

The diagnosis and treatment of lung cancer

NICE guideline

Second draft for consultation, September 2004

If you wish to comment on the recommendations, please make your comments on the **full** version of the draft guideline.

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Abbreviations

CHART	Continuous Hyperfractionated Accelerated Radiotherapy
CT	Computerised tomography
CXR	Chest X-ray
DS	Diagnostic studies
ED	Extensive disease
EUS	Endobronchial ultrasound
EUS-NA	Endoscopic ultrasound guided needle aspiration
FDG	¹⁸ F-fluorodeoxyglucose
FNA	Fine needle aspiration
GP	General practitioner
GPP	Good practice point
LD	Limited disease
MDT	Multidisciplinary team
MRI	Magnetic resonance imaging
NHS	National Health Service
NSCLC	Non-small-cell lung cancer
PCI	Prophylactic cranial irradiation
PDT	Photodynamic therapy
PET	Positron emission tomography
PS	Performance status
RT	Radiotherapy
SCLC	Small cell lung cancer
SPECT	Single photon emission computerised tomography
SPN	Solitary pulmonary nodules
SVCO	Superior vena cava obstruction
SND	Systematic nodal dissection
TTNA	Transthoracic needle aspiration
US	Ultrasound
VATS	Video assisted thoracoscopy

Glossary of terms

Amended from a glossary produced by the Patient Involvement Unit.

Adjuvant chemotherapy	The use of chemotherapy after initial treatment by surgery and/or radiotherapy.
Adjuvant radiotherapy	The use of radiotherapy after treatment by surgery.
Benign	Non-cancerous. Does not metastasise, and treatment or removal is curative.
Comorbidity	Coexistence of a disease or diseases in the people being studied in addition to the health problem that is the subject of the study.
Diagnostic study	A study to assess the effectiveness of a test or measurement in terms of its ability to accurately detect or exclude a specific disease.
Elective	Name for clinical procedures that are regarded as advantageous to the patient but not urgent.
Good performance status	Performance Status 0/1 WHO/Zubrod scale or 80–100 Karnofsky scale.
Lymph	Almost colourless fluid that bathes body tissues and is carried by lymphatic vessels. Contains cells that help fight infection and disease.
Lymph nodes or glands	Small bean-shaped organs located along the lymphatic system. Nodes filter bacteria or cancer cells that might travel through the lymphatic system.
Malignant	Cancerous. Malignant tumours can invade and destroy surrounding tissue and have the capacity to spread.
Metastasis	Spread of cancer from one part of the body to another.
Negative lymph nodes	Lymph nodes showing no signs of cancer.
Neoadjuvant chemotherapy	Chemotherapy that is given before the treatment of a primary tumour with the aim of improving the results and preventing the development of metastases.
NSCLC	Non-small-cell lung cancer.
Positive lymph nodes	Lymph nodes that contain cancer cells.
Primary care	Healthcare delivered to patients outside hospitals. Primary care covers a range of services provided by GPs, nurses and

	other healthcare professionals, dentists, pharmacists and opticians.
Primary tumour	Original site of the cancer.
SCLC	Small cell lung cancer
Scottish Intercollegiate Guidelines Network (SIGN)	SIGN was established in 1993 to sponsor and support the development of evidence-based clinical guidelines for the NHS in Scotland.
Secondary care	Care provided in hospitals.
Sensitivity	In diagnostic testing, it refers to the chance of having a positive test result if you have the disease. 100% sensitivity means that all those with the disease will test positive, but this is not the same the other way around. A patient could have a positive test result but not have the disease – this is called a ‘false positive’. The sensitivity of a test is also related to its ‘negative predictive value’ (true negatives) – a test with a sensitivity of 100% means that all those who get a negative test result do not have the disease. To fully judge the accuracy of a test, its <i>specificity</i> must also be considered.
Specificity	In diagnostic testing, it refers to the chance of having a negative test result if you do not have the disease. 100% specificity means that all those without the disease will test negative, but this is not the same the other way around. A patient could have a negative test result yet still have the disease – this is called a ‘false negative’. The specificity of a test is also related to its ‘positive predictive value’ (true positives) – a test with a specificity of 100% means that all those who get a positive test result definitely have the disease. To fully judge the accuracy of a test, its <i>sensitivity</i> must also be considered.
Staging	Process of describing to what degree cancer has spread from its original site to another part of the body. Staging involves clinical, surgical and pathology assessments.
TNM classification	TNM classification provides a system for staging the extent of cancer. T refers to the size of the primary tumour. N refers to the involvement of the lymph nodes. M refers to the presence of metastases or distant spread of the disease.

Introduction

In England and Wales, nearly 29,000 deaths were attributed to lung cancer in 2002. Lung cancer is the most common form of cancer death for men, who account for 60% of lung cancer cases. In women, it is the second most common form of cancer death after breast cancer.

Survival rates for lung cancer are very poor. In England, for patients diagnosed between 1993 and 1995 and followed up to 2000, 21.4% of men and 21.8% of women with lung cancer were alive 1 year after diagnosis and only 5.5% of both men and women were alive after 5 years. For Wales, the latest figures on survival for people diagnosed between 1994 and 1998 showed 1-year relative survival of 20.5% for both men and women and 5-year relative survival figures of 6% for both men and women. These figures are around 5 percentage points lower than the European average, and 7–10 percentage points lower than that of the USA.

Lung cancers are classified into two main categories: small-cell lung cancers (SCLC), which account for approximately 20% of cases, and non-small-cell lung cancers (NSCLC), which account for the other 80%. Non-small-cell lung cancers include squamous cell carcinomas (35%), adenocarcinomas (27%) and large cell carcinomas (10%).

This guideline offers best practice advice on the care of adults who are suspected of having or are diagnosed with lung cancer. They are based on the best available evidence, and are produced to help healthcare professionals and patients make informed choices about appropriate healthcare. Although guidelines assist the practice of healthcare professionals, they do not replace their knowledge and skills.

Key priorities for implementation

The following recommendations have been identified as priorities for implementation.

Access to services

- All patients diagnosed with lung cancer should be offered information, both verbally and written, on all aspects of their diagnosis, treatment and care. This information should be tailored to the individual requirements of the patient and audio and videotaped formats should also be considered.
- Urgent referral for a chest X-ray should be offered when a patient presents with:
 - haemoptysis, or
 - any of the following unexplained or **persistent** (that is, lasting more than 3 weeks) symptoms or signs
 - ✧ cough
 - ✧ chest/shoulder pain
 - ✧ dyspnoea
 - ✧ weight loss
 - ✧ chest signs
 - ✧ hoarseness
 - ✧ finger clubbing
 - ✧ features suggestive of metastasis from a lung cancer (for example, brain, bone, liver or skin)
 - ✧ cervical/supraclavicular lymphadenopathy
- If a chest X-ray (CXR) or chest computed tomography (CT) scan suggests lung cancer (including pleural effusion and slowly resolving consolidation), patients should be offered an urgent referral to a chest physician, who is a member of the lung cancer multidisciplinary team (MDT).

Staging

- Every cancer network must have a system of rapid access to ^{18}F -fluoro-deoxyglucose positron emission tomography (FDG-PET) scanning.

Radical radiotherapy alone for treatment of non-small-cell lung cancer

- Patients with stages I and II NSCLC who are medically inoperable should be treated using the continuous hyperfractionated accelerated radiotherapy (CHART) regimen in preference to 60Gy at 2Gy per day over 6 weeks.

Chemotherapy for non-small-cell lung cancer

- Chemotherapy should be offered to patients with stages III and IV NSCLC and good performance status (PS WHO 0, 1 or a Karnofsky score of 80–100) to improve survival, disease control and quality of life.

Palliative interventions and supportive and palliative care

- Non-drug interventions for breathlessness should be delivered by a lung cancer multidisciplinary team (MDT), facilitated/coordinated by a professional with an interest in breathlessness and expertise in the techniques (for example, nurse, physiotherapist, occupational therapist or other). Although it may be provided within a breathlessness clinic, patients should have access to such support in all care settings.

Service organisation

- The care of all patients with a working diagnosis of lung cancer should be discussed at a lung cancer multidisciplinary team (MDT) meeting.
- Early diagnosis clinics for the investigation of putative lung cancer patients are associated with a reduction in diagnostic delay and a reduction in patient anxiety, and should be utilised where possible.
- All cancer units should have one or more trained lung cancer nurse specialists to see patients before and after diagnosis, to provide continuing support, and to facilitate communication between the MDT, secondary care team, the general practitioner and the community team. Their role includes the availability for patients to access advice and support whenever they need it

The following guidance is evidence based. The grading scheme used for the recommendations is described in Appendix A. Recommendations are graded A, B, C, D or GPP according to the level of evidence on effectiveness that the recommendation is based on. Studies of diagnostic accuracy are graded A(DS), B(DS), C(DS) or D(DS). Some recommendations are based on both diagnostic and effectiveness evidence and therefore receive two grades to reflect this. A summary of the evidence on which the guidance is based is provided in the full guideline (see Section 5).

1 Guidance

1.1 Access to services

1.1.1 All patients diagnosed with lung cancer should be offered information, both verbal and written, on all aspects of their diagnosis, treatment and care. This information should be tailored to the individual requirements of the patient and audio and videotaped formats should also be considered. **[GPP]**

1.1.2 Treatment options and plans should be discussed with the patient and patients should be involved in all decisions on their treatment and care. This must be tailored around the patient's needs and wishes to be involved and their capacity to make decisions. **[GPP]**

1.1.3 The public need to be better informed of the symptoms and signs that are characteristic of lung cancer, through coordinated campaigning to raise awareness. **[GPP]**

1.1.4 Urgent referral for a chest X-ray should be offered when a patient presents with: **[D]**

- haemoptysis, or
- any of the following unexplained or **persistent** (that is, lasting more than 3 weeks) symptoms or signs:
 - cough
 - chest/shoulder pain

- dyspnoea
- weight loss
- chest signs
- hoarseness
- finger clubbing
- features suggestive of metastasis from a lung cancer (for example, brain, bone, liver or skin)
- cervical/supraclavicular lymphadenopathy.

1.1.5 If a chest X-ray or chest CT suggests lung cancer (including pleural effusion and slowly resolving consolidation), patients should be offered an urgent referral to a chest physician who is a member of the lung cancer multidisciplinary team (MDT). **[D]**

1.1.6 If the chest X-ray is normal but there is a high suspicion of lung cancer, patients should be offered urgent referral to a member of the lung cancer MDT, usually the chest physician. **[D]**

1.1.7 Patients should be offered an urgent referral to a member of the lung cancer MDT, usually the chest physician while awaiting the result of a chest X-ray, if any of the following are present:

- persistent haemoptysis in smokers/ex-smokers over 40 years of age
- signs of superior vena caval obstruction (swelling of the face/neck with fixed elevation of jugular venous pressure)
- stridor (consider emergency referral). **[D]**

1.2 *Diagnosis*

- 1.2.1 Where a chest X-ray has been requested in primary or secondary care and is incidentally suggestive of lung cancer, a second copy of the radiologist's report should be sent to a designated member of the lung cancer MDT, usually the chest physician. The MDT should have a mechanism in place to follow up these reports to ensure the patient's GP has a management plan in place. **[GPP]**
- 1.2.2 Patients with known or suspected lung cancer should be offered a contrast-enhanced chest computerised tomography (CT) scan to further the diagnosis and stage the disease. The scan should be extended to include the liver and adrenals. **[GPP]**
- 1.2.3 Chest CT should be performed prior to an intended fibreoptic bronchoscopy. **[A; C (DS)]**
- 1.2.4 For patients with central lesions, bronchoscopy should be performed on those patients who are able and willing to undergo the procedure. Bronchial biopsy is the most accurate technique. **[B (DS)]**
- 1.2.5 Sputum cytology is rarely indicated and should be reserved for the investigation of patients with centrally placed nodules or masses, but unable to tolerate or unwilling to have bronchoscopy or other invasive tests. **[B (DS)]**
- 1.2.6 Percutaneous transthoracic needle biopsy is recommended for diagnosis of lung cancer in patients with peripheral lesions. **[B (DS)]**
- 1.2.7 Surgical biopsy should be performed for diagnosis where other less invasive methods of biopsy have not been successful or are not possible. **[B(DS)]**
- 1.2.8 Where there is evidence of distant metastases, biopsies should be taken from the metastatic site if this can be achieved more easily than from the primary site. **[GPP]**

- 1.2.9 An ¹⁸F-fluoro-deoxyglucose positron emission tomography (FDG-PET) scan should be performed to investigate solitary pulmonary nodules in cases where a biopsy is not possible or has failed. **[C; B (DS)]**

1.3 Staging

1.3.1 Non-small-cell lung cancer (NSCLC)

- 1.3.1.1 In the assessment of mediastinal and chest wall invasion:
- CT alone cannot be relied upon **[B (DS)]**
 - other techniques such as ultrasound should be considered where there is doubt **[GPP]**
 - Surgical assessment may be necessary if there are no other contraindications to resection. **[GPP]**
- 1.3.1.2 Magnetic resonance imaging (MRI) should not routinely be performed to assess T-stage in non-small-cell lung cancer. **[C (DS)]**
- 1.3.1.3 MRI should be performed, where necessary to assess the extent of disease, for patients with superior sulcus tumours. **[B (DS)]**
- 1.3.1.4 Every cancer network must have a system of rapid access to FDG-PET scanning. **[GPP]**
- 1.3.1.5 Patients who are staged as candidates for surgery on CT should have an FDG-PET scan to look for involved intrathoracic lymph nodes and distant metastases. **[A (DS)]**
- 1.3.1.6 Patients who are otherwise surgical candidates and have, on CT, limited (1–2 stations) N2 disease of uncertain pathological significance should have an FDG-PET scan. **[GPP]**
- 1.3.1.7 Patients who are candidates for radical radiotherapy on CT should have an FDG-PET scan. **[B (DS)]**
- 1.3.1.8 Patients staged as N0 or N1 and M0 (stages I and II) by CT and FDG-PET and suitable for surgery should be offered surgical resection. **[A]**

- 1.3.1.9 Histological/cytological investigation should be performed to confirm N2/3 disease where FDG-PET is positive, unless there is definite distant metastatic disease identified or there is a high certainty that the N2/3 disease is metastatic, for example, if there is a chain of high FDG uptake in lymph nodes. This should be achieved by the most appropriate method. **[B (DS)]**
- 1.3.1.10 When an FDG-PET scan for N2/N3 disease is negative, biopsy is not required even if the patient's nodes are enlarged on CT. **[B (DS)]**
- 1.3.1.11 If FDG-PET is not available, suspected N2/3 disease, as shown by CT scan (nodes with a short axis > 1cm), should be histologically sampled in patients being considered for surgery or radical radiotherapy. **[GPP]**
- 1.3.1.12 A CT or MRI scan should be performed for patients with clinical signs or symptoms of brain metastasis. **[GPP]**
- 1.3.1.13 An X-ray should be performed in the first instance for patients with localised signs or symptoms of bone metastasis. If the results are negative, either a bone scan or an MRI scan should be performed. **[GPP]**

1.3.2 Small-cell lung cancer (SCLC)

- 1.3.2.1 SCLC patients should be staged by a contrast-enhanced CT scan of the chest, liver and adrenals and by selected imaging of any symptomatic area. **[GPP]**

1.4 Surgery with curative intent for patients with NSCLC

- 1.4.1 For stage I (IA and IB) NSCLC patients, with no medical contraindications, surgical resection is recommended. **[D]**
- 1.4.2 For stage I (IA and IB) NSCLC patients, who can tolerate lobar resection, lobectomy is the procedure of choice. **[C]**

- 1.4.3 Pending further research, patients with stage I (IA and IB) NSCLC who would not tolerate lobectomy because of comorbid disease or pulmonary compromise, should be considered for limited resection or radical radiotherapy. **[D]**
- 1.4.4 Sleeve resection offers an acceptable alternative to pneumonectomy for selected stage II NSCLC patients in whom a complete resection can be achieved with either procedure, regardless of lung function. **[C]**
- 1.4.5 For patients with T3 NSCLC with chest wall involvement undergoing surgery, complete resection of the tumour should be the aim by either extrapleural or en bloc chest wall resection. **[C]**
- 1.4.6 For all stage I (IA and IB) NSCLC patients undergoing surgical resection, clear surgical margins should be the aim. **[C]**
- 1.4.7 All patients undergoing surgical resection for lung cancer should have systematic nodal dissection (SND) to provide accurate pathological staging. **[GPP]**

1.5 Radical radiotherapy alone for treatment of NSCLC

- 1.5.1 All patients should be asked to undergo pulmonary function tests prior to radical radiotherapy for NSCLC. **[GPP]**
- 1.5.2 Patients who are otherwise suitable for radical radiotherapy but have poor lung function should be offered radiotherapy, provided the volume of irradiated lung is small. **[GPP]**
- 1.5.3 Patients with stages I and II NSCLC who are medically inoperable should be offered the continuous hyperfractionated accelerated radiotherapy (CHART) regimen in preference to 60 Gy at 2 Gy per day over 6 weeks. **[A]**
- 1.5.4 Patients with stages IIIA and IIIB NSCLC who are eligible for radical radiotherapy and who cannot tolerate or do not wish to have

chemotherapy, should be offered the CHART regimen in preference to 60 Gy at 2 Gy per day over 6 weeks. **[A]**

- 1.5.5 If CHART is not available, conventionally fractionated radiotherapy to a dose of 64–66 Gy in 32–33 fractions over 6½ weeks or 55 Gy in 20 fractions over 4 weeks should be considered. **[GPP]**

1.6 Chemotherapy for patients with NSCLC

- 1.6.1 Chemotherapy should be offered to patients with stages III and IV NSCLC and good performance status (PS WHO 0, 1 or a Karnofsky score of 80–100) to improve survival, disease control and quality of life. **[A]**

- 1.6.2 Optimal chemotherapy for advanced NSCLC is likely to be a single third-generation (docetaxel, gemcitabine, paclitaxel and vinorelbine) drug plus a platinum. **[GPP]**

- 1.6.3 Either carboplatin or cisplatin can be administered for NSCLC patients receiving platinum-containing regimens taking account of their toxicities, efficacy and convenience. **[GPP]**

- 1.6.4 Docetaxel monotherapy should be considered if second-line treatment is appropriate for patients with locally advanced or metastatic NSCLC in whom relapse has occurred after prior chemotherapy. **[A]**

1.7 Combination treatment for NSCLC

- 1.7.1 Patients with stages I, II or IIIA NSCLC who are suitable for resection should not receive preoperative chemotherapy unless it is part of a clinical trial. **[B]**

- 1.7.2 Preoperative radiotherapy is not recommended for operable patients with NSCLC. **[A]**

- 1.7.3 Postoperative radiotherapy, following complete resection, is not recommended for patients with NSCLC. **[A]**

- 1.7.4 Postoperative radiotherapy should be considered after incomplete resection of the primary tumour for patients with NSCLC with the aim of improving local control. **[D]**
- 1.7.5 Adjuvant chemotherapy should be offered to NSCLC patients following complete resection who opt for this treatment following discussion of the risks and benefits . **[B]**
- 1.7.6 Patients who are pathologically staged as II and III NSCLC, following resection, should not receive post-operative chemoradiotherapy unless it is within a clinical trial. **[B]**
- 1.7.7 Patients with stage III NSCLC who are not suitable for surgery but are eligible for radical radiotherapy should be treated with sequential chemoradiotherapy. **[GPP]**

1.8 Treatment of small cell lung cancer

- 1.8.1 Patients with SCLC should be offered a staging assessment, which should include an evaluation of the major prognostic factors: performance status, serum LDH, stage, liver function tests and serum sodium. **[D]**
- 1.8.2 All SCLC patients should be offered:
- platinum-based chemotherapy **[A]**
 - multidrug regimens, because they are more effective and have a lower toxicity than single-agent regimens. **[A]**

- 1.8.3 Four to six cycles of chemotherapy should be offered to patients with responding disease. Maintenance treatment is not recommended. **[A]**
- 1.8.4 Second-line chemotherapy should be offered to patients with responding disease after first-line chemotherapy, although the benefits are less than those of first-line chemotherapy. **[GPP]**
- 1.8.5 Patients should be considered for thoracic consolidation radiotherapy following chemotherapy if they have a complete or good partial response and complete response at distant metastatic sites. **[A]**
- 1.8.6 Patients undergoing consolidation thoracic irradiation should receive a dose in the range of 40 Gy/15 fractions over 3 weeks to 50 Gy/25 fractions over 5 weeks. **[GPP]**
- 1.8.7 Patients with limited disease and complete or good partial response after primary treatment should be considered for prophylactic cranial irradiation (PCI). **[A]**

1.9 Palliative interventions and supportive and palliative care

This section focuses on palliative interventions and supportive and palliative care for patients with lung cancer and therefore only evidence specific to lung cancer was reviewed. The National Institute of Clinical Excellence (NICE) recently published guidance and recommendations to improve supportive and palliative care for adults with cancer¹. This guidance should be used alongside this document.

- 1.9.1 Patients who may benefit from specialist palliative care services should be identified and referred without delay **[GPP]**
- 1.9.2 External beam radiotherapy should be considered for the relief of breathlessness, cough, haemoptysis or chest pain. **[A]**

¹ National Institute for Clinical Excellence. *Guidance on cancer services*. Improving supportive and palliative care for adults with cancer – the manual. 2004. London, National Institute for Clinical Excellence.

- 1.9.3 Opioids, such as codeine or morphine, should be considered for antitussive therapy to reduce cough. **[A]**
- 1.9.4 Debulking bronchoscopic procedures should be considered for the relief of distressing large airway obstruction or bleeding due to endobronchial tumour within a large airway. **[D]**
- 1.9.5 Endobronchial symptoms not palliated by other means can be considered for endobronchial therapy (for example, photodynamic therapy or brachytherapy). **[D]**
- 1.9.6 Patients with extrinsic compression can be considered for treatment with stents. **[D]**
- 1.9.7 Non-drug interventions based on psychosocial support, breathing control and coping strategies should be considered in managing patients with breathlessness. **[A]**
- 1.9.8 Non-drug interventions for breathlessness should be delivered by a multidisciplinary group, facilitated/co-ordinated by a professional with an interest in breathlessness and expertise in the techniques (for example, a nurse, physiotherapist or occupational therapist). Although it may be provided within a breathlessness clinic, patients should have access to such support in all care settings. **[GPP]**
- 1.9.9 Patients with troublesome hoarseness due to recurrent laryngeal nerve palsy should be referred to an ear, nose and throat specialist for advice. **[GPP]**
- 1.9.10 Patients who present with superior vena cava obstruction should be offered chemotherapy and radiotherapy according to the stage of disease and performance status. **[A]**
- 1.9.11 Stent insertion should be considered for the immediate relief of severe symptoms of superior vena caval obstruction or following failure of earlier treatment. **[B]**

- 1.9.12 Corticosteroids and radiotherapy should be considered for symptomatic treatment of cerebral metastases in lung cancer. **[D]**
- 1.9.13 Other symptoms, including, weight loss, loss of appetite, difficulty swallowing, fatigue and depression should be managed by multidisciplinary groups that include supportive and palliative care professionals. **[GPP]**
- 1.9.14 Pleural aspiration drainage should be performed in an attempt to relieve the symptoms of a pleural effusion. **[B]**
- 1.9.15 In patients who benefit symptomatically from aspiration/drainage of fluid, longer-term benefit should be offered by talc pleurodesis. **[B]**
- 1.9.16 For patients with bone metastasis requiring palliation and for whom standard analgesic treatments are inadequate, single fraction radiotherapy should be administered. **[B]**
- 1.9.17 Spinal cord compression is a medical emergency and immediate treatment, within 24 hours, with radiotherapy and corticosteroids is recommended. **[D]**
- 1.9.18 Patients with spinal cord compression should have early referral to the oncology physiotherapist and occupational therapist for assessment, treatment and rehabilitation. Referral to the oncology occupational therapist should be made for wheelchair assessment, assessment of activities of daily living and home assessment. **[GPP]**
- 1.9.19 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*. **[GPP]**

1.10 Service organisation

- 1.10.1 All patients with a likely diagnosis of lung cancer should be referred to a member of a lung cancer MDT (usually a chest physician). **[D]**

- 1.10.2 The care of all patients with a working diagnosis of lung cancer should be discussed at a lung cancer MDT meeting. **[D]**
- 1.10.3 Early diagnosis clinics for the investigation of putative lung cancer patients are associated with a reduction in diagnostic delay and a reduction in patient anxiety, and should be utilised where possible. **[A]**
- 1.10.4 All cancer units should have one or more trained lung cancer nurse specialists to see patients before and after diagnosis, to provide continuing support, and to facilitate communication between the MDT, secondary care team, the general practitioner and the community team. Their role includes the availability for patients to access advice and support whenever they need it **[D]**
- 1.10.5 Patients with lung cancer suitable for radical treatment, chemotherapy or requiring radiotherapy or ablative treatment for relief of symptoms, should be treated without undue delay, according to the Welsh Assembly Government and Department of Health recommendations (within 31 days of the decision to treat and within 62 days of their urgent referral). **[D]**
- 1.10.6 Patients who cannot be offered curative treatment, and are candidates for palliative radiotherapy, can be either observed until symptoms arise and then treated or treated with palliative radiotherapy immediately. **[A]**
- 1.10.7 When patients finish their treatment, a personal follow-up plan should be discussed and agreed with them, following discussion with the multiprofessionals involved in the patient's care. GPs should be informed of the plan. **[GPP]**
- 1.10.8 After completion of their treatment, patients with an expectation of life more than 3 months should have access to protocol-controlled, nurse-led follow-up as an option. **[A]**
- 1.10.9 Patients who have had attempted curative surgery for NSCLC or radical radiotherapy should be followed up routinely by their surgeon or

radiotherapist for 6 and 9 months respectively, while there is a possibility of post treatment complications. Thoracic imaging should be part of the review. **[D]**

- 1.10.10 For patients who have had attempted curative surgery for NSCLC, any routine follow-up should not extend beyond 5 years. **[D]**
- 1.10.11 Patients who have had palliative radiotherapy or chemotherapy should be followed up routinely at 1 month after completion of treatment. Chest X-ray should be part of the review if clinically indicated. **[D]**
- 1.10.12 Patients with lung cancer should be encouraged to stop smoking after, as well as before, treatment. **[D]**
- 1.10.13 The opinions and experiences of lung cancer patients and carers should be collected and used to improve the delivery of lung cancer services. Patients should receive feedback on any action taken as a result of such surveys. **[GPP]**

2 Notes on the scope of the guidance

All NICE guidelines are developed in accordance with a scope document that defines what the guideline will and will not cover. The scope of this guideline was established at the start of the development of this guideline, following a period of consultation; it is available from

www.nice.org.uk/page.aspx?o=32707

The guideline offers best practice advice on the care of adults who are suspected of having or are diagnosed with lung cancer. The guideline is relevant to primary and secondary healthcare professionals who have direct contact with patients who are suspected of having or are diagnosed with lung cancer, and make decisions about their care.

The guideline covers adults over the age of 18 years who are suspected as having, or are diagnosed with, lung cancer.

The guideline does not cover the diagnosis or management of people with mesothelioma, lung metastases from cancer arising from outside the lung and the prevention of lung cancer, nor does it cover children.

3 Implementation in the NHS

3.1 In general

Local health communities should review their existing practice for the diagnosis and management of lung cancer against this guideline. The review should consider the resources required to implement the recommendations set out in Section 1, the people and processes involved and the timeline over which full implementation is envisaged. It is in the interests of patients that the implementation timeline is as rapid as possible.

Relevant local clinical guidelines, care pathways and protocols should be reviewed in the light of this guidance and revised accordingly.

This guideline should be used in conjunction with the NICE technology appraisals listed in Section 6.

3.2 Priority areas for audit

A national cancer dataset has been developed by the NHS Information Authority in collaboration with clinicians and the Department of Health. A data subset for lung cancer has been derived by the Intercollegiate Lung Cancer Group to support the National Lung Cancer Data Project (LUCADA), a national ongoing audit programme for lung cancer. The Guideline Development Group notes that many of the recommendations within the complete guideline are auditable through this dataset. All English Cancer Networks are being encouraged to take part in this programme which began its national roll-out in July 2004. A copy of this dataset and further details of the LUCADA project can be found at:

www.nhsia.nhs.uk/ncasp/pages/audit_topics/cancer.asp?om=m1#lung or
www.rcplondon.ac.uk/college/ceeu/ceeu_lung_home.htm

The audit criteria highlighted in Appendix D are based on the recommendations selected as key priorities for implementation. Only two of these highlighted criteria fall within the LUCADA dataset. Audit criteria, exceptions and definitions of terms for those recommendations that are not included in LUCADA are specified.

4 Research recommendations

The following research recommendations have been identified for this NICE guideline, not as the most important research recommendations, but as those that are most representative of the full range of recommendations. The Guideline Development Group's full set of research recommendations is detailed in the full guideline produced by the National Collaborating Centre for Acute Care (see Section 5).

4.1 Staging

- 4.1.1 Further research is needed into the use of FDG-PET scanning in follow-up of patients after radical treatment to investigate possible recurrence of the disease.
- 4.1.2 Further research is needed into the use of FDG-PET scanning in staging patients with SCLC.

4.2 Surgery

- 4.2.1 In stage I (IA and IB) NSCLC, further randomised trials on the role of limited resection in comparison to lobar resection for small lung tumours (less than 2 cm) are needed.
- 4.2.2 In patients with clinical stage I (IA and IB) NSCLC who are suitable for surgical resection, further research on the role of anatomical resection by thoroscopic techniques in comparison to open resection is needed.
- 4.2.3 In patients with stage IIIA (N2) NSCLC detected through pre-operative staging, surgery alone is associated with a relatively poor prognosis.

Therefore, patients with stage IIIA3 should be evaluated in a multidisciplinary setting.

4.3 *Radical radiotherapy alone for treatment of NSCLC*

4.3.1 Research should be conducted into patients with poor lung function being treated with radical radiotherapy.

4.4 *Chemotherapy for NSCLC*

4.4.1 Further trials to identify optimum timing, combination, dosage and duration of chemotherapy should be undertaken. These should include assessment of quality of life.

4.4.2 Trials should be conducted into the risks and benefits of chemotherapy for patients with performance status 2.

4.5 *Combination treatment for NSCLC*

4.5.1 Further large-scale prospective trials should be conducted into the use of post-operative radiotherapy in the treatment of completely resected stage III NSCLC patients.

4.5.2 Prospective randomised controlled trials should be conducted into the use of pre-operative radiotherapy and chemotherapy in the treatment of patients with Pancoast tumours.

4.5.3 Trials investigating concurrent chemoradiotherapy with alternative fractionation schedules such as 55 Gy in 20 fractions or CHART should be supported. Essential features of these trials would include detailed recording of the impact of quality of life and toxicity, particularly anaemia which may have a confounding effect.

4.6 *Endobronchial treatment as radical treatment for NSCLC*

4.6.1 Further trials, preferably randomised, of the use of endobronchial techniques (photodynamic therapy, brachytherapy, cryotherapy,

electrocautery, Nd-YAG laser ablation) as curative treatment in patients with early-stage NSCLC not suitable for conventional treatment should be conducted.

4.7 *Treatment of small cell lung cancer*

4.7.1 Patients with extensive disease SCLC and a complete response at distant metastatic sites and a complete or good partial response within the thorax after treatment should be entered into clinical trials to determine the benefit of PCI in terms of survival and quality of life.

4.8 *Supportive and palliative care*

4.8.1 Research is needed to improve the efficacy of non-drug treatments.

4.8.2 The role of bisphosphonates in the palliation of bone metastasis needs further research.

4.8.3 The management of common symptoms, such as cachexia, fatigue, anorexia and breathlessness experienced by patients with lung cancer needs further research.

4.9 Service organisation

4.9.1 For patients who have had attempted curative treatment and have completed their initial follow up, trials should examine the duration of follow-up and whether regular routine follow-up is better than symptom-led follow-up in terms of survival, symptom control and quality of life.

4.9.2 The impact of the time between first symptom (or first detection if asymptomatic) and treatment on survival and quality of life of lung cancer patients should be investigated.

5 Other versions of this guideline

Full guideline

The National Institute for Clinical Excellence commissioned the development of this guidance from the National Collaborating Centre for Acute Care. The Centre established a Guideline Development Group, which reviewed the evidence and developed the recommendations. The full guideline *Diagnosis and Treatment of Lung Cancer* is published by the National Collaborating Centre for Acute Care; it is available from its website (www.rcseng.ac.uk/about_the_college/role_of_the_college/nccac_html), the NICE website (www.nice.org.uk) and on the website of the National Electronic Library for Health (www.nelh.nhs.uk). **[Note: these details will apply to the published full guideline.]**

The members of the Guideline Development Group are listed in Appendix B. Information about the independent Guideline Review Panel is given in Appendix C.

The booklet *The Guideline Development Process – An Overview for Stakeholders, the Public and the NHS* has more information about the Institute's guideline development process. It is available from the Institute's website and copies can also be ordered by telephoning 0870 1555 455 (quote reference N0472).

Information for the public

A version of this guideline for people with lung cancer, their carers, and the public is available from the NICE website ([WWW.nice.org.uk](http://www.nice.org.uk)) or from the NHSD Response Line (telephone 0870 1555 455 and quote reference number N0XXX for an English version and N0XXX for a version in English and Welsh). This is a good starting point for explaining to patients the kind of care they can expect.

Quick reference guide

A quick reference guide for health professionals is also available from the NICE website (www.nice.org.uk/CG0XXquickrefguide) or from the NHS Response Line (telephone 0870 1555 455 and quote reference number N0XXX).

6 Related NICE guidance

Improving supportive and palliative care for adults with cancer – the manual. *Guidance on cancer services*. (March 2004). Available from www.nice.org.uk

Doxetaxel, paclitaxel, gemcitabine and vinorelbine for non-small-cell lung cancer. *NICE Technology Appraisal Guidance* No. 26. (June 2001). Available from www.nice.org.uk

National Institute for Clinical Excellence (2004) The role of bisphosphonates in metastatic disease. *Health Technology Appraisal* Vol.8, Issue 4. Available from www.ncchta.org

7 Review date

The process of reviewing the evidence is expected to begin 4 years after the date of issue of this guideline. Reviewing may begin earlier than 4 years if significant evidence that affects the guideline recommendations is identified sooner. The updated guideline will be available within 2 years of the start of the review process.

Appendix A: Grading of recommendations

Levels of evidence for intervention studies.

Level of evidence	Type of evidence
1 ^{**}	High-quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias
1 [*]	Well-conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias
1 ⁻	Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias [*]
2 ^{**}	High-quality systematic reviews of case-control or cohort studies High-quality case-control or cohort studies with a very low risk of confounding, bias or chance and a high probability that the relationship is causal
2 [*]	Well-conducted case-control or cohort studies with a low risk of confounding, bias or chance and a moderate probability that the relationship is causal
2 ⁻	Case-control or cohort studies with a high risk of confounding bias, or chance and a significant risk that the relationship is not causal [*]
3	Non-analytic studies (for example, case reports, case series)
4	Expert opinion, formal consensus
[*] Studies with a level of evidence '-' should not be used as a basis for making a recommendation (see section 7.4)	

Levels of evidence for studies of the accuracy of diagnostic tests.

Levels of evidence	Type of evidence
Ia	Systematic review (with homogeneity) [†] of level-1 studies [†]
Ib	Level-1 studies [†]
II	Level-2 studies [‡] Systematic reviews of level-2 studies
III	Level-3 studies [§] Systematic reviews of level-3 studies
IV	Evidence obtained from expert committee reports or opinions and/or clinical experience without explicit critical experience, based on physiology, bench research or 'first principles'
[*] Homogeneity means there are no or minor variations in the directions and degrees of results between individual studies that are included in the systematic review. [†] Level-1 studies are studies: <ul style="list-style-type: none"> • that use a blind comparison of the test with a validated reference standard (gold standard) • in a sample of patients that reflects the population to whom the test would apply. [‡] Level-2 studies are studies that have only one of the following: <ul style="list-style-type: none"> • narrow population (the sample does not reflect the population to whom the test would apply) • use a poor reference standard (defined as that where the 'test' is included in the 'reference', or where the 'testing' affects the 'reference') • the comparison between the test and reference standard is not blind • case-control studies. [§] Level-3 studies are studies that have at least two or three of the features listed above [§] .	

Classification of recommendations for studies of the accuracy of intervention studies.

Class	Evidence
A	<ul style="list-style-type: none"> At least one meta-analysis, systematic review, or RCT rated as 1++, and directly applicable to the target population, or A systematic review of RCTs or a body of evidence consisting principally of studies rated as 1+, directly applicable to the target population and demonstrating overall consistency of results Evidence drawn from a NICE technology appraisal
B	<ul style="list-style-type: none"> A body of evidence including studies rated as 2++, directly applicable to the target population and demonstrating overall consistency of results, or Extrapolated evidence from studies rated as 1++ or 1+
C	<ul style="list-style-type: none"> A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results, or Extrapolated evidence from studies rated as 2++
D	<ul style="list-style-type: none"> Evidence level 3 or 4, or Extrapolated evidence from studies rated as 2+, or Formal consensus
D (GPP)	<ul style="list-style-type: none"> A good practice point (GPP) is a recommendation for best practice based on the experience of the Guideline Development Group

Classification of recommendations for studies of the accuracy of diagnostic studies.

Class	Level of evidence (see Table 7.2)
A (DS)	Studies with level of evidence Ia or Ib
B (DS)	Studies with level of evidence II
C (DS)	Studies with level of evidence III
D (DS)	Studies with level of evidence IV

Appendix B: The Guideline Development Group

Dr Jesme Baird

Chair, patient representative, Roy Castle Lung Cancer Foundation

Ms Caroline Belchamber*

Chartered Society of Physiotherapy

Dr David Bellamy

Standing Committee of General Practitioners

Ms Denise Blake

Royal Pharmaceutical Society of Great Britain

Dr Colin Clelland

Royal College of Pathologists

Dr Dennis Eraut

British Thoracic Society

Dr Fergus Gleeson

Faculty of Clinical Radiology

Dr Peter Harvey

British Psychosocial Oncology Society

Dr Jennifer Hill

Research Fellow, Project Manager, NCC-AC

Mr Ian Hunt

Clinical Consultant, NCC-AC

Ms Patricia Hunt

Royal College of Nursing – palliative care

Ms Barbara Leung

Royal College of Nursing – lung cancer

Ms Katherine Malholtra*

Chartered Society of Physiotherapy

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Patient representative. Formerly of CancerBACUP

Ms Maureen McPake

Society of Radiographers

Ms Catriona Moore[‡]

Patient representative, CancerBACUP

Dr Martin Muers

British Thoracic Society

Dr Mike O'Doherty

British Nuclear Medicine Society

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Ms Veena Mazarello Paes

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Ms Denise Silvey

Royal College of Nursing – lung cancer

Dr Colin Sinclair

Royal College of Anaesthetists

Ms Rachel Southon

Information Scientist, NCC-AC

Mr Peter Tebbit

National Council for Hospice and Specialist Palliative Care

Ms Louise Thomas

Research Associate, NCC-AC

Professor Tom Treasure

Society of Cardiothoracic Surgeons

Dr Andrew Wilcock

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Ms Judy Williams*

Chartered Society of Physiotherapy

Professor Penella Woll

Royal College of Physicians

Mr David Wonderling

Health Economist, NCC-AC

* Shared seat on Guideline Development Group

‡ Shared seat on Guideline Development Group

Appendix C: The Guideline Review Panel

The Guideline Review Panel is an independent panel that oversees the development of the guideline and takes responsibility for monitoring its quality. The Panel includes experts on guideline methodology, health professionals and people with experience of the issues affecting patients and carers. The members of the Guideline Review Panel were as follows.

Mr Peter Robb (Chair)

Consultant ENT Surgeon, Epsom & St Helier University Hospitals and The Royal Surrey County NHS Trusts

Joyce Struthers

Patient representative

Dr Peter Duncan

Consultant in Anaesthetics and Intensive Care Medicine, Royal Preston Hospital, Preston

Anne Williams

Deputy Director of Clinical Governance, Kettering General Hospital NHS Trust

Appendix D: Technical detail on the criteria for audit

The audit criteria highlighted in below are based on the recommendations selected as key priorities for implementation. Only two of these highlighted criteria fall within the LUCADA dataset. Audit criteria, exceptions and definitions of terms for those recommendations that are not included in LUCADA are specified.

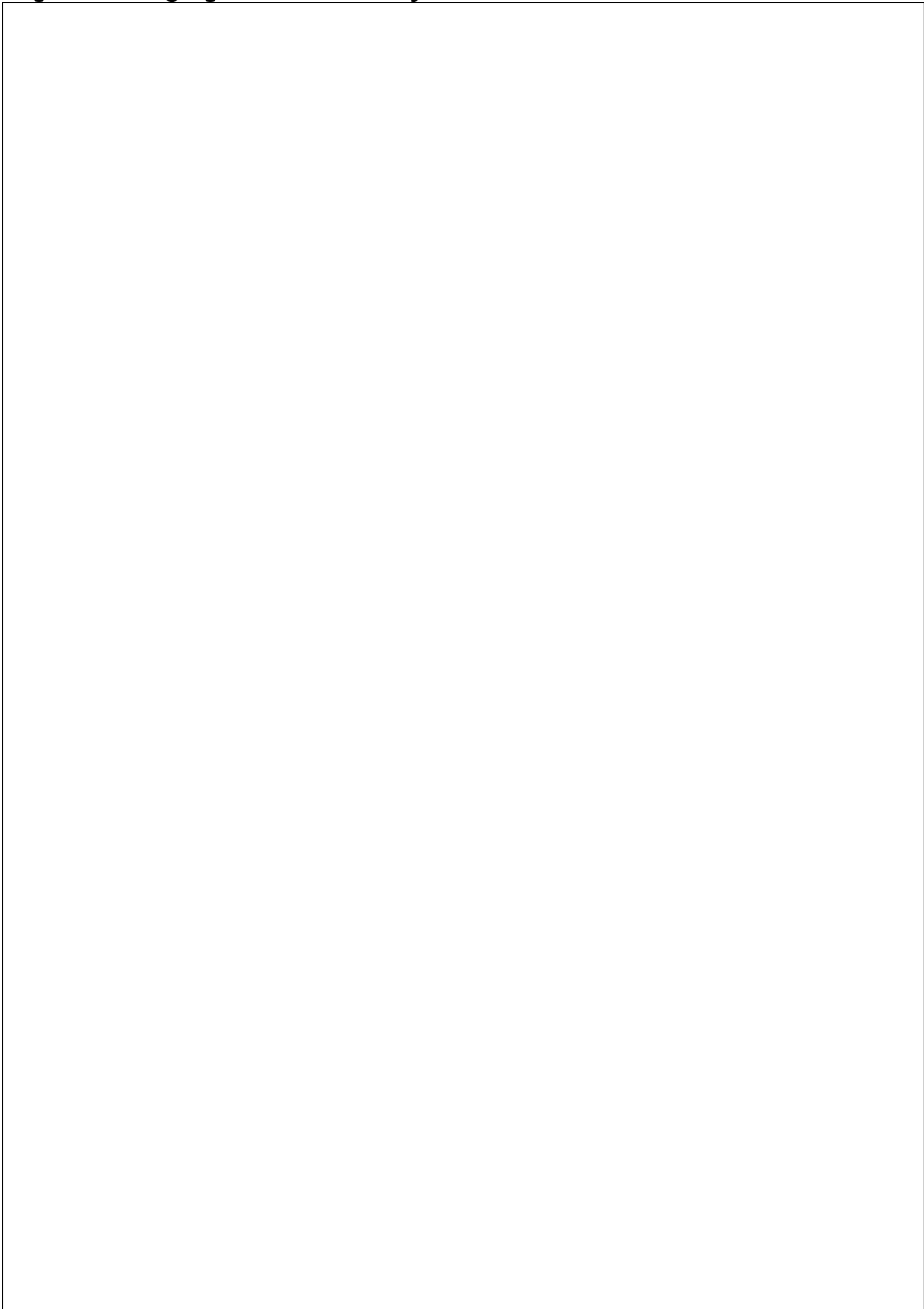
Recommendation	Criterion	Definition of terms
<p>Urgent referral for a chest X-ray should be offered when a patient presents with:</p> <ul style="list-style-type: none"> • haemoptysis, or • any of the following unexplained or persistent (that is, lasting more than 3 weeks) symptoms or signs: <ul style="list-style-type: none"> – cough – chest/shoulder pain – dyspnoea – weight loss – chest signs – hoarseness – finger clubbing – features suggestive of metastasis from a lung cancer (for example, brain, bone, liver or skin) – cervical/supraclavicular lymphadenopathy 	<p>Percentage of patients that present to a GP with the following symptoms and signs who are offered an urgent referral for a chest X-ray:</p> <ul style="list-style-type: none"> • haemoptysis, or • any of the following unexplained or persistent (that is, lasting more than 3 weeks) symptoms or signs: <ul style="list-style-type: none"> – cough – chest/shoulder pain – dyspnoea – weight loss – chest signs – hoarseness – finger clubbing – features suggestive of metastasis from a lung cancer (for example, brain, bone, liver or skin) – cervical/supraclavicular lymphadenopathy 	
<p>If a chest X-ray or chest CT suggests lung cancer (including pleural effusion and slowly resolving consolidation), patients should be offered an urgent referral to a chest physician, who is a member of the lung cancer multidisciplinary team (MDT)</p>	<p>Percentage of patients with a chest X-ray or chest CT suggestive of lung cancer (including pleural effusion and slowly resolving consolidation) that are offered an urgent referral to a chest physician, who is a member of the lung cancer multidisciplinary team.</p>	
<p>Every cancer network must have a system of rapid access to ¹⁸F-fluoro-deoxyglucose positron emission tomography (FDG-PET) scanning.</p>	<p>Percentage of cancer networks that have a system of rapid access to ¹⁸F-fluoro-deoxyglucose positron emission tomography (FDG-PET) scanning.</p>	<p>Rapid = within 4 weeks of the staging CT and clinical assessment as operable</p>
<p>Patients with stages I and II NSCLC</p>	<p>Percentage of medically inoperable</p>	

Recommendation	Criterion	Definition of terms
who are medically inoperable should be offered the continuous hyperfractionated accelerated radiotherapy (CHART) regimen in preference to 60 Gy at 2 Gy per day over 6 weeks.	patients with stages I and II NSCLC who are treated using the continuous hyperfractionated accelerated radiotherapy (CHART) regimen in preference to 60 Gy at 2 Gy per day over 6 weeks.	
Chemotherapy should be offered to patients with stages III and IV NSCLC and good performance status (PS WHO 0, 1 or a Karnofsky score of 80–100) to improve survival, disease control and quality of life.	This is covered by the LUCADA dataset.	
All patients diagnosed with lung cancer should be offered information, both verbal and written, on all aspects of their diagnosis, treatment and care. This information should be tailored to the individual requirements of the patient and audio and videotaped formats should also be considered.	Percentage of patients diagnosed with lung cancer that are offered information, both verbal and written, on all aspects of their diagnosis, treatment and care. This information should be tailored to the individual requirements of the patient and audio and videotaped formats should also be considered.	
Non-drug interventions for breathlessness should be delivered by a multidisciplinary group, facilitated/coordinated by a professional with an interest in breathlessness and expertise in the techniques (for example, nurse or physiotherapist). Although it may be provided within a breathlessness clinic, patients should have access to such support wherever they are.	Percentage of patients with lung cancer that experience breathlessness who have access to support from a multidisciplinary group with an interest in breathlessness and expertise in non-drug interventions (for example, nurse or physiotherapist).	
The care of all patients with a working diagnosis of lung cancer should be discussed at a lung cancer MDT meeting.	This is covered by the LUCADA dataset.	
Early diagnosis clinics for the investigation of putative lung cancer patients are associated with a reduction in diagnostic delay and a reduction in patient anxiety, and should be utilised where possible.	Percentage of patients with putative lung cancer who are seen in an early diagnosis clinic.	
All cancer units should have one or more trained lung cancer nurse specialists to see patients before and after diagnosis, to provide continuing support, and to facilitate	Percentage of cancer units that have one or more trained lung cancer nurse specialists that see patients before and after diagnosis, provides continuing support, facilitates communication	

Recommendation	Criterion	Definition of terms
communication between the MDT, secondary care team, the general practitioner and the community team. Their role includes the availability for patients to access advice and support whenever they need it.	between the MDT, secondary care team, the general practitioner and the community team and who are available for patients to access advice and support whenever they need it.	

Appendix E: Classification systems for lung cancer patients

Figure 1: Staging classification system for NSCLC



Footnotes:

***T1:** The uncommon superficial tumour of any size with its invasive component limited to the bronchial wall which may extend proximal to the main bronchus is classified as T1.

****T4:** Most pleural effusions associated with lung cancer are due to tumour. There are, however, some few patients in whom cytopathological examination of pleural fluid (on more than one specimen) is negative for tumor, the fluid is non-bloody and is not an exudate. In such cases where these elements and clinical judgment dictate that the effusion is not related to the tumour, the patients should be staged T1, T2 or T3, excluding effusion as a staging element.

*****M1:** Separate metastatic tumour nodules in the ipsilateral nonprimary tumour lobe(s) of the lung also are classified M1.

Source: Mountain CF, Libshitz HI and Hermes KE. *A handbook for staging, imaging, and lymph node classification.* www.ctsnet.org/book/mountain/

Figure 2: Stage grouping (TNM subsets)

		Tumour			
		T1	T2	T3	T4
Nodes	N0	IA	IB	IIB	IIIB
	N1	IIA	IIB	IIIA	IIIB
	N2	IIIA	IIIA	IIIA	IIIB
	N3	IIIB	IIIB	IIIB	IIIB

Stage IV = M1

Surgical candidates cTNM =

Figure 3: Staging classification system for SCLC

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Source: Mountain CF, Libshitz HI and Hermes KE. *A handbook for staging, imaging, and lymph node classification*. www.ctsnet.org/book/mountain/ .

Figure 4: Performance status scales

Zubrod/ WHO scale	Karnofsky scale
0 Asymptomatic	100 Asymptomatic
1 Symptomatic, but ambulatory (unable to work)	90 Normal activity, minor symptoms 80 Normal activity, some symptoms
2 In bed < 50% of day (unable to work but able to live at home with some assistance)	70 Unable to work, care for self 60 Occasional assistance with needs
3 In bed > 50% of day (unable to care for self)	50 Considerable assistance 40 Disabled, full assistance needed
4 Bedridden	30 Needs some active supportive care 20 Very sick, hospitalisation needed 10 Moribund 0 Dead

Source: Detterbeck FC, Rivera M. Clinical presentation and diagnosis. In Detterbeck FC, Rivera MP, Socinski MA, Rosenman JG, eds. *Diagnosis and treatment of lung cancer : An evidence-based guide for the practicing clinician*, pp 45-72. Philadelphia: WB Saunders Company, 2001.