foundation Trust, and Mount Vernon Cancer Centre – deliver stereotactic ablative radiotherapy (SABR). The centres have different radiation planning and treatment delivery facilities but the principles of treatment are the same across the LCA. As lung cancer is a common cancer with a large number of patients undergoing radiotherapy, treatment should be available at all sites.

Early stage NSCLC patients (T1–3N0) will normally be offered surgery as the preferred treatment option. However, a substantial proportion of these patients have significant co-morbidities, poor lung function, poor performance status and so on, making surgery hazardous and rendering the patient inoperable. These patients may, however, still be suitable for non-surgical radical treatment in the form of radical radiotherapy.

Patients in this group should be referred to a clinical oncologist for assessment. The preferred non-surgical radiotherapy option is SABR. SABR is a modification of conventional fractionated radiotherapy based on principles used in intracranial stereotactic radiosurgery (SRS). It utilises newly developed imaging and planning techniques to more precisely target treatment with highly ablative doses of radiation while minimising normal tissue toxicity.

The majority of work with SABR has been with lung tumours, both primary and oligo-metastatic disease. There is now considerable non-randomised evidence supporting SABR as superior to conventional radiotherapy with respect to local control and survival in early NSCLC.

11.2 Patient selection

Patients must be identified as suitable for SABR. This decision must be made in an MDM setting but ultimately by a clinical oncologist with experience in SABR.

11.2.1 Inclusion criteria

- MDT-confirmed diagnosis of NSCLC based on findings of positive histology, positive PET scan or growth on serial CT scans.
- NSCLC, clinical stages of T1, T2 (≤ 5 cm), T3 due to chest wall invasion (≤ 5 cm), N0 M0.
- Peripheral lesions gross tumour volume (GTV) or internal target volume (ITV) outside a 2cm radius of the proximal airways. This is defined as 2cm from the bifurcation of the second order bronchus (i.e. where the right upper lobe bronchus splits). Central lesions, less than 2cm from the proximal airways, should be treated with caution and only considered for a conservative dose-fractionation schedule.
- Patient not suitable for surgery because of medical co-morbidity, technical inoperability or patient declines surgery after surgical assessment.
- World Health Organization (WHO) performance status 0–2.
- Age ≥ 18 years and life expectancy > 3 months.

11.2.2 Exclusion criteria

- Previous radiotherapy within the planned treatment volume.
- Sepsis, pericardial or pulmonary infections.
- History of autoimmune disease
- Bronchioloalveolar sub-type histology.

11.2.3 Pre-radiotherapy assessment

- MDT review of histology or, in absence of histology, review of PET and/or serial growth on CT.
- Full staging with CT scan of chest and abdomen and PET scan.
- Consider imaging of the brain.
- Pulmonary function tests including transfer factor.
- FBC, electrolytes and creatinine, LFTs.
- Other investigations that may be required as directed by a clinician.

11.3 Patient information and consent

Information booklets about lung cancer and radiotherapy, patient information sheets specifically about SABR, treatment planning and contact details for the relevant members of the team should be made available to patients prior to obtaining consent.

Signed informed consent should be completed following each department's guidelines.

11.4 Radiotherapy localisation imaging and contouring

11.4.1 Position and immobilisation

- Each fraction of SABR takes more time to deliver than a fraction of conventional radiotherapy. It is therefore essential that the patient is in a position that is comfortable and reproducible between treatments.
- Patients should be scanned and treated using a robust immobilisation system following each department's guidelines.
- If a patient is unable to comply with acceptable immobilisation criteria, they will be deemed unsuitable for SABR.

11.4.2 Planning scan

A tumour motion management technique should be used:

- four-dimensional (4-D) CT individualised tumour motion encompassing technique
- free-breathing CT with abdominal compression for motion reduction
- breath-hold CT using an active breathing control (ABC) device for gating treatment to breath-hold deep inspiration
- free-breathing CT with CyberKnife tumour tracking.

The extent of the scan must be sufficient to include all potential organs at risk. As a guide, contiguous axial slices of ≤ 3 mm will be obtained from the upper cervical spine to the lower edge of the liver, taking care to include all lung parenchyma on the planning scan.

11.4.3 Delineation of target volumes

- All tumour contours must be reviewed robustly according to local protocol.
- **Gross tumour volume (GTV)** is defined as the radiologically visible tumour in the lung, contoured using lung windows. Mediastinal windows may be suitable for defining tumours adjacent to the chest wall. Where available, information from other imaging modalities should be used to aid delineation of the GTV.
- **Clinical target volume (CTV)** is defined as the GTV with no margin for microscopic disease extension.
- **Internal target volume (ITV)** is the tumour volume obtained using a 4-D CT scan. This is defined as tumour contoured, using information from all phases of a 4-D CT scan. If using breath-hold technique with ABC, no ITV is required.
- **Planning target volume (PTV)** – the margins from GTV/ITV to PTV should be determined according to local protocols, depending on an individual centre's set-up accuracy, as margin parameters may vary according to the planning systems and treatment machines available at different hospitals across the LCA.

11.4.4 Delineation of organs at risk (OARs)

- All OAR contours must be reviewed robustly according to local protocol. The OAR must be inspected to ensure that wherever a treatment beam traverses the OAR, it has been contoured.
- **Spinal cord:** The spinal canal must be contoured on all slices and grown by 3mm to create a planning organ at risk volume (PRV).
- **Oesophagus:** The oesophagus must be contoured using mediastinal windows on CT to correspond to the mucosa, submucosa and all muscular layers out to the fatty adventitia.
- **Heart:** The heart must be contoured along with the pericardial sac. The superior aspect (or base) for purposes of contouring is defined as the inferior aspect of the pulmonary artery (as seen in a coronal reconstruction of the CT scan) and extends inferiorly to the apex of the heart.
- **Trachea and proximal bronchial tree:** The trachea and bronchial tree must be contoured as two separate structures using lung windows. For this purpose, the trachea will be divided into two sections: the proximal trachea and the distal 2cm of trachea. The proximal trachea must be contoured as one structure, and the distal 2cm of trachea will be included in the structure identified as the proximal bronchial tree. Differentiating these structures in this fashion will facilitate identifying if the eligibility requirements listed in section 11.2 have been met.
 - **Proximal trachea:** Contours must begin 10cm superior to superior extent of PTV or 5cm superior to the carina (whichever is the more superior) and continue inferiorly to the superior aspect of the proximal bronchial tree.
 - **Proximal bronchial tree:** This includes the most inferior distal 2cm of trachea and the proximal airways on both sides. The following airways will be included: distal 2cm trachea, carina, right and left main stem bronchi, right and left upper lobe bronchi, the bronchus intermedius, right middle lobe bronchus, lingular bronchus, and the right and left lower lobe bronchi. Contouring of the lobar bronchi must end immediately at the site of a segmental bifurcation.
 - **Proximal airways plus 2cm:** As part of adhering to the eligibility requirements for enrolling patients with tumours in the zone of the proximal bronchial tree listed above, it is convenient to define an artificial structure 2cm larger in all directions from the proximal bronchial tree. If the ITV falls within this artificial structure, caution must be taken and the patient's suitability for standard SABR dose schedules reconsidered.

- **Whole lung:** Left and right lungs should be contoured together as a single structure using a pulmonary window level. All inflated and collapsed lung must be included. However, the GTV/ITV and trachea/proximal bronchus as defined above must not be included. The lungs minus GTV/ITV must be kept within normal tissue dose constraints listed below.
- **Brachial plexus:** The defined ipsilateral brachial plexus originates from the spinal nerves exiting the neuroforamina on the involved side from around C5 to T2. However, for the purposes of this protocol, only the major trunks of the brachial plexus must be contoured using the subclavian and axillary vessels as a surrogate for identifying the location of the brachial plexus. This neurovascular complex will be contoured starting proximally at the bifurcation of the brachiocephalic trunk into the jugular/subclavian veins (or carotid/subclavian arteries), and following along the route of the subclavian vein to the axillary vein, ending after the neurovascular structures cross the 2nd rib.
- **Skin and chest wall:** The body contour should be outlined wherever the beams traverse it. The skin contour must be inspected to ensure that beams do not overlap, producing excessive skin dose, especially where there is a skin fold. Skin should be separately contoured to a depth of 5mm. The ipsilateral chest wall (defined as a ring of 3cm depth) should be assessed to minimise the amount receiving 30Gy without compromising on PTV coverage.

11.5 Selection of optimal plan

11.5.1 Generation of treatment plan

- To achieve adequate target coverage using SABR while sparing critical OARs, including the skin surface, at least seven beams are typically required or a volumetric modulated arc therapy (VMAT) planned delivery. The beam configuration may be coplanar or non-coplanar, depending on the size and location of the lesion.
- Lower energy beams such as 6MV should be used, due to the wide penumbra of higher energy beams, the small beam apertures used in SABR and the problems associated with secondary build-up.
- Plan optimisation is to use homogeneity correction for lung and ideally a type B algorithm.
- Analysis of the dose-volume histogram (DVH) for the PTV and OAR forms the basis for selecting a particular treatment plan. It is therefore recommended that plans be calculated on a fine dose grid, with a separation no greater than 2.5mm, to ensure the accuracy of the DVH calculations.
- Patients can be treated on a conventional linear accelerator with online image guided radiotherapy (IGRT) capacity or on a CyberKnife machine.

11.5.2 Normal tissue dose constraints

Table 11.1 lists the SABR consortium guidelines for dose constraints based on the European ROSEL study of SABR (Hurkmans et al. 2009). These dose limits are based on the highest dose/fractionation regimes reported in lung SABR and therefore should be safe for the lower biologically effective dose regimes used in lung SABR.

11.5.3 Dose distribution and conformity requirements

Successful treatment planning will require accomplishment of the following criteria:

- The dose should be prescribed so as to ensure that the isodose covering the PTV is of the intended value given below; this should be 60–90% of the maximum dose at the normalisation point (typically and ideally 80%).
- Adequate dose and conformity to the PTV will be realised by satisfying the constraints given below in Table 11.2 and Table 11.3.

Table 11.1: Normal tissue dose constraints (agreed through UK SABR consortium)

OAR	Volume (cm ³)	3#		5#		8–10#	
		Tolerance	Minor deviation	Tolerance	Minor deviation	Tolerance	Minor deviation
Spinal cord*	0.01	18Gy	18–22Gy	25Gy	25–28Gy	25Gy	25–28Gy
Oesophagus*	1.0	24Gy	24–27Gy	27Gy	27–28.5Gy	27Gy	27–28.5Gy
Brachial plexus*	1.0	24Gy	24–26Gy	27Gy	27–29Gy	27Gy	27–29Gy
Heart*	1.0	24Gy	24–26Gy	27Gy	27–29Gy	50Gy	50–60Gy
Trachea, bronchus*	1.0	30Gy	30–32Gy	32Gy	32–35Gy	32Gy	32–35Gy
Lungs – GTV		V20 < 10% V12.5 < 15%	N/A	V20 < 10% V12.5 < 15%	N/A	V20 < 10% V12.5 < 15%	N/A
Liver (constraints only valid if >1000cc of liver imaged)		700cc < 15Gy D33 < 21% D50 < 15Gy	N/A	700cc < 15Gy D60 < 30Gy Mean < 20Gy	N/A	D30 < 27Gy D50 < 24Gy	N/A
Chest wall	30.0 0.01	30Gy 37Gy	N/A	32Gy 39Gy	N/A	32-35Gy 39Gy	N/A

Table 11.2: PTV planning optimisation constraints

PTV criteria	54Gy in 3 fractions	55Gy in 5 fractions	60Gy in 8 fractions
D95	100% of nominal coverage dose		
D99	90% of nominal coverage dose		
Dmax tolerance	110–140% of nominal coverage dose		
Dmax minor dev	105–110% or 140–145% of nominal coverage dose		

Table 11.3: Dose conformity requirements

3 fractions	Vol(100%)/Vol(PTV)		Vol(50%)/Vol(PTV)		Max dose >2cm	
Vol PTV (cc)	Tolerance	Minor dev	Tolerance	Minor dev	Tolerance	Minor dev
<20	<1.25	1.25–1.40	<12	12–14	<35.1Gy	35.1–40.5Gy
20–40	<1.15	1.15–1.25	<9	9–11	<37.8Gy	37.8–43.2Gy
>40	<1.10	1.10–1.20	<6	6–8	<37.8Gy	37.8–43.2Gy
60–90	<1.10	1.10–1.20	<5	5–7	<37.8Gy	37.8–43.2Gy
>90	<1.10	1.10–1.20	<4.5	4.5–6.5	<37.8Gy	37.8–43.2Gy

5–10 fractions	Vol(100%)/Vol(PTV)		Vol(50%)/Vol(PTV)		Max dose >2cm	
Vol(PTV) (cc)	Tolerance	Minor dev	Tolerance	Minor dev	Tolerance	Minor dev
<20	<1.25	1.25–1.40	<12	12–14	<35.8Gy	35.8–41.3Gy
20–40	<1.15	1.15–1.25	<9	9–11	<38.5Gy	38.5–44.0Gy
>40	<1.10	1.10–1.20	<6	6–8	<38.5Gy	38.5–44.0Gy
60–90	<1.10	1.10–1.20	<5	5–7	<38.5Gy	38.5–44.0Gy
>90	<1.10	1.10–1.20	<4.5	4.5–6.5	<38.5Gy	38.5–44.0Gy

Vol(100%)/Vol(PTV): ratio of prescription isodose (e.g. 54Gy, 55Gy or 60Gy) volume to the PTV.

Vol(50%)/Vol(PTV): ratio of 50% prescription isodose (27Gy, 27.5Gy or 30Gy) volume to the PTV.

Max dose >2cm: maximum dose (% of nominal prescription dose) at least 2cm from the PTV in any direction.

11.6 Dose schedules

- The dose-fractionation must be decided according to its appropriateness to the individual patient and this must be checked when the patient is seen by the clinical oncologist during their first clinic consultation.
- Fractionation schedules are dependent on target volume, proximity to central structures and chest wall and dose constraints on OARs. The fractionation schedules that clinicians will choose from for early stage NSCLC are:
 - 18Gy x 3 # (standard dose-fractionation)
 - 11Gy x 5 # (conservative dose-fractionation)
 - 7.5Gy x 8 # (very conservative dose-fractionation).
- The conservative dose-fractionation is recommended when any part of the PTV is in contact with the chest wall. It is recommended that the inter-fraction interval be at least 40 hours, with a maximum interval of 4 days between treatment fractions.
- **All clinical plans should be signed by a consultant prior to the start of treatment.**

11.7 Treatment verification and delivery

- Prior to treatment delivery, the patient should be considered for a plan check appointment.
- Patients treated on a linear accelerator will have cone-beam CT scans performed before each treatment with an online tumour match to the planning CT and remote couch correction performed by an experienced clinician or radiographer. Further cone-beam CTs are considered after couch correction, during and after treatment, on an individual patient basis to ensure adequate verification of treatment delivery. 4-D cone beam CT assessment should be used where available.
- Patients treated on CyberKnife will have regular external monitoring and internal monitoring of tumour position (X-sight lung) or fiducial marker position with continuous updating of the beam position.

11.8 Patient management during and following treatment

11.8.1 On-treatment review

The assessments during treatment are given in Table 11.4. Patients should be reviewed according to clinical need. The Common Terminology Criteria for Adverse Events (CTCAE) v4.0 (Common Toxicity Criteria) should be used for assessing toxicity during and after radiotherapy. For management of treatment-related toxicity, please refer to the LCA Acute Oncology Clinical Guidelines (2013).

11.8.2 Follow-up after treatment

- The first follow-up should be at 4 weeks post-radiotherapy for an acute toxicity assessment or sooner if clinically indicated.
- Subsequent follow-up visits will be of the order of 3-monthly for the first year, and 6-monthly for subsequent years because of greater risk of recurrence after radical radiotherapy than resection. The patient can contact the CNS/key worker if they have any concerns between follow-up appointments, or they can become part of a protocol nurse-led clinic.
- The first post-treatment CT scan should be done at 3 months and then repeated at least every 3–12 months. Due attention must be paid to the difficulty that can arise in differentiating local recurrence from tumour progression in certain scenarios.

- Lung function tests should be performed, guided by patient's symptoms and radiological investigations.
- Radiological response should be documented using Response Evaluation Criteria in Solid Tumours (RECIST). If possible, patients should be followed for a minimum of 5 years.
- Longer-term follow-up should be at the discretion of the clinical team and patient.

Table 11.4: Assessments at baseline and during radiotherapy

Procedure	Baseline	During radiotherapy
Medical history	X	
Physical examination	X	
Weight	X	X
WHO performance status score	X	X
FBC	X	
Biochemistry	X	
Full lung function tests	X	
CT scan thorax and abdomen	X	
Chest X-ray	optional	
CT/MRI head	If clinically indicated	
PET/CT	X	
Informed consent	X	
Adverse event monitoring CTCAE v4.0	X	X

11.9 Percutaneous thermal tumour ablation (PTTA)

For primary lung cancer, PTTA may be considered as monotherapy for localised disease or as part of combined curative or palliative therapy (including in higher stage disease). For lung metastases, PTTA is a useful option for local disease control. As expertise within the LCA is limited at the present time, referrals should be discussed only with specialist centres with the appropriate expertise.

12 Management of Locally Advanced Non-small Cell Lung Cancer

12.1 Radical concomitant chemo-radiotherapy/sequential chemo-radiotherapy/radiotherapy alone

For good performance status patients with locally advanced disease, there is increasing evidence that local disease control improves with increasing treatment intensity. A meta-analysis (Aupérin et al. 2010) revealed an absolute overall survival benefit of 4.5% at 5 years for concomitant versus sequential chemotherapy at the expense of increased acute oesophageal toxicity. Additionally, a recent meta-analysis confirmed modified intensification fractionation schedules (accelerated radiotherapy using hyper/hypo fractionation) was associated with an absolute overall survival benefit of 2.5% at 5 years, again at the expense of increased acute oesophageal toxicity.

The choice between concomitant chemo-radiotherapy, sequential chemo-radiotherapy and radical radiotherapy alone should be discussed at the MDM and be based on the extent of disease, performance status of the patient, and additional co-morbidities. On an individual patient basis, risks and benefits should be discussed in detail with an oncologist.

The treatment of the superior sulcus tumours (Pancoast tumours) may differ from that of other locally advanced NSCLC. Their position and close proximity to vital structures (such as nerves and spine) may make a radical approach difficult with either surgery or chemo-radiotherapy alone. As a result, depending on the disease extent and fitness of the patient, treatment may involve chemotherapy and radiotherapy given prior to surgery. Management of these patients should be carefully considered by the MDT and scheduling of treatment should be planned ahead to avoid delays in the treatment pathway.

12.2 Patient selection

- MDT-confirmed diagnosis of NSCLC based on findings of positive histology, positive PET scan or growth on serial CT scans.
- T1–3, N1–3 or T4 N0–3 M0 disease, which can be encompassed within a radical radiotherapy plan.
- Post-operative radiotherapy should be considered in patients with a positive resection margin.
- WHO performance status 0–1 and a subset of patients with performance status 2 whose general condition is explained by disease rather than a result of co-morbidities can be considered at the discretion of a clinical oncology consultant.
- Satisfactory respiratory function assessed on full lung function tests including lung volumes and transfer factor.

12.3 Chemotherapy schedule

- Vinorelbine/cisplatin for 3–4 cycles (see Appendix 2).
- Carboplatin can be substituted for cisplatin for patients in whom cisplatin is contra-indicated (see Appendix 2).

Toxicity with each cycle should be assessed according to WHO grade and recorded in line with local guidelines. Patient response should be assessed, usually with a repeat CT, after 2 or 3 cycles. In the presence of objective response, or symptom improvement with stable disease, a further cycle should be given.

12.4 Radical radiotherapy

12.4.1 Pre-radiotherapy assessment

- MDT review of histology or, in absence of histology, review of PET and/or serial growth on CT.
- Full staging with CT scan of chest and abdomen and PET scan.
- Consider imaging of the brain.
- Pulmonary function tests including transfer factor.
- FBC, electrolytes and creatinine, LFTs.
- Other investigations that may be required as directed by a clinician.

12.4.2 Patient information and consent

Information booklets about lung cancer and radiotherapy, patient information sheets about treatment planning and contact details for the relevant members of the team should be made available to patients prior to obtaining consent.

Signed informed consent should be completed following each department's guidelines.

12.4.3 Technique

Patient set-up and immobilisation, localisation imaging, target definition, normal tissue constraints, treatment delivery and verification should follow local guidelines.

12.4.4 Dose schedules

- CHART 54Gy in 36 # over 12 days
- 55Gy in 20 # over 4 weeks
- 64–66Gy in 32–33 # over 6.5 weeks
- Post-operatively 60Gy in 30 # over 6 weeks
- Lower total doses as part of tri-modality approach for superior sulcus tumours close to sensitive normal tissue structures, such as spinal cord, can be considered and discussed by the MDT.

12.5 Patient management during and following treatment

- Patients should be seen regularly throughout treatment and then initially 4–6, weeks after completing radical treatment or sooner if symptomatic. Subsequent follow-up is 3, 6, 9 and 12 months after treatment completion then at 6-monthly intervals up to 5 years with documentation of acute and late toxicity at each visit. Follow-up may be shared between the clinical oncology, medical oncology and medical team as deemed suitable for each patient.
- A CT scan of the chest is considered at 3, 6 and 12 months after completion of radical radiotherapy with a chest X-ray at other times. Repeat spirometry should be considered if there is concern about respiratory decline post-radiotherapy.

13 Management of Metastatic Non-small Cell Lung Cancer

13.1 First-line chemotherapy

Most patients have advanced stage disease at the time of diagnosis. Even patients without any cancer-related symptoms at diagnosis will manifest symptoms as their disease progresses. The overall goals of systemic treatment are to improve symptoms, preserve or improve quality of life and prolong survival. This is an area in which there is a lot of research and guidelines do not always reflect updated practice. NICE is in the process of updating its recommendations.

All patients should have timely access to current molecular diagnostic tests, enabling them to access any treatment recommended by the results within the timeframe of the Cancer Waiting Times initiative. The network will deliver systemic therapies in accordance with NICE clinical guidelines and therapies available via the Cancer Drugs Fund.

13.1.1 Key points from recent studies

- First-line therapy with an EGFR-TKI improved the response rate, progression-free survival, and quality of life in patients with advanced NSCLC which harboured a sensitising EGFR mutation (15% of non-squamous lung cancer) (NICE 2010/TA192; NICE 2012/TA258).
- In patients with non-squamous histology, a cisplatin/pemetrexed regimen was associated with a median overall survival rate superior to that of cisplatin/gemcitabine (12.6 months vs 10.9 months). In addition, this regimen was also associated with a favourable tolerability profile. These results led to NICE approval of the cisplatin/pemetrexed regimen for patients with adenocarcinoma or large-cell carcinoma (NICE 2009/TA181).
- The use of switch maintenance pemetrexed in patients who have not received this agent in the first line and who are not progressing is associated with a prolonged progression-free survival and overall survival (NICE 2010/TA190).
- The use of continuous maintenance pemetrexed has demonstrated improvements in progression-free survival and overall survival (under NICE review).
- Patients with an EML4-ALK or ROS1 mutation (4–7% of all NSCLC) benefit from the use of crizotinib (under NICE review).

13.1.2 Patient assessment

- Performance status and co-morbidities.
- Histological sub-type.
- Presence of a sensitising mutation in genes with approved therapeutic agents.

13.1.3 Choice of systemic agent

- A few mutations in the EGFR gene are TKI resistant. Those patients should receive chemotherapy as first systemic therapy. Guidance on the sensitivity of the mutation to EGFR-TKI is given in the EGFR molecular analysis report. Patients with wild-type EGFR should receive chemotherapy as first systemic option.
- Platinum-doublet combination chemotherapy should be offered to all patients with stage 4 and performance status 0 or 1, especially those with systemic symptoms.

- Non-squamous histology: third generation drug (pemetrexed, gemcitabine, vinorelbine, paclitaxel or docetaxel) in combination with platinum agent (cisplatin or carboplatin when cisplatin is contraindicated), as per NICE guidelines.
- Squamous histology: third generation drug (gemcitabine, vinorelbine, paclitaxel or docetaxel) in combination with platinum agent (cisplatin or carboplatin when cisplatin is contraindicated).
- Selected patients with performance status 2 may benefit from single agent chemotherapy, and adequate home support and follow-up should be provided. Single agent vinorelbine and gemcitabine both have activity and are well tolerated by patients.
- Duration of treatment with targeted inhibitors is an area of current research. Some patients have ongoing clinical benefit from these agents in the face of progression of a solitary lesion or as re-challenge following therapeutic selection of the tumour with a cytotoxic agent.

13.2 Second- and third-line chemotherapy

The benefit of second-line therapies has had a major positive impact on the prognosis of NSCLC. If performance status allows, recurrent disease following first-line combination chemotherapy should be considered for second-line treatment. Second-line chemotherapy is associated with a survival benefit compared with best supportive care; therefore, it should be offered at the first detection of disease progression, rather than delayed until the development of symptoms.

Options for second-line treatment include pemetrexed, docetaxel and erlotinib. Erlotinib has been approved by NICE as second-line treatment as an alternative to docetaxel (NICE 2012/TA162). The decision to use erlotinib or docetaxel should be made after a discussion between the responsible clinician and the individual about the potential benefits and adverse effects of each treatment.

Those patients who have EGFR mutations or belong to the favourable response group – female, adenocarcinoma histology, never smokers and East Asian ethnicity – should be treated with erlotinib. Similarly, chemo-refractory patients tend to do better with erlotinib. Docetaxel would be the preferred option in smokers with squamous histology although some may gain cytostatic benefit from erlotinib. In other patients, current data should be considered in making the decision.

Certain agents are available for third-line treatment. In the absence of contraindications those patients progressing after erlotinib/docetaxel and maintaining a good performance status can be considered for third-line treatment. As before, our favoured option would be a clinical trial.

13.3 Palliative radiotherapy

13.3.1 Symptomatic chest disease

- Patients with symptoms such as haemoptysis, cough, pain, dysphagia and breathlessness should receive palliative thoracic radiotherapy when appropriate according to their performance status.
- NB: Consideration should be given to the spinal cord dose with isodose intervention and cord shielding as appropriate.
- Performance status 0–1: 39Gy in 13 # / 36Gy in 12 # over 2.5 weeks.
- Performance status 2–3: 17Gy in 2 # 7 days apart.
- Performance status 3–4, or any metastatic disease: 10Gy single #

13.3.2 Superior vena cava obstruction/central airway obstruction with stridor

Please refer to Superior Vena Cava Obstruction, Chapter 16 in the LCA Acute Oncology Clinical Guidelines (2013).

- Consider referral for superior vena cava (SVC) stent/airway stent/laser therapy.
- Consider 20Gy in 5 # over 1 week.
- Consider dexamethasone and proton pump inhibitor (PPI) cover until completion of radiotherapy. It is then imperative to reduce the dose with a view to discontinuation as quickly as symptoms allow.

13.3.3 Painful bone metastases

- Consider referral for prophylactic pinning of weight-bearing bones.
- Consider 8Gy in single #
- Consider 20Gy in 5 # over 1 week if there is a significant soft tissue component or associated nerve root symptoms.

13.3.4 Brain metastases

Please refer to the LCA Acute Oncology Clinical Guidelines (2013).

- Performance status 0–1: 20Gy in 5 #
- Performance status 2–3: 12Gy in 2 #
- Consider dexamethasone and PPI cover until completion of radiotherapy. It is then imperative to reduce the dose with a view to discontinuation as quickly as symptoms allow.

NB: 1–3 brain metastases confirmed on MRI scan in patients with disease controlled at other sites should be considered for a neurosurgical opinion. Surgical resection followed by whole brain radiotherapy may be an option or whole brain radiotherapy followed by stereotactic boost.

13.3.5 Spinal cord compression

Please refer to the LCA Acute Oncology Clinical Guidelines (2013).

- Consider referral for neurosurgery.
- Consider 20Gy in 5 # over 1 week.
- Consider dexamethasone and PPI cover until completion of radiotherapy. It is then imperative to reduce the dose with a view to discontinuation as quickly as symptoms allow.

13.4 Follow-up of patients after treatment with palliative intent

Follow-up should be individualised to anticipate treatment-related toxicity and potential changes in symptoms or quality of life. Referrals to community palliative care teams should be made early.

14 Management of Small Cell Lung Cancer

14.1 Introduction

The objective response rate to platinum-etoposide combination chemotherapy in small cell lung cancer (SCLC) is around 65%, with nearly all patients attaining some radiological tumour regression, and this should be offered to most patients with limited and advanced disease. Recommended first-line treatment is 4–6 cycles of cisplatin/carboplatin and etoposide. Unlike NSCLC, poor performance status is not a contraindication to chemotherapy in this context, and dose-attenuated chemotherapy should be considered. Possible regimes include dose-attenuated carboplatin-etoposide, single agent carboplatin, and oral etoposide monotherapy. Details of chemotherapy schedules are given in Appendix 3. For selected patients with concerns about alopecia, platinum-gemcitabine doublets can be used (Lee et al. 2009/PMID: 18786981). For patients with relapsed SCLC, systemic therapy options include platinum-doublet re-challenge (Vincent et al. 1988/PMID: 2830043), CAV, ACE or topotecan. Growth factors and antibiotics should be given as per local guidelines, and are encouraged.

14.2 Limited stage disease (T1–4, N0–3, M0)

14.2.1 Surgery

Surgery can be considered in patients with histologically proven T1–3, N0 SCLC (the merits of each case should be discussed at the MDM), as per BTS guidelines 2010 (Lim and Woodhead/BTS 2011/PMID: 21502103). Patients with peripheral small cell lung tumours that are not bronchoscopically visible and who have no evidence of lymph node involvement represent the most suitable group for resection. Staging investigations should include mediastinoscopy or EBUS to ensure that mediastinal nodes are not involved. Post-operative chemotherapy and prophylactic cranial irradiation (PCI) should be given. Thoracic radiotherapy should be considered to mediastinum if lymph nodes are involved, or if the patient has not had systematic nodal dissection.

14.2.2 Chemo-radiotherapy

- In general, patients with limited stage SCLC should be treated with a combination of chemotherapy and radiotherapy. The standard chemotherapy regimen is cisplatin and etoposide for 4–6 cycles (see Appendix 2). Carboplatin can be substituted for cisplatin in patients for whom cisplatin is contraindicated (e.g. performance status 2, renal impairment).
- Clinical trials have reported better survival in patients randomised to concurrent chemo-radiotherapy compared with sequential chemo-radiotherapy. Based on data obtained by meta-analysis, radiotherapy should be given up to and including the third cycle of chemotherapy but it is currently unclear if thoracic radiotherapy should commence with the first, second or third cycle, with one large randomised phase III trial demonstrating no difference in survival between radiotherapy commenced with the third cycle and radiotherapy commenced with the first.
- Options for radical thoracic radiotherapy in the concurrent setting include a twice daily schedule of 45Gy in 30 # over 3 weeks and once daily schedules (e.g. 50Gy in 25 # over 5 weeks). Higher doses of radiation (≥ 66 Gy) delivered once daily concurrently with chemotherapy are currently under evaluation. Limited data supports the use of conformal radiotherapy without elective nodal irradiation to decrease acute toxicity.

- Patients who are not suitable for concurrent chemo-radiotherapy, as outlined above, but who are eligible for platinum-based chemotherapy should be treated with sequential chemo-radiotherapy. Such patients should receive 4–6 cycles of platinum-etoposide chemotherapy, and be assessed for response evaluation every 2–3 cycles, after which they should have radical thoracic radiotherapy. A standard schedule is 40Gy in 15 # over 3 weeks.
- Patients with any response to chemotherapy or stable disease should be given PCI (e.g. 25Gy in 10 # over 2 weeks).

14.3 Extensive stage disease (T0–4, N0–3, M1; or M0 medically unsuitable for radical therapy)

14.3.1 First-line chemotherapy

Recommended first-line treatment is 4–6 cycles of carboplatin or cisplatin combined with etoposide (see Appendices 2 and 3). Radiological response evaluation to chemotherapy should occur every 2–3 cycles of chemotherapy.

14.3.2 Radiotherapy

- Patients who have experienced a complete response at extrathoracic sites can be considered for consolidation thoracic radiotherapy 40Gy in 15 # over 3 weeks.
- Palliative thoracic radiotherapy should be offered to patients with extensive disease and symptoms from intrathoracic disease that fails to respond to chemotherapy. The schedule is dependent on the patient's performance status:
 - 30Gy in 10 # over 2 weeks for WHO performance status 0–1
 - 20Gy in 5 # over 1 week or 17Gy in 2 # a week apart for WHO performance status 2–3
 - 10Gy single fraction for WHO performance status 3–4.
- PCI is recommended for patients who do not progress on chemotherapy (20Gy in 5 # over 1 week). Patients presenting with brain metastases should be offered palliative whole brain radiotherapy (20Gy in 5 # over 1 week).

14.3.3 Second-line chemotherapy

On completion of first-line treatment, patients should be reviewed regularly and consideration given to second-line chemotherapy on relapse. Patients' performance status can deteriorate rapidly at time of relapse and consideration should be given to treatment of asymptomatic or minimally symptomatic relapse. Approved regimes for relapse include: re-challenge with first-line therapy (if the patient relapses 90 days or more from last dose of chemotherapy), platinum-gemcitabine for patients with concerns about alopecia, CAV, ACE and oral topotecan (Appendix 2).

Bone-modifying agents (denosumab/zolendronic acid) should be offered to patients as per NICE guidelines/licence. Consideration of palliative radiotherapy to sites of bony metastases should be given as per NSCLC.

SCLC patients with performance status 3 should be considered for palliative chemotherapy. Such patients will likely require attenuated dose chemotherapy (e.g. carboplatin AUC5 monotherapy, carboplatin-etoposide day 1 only, or etoposide monotherapy), and this should be discussed with the consultant oncologist.

15 Supportive and Palliative Care

Supportive and palliative care of the patient should be provided by general and specialist palliative care providers in accordance with the NICE guidance *Improving supportive and palliative care for adults with cancer* (NICE 2004).

All patients should have contact with a specialist nurse (usually their key worker) from referral into secondary care. Palliative care input should be available both at the MDMs and at the initial consultation. Patients who may benefit from specialist palliative care services should be identified and seen without delay: the specialist palliative care team within each Trust is available for advice about symptom management. It is also important to consider whether, if it has not been done already, referral should be made to the relevant community palliative care service for ongoing support of the patient at home following diagnosis in the outpatient department or hospital discharge. Again, the hospital palliative care team can advise.

15.1 Key stages for consideration of palliative care needs

There are key points in a patient's illness when their palliative care needs should be specifically considered and this may stimulate referral to multiprofessional specialist palliative care services; these key points include:

- pre-diagnosis if advanced disease is suspected
- diagnosis
- at commencement of definitive treatment of the disease
- on completion of the primary treatment plan
- on disease recurrence or relapse
- at the point of recognition of incurability
- end of life care
- other times requested by a patient.

The LCA's holistic needs assessment (HNA) form is a helpful tool, providing key questions relating to patient's emotional, personal and social support needs.

This resource is available to download through:

www.londoncanceralliance.nhs.uk/information-for-healthcare-professionals/pathway-groups/survivorship/.

Palliative treatments include external beam radiotherapy and chemotherapy for the relief of breathlessness, cough, haemoptysis or chest pain, and patients should be discussed with/referred to oncologists for consideration of treatment. Symptom management is as important for patients for whom cure is possible as it is for those who will have continuing disease. **In each case, consider if potentially reversible causes exist** and, if so, whether such intervention is appropriate.

In this section, 'palliation' and 'palliative treatment' refer to interventions designed to relieve specific symptoms, not merely to treatments that are not expected to be curative.

Examples of common symptoms and possible causes which should be considered in patients with lung cancer and their management are listed in Table 15.1 below. For more detail refer to the Palliative Care Adult Network Guidelines at: <http://book.pallcare.info/>.

Table 15.1: Common symptoms and possible causes

Symptom/sign	Palliative interventions to be considered
Breathlessness	<p><i>Bronchial narrowing or obstruction by tumour:</i> radiotherapy (external beam or endobronchial procedures (see next section)); corticosteroids</p> <p><i>Pleural effusion:</i> aspiration/drainage +/- talc pleurodesis (see below)</p> <p>Palliation: opioids, initially morphine 2.5mg PRN PO; benzodiazepines if anxiety prominent</p> <p>Non-drug interventions, e.g. fan, breathing techniques, anxiety reduction*</p> <p>Optimisation of concomitant medical conditions, e.g. COPD, asthma, congestive heart failure</p>
Chest wall pain/bone pain	<p>Consider cause and investigate as necessary</p> <p>Analgesic medication, both opioids and neuropathic pain agents, e.g. tricyclic antidepressant, gabapentin or pregabalin</p> <p>Via MDT: radiotherapy/radiofrequency ablation</p> <p>Nerve blocks, bisphosphonates, rehabilitation</p>
Cough	<p><i>Productive cough:</i> nebulised saline, mucolytic, antibiotic as appropriate</p> <p><i>Non-productive cough:</i> antitussives, opioids (pholcodine, codeine, morphine)</p> <p>External beam radiotherapy</p>
Haemoptysis	<p>Check and correct clotting defects</p> <p>Antibiotics if infection is an underlying cause and consider tranexamic acid.</p> <p>Clot-stabilising drugs, e.g. etamsylate (formerly known as ethamsylate)</p> <p>Large bleeds > 15ml daily – radiotherapy</p> <p>Endobronchial/endovascular procedures</p>
Hoarseness	<p>Referral to ear, nose and throat specialist for consideration of vocal cord injection</p> <p>Non-drug interventions, e.g. speech and language therapy assessment</p>
Nausea/vomiting	<p>Consider likely cause and manage reversible factors, e.g. constipation, hypercalcaemia,</p> <p>Antiemetic medication: e.g. haloperidol 1.5mg ON or cyclizine 50mg TDS if specific cause unclear. Give by continuous subcutaneous infusion if oral absorption compromised</p>
Facial swelling	<p>SVC obstruction</p> <p>Dexamethasone 12–16mg daily PO or IV</p> <p>Chemotherapy/radiotherapy depending of stage/type of disease</p> <p>Endovascular stenting</p>

Symptom/sign	Palliative interventions to be considered
Limb weakness and numbness	Consider spinal cord compression and/or brain metastases according to signs Dexamethasone 8mg BD, PO or IV See below for management
Anorexia/cachexia	Dexamethasone 2–4mg OD orally; megestrol acetate 160–480mg Dietetic advice
Constipation	Laxative: regular senna 7.5–15mg OD initially but titrate dose against response. Add softening laxative if colic occurs Dietetic advice
Insomnia	Consider contributing factors, e.g. physical discomfort, anxiety, depression Relaxation and sleep hygiene techniques Hypnotic
Anxiety/depression	Non-pharmacological techniques: counselling, cognitive behaviour therapy Antidepressant: sertraline, citalopram, mirtazapine tend to be best tolerated Consider psychiatric referral if depression unresponsive to treatment or if suicide risk identified
Dysphagia	Dietary modification and dietary advice Corticosteroids Referral to speech and language therapist Oesophageal stent

* Non-drug interventions for breathlessness should be delivered by a multidisciplinary group, coordinated by a professional with expertise in the techniques (such as a nurse, physiotherapist or occupational therapist). Patients should have access to this support in all care settings.

15.2 Specific therapies

15.2.1 Pleural effusion

- Pleurodesis should only be carried out if the patient is symptomatic from the effusion.
- Ensure that the patient understands that a pleurodesis is not always effective if the lung does not reinflate completely and may have to be repeated.
- Patients with good performance status should be referred to a thoracic surgical centre for thoracoscopic pleurodesis.
- Medical thoracoscopy is an option where available and is more successful than bedside pleurodesis with talc slurry, which should be conducted according to the BTS guidelines.
- Failure of medical pleurodesis, recurrent or bilateral effusion in patients not fit for anaesthesia are indications for indwelling pleural catheter insertion, and this should be considered by the MDT.

15.2.2 Large airway obstruction

Approximately 70% of lung cancers develop within the large airways and frequently cause obstructive symptoms, such as cough, breathlessness and persistent infections, as they progress. Although chemotherapy and radiotherapy may provide effective palliation, they are limited by their cumulative toxicity and slowness of response. Endobronchial treatments have therefore been developed to provide rapid relief with minimal toxicity and should be regarded as being complementary. All units should have access to centres with these treatments.

Indications for endobronchial treatment

Treatment is only offered to patients whose main symptoms are due to endobronchial disease. The benefits of treatment vary according to the level of obstruction, being most marked in patients with centrally situated tumours (e.g. trachea, main carina and proximal main bronchi), but diminish with more peripheral obstruction. Patients are likely to benefit from treatment if patent airways supplying viable lung tissue exist beyond the point of obstruction. CT scan of the chest with IV contrast should be performed prior to stenting and endobronchial therapy. Surgical endobronchial treatment includes diathermy, cryotherapy and laser therapy. Debulking of endobronchial tumour may be necessary prior to stenting.

Airway stents

The majority of airway stenting is performed using expandable metallic stents. They can be temporary or permanent. The stent is passed across the airway stricture and released under X-ray screen control under general anaesthesia. The expansile properties of the stent then gradually overcome the compressive effects of the tumour.

Endobronchial radiotherapy

This is administered under IV sedation with topical anaesthesia. After placing an afterloading catheter bronchoscopically within the involved airway, a high activity iridium-192 source is loaded by remote control into the catheter and then placed alongside the tumour. The dose of radiation falls off steeply with distance, so that very high doses are delivered to the tumour and peribronchial tissues but negligible doses to the lung parenchyma, spinal cord and oesophagus. It can therefore be used in areas of the lung that have previously been treated with radiotherapy. Treatment is usually completed within 10–15 minutes and can be offered on a day case basis.

Palliative external beam radiotherapy

Palliative radiotherapy should also be considered to improve localised symptoms, if the patient has not received treatment before. This should be fractionated therapy e.g. 20Gy in 5 daily fractions or 30Gy in 10 fractions over 2 weeks. High dose dexamethasone (8mg per day) should be prescribed to reduce reactive oedema.

15.2.3 Superior vena cava obstruction

First-line treatment in SVC obstruction associated with NSCLC is insertion of an SVC stent. Consideration can then be given to the role of palliative radiotherapy or chemotherapy. Any role for anti-coagulation should be discussed with the interventional radiologist.

Patients with SCLC and SVC obstruction should proceed instead directly to chemotherapy if possible. If there is a delay in stent insertion or treatment, symptoms may be improved with dexamethasone 8–16mg daily.

Patients with SVC obstruction as the first presenting feature of suspected lung cancer require histological confirmation of diagnosis.

Please refer to Superior Vena Cava Obstruction, Chapter 16 in the LCA Acute Oncology Clinical Guidelines (2013).

15.2.4 Hypercalcaemia

All patients with symptomatic hypercalcaemia should receive aggressive intravenous hydration for 24 hours. Bisphosphonate therapy should then be instituted, using pamidronate 90mg in 500ml 0.9% saline over 90 minutes (reduce dose if creatinine >1.5x normal) or zoledronate 4mg in 100ml 0.9% saline over 15 minutes (reduce dose in renal impairment according to local guidelines/Summary of Product Characteristics (SPC)). Unless the patient enjoys a significant response to chemotherapy in the meantime, repeated pamidronate doses should be administered monthly in the day unit. Hypercalcaemia refractory to pamidronate may respond to zoledronate. It is a poor prognostic sign if the calcium remains raised despite these interventions, but treatment with calcitonin could be considered.

Refer to Hypercalcaemia of Malignancy, Chapter 6 in the LCA Acute Oncology Clinical Guidelines (2013).

15.2.5 Brain metastases

Radiotherapy for brain metastases is discussed in section 13.3.4. Dexamethasone up to 16mg daily is used; higher doses are associated with greater toxicity and should be reduced after response. Following a seizure associated with brain metastases, patients should be commenced on anti-convulsants. All patients with brain metastases should be advised to discontinue driving. Whole brain radiotherapy should be considered in patients with performance status 0–3, especially those who show an improvement following steroid therapy. Whole brain radiotherapy is fractionated according to extent of metastases, performance status and neurological symptoms:

- generally 12Gy in 2 fractions on consecutive days
- patients with a risk of increasing oedema or obstructive hydrocephalus should be considered for a more fractionated regimen: 30Gy in 10 fractions over 2 weeks or 20Gy in 5 daily fractions.

In some circumstances, chemotherapy should be considered for SCLC brain metastases, and these cases should be reviewed by the MDT.

If a patient has a solitary brain metastasis on CT scan and has lung cancer otherwise controlled or asymptomatic, then an MRI should be carried out. If the MRI shows the lesion is truly solitary then the patient should be referred for a neurosurgical opinion. If the lesion is resected, radiotherapy can sometimes be withheld. If the lesion is not resectable but is still solitary, <4cm in size, then stereotactic radiotherapy is given.

Please refer to Raised Intracranial Pressure/Central Nervous system (CNS) Space Occupying Lesions, Chapter 15 in the LCA Acute Oncology Clinical Guidelines (2013).

15.2.6 Spinal cord compression

Patients should be referred as per the LCA Acute Oncology Clinical Guidelines (2013).

The MDT, including neurosurgeons at the centre, should be involved in investigation and treatment. Isolated lesions may be treated by neurosurgery, otherwise radiotherapy is delivered to the site of disease. An applied dose of 20Gy in 5 fractions over 7 days is delivered, anticipating the commencement of therapy within 24 hours of diagnosis.

15.2.7 Hair loss

Alopecia occurs in about 15% of patients receiving gemcitabine or vinorelbine chemotherapy, and in the majority following etoposide. Patients should be offered the opportunity to discuss wigs, scarves and turbans in the clinic at the time treatment is started.

15.2.8 Anaemia and thrombocytopenia

Transfusion is generally offered when Hb <10g/dL. Anaemic patients should be considered for participation in trials of recombinant erythropoietin. Platelet transfusions are required when platelets fall below $20 \times 10^9/L$, or <40 in association with bleeding, purpura or extensive bruising.

15.2.9 Neutropenia

Febrile neutropenia and neutropenic sepsis in lung cancer patients receiving chemotherapy are treated according to the local Trust protocol. There is no evidence to support the use of therapeutic granulocyte colony-stimulating factor (G-CSF) in this setting.

15.2.10 Pneumonitis

Patients who develop radiation pneumonitis, following high dose thoracic radiotherapy, should be treated with prednisolone (40mg daily) for 3–4 weeks, reducing thereafter depending on response. Radiation pneumonitis typically develops 4–8 weeks after completion of radiotherapy and patients should be examined specifically for this at their first post-radiotherapy consultation.

Please refer to Radiotherapy Induced Complications, Chapter 14 in the LCA Acute Oncology Clinical Guidelines (2013).

15.2.11 Mucositis and oesophagitis

Please refer to Mucositis, Chapter 10 in the LCA Acute Oncology Clinical Guidelines (2013).

15.2.12 Anorexia and cachexia

Weight loss and poor nutritional status is common in lung cancer patients and is a negative prognostic indicator. Treatment, whether it be surgery, chemotherapy or radiotherapy, is known to be less effective and carries increased risk of complications and toxicities in those who have experienced significant weight loss.

As recommended by the NICE guidelines for nutritional support in adults (NICE 2006/CG32), all patients should be nutritionally screened on admission to hospital and on attending an outpatient appointment. Patients identified at risk of malnutrition should be managed by an appropriate care plan which should include referral to a dietitian for high-risk patients. Where formal screening tools are not in use, doctors,

nurses and other healthcare professionals should ensure that patients are asked about their appetite and weight, and whether there are any particular difficulties with eating and drinking, at each visit to hospital.

The management of anorexia and cachexia should involve identifying reversible causes (e.g. dry or painful mouth, oral candida, nausea and vomiting, pain). Refer to a dietitian for advice. Nutritional supplement drinks may be appropriate to improve nutritional intake. Supplements enriched with fish oils (namely, eicosapentaenoic acid) may be of benefit but current evidence is conflicting.

Corticosteroids improve appetite and sense of well-being, but do not result in weight gain. The effect is short lived. Their effect on appetite should be reviewed after a defined period (e.g. 1 week) and discontinued if ineffective. If beneficial, the dose should be reduced after a period (e.g. 1 month).

Progesterones increase appetite and weight gain but in relatively high doses. The therapeutic effect may take weeks to become apparent. Suggested doses are megestrol acetate 160–480mg per day.

15.2.13 Hypertrophic pulmonary osteoarthropathy

This can be improved upon by treatment for the cancer but also by an infusion of bisphosphonates.

16 The Lung Cancer CNS/Key Worker

All cancer units/centres should have one or more trained lung cancer CNSs to see patients before and after diagnosis, to provide continuing support, and to facilitate communication between the secondary care team (including the MDT), the patient's GP, the community team and the patient. Although the role of key worker is not strictly that of the CNS, the key worker competencies (as adapted by the North West London Cancer Network) mimic that of the CNS role (see Appendix 5). The role includes helping patients to access advice and support whenever they need it.

“A consultation with the lung cancer nurse specialist should include a detailed assessment of the patient's physical, psychological, social and emotional concerns either during or following the diagnostic process. The nature of follow up consultations will depend on the complexity of the patient's needs and also local arrangements.”

(National Lung Cancer Forum for Nurses (NLCFN) 2004)

The activities of the lung cancer CNS falls into four distinct categories, as agreed by the NLCFN. These are:

- clinical
- developmental
- education
- professional leadership.

All patients newly diagnosed with lung cancer and malignant pleural mesothelioma have access to a lung cancer CNS as the main key worker.

The lung cancer CNS is involved in all aspects of the disease journey, from pre-diagnosis to end of life care, in both out- and inpatient settings. The CNS has a pivotal role in the MDT, ensuring that appropriate professionals are involved and working across boundaries in an effort to provide seamless care and support for patients and carers.

The responsibilities of the lung cancer CNS include providing both telephone and face-to-face support and advice. The contacts are often in conjunction with follow-up with the medical/oncology team, offering extra support as needed, or instead of outpatient appointments, freeing up valuable time in the oncology/medical clinics.

The lung cancer CNS will be actively involved in the nine key elements according to NLCFN guidelines (NLCFN 2012), identified as significant by cancer patients.

These include:

- an holistic approach to care
- getting the bad news
- care coordination
- responsiveness and ease of access to benefits and support
- inpatient care
- pain control and symptom management
- staff attitudes and empathy

- end of life choice and the actual experience
- carer focus.

NICE guidelines (2012/QS17) recommended that patients be offered access to protocol driven follow-up, led by the lung cancer CNS. The emphasis on the purpose of follow-up will depend on which modality of treatment has been given. Treatment with curative intent will have more emphasis on detection of recurrent disease whereas active treatment with palliative intent may have more of a focus on detection of disease progression and symptom control. If no active treatment has been offered, then follow-up will be directed towards symptom control.

Good communication between healthcare professionals and patients is essential. It should be supported by evidence-based written information tailored to the patient's needs. Treatment and care, and the information patients are given about it, should be culturally appropriate.

All patients seen within the LCA with a diagnosis of lung cancer will be given the name and contact details of a key worker. It is the responsibility of this key worker to refer on to a new key worker when:

- a patient's care and follow-up is taken over by another hospital
- a patient's care is handed over to a community or hospital palliative care team.

16.1 Team membership

The lung cancer CNSs within the LCA have joined together to form the LCA Lung CNS Forum. This forum, where possible, is to be attended by all the lung cancer CNSs within the LCA on a 3-monthly basis. The forum will provide a lead on service development and provision, establish best practice and support the implementation of the LCA Lung Cancer Clinical Guidelines.

The objectives set for 2013/14 are:

- the piloting of the LCA HNA tool
- the development of patient experience monitoring tools/surveys to capture patient experience/satisfaction
- providing education across the LCA for ward-based nursing staff
- exploring the introduction of additional support groups for LCA lung cancer patients/carers.

16.2 Patient information

All patients with a diagnosis of lung cancer should be offered clear and comprehensive information, both verbal and written, on all aspects of their diagnosis, treatment and care. This information will be tailored to the individual requirements of the patients and their carers. Audio and videotaped formats will also be considered. This information should cover:

- referral
- investigations
- diagnosis
- MDT and key worker details
- treatment
- after treatment

- symptom control
- psychological support
- bereavement.

The National Cancer Action Team introduced information prescriptions (IPs) across the country to provide standardised, personalised information for patients and their carers. This is a national resource accessed via the NHS Choices website. In those Trusts across the LCA which have access to IPs, this should be considered the written information of choice. Individual Trusts will use leaflets when giving information for local procedures. Patients with lung cancer should be signposted to local sources of support and written information from the Roy Castle Lung Foundation and Macmillan Cancer Support where IPs are not available.

16.3 Holistic needs assessment

The LCA Lung Cancer CNS Forum acknowledges the need for an holistic approach to the assessment of lung cancer patient and their carers. The recommendation of the NLCFN (*Guidance for the supportive and palliative care of Lung Cancer and mesothelioma patients and their families, 2012*) states:

“Ensure all lung cancer patients and carers with palliative and end of life care needs are identified and their physical, social, emotional and spiritual needs are appropriately assessed and reviewed.

Ensure individualised care plans are developed and implemented in conjunction with the patients and carers taking into account their needs, wishes and preferences.”

The LCA Survivorship Group has recommended the adoption of an HNA tool (see Appendix 7) based on a distress thermometer and concerns checklist. The group has chosen to measure its use within 31 days of diagnosis and within 6 weeks of primary treatment.

The LCA Lung Cancer CNS Forum will pilot this HNA tool and will work with the LCA Survivorship Group to ensure that lung cancer patients and their carers receive appropriate assessment and support.

17 Lung Cancer Survivorship Guidelines

As cancer treatments become more effective, more people are living with and beyond cancer with specific needs as a direct result of the cancer and its treatment. The consequences of cancer treatment are dependent on multiple factors and affect each person differently. Consequences may be physical (e.g. cardiovascular conditions, impact on fertility, bone health and gastro-intestinal); emotional and psychological (e.g. anxiety, self-confidence and depression); social; spiritual; or cognitive. They can have an impact on every aspect of a person and on their family's lives, from the ability to work, through to the ability to have a family or to participate in social activities. It is widely acknowledged that cancer survivors have a multitude of unmet needs following treatment, with a majority still having some needs 6 months later. Good survivorship care enables the person to live as full and active a life as possible.

Survivorship can be defined as:

“cover[ing] the physical, psychological and economic issues of cancer, from diagnosis until end of life. It focuses on the health and life of a person with cancer beyond the diagnosis and treatment phases. Survivorship includes issues related to the ability to get healthcare and follow-up treatment, late effects of treatment, second cancer and quality of life. Family members, friends and caregivers are also part of the survivorship experiences.”

National Cancer Institute, Dictionary of Cancer Terms, definition of 'survivorship'
(www.cancer.gov/dictionary?Cdrid=445089)

The National Cancer Survivorship Initiative (NCSI) vision document (DH 2010) mandated five shifts in care for individuals completing cancer treatment. NCSI advocates cancer being treated as a chronic illness, with patients empowered and supported to take an active role in their care. *Improving Outcomes: a Strategy for Cancer* (DH 2011) states that people living with and beyond a cancer diagnosis should have their full needs addressed to prevent long-term disability, enabling them to live a full, active, good quality life for as long as possible. Work within the NCSI has to date focused on survivorship from the end of treatment, but its report, *Living With and Beyond Cancer: Taking Action to Improve Outcomes* (DH 2013), acknowledges that survivorship care from the point of diagnosis is also vital. It challenges services to develop further and focuses on five new areas:

- information and support from diagnosis
- promoting recovery
- sustaining recovery
- managing consequences
- supporting people with active and advanced disease.

The importance of good survivorship care is well known: those who have unmet needs are 20% more likely to visit their GP and twice as likely to attend A&E than their healthy counterparts. They are more likely to be unemployed and many report economic hardship. Much has been achieved both nationally and locally to address this agenda. It is essential that in the LCA our patients have access to high-quality, equitable survivorship services on a par with the best in the country. We will continue to build on the successes to date.

The Consequences of Cancer and its Treatment (CCaT) collaborative group (a Macmillan Community of Interest) produced a '10 Top Tips' guidance document for patients. These cover the key components of

good survivorship care, and the LCA expects services to address these areas. The following nine points for professionals are based on the CCaT's work.

17.1 Discuss a person's needs.

The holistic needs assessment (HNA) has been shown to be effective in identifying a person's areas of concern. It can take many forms and the LCA has developed its own tool, based on the concerns checklist and distress thermometer. The tool allows patients to specify what is of most concern to them, and so directs subsequent discussion and intervention to addressing these needs. It has scope to cover physical, emotional, spiritual, finance and welfare, and practical concerns. It is anticipated that as the HNA becomes embedded within the pathway, patients will start to ask for an HNA and professionals need to be able to respond to this.

Recommendation: Every patient should be offered an HNA at key pathway points, including at diagnosis and end of treatment, and whenever a person requests one.

17.2 Provide a treatment summary and care plan

A **treatment summary** provides a summary of the cancer treatments received by the end of first treatment, planned follow-ups (including mechanisms for these) and signs and symptoms of which to be aware. Their aim is to provide information not only to the patient, but also to the GP about possible consequences of cancer and its treatment, signs of recurrence and other important information.

A **care plan** is generated as a result of an HNA and is the agreed plan between the patient and healthcare professional about how the identified areas of concern will be addressed. This may cover provision of information (e.g. through an information prescription), onward referral for specialist assessment and intervention (e.g. breathlessness management), or things which the patient themselves can do (e.g. contact their HR department about graduated return to work options).

Recommendations: An end of treatment consultation should be offered to every patient. This should include an end of treatment HNA and associated written care plan, and should also include the discussion and provision of a comprehensive treatment summary.

In addition, following treatment all patients should be assessed for chest symptoms which may not be related to their lung cancer. If a patient has COPD, a referral back to GP or chest physicians should be considered for management of COPD.

17.3 Provide a main contact

Several pieces of UK-wide work have shown the necessity of a key contact, or key worker, not least the national Cancer Patient Experience Survey. It is now agreed that both patients and GPs (and other healthcare professionals) benefit from having a named person to contact if they need help or advice about issues related to the consequences of cancer and its treatment.

Recommendation: The treatment summary should include the details of a key worker in addition to details of who to contact out of hours. This should be sent to the GP, the patient and any others whom the patient identifies as necessary.

17.4 Identify post-treatment symptoms

As discussed above, cancer and its treatments can have far-reaching consequences and people with associated unmet needs are more likely to access healthcare services than their healthy counterparts. Providing information on likely post-treatment symptoms (e.g. neuropathic pain following thoracic surgery or peripheral neuropathy following chemotherapy), and how these can be managed or avoided, allows people to seek the right help from the right people at the right time.

Recommendation: Information on anticipated or possible consequences of cancer treatment and what to do if they occur should be routinely provided to all patients. This should be done from the time of discussion of treatment onwards, with the information clearly reiterated during the end of treatment consultation.

17.5 Provide support about day-to-day concerns

Life changes following a cancer diagnosis. It is recognised that people need help and support to find a 'new normal'. This may cover any one of a multitude of aspects, from work and education, through to financial worries and needing help with caring responsibilities. Help should be offered at all key points in the pathway, but may be of particular relevance at the end of treatment and may well be highlighted in the HNA. There are various options for written information provision (e.g. Macmillan Cancer Support information leaflets and information prescriptions) as well as some specialist services (e.g. Citizens Advice). Reports published by the NCSI, available on the NCSI website, may be of use to professionals.

Recommendation: Patients should be routinely asked about whether they need support with day-to-day issues and referrals made to specialist services when necessary.

17.6 Talk about how you feel

Having a cancer diagnosis has an emotional impact, and at the end of treatment people experience a wide range of emotions. Sometimes, these can be dealt with by the person alone or with support from the key worker and others, but some people will need referral to psychological support services. This may be true not only for patients but their family and carers too.

Recommendation: Use an HNA to identify emotional concerns. Further screening tools (e.g. the Hospital Anxiety and Depression Scale) should be considered, with subsequent referrals made as necessary.

17.7 Healthy lifestyle

There is a growing body of evidence which supports the adoption of a healthy lifestyle for those who have had a cancer diagnosis.

17.7.1 Smoking cessation

Tobacco smoking is the main cause of preventable morbidity and premature death in England. End of treatment provides an opportunity to deliver stop smoking interventions at a point at which an individual may be more susceptible to health advice and hence more motivated to quit.

Recommendation: All current smokers should be asked about their smoking habit and offered smoking cessation advice with onward referral to local services as necessary.

17.7.2 Diet

The role that diet can play in cancer incidence has been widely documented. However, with smoking being the major risk factor for lung cancer, it is difficult to establish the much weaker relationship between dietary factors and the development of lung cancer. The nutritional issues during or following treatment include weight loss or gain; changes in body composition (e.g. loss of muscle mass); and particular eating difficulties (e.g. anorexia, swallowing problems, taste changes and limited capacity for food). There are also longer term side effects that can arise from treatment (e.g. oesophageal strictures as a result of high dose radiotherapy).

With lung cancer, the completion of one treatment is often closely followed by the initiation of another (e.g. adjuvant chemotherapy following surgery; sequential radiotherapy following chemotherapy or surgery) and therefore dietary advice should be focused on maintaining weight and strength and optimising nutritional intake where the symptoms or side effects of treatment may make this difficult. Due to the large proportion of lung cancer patients presenting with advanced disease, they are often managed palliatively with a focus on symptom control and quality of life; dietary advice should fall in line with these goals.

In those who are treated with a curative intent, diet and lifestyle advice should be focused on preventing recurrence or the development of other cancers/chronic diseases; advising on the WCRF (2007) dietary recommendations may be appropriate. However, many lung cancer patients would already have had co-morbidities at presentation, including COPD, and it is important that, when providing healthy eating advice, there should remain a focus on adequate calorie and protein intake to maintain/restore lean body mass, in particular with those who have a low body mass index (BMI).

Recommendation: Patients are provided with dietary advice, based on the WCRF recommendations, at the end of treatment with referral to specialist dietitians as needed.

17.7.3 Physical activity

There has been a dramatic rise in the amount of high-quality published research on the role of exercise in cancer in recent years. Physical activity results in improvement in quality of life, fitness and function and symptoms related to cancer and its treatments. It reduces cancer recurrence, incidence of second cancers and reduces both all-cause and cancer-specific mortality.

There is wide consensus that cancer survivors should exercise to the same level as the general population for health benefits. Research suggests that a combination of cardiovascular and muscular strength training has additional benefits over and above undertaking only one type of exercise.

Recommendations: Patients should be encouraged to maintain or increase their level of physical activity both during and after treatment in line with national guidance. They should be referred for specialist assessment by a physiotherapist as necessary

Patients should also be offered access to a health promotion event, such as a health and well-being clinic, at the end of treatment.

17.7.4 Pulmonary rehabilitation

Definition:

“Pulmonary rehabilitation is an evidence-based, multidisciplinary, and comprehensive intervention for patients with chronic respiratory diseases who are symptomatic and often have decreased daily life activities. Integrated into the individualized treatment of the patient, pulmonary rehabilitation is designed to reduce symptoms, optimize functional status, increase participation, and reduce health-care costs through stabilizing or reversing systemic manifestations of the disease. Comprehensive pulmonary rehabilitation programs include patient assessment, exercise training, education, and psychosocial support.”

(American Thoracic Society/European Respiratory Society 2006)

There is evidence to support the use of pulmonary rehabilitation in patients with lung cancer, particularly in the context of promoting cancer survivorship post-treatment. Evidence demonstrates improved quality of life and fitness levels. The generally accepted description for patients suitable for pulmonary rehabilitation suggests patients with long-standing dyspnoea secondary to a respiratory diagnosis. As pulmonary rehabilitation tends to involve a programme of exercises and education sessions, the patients may need individual assessment for suitability for referral.

Pulmonary rehabilitation programmes utilise expertise from various healthcare disciplines that is integrated into a comprehensive, cohesive programme tailored to the needs of each patient; a multidisciplinary approach is therefore recommended. Referral should be according to local working practices and guidelines.

Recommendation: Lung cancer patients should be referred for specialist assessment to a pulmonary rehabilitation service.

17.8 Self-managed follow-up

There is a move towards increased self-management and follow-up closer to home. This has clear benefits to patients, including reduced anxiety in the lead-up to routine appointments and less interference in their day-to-day life caused by travelling to hospitals. In addition, research has shown that recurrence is more likely to be detected by the patient themselves between appointments, rather than at the outpatient appointment. By reducing unnecessary appointments, Trusts are able to see new patients more quickly and spend more time with more complex patients.

For self-management to be effective, patients need to be given the right information about the signs and symptoms of recurrence and clear pathways to follow if they have concerns. They should also be guaranteed a fast, explicit route to re-access services if necessary. A telephone helpline is suggested, which should be staffed by senior, experienced staff.

Recommendation: In addition to the use of treatment summaries (as described above), services should investigate the feasibility of rolling out self-managed/patient-led follow-up.

17.9 Encourage survivors to share their experience

Sharing the experience of living with and beyond cancer can be beneficial to the patients themselves, their carers and others who have a cancer experience. Providing feedback on their experience, and volunteering and participation in research can all have a positive impact on the patient.

Recommendation: Patients should be offered information about local support groups and where they can access further information on sharing their experiences.

To summarise, these guidelines set out how to best address survivorship care, based on best available evidence, current national policy and guidance and in response to work such as the national Cancer Patient Experience Survey.

Appendix 1: Urgent Suspected Lung Cancer Referral Forms

South West London Referral Form

SOUTH WEST LONDON CANCER NETWORK How to make urgent referrals for suspected lung cancers	
Please FAX / EMAIL this form to the Cancer Office at the relevant hospital, with or without an accompanying letter. E-Mails MUST be sent from a NHS.net address. Please ensure that the referral reaches the hospital within 24 hours of the GP's decision to refer.	
Epsom and St Helier NHS Trust Epsom General Hospital Dorking Road, Epsom Surrey KT18 7EG FAX: 020 8296 2741 TEL: 020 8296 2742	Epsom and St Helier NHS Trust St Helier Hospital Wrythe Lane, Carshalton Surrey SM5 1AA FAX: 020 8296 2741 TEL: 020 8296 2742
Croydon Health Services NHS Trust Croydon University Hospital London Road, Croydon Surrey CR7 7YE FAX: 020 8401 3337 TEL: 020 8401 3986	St George's Healthcare NHS Trust St George's Hospital Blackshaw Road, Tooting London SW17 0QT FAX: 020 8725 0778 TEL: 020 8725 1111 E-MAIL : cancerreferraloffice@stgeorges.nhs.uk
Kingston Hospital NHS Trust Kingston Hospital Galsworthy Road Kingston KT2 7QB FAX: 020 8934 3306 TEL: 020 8934 3305	Kingston Hospital NHS Trust Queen Mary's Hospital Roehampton Lane London SW15 6PN FAX: 020 8812 7937 TEL: 020 8487 6037 / 6032

SOUTH WEST LONDON CANCER NETWORK Suspected Lung Cancer Referral Form (NICE 2006)	
Urgent Referrals Criteria (Please tick category) Urgent referral for a chest x-ray: <ul style="list-style-type: none"> Haemoptysis <input type="checkbox"/> Unexplained changes in existing symptoms in patients with chronic respiratory problems, or new persistent problems (more than 3 weeks) <input type="checkbox"/> Cough, chest or shoulder pain, dyspnoea, weight loss, chest signs, hoarseness, finger clubbing, features suggesting a metastasis from the lung, persistent cervical or supraclavicular lymphadenopathy, fatigue Urgent suspected cancer 2 week wait faxed referral to Chest Physician - any of the following: LG1 Chest x-ray suggestive or suspicious of lung cancer <input type="checkbox"/> LG2 Persistent haemoptysis in smokers/ex-smokers over 40 years of age <input type="checkbox"/> LG3 Signs of superior vena caval obstruction <input type="checkbox"/> LG4 Stridor (consider emergency referral for admission) <input type="checkbox"/> X-ray result: - must be attached Abnormal <input type="checkbox"/> Attached <input type="checkbox"/> NB: If the chest x-ray is normal and the GP is still concerned or suspicious then an urgent referral should be made.	Date of GP decision to refer: _____ No of pages faxed: _____ GP DETAILS GP Name & Initials: _____ GP Practice Code: _____ Address: _____ Post Code: _____ Telephone No: _____ Fax No: _____ PATIENT DETAILS Last Name: _____ First Name: _____ Address: _____ Post Code: _____ Daytime Tel or Mobile: _____ Gender: M <input type="checkbox"/> F <input type="checkbox"/> Date of Birth: _____ Age: _____ Interpreter required? Y / N Language: _____ Ethnicity: _____ Hospital No: _____ NHS No: _____ COMMENTS/OTHER REASONS FOR URGENT REFERRAL _____ Patient Awareness Questions: 1. Has the patient been made aware of the nature of their referral? Yes <input type="checkbox"/> No <input type="checkbox"/> 2. Has the patient been supplied with supportive information about the Urgent Suspected Cancer referral process? Yes <input type="checkbox"/> No <input type="checkbox"/> 3. Have you asked the patient if they will be available to attend an appointment within the next two weeks? Yes <input type="checkbox"/> No <input type="checkbox"/> 4. Has the patient indicated to you that they would be available to attend an appointment within the next two weeks? Yes <input type="checkbox"/> No <input type="checkbox"/>

South East London Referral Form

SOUTH EAST LONDON CANCER NETWORK Information to support Lung referrals

Refer urgently patients with:

- Persistent haemoptysis in smokers or ex-smokers aged 40 years and older.
- A chest X-ray suggestive of lung cancer (including pleural effusion and slowly resolving consolidation).
- A normal chest X-ray where there is a high clinical suspicion of lung cancer.
- A history of asbestos exposure and recent onset of chest pain, shortness of breath or unexplained systemic symptoms where a chest X-ray indicates pleural effusion, pleural mass or any suspicious lung pathology.

↳ Use this [protocol](#) to refer urgently (2 Week Wait)

Refer urgently* for a chest X-ray patients with:

* the report should be returned within 5 working days

- Haemoptysis.
- Unexplained or persistent (>3 wks)
 - o Chest and/or shoulder pain
 - o Dyspnoea
 - o Weight loss
 - o Chest signs
 - o Hoarseness
 - o Finger clubbing
 - o Cervical or supraclavicular lymphadenopathy
 - o Cough
- Features suggestive of metastasis from a lung cancer (e.g. brain, bone, liver, skin).
- Underlying COPD with unexplained changes in existing symptoms.
- Chest pain, breathlessness in a patient known to have asbestos exposure.

↳ Follow local procedures for urgent chest X-rays

Refer immediately (acute admission) patients with:

- Signs of superior vena cava¹ obstruction (swelling of the face/neck with fixed elevation of jugular venous pressure).
- Stridor.

↳ Refer to hospital immediately by phone / A&E

Risk factors:

- All current or ex-smokers.
- Patients with COPD.
- People who have been exposed to asbestos.
- People with a previous history of cancer (especially head and neck).

An urgent referral for a chest X-ray or to a specialist can be considered sooner in these patients (for example, if signs and symptoms have lasted less than 3 weeks).

Patient information and support:

Consider the information and support needs of patients and the people who care for them while they are waiting for the referral appointment. Resources for GPs to use are available from the Cancer Network on 020 7693 0160, or visit our website www.seclcn.nhs.uk.

¹ Approved by the South East London Cancer Network in November 2006. For comments or additional copies contact the Network on Tel: 020 7188 7090 / Fax: 020 7188 7020, or visit www.seclcn.nhs.uk

SOUTH EAST LONDON CANCER NETWORK Lung Urgent Suspected Cancer Referral

Please tick the box of the hospital clinic you are referring to and fax this form to the relevant Urgent Referral Team within 24 hours. Guidelines are on the reverse side.

- | | | |
|---|--|---|
| <input type="checkbox"/> Princess Royal
Fax: 01689 863197
Tel: 01689 866876 | <input type="checkbox"/> Queen Elizabeth
Fax: 020 8836 4035
Tel: 020 8836 5964/5 | <input type="checkbox"/> Guy's & St Thomas'
Fax: 020 7188 0923
Tel: 020 7188 0902 |
| <input type="checkbox"/> King's College
Fax: 020 3299 1615
Tel: 020 3299 1516 | <input type="checkbox"/> Lewisham
Fax: 020 8333 3451
Tel: 020 8333 3490 | <input type="checkbox"/> Queen Mary's
Fax: 020 8308 9264
Tel: 020 8308 9230 |

SECTION 1 - PATIENT INFORMATION. PLEASE COMPLETE IN BLOCK CAPITALS

SURNAME	First name	Initials	Date of referral
FIRST NAME	NHS Number	Hospital Number	Referring GP
Gender	M, F	D.O.B.	Telephone
Address	Patient aware the referral is urgent?		Fax
Daytime Telephone	Post Code	Interpreter required?	Post Code
	Home Telephone (if different) / Mobile No.	Transporter required?	

SECTION 2 - PRACTICE INFORMATION. USE PRACTICE STAMP IF AVAILABLE

Referring GP	Date of referral
Practice Address	Telephone
Post Code	Fax

SECTION 3 - CLINICAL INFORMATION. PLEASE TICK THE RELEVANT BOXES

Haemoptysis <input type="checkbox"/> None <input type="checkbox"/> Once <input type="checkbox"/> Persistent	<input type="checkbox"/> Chest and/or shoulder pain <input type="checkbox"/> Dyspnoea <input type="checkbox"/> Hoarseness	<input type="checkbox"/> Weight loss Amount: _____ Over period: _____	<input type="checkbox"/> Cough <input type="checkbox"/> Changes in underlying chronic respiratory problems
<input type="checkbox"/> Current/ex-smoker <input type="checkbox"/> Asbestos exposure <input type="checkbox"/> COPD	History <input type="checkbox"/> Prior cancer diagnosis Date Diagnosed: _____	Clinical Examination <input type="checkbox"/> Chest signs <input type="checkbox"/> Signs of SVCO <input type="checkbox"/> Signs of metastases	<input type="checkbox"/> Finger clubbing <input type="checkbox"/> Cervical LNS
Chest X-ray Results			Additional Information

Continue on separate sheet, and attach patient 5001988/record summary if available. www.seclcn.nhs.uk

North West London Referral Form

URGENT SUSPECTED LUNG CANCER REFERRAL FORM			
PLEASE ENSURE THAT THIS FORM IS ATTACHED TO YOUR CHOOSE AND BOOK REFERRAL			
Hospital to which patient is being referred:			
Patient details		GP Details	
NHS No:		Dr:	
Surname:		Address:	
First Name:			
Age / D.O.B:		Tel:	Fax:
Address:		Email:	
Postcode:		Date of decision to refer:	
Tel day:	Tel eve:	Signature:	
Have you informed the patient that you suspect lung cancer?		Y / N	
Have you given the patient the 2WW information leaflet		Y / N	
Have you told the patient they will be seen within 2 weeks?		Y / N	
Has the patient had a previous diagnosis of cancer?		Y / N (Specify if known)	
Has the patient previously visited this hospital? Y / N		First language:	
Hospital number (if known):		Interpreter required? Y / N	
Symptoms and Clinical Findings			
Presenting complaint / New symptoms:			
Chest X-ray: <i>Urgent Chest X-ray must be done for patients referred under these guidelines</i>			
Chest X-ray requested	<input type="checkbox"/>	Chest X-ray done, report not yet received	<input type="checkbox"/>
Chest X-ray done, report received	<input type="checkbox"/>	Fax report with this form	
Date		Where.....	
Abnormal suspicious of cancer	<input type="checkbox"/>	Abnormal other	<input type="checkbox"/>
CXR Report			
COPD / Smoking:			
History of COPD	<input type="checkbox"/>	Current Smoker	<input type="checkbox"/>
Ex Smoker	<input type="checkbox"/>	Number of pack years.....	
Symptoms:			
Persistent Haemoptysis in smoker or ex smoker > 40 years	<input type="checkbox"/>		
Unexplained or persistent (>3 weeks) symptoms			
Cough	<input type="checkbox"/>	Wheeze	<input type="checkbox"/>
Weight loss			<input type="checkbox"/>
Chest / shoulder pain	<input type="checkbox"/>	Hoarseness	<input type="checkbox"/>
Chest signs			<input type="checkbox"/>
Finger clubbing	<input type="checkbox"/>		
Lymphadenopathy cervical or supraclavicular or features of metastasis from lung cancer			<input type="checkbox"/>
Additional Information: Include any investigations arranged or results obtained and any other information you think is relevant.			
Continue on a separate sheet if necessary ensuring patient details and referring doctor's name are on additional sheets			

North West London Hospitals NHS Trust Fax: 020 8235 4188 Tel: 020 8235 4293	Imperial College Healthcare NHS Trust Fax: 020 3312 1580 Tel: 020 3312 1527	Chelsea and Westminster NHS Foundation Trust Fax: 020 3315 8814 Tel: 020 3315 2687
Ealing Hospital NHS Trust Fax: 020 8967 5005 Tel: 020 8967 5000, x3921	Hillingdon Hospital NHS Trust 2WW fax line : 01895 279807 Tel: 01895 279266 Alternate Fax: 01895 279890	Royal Brompton and Harefield Hospitals NHS Trust Royal Brompton Hospital Fax: 020 7351 8085 Tel: 020 7351 8021 Harefield Hospital Fax: 01895 828948 Tel main: 01895 828692 Tel 2: 01895 828690
West Middlesex University Hospital NHS Trust Fax: 020 8321 5157 Tel: 020 8321 6776		

Draft LCA Urgent Suspected Lung Cancer Referral Form



DRAFT LCA URGENT SUSPECTED CANCER REFERRAL FORM (LUNG)

Please X the corresponding box for the hospital the referral is being made to and FAX to the Urgent Referral Team within 24 hours

Charing Cross Hospital (Imperial) Fax: 020 3312 1580	c	Harefield Hospital Fax: 01895 828580	c	Queen Elizabeth Hospital, Woolwich Fax: TBC	c
Chelsea and Westminster Hospital Fax: TBC	c	Hillingdon Hospital Fax: 01895 279807	c	Queen Mary's Hospital, Roehampton Fax: 020 8812 7937	c
Groydon University Hospital Fax: 020 8401 3337	c	Kings College Hospital Email: kch-tr.cancerdata@nhs.net	c	Royal Brompton Hospital Fax: 02073518021	c
Central Middlesex Hospital Fax: TBC	c	Kingston Hospital Fax: 020 8934 3306	c	St Georges Hospital Fax: 0208 725 0778	c
Ealing Hospital Fax: 020 8967 5005	c	Lewisham Hospital Fax: 020 8333 3451	c	St Helier Hospital Fax: 020 8296 2741	c
Epsom Hospital Fax: 020 8296 2741	c	Northwick Park Hospital Fax: TBC	c	St Marys Hospital (Imperial) Fax: 020 3312 1580	c
Guys & St Thomas' Hospital Fax: 020 7188 0923	c	Princess Royal University Hospital Fax: TBC	c	West Middlesex Hospital Fax: 020 8321 5157	c

Patient Details		GP Details	
NHS No:		Dr:	
Surname:		Address:	
First Name:			
Age/ D.O.B:		Tel:	Fax:
Address:		Email:	
Postcode:		Date of decision to refer:	
Tel home:		Signature:	
	Tel mob: Consent to text: Y <input type="checkbox"/> N <input type="checkbox"/>		
Have you informed the patient that you suspect lung cancer? Y <input type="checkbox"/> N <input type="checkbox"/> Have you told the patient that they will be seen within 2 weeks? Y <input type="checkbox"/> N <input type="checkbox"/> <i>(specify if known)</i> Have you given the patient written info about the 2 week wait? Y <input type="checkbox"/> N <input type="checkbox"/>			

Has the patient previously visited the hospital? Y <input type="checkbox"/> N <input type="checkbox"/>	Interpreter required? Y <input type="checkbox"/> N <input type="checkbox"/>
Hospital number (if known):	Language:

Symptoms and Clinical Findings	
Symptoms:	
Symptoms first noted (time period)	c
Haemoptysis in smoker or ex smoker aged > 40 years	c
Unexplained or persistent (>3 weeks) symptoms	c
Cough	Wheeze/Dyspnoea c
Weight loss	Hoarseness c
Chest/shoulder pain	Chest signs c
Finger clubbing	c
Lymphadenopathy cervical or supraclavicular	c
Features of metastasis from lung cancer, e.g. bone pain, neurological symptoms	c
PMH and Additional Clinical Information: Include any investigations arranged or results obtained, and any other information you think relevant.	
History of COPD	Dementia c
Renal failure	Diabetes c
Medication list attached	Patient medical history attached c
Chest X-ray: Urgent chest x-ray must be done for patients referred under these guidelines	
Chest X-ray requested	Y <input type="checkbox"/> N <input type="checkbox"/>
Where/date requested	
Abnormal suspicious of cancer	Abnormal other c
CT report	Y <input type="checkbox"/> N <input type="checkbox"/>
Please fax report X-ray or CT report with form	
Recent blood tests (FBC, U&E, LFTs, Ca):	
Available	c
Requested	c
COPD/Smoking:	
History of COPD	c
Current Smoker	c
Ex Smoker	c
Have you referred to for smoking cessation services	Y <input type="checkbox"/> N <input type="checkbox"/>
Continue on a separate sheet if necessary ensuring patient details and the referring doctor's name are on additional sheets.	

Appendix 2: Systemic Anti-cancer Therapy in Lung Cancer

Please refer to local Trust policies and guidelines for doses of drugs administered, approved blood parameters for drug administration, supportive care medication, criteria for dose modification or dose delay, and management of drug toxicities. Drugs may be funded via NICE, the Cancer Drugs Fund, co-payment, or local Trust business case.

ADMINISTRATION

Gefitinib is usually prescribed at a dose of 250mg daily as per NICE 2010/TA192. Given as 28-day cycle.

Erlotinib is usually prescribed at a dose of 150mg daily as per NICE 2012/TA258. Given as 28-day cycle.

Pemetrexed is usually given at a dose of 500mg/m² every 21 days with Vitamin B12 intramuscular and folic acid oral supplementation, and dexamethasone prophylaxis, as per NICE 2010/TA190, or NICE 2009/TA181.

Topotecan is usually given every 21 days at a dose of 2.3mg/m² orally days 1–5, as per NICE 2009/TA184.

The following are recognised by NICE 2011/CG121 as treatment options:

- **Cisplatin** is usually given every 21 days at a dose of 75–80mg/m².
- **Carboplatin** is usually given every 21 days at a dose of AUC5.
- **Gemcitabine** is usually given on days 1 and 8 of a 21-day cycle at doses 1,000–1,250mg/m².
- **Vinorelbine** is given either PO or IV, usually on days 1 and 8 of a 21-day cycle at usual doses of 25mg/m² (IV) or 60mg/m² (PO) and 30mg/m² (IV) or 80mg/m² (PO).
- **Docetaxel** is usually given at 60–75mg/m² IV every 21 days.
- **Paclitaxel** is usually given every 21 days at a dose of 175–225mg/m².
- **Etoposide** is usually given on days 1–3 every 21 days, at a dose of 100mg/m² IV on day 1 and then either 100mg/m² OD IV or 100mg/m² BID PO on days 2 and 3.
- **Etoposide** may be given orally every 21 days at a usual dose of 50mg BID days 1-14.

Other regimes include:

- **MVP** (mitomycin 6mg/m², vinblastine 6mg/m², cisplatin 50–75mg/m²) and usually given every 21 days.
- **ACE** (doxorubicin 50mg/m², cyclophosphamide 600mg/m², etoposide 100mg/m²) and usually given every 21 days.
- **CAV** (doxorubicin 50mg/m², cyclophosphamide 750mg/m², vincristine 2mg) and usually given every 21 days.

Appendix 3: SCLC Chemotherapy Regime – Oral Etoposide

AIM

Palliative therapy for patients with poor performance status.

ADMINISTRATION

Days 1–14, 50mg orally BD every 3 weeks.

MONITORING

Baseline: FBC and electrolytes/creatinine

Day 1 each cycle: proceed if Hb >10g/dl, neutrophils >1.5 x 10⁹/l, platelets >100 x 10⁹/l. If not, defer 1 week.

DOSE REDUCTION

Discuss with consultant oncologist.

PRESCRIBERS

Only consultants and specialist registrars in oncology.

Senior house officers/non-medical prescribers (NMPs) can prescribe subsequent course if there is no change in dose and the patient has been discussed with specialist registrar/consultant.

COMMON SIDE EFFECTS

Neutropenia and sepsis, thrombocytopenia, anaemia, alopecia, diarrhoea.

Platinum-Gemcitabine

As per NSCLC (see Chapter 12).

Appendix 4: Radiotherapy: Radiotherapy Normal Tissue Delineation and Tolerances for Radical Treatment

Values given are for a 2Gy per fraction schedule. For alternative fractionation, adjustments should be made for radiobiological equivalence.

- **Normal lung:** $V_{20} \leq 30\text{--}35\%$, $D_{\text{mean}} \leq 18\text{Gy}$. The normal lung consists of both lungs considered together as one organ but excluding the GTV/CTV/ITV. It is important to ensure that both lungs are contoured from apex to base and care should be taken to exclude the trachea and proximal bronchi.
- **Spinal cord:** $D_{\text{max}} \leq 46\text{Gy}$. The spinal canal will be contoured and taken to represent the cord. The spinal cord PRV should be created by expanding the canal appropriately for local set-up.
- **Oesophagus:** Ideally $D_{\text{mean}} < 34\text{Gy}$, $V_{60} < 30\%$, treated length $< 13.5\text{cm}$, $D_{\text{max}} < 58\text{Gy}$. The oesophagus should be contoured from the cricoid cartilage to the gastro-oesophageal junction.
- **Heart:** $V_{40} < 100\%$, $V_{60} < 33\%$. The heart including the pericardium will be contoured. The cranial extent should include the infundibulum of the right ventricle and the apex of both atria. The caudal extent should be defined by the lowest part of the left ventricle's inferior wall that is distinguishable from the liver.

Appendix 5: Competencies for Key Worker Role

- Work as an integral member of the multidisciplinary team to ensure continuity of patient care.
- Initiate and participate in case conferences with all professionals involved in the delivery of patient care.
- Communicate and coordinate information to patients and carers, evaluating their levels of understanding and utilising a range of skills/techniques to overcome any communication difficulties.
- Demonstrate ability to verbally summarise patient information to facilitate understanding.
- Act as an advocate for the patient.
- Act as a communication resource and coordinator for other members of the multiprofessional team in the care of the key worker's patient caseload.
- In conjunction with the MDT, provide patients with comprehensive information on the options available to them for treatment and care. Utilise their specialist knowledge and skills regarding disclosure of information.
- Coordinate the onward referral of patient and/or family members to appropriate clinical or support services.
- Ensure accurate follow-up documentation is maintained, including any changes in the named key worker.
- Utilise support strategies and interventions available to care for patients with complex needs, for example patient exhibiting denial/anger following a cancer diagnosis, adverse reactions to alteration in body image or reaching end of life.
- Demonstrate knowledge of holistic care relating to areas across the patient journey such as screening, curative and palliative treatment, spiritual care, aspects of nutrition and pharmacology, rehabilitation, discharge and collaborative working.
- Initiate appropriate referral or access to sources of specialist support for those experiencing, for example, sexual difficulties as a result of their illness or treatment.
- Utilise all forms of patient information to enable the patient to have a better understanding of their diagnosis and treatment plan. This will include the use of specific resources for patient/carers from minority groups.
- Facilitate the development of teaching and learning skills used to educate patients and other personnel.
- Contribute to the monitoring, audit and evaluation of adherence to policy/procedures/guidelines and standards of practice, initiating changes where appropriate to improve delivery of care to patients/carers within the MDT.
- Demonstrate ability to recognise abnormal grief reactions and refer on to appropriate agencies and healthcare professionals.
- Demonstrate a comprehensive knowledge of the assessment, care, management support, training education and information requirements for patients and carers across the care pathway for the particular specialty area.
- Assess and provide support that is appropriate to the context and sensitive to meet the patient/carer and/or family's needs, facilitating access to additional support from other healthcare professionals or agencies as applicable and with the agreement of the patient and/or carer.
- Understand the ethical issues relating to treatment in advanced disease.

- Have sufficient knowledge and links with national/local support groups and be able to provide/record information relating to these groups to guide and advise patients.
- Provide information, education and relevant telephone contacts to patients and carers regarding the procedures and management of the side effects of treatment associated with the client group encountered in their practice.
- Be aware of local contact arrangements in the event of patients experiencing unwanted side effects.
- Demonstrate knowledge to prepare, inform and educate patients/carers for survivorship and, where applicable, primary care personnel regarding any associated care requirements, symptom management and contact details on discharge.
- Participate in inter-professional/inter-agency evaluation and audit to effect change for the continued improvement of the quality of care and service for patients.

Appendix 6: LCA Key Worker Policy

Definition

A key worker is a person who, with the patient's consent and agreement, takes a key role in coordinating the patient's care and promoting continuity, ensuring the patient knows who to access for information and advice in relation to their cancer diagnosis. In addition, the key worker will facilitate patients making informed decisions about their treatment.

The implementation of the key worker role is a requirement of the National Cancer Peer Review Programme and detailed in the *Manual for Cancer Services*, published by the National Cancer Action Team (NCAT), and related site-specific *Improving Outcomes Guidance*, issued by the National Institute for Health and Care Excellence (NICE).

Principles and responsibilities

Designation

- 1) The key worker is a named clinical member of the site-specific multidisciplinary team (MDT), and acts as the point of contact between the patient and MDT.
- 2) The key worker is a healthcare professional.
- 3) The key worker is assigned by the core Clinical Nurse Specialist (CNS) of an MDT, agreed by the MDT and recorded within the patient record and multidisciplinary meeting proforma.
- 4) The name of the key worker, designation and contact details will also be recorded in the patient handheld record (PHR), if used, and included in all correspondence and in the patient medical records. All entries in the medical notes will comply with the NHS Litigation Authority standards.

Access

- 5) All cancer patients will be made aware of their allocated key worker, but have the right to ask for an alternative if they prefer. This will usually happen at diagnosis.
- 6) The key worker will provide a contact number to all the patients for whom they act as the key worker.

Multi-professional communication

- 7) If a more appropriate person is identified as a key worker at a point in the patient's pathway, this will be discussed and agreed by the patient and the new key worker, and recorded in the patient's notes. This situation is most likely to arise with referral to the palliative care team. In such cases the palliative care CNS will check if a key worker has already been identified for the patient by the relevant tumour MDT. The palliative care CNS will then negotiate and document care responsibilities in the patient's notes.
- 8) The key worker may change as patients pass through various stages of the care trajectory or when care is transferred to a different Trust. It is the responsibility of the key worker to hand over to the next one, to document this in the patient's notes and to keep the patient informed.

- 9) The key worker will lead on patient communication issues and coordination of the pathway for patients referred to the team.
- 10) The key worker will ensure that the patient pathway is coordinated and that all relevant information is transferred to the appropriate professionals as the patient moves across care boundaries, e.g. on admission to and discharge from institutions, when care is transferred between teams.
- 11) The key worker has responsibility for ensuring that holistic needs assessments (HNA) are recorded/documentated in patient records.

Patient communication and support

- 12) Where possible, the key worker will be available to support the patient on diagnosis to signpost and provide them with information and contacts for the MDT, national information and support services, self-help groups and associated site-specific support.
- 13) If the key worker is not available at the time of diagnosis, the person who is providing support at the time will ensure that the patient is aware of the key worker role and provide the relevant contact details.
- 14) The key worker will be accessible to the patient as a constant point of contact, handing over to colleagues when unavailable and making sure that the patient has clear information about alternative contacts and cover arrangements.
- 15) The key worker will provide information, care and support throughout the patient journey regardless of the patient's condition, liaising between health professionals to ensure continuity of care and a seamless service.

Data/audit

- 16) The key worker will contribute to the audit of key worker role in their organisation.

Annex A

NCAT peer review standard

There should be an operational policy whereby a single named key worker for the patient's care at a given time is identified by the MDT members for each individual patient and the name and contact number of the current key worker is recorded in the patient's case notes. The responsibility for ensuring that the key worker is identified should be that of the nurse MDT member(s).

The above policy should have been implemented for patients who came under the MDT's care after publication of these measures and who are under their care at the time of the peer review visit.

Notes

- According to the NICE supportive and palliative care guidance, a key worker is a person who, with the patient's consent and agreement, takes a key role in coordinating the patient's care and promoting continuity, e.g. ensuring that the patient knows who to access for information and advice. This is not intended to have the same connotation as the key worker in social work.
- It may be necessary to agree a single key worker across both a cancer site-specific MDT and the specialist palliative care MDT for certain patients.

October 2013

Appendix 7: LCA Holistic Needs Assessment Tool



London Holistic Needs Assessment

For each item below, please tick **yes** or **no** if they have been a concern for you during the last week, including today. Please also tick **discuss** if you wish to speak about it with your health professional.
Choose not to complete the assessment today by ticking this box

Date:	<input type="text"/>	Practical concerns	Yes	No	Discuss	Physical concerns	Yes	No	Discuss
Name:	<input type="text"/>	Caring responsibilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	High temperature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hospital/NHS number:	<input type="text"/>	Housing or finances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Wound care	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Please tick the number that best describes the overall level of distress you have been feeling during the last week, including today:		Transport or parking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Passing urine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Work or education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Constipation or diarrhoea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	<input type="checkbox"/>	Information needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Indigestion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	<input type="checkbox"/>	Difficulty making plans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Nausea and/or vomiting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	<input type="checkbox"/>	Grocery shopping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cough	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	<input type="checkbox"/>	Preparing food	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Changes in weight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	<input type="checkbox"/>	Bathing or dressing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Eating or appetite	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	<input type="checkbox"/>	Laundry or housework	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Changes in taste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	<input type="checkbox"/>	Family concerns				Sore or dry mouth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	Relationship with children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Feeling swollen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	Relationship with partner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Breathlessness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	<input type="checkbox"/>	Relationship with others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0	<input type="checkbox"/>	Emotional concerns				Dry, itchy or sore skin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
For health professional use		Loneliness or isolation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tingling in hands or feet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Date of diagnosis:	<input type="text"/>	Sadness or depression	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hot flushes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diagnosis:	<input type="text"/>	Worry, fear or anxiety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Moving around or walking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pathway point:	<input type="text"/>	Anger, frustration or guilt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fatigue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Memory or concentration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sleep problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Hopelessness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Communication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Sexual concerns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Personal appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						Other medical condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Spiritual concerns							
		Regret about the past	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
		Loss of faith or other spiritual concern	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
		Loss of meaning or purpose in life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

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Care Plan

During my holistic needs assessment, these issues were identified and discussed:

Preferred name:

Hospital/NHS number:

Number	Issue	Summary of discussion	Actions required/by (name and date)
Example	Breathlessness	Possible causes identified Coping strategies discussed Printed information provided	Referral to anxiety management programme; CNS to complete by 24 th Dec
1			
2			
3			
4			

Other actions/outcomes d.g. a dditional information g ven,th alth po motion, smoking cessation, 'My actions':

Signed (patient):	Date:
Signed (healthcare professional):	Date:
For health professional use	
Date of diagnosis:	Pathway point:

Appendix 8: NCSI Treatment Summary



GP Name
GP Address

Dear Dr X

Re: Add in patient name, address, date of birth and record number

Your patient has now completed their initial treatment for cancer and a summary of their diagnosis, treatment and on-going management plan are outlined below. The patient has a copy of this summary.

Diagnosis:	Date of Diagnosis:	Organ/Staging Local/Distant
Summary of Treatment and relevant dates:		Treatment Aim:
Possible treatment toxicities and / or late effects:		Advise entry onto primary care palliative or supportive care register Yes / No
		DS 1500 application completed Yes/No
		Prescription Charge exemption arranged Yes/No
Alert Symptoms that require referral back to specialist team:		Contacts for re referrals or queries: In Hours: Out of hours:
		Other service referrals made: (delete as nec) District Nurse AHP Social Worker Dietician Clinical Nurse Specialist Psychologist Benefits/Advice Service Other
Secondary Care Ongoing Management Plan: (tests, appointments etc)		
Required GP actions in addition to GP Cancer Care Review (e.g. ongoing medication, osteoporosis and cardiac screening)		
Summary of information given to the patient about their cancer and future progress:		
Additional information including issues relating to lifestyle and support needs:		

Completing Doctor:

Signature:

Date:



GP READ CODES FOR COMMON CANCERS (For GP Use only). Other codes available if required. (Note: System codes are case sensitive so always ensure codes are transcribed exactly as below).

System 1	(5 digit codes)	All other systems	Version 3 five byte codes (October 2010 release)
Diagnosis:		Diagnosis	
Lung Malignant Tumour	XaOKG	Malignant neoplasm of bronchus or lung	B22z.
Carcinoma of Prostate	X78Y6	Malignant neoplasm of prostate	B46..
Malignant tumour of rectum	XE1vW	Malignant neoplasm of Rectum	B141.
Bowel Intestine	X78gK	Malignant neoplasm of Colon	B13..
Large Bowel	X78gN	Malignant neoplasm of female breast	B34..
Female Malignant Neoplasia	B34..	Malignant neoplasm of male breast	B35..
Male Malignant Neoplasia	B35..		
Histology/Staging/Grade:		Histology/Staging/Grade:	
Histology Abnormal	4K14.	Histology Abnormal	4K14.
Tumour grade	X7A6m	Tumour staging	4M...
Dukes/Gleason tumour stage	XaOLF	Gleason grading of prostate Ca	4M0..
Recurrent tumour	XaOR3	Recurrence of tumour	4M6..
Local Tumour Spread	X7818		
Mets from 1°	XaFr.	Metastatic NOS	BB13.
Treatment		Treatment	
Palliative Radiotherapy	5149.	Radiotherapy tumour palliation	5149.
Curative Radiotherapy	XalpH	Radiotherapy	7M371
Chemotherapy	x71bL	Chemotherapy	8BAD.
Radiotherapy	Xa851		
Treatment Aim:		Treatment Aim:	
Curative procedure	Xallm	Curative treatment	8BJ0.
Palliative procedure	XaiL3	Palliative treatment	8BJ1.
Treatment toxicities/late effects:			
Osteoporotic #	Xa1TO	At risk of osteoporosis	1409.
Osteoporosis	XaELC	Osteoporosis	N330.
Infection	Xa9ua		
Ongoing Management Plan		Ongoing Management Plan	
Follow up arranged (<1yr)	8H8..	Follow up arranged	8H8..
Follow up arranged (>1yr)	XaL..		
No FU	8HA1.	No follow up arranged	8HA..
Referral PRN	8HAZ.		
Referrals made to other services:		Referrals made to other services:	
District Nurse	XaBsn	Refer to District Nurse	8H72.
Social Worker	XaBsr	Refer to Social Worker	8H75.
Nurse Specialist	XaAgg		
SALT	XaBT6		

Actions required by the GP		Actions required by the GP	
Tumour marker monitoring	Xalqg	Tumour marker monitoring	8A9..
PSA	Xalqh	PSA	43Z2.
Osteoporosis monitoring	XalSd	Osteoporosis monitoring	66a..
Referral for specialist opinion	Xalst		
Advised to apply for free prescriptions	9D05	Entitled to free prescription	6616.
Cancer Care Review	Xalyc	Cancer Care Review	8BAV.
Palliative Care Review	XalG1	Palliative Care Plan Review	8CM3.
Medication:		Medication:	
New medication started by specialist	XEOhn	Medication given	8BC2.
Medication changed by specialist	8B316	Medication changed	8B316
Advice to GP to start medication	XaKbF		
Advice to GP to stop medication	XaJC2		
Information to patient:		Information to patient:	
DS1500 form claim	XaCDx	DS1500 completed	9EB5.
Benefits counselling	6743.	Benefits counselling	6743.
Cancer information offered	XalmL	Cancer information offered	677H.
Cancer diagnosis discussed	XalpL	Cancer diagnosis discussed	8CL0.
Aware of diagnosis	XaQly		
Unaware of prognosis	XaVzE		
Carer aware of diagnosis	XaVzA		
Miscellaneous:		Miscellaneous:	
On GSF palliative care framework	XaJv2	On GSF Palliative Care Framework	8CM1.
GP OOH service notified	Xaltp	GP OOH service notified	9e0..
Carers details	9180.	Carer details	9180.

Appendix 9: Lung Pathway Metrics

Lung pathway group metrics

Last updated November 2013

[Log of updates](#)



Cancer Waiting Times 1.1- 2 week wait GP urgent referral to 1 st seen 1.2- 31 day decision to treat to 1 st treatment 1.3- 31 day subsequent surgery 1.4- 31 day subsequent drugs 1.5- 31 day subsequent radiotherapy 1.6- 62 day GP urgent referral to 1 st treatment 1.7- 62 day GP urgent referral to 1 st treatment – median waits 1.8- 62 day GP urgent referral to 1 st treatment – distribution of week treated	3. Patient experience 3.1 NCPES Q12 - Patient felt they were told sensitively they had cancer 3.2 NCPES Q20 - Patient given name of the CNS in charge 3.3 NCPES Q21 - Patient finds it easy to contact CNS 3.4 NCPES Q52 - Patient given clear written information about what should/should not do post discharge 3.5 NCPES Q67 - Patient given right amount of information about condition and treatment 3.6 NCPES Q70 - Patient's rating of care 'very good'/'excellent'	Treatment 6.1 Lung cancer resection rates - overall 6.2 Lung cancer resection rates - NSCLC - Total 6.3 Lung cancer resection rates - NSCLC - Stage 1 & 2 Peer review 7.1 Network board measures 7.2 NSSG measures 7.3 Trust MDT measures	Incidence/mortality/survival 8.1 - Incidence rates Trachea, Bronchus and Lung (C33-34) Mesothelioma (C45) 8.2 - Mortality rates Trachea, Bronchus and Lung (C33-34) Mesothelioma (C45) 8.3 - Population Survival rates - Trachea, Bronchus and Lung (C33-34) - 1 year survival by cancer network - 1 year survival by aee group 8.4 - Provider level survival rates - Median Survival of patients - 3 month survival - 1 year survival 8.5 - Number of cases 8.6 Number of deaths
Data collection /Numbers 2.1- % of cases fully staged in MDI fed to ICR 2.2 LUCADA data completeness 2.3 Breakdown of staging completeness - LUCADA 2.4 - Breakdown of stage - SCLC - LUCADA 2.5 - Breakdown of performance status - LUCADA 2.6 - Number of patients diagnosed and demographic details	Prevention/Early diagnosis 4.1 % emergency presentation Diagnosis	9. Cancer Research 9.1 NCRN clinical trials data	

Collated by Stephen Scott stephenscott@nhs.net
 In strictest confidence - For NHS internal use only

Appendix 10: Treatment of Teenagers and Young Adults

Treatment for patients from the age of 16 to their 25th birthday should be in line with national guidance regarding the management of teenagers and young adults with cancer.

Patients from the age of 16 to the end of their 18th year should be treated in the principal treatment centre.

Teenagers and young adults (TYA) from the age of 19 to their 25th birthday will follow the adult pathway but should be offered choice of treatment in a TYA-designated hospital or at the principal treatment centre. TYAs in this age group should be treated either in the principal treatment centre or a designated hospital.

The principal treatment centre for South Thames is The Royal Marsden NHS Foundation Trust. The North West London TYA principal treatment centre is University College London Hospitals NHS Foundation Trust.

Principal treatment centre contacts

The Royal Marsden NHS Foundation Trust	Lead Clinician – Julia Chisholm julia.chisholm@rmh.nhs.uk TCT Nurse Consultant for Adolescents and Young Adults – Louise Soanes lsoanes@nhs.net
University College London Hospitals	Lead Clinician – Rachael Hough rachael.hough@uclh.nhs.uk TCT Nurse Consultant – Wendy King wendy.king@uclh.nhs.uk

TYA-designated centre contacts

Joint Centre (Guy's and St Thomas' NHS Foundation Trust/King's College Hospital NHS Foundation Trust)	Guy's and St Thomas'	Lead Clinician – Robert Carr robert.carr@gstt.nhs.uk Lead Nurse – Gavin Maynard-Wyatt gavin.maynard-wyatt@gstt.nhs.uk
Joint Centre (Guy's and St Thomas' NHS Foundation Trust/King's College Hospital NHS Foundation Trust)	King's College Hospital	Lead Clinician – Donal.Mclornan donal.mclornan@nhs.net Lead Nurse – Gavin Maynard-Wyatt Gavin.maynard-wyatt@gstt.nhs.uk
St George's Healthcare NHS Trust	St George's Hospital	Lead Clinician – Jens Samol jens.samol@stgeorges.nhs.uk Lead Nurse – Linda Shephard linda.shephard@stgeorges.nhs.uk
Chelsea and Westminster Hospital NHS Foundation Trust	Chelsea and Westminster (HIV and skin only)	Lead Clinician – Mark Bower (interim) mark.bower@chelwest.nhs.uk Lead Nurse – Kate Shaw (interim) kate.shaw@chelwest.nhs.uk
Imperial College Healthcare NHS Trust	Charing Cross	Lead Clinician – Josu de la Fuente (deputy) j.delafuente@imperial.ac.uk Lead Nurse – Sinead Cope sinead.cope@imperial.nhs.uk
East and North Hertfordshire NHS Trust	Mount Vernon Cancer Centre	Lead Clinician – Gordon Rustin grustin@nhs.net Lead Nurse – Laura Miles laura.miles@nhs.net

Abbreviations

2ww	2 week wait
4-D	Four-dimensional
ABC	Active breathing control
BTS	British Thoracic Society
CNS	Clinical nurse specialist
COPD	Chronic obstructive pulmonary disease
CT	Computerised tomography
CTCAE	Common Terminology Criteria for Adverse Events (formerly known as the Common Toxicity Criteria)
CTV	Clinical target volume
CXR	Chest X-ray
DH	Department of Health
DVH	Dose-volume histogram
EBUS	Endobronchial ultrasound
ECG	Electrocardiogram
EGFR	Epidermal growth factor receptor
ERAS	Enhanced recovery after surgery
FBC	Full blood count
FEV ₁	Forced expiratory volume in one second
FNA	Fine needle aspiration
FVC	Forced vital capacity
GP	General practitioner
GTV	Gross tumour volume
Gy	Gray
HNA	Holistic needs assessment
IGRT	Image guided radiotherapy
ITV	Internal target volume
IV	Intravenous
LCA	London Cancer Alliance
LFT	Liver function test
MDM	Multidisciplinary meeting
MDT	Multidisciplinary team
MRI	Magnetic resonance imaging
NCSCT	NHS Centre for Smoking Cessation and Training

NCSI	National Cancer Survivorship Initiative
NICE	National Institute for Health and Care Excellence
NLCFN	National Lung Cancer Forum for Nurses
NSCLC	Non-small cell lung cancer
OAR	Organ at risk
PET	Positron emission tomography
PRV	Planning organ at risk volume
PS	Performance status
PTTA	Percutaneous thermal tumour ablation
PTV	Planning target volume
RCPATH	Royal College of Pathologists
SABR	Stereotactic ablative radiotherapy
SCLC	Small cell lung cancer
SRS	Stereotactic radiosurgery
SVC	Superior vena cava
TBNA	Transbronchial needle aspiration
TKI	Tyrosine kinase inhibitor
TLCO	Total gas transfer of the lung for carbon monoxide
UEC	Urea, electrolytes and creatinine
WHO	World Health Organization

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