Lung Tumour Working Group Clinical Guidelines 2012

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23rd February 2005.

1.6 Chemotherapy for patients with NSCLC

1.7 Combination treatment for NSCLC

1.7.1 Patients with stage I, II or IIIA NSCLC who are suitable for resection should not be offered preoperative chemotherapy unless it is part of a clinical trial.

1.7.2 Preoperative radiotherapy is not recommended for patients with NSCLC who are able to have surgery.

1.7.3 Postoperative radiotherapy is not recommended for patients with NSCLC after complete resection.

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.

1.7.5 Adjuvant chemotherapy should be offered to NSCLC patients who have had a complete resection, with discussion of the risks and benefits.

1.7.6 Patients who are pathologically staged as II and III NSCLC following resection should not receive postoperative chemoradiotherapy unless it is within a clinical trial.
1.7.7 Patients with stage III NSCLC who are not suitable for surgery but are eligible for radical radiotherapy should be offered sequential chemoradiotherapy. 

1.8.1 Patients with SCLC should be offered an assessment that includes evaluation of the major prognostic factors: performance status, serum lactate dehydrogenase, liver function tests, serum sodium, and stage. 

1.8.2 All patients with SCLC should be offered: 

1.8.4 Patients with limited-stage SCLC should be offered thoracic irradiation concurrently with the first or second cycle of chemotherapy or following completion of chemotherapy if there has been at least a good partial response within the thorax. For patients with extensive disease, thoracic irradiation should be considered following chemotherapy if there has been a complete response at distant sites and at least a good partial response within the thorax. 

1.8.5 Patients undergoing consolidation thoracic irradiation should receive a dose in the range of 40 Gy in 15 fractions over 3 weeks to 50 Gy in 25 fractions over 5 weeks. 

1.8.6 Patients with limited disease and complete or good partial response after primary treatment should be offered prophylactic cranial irradiation. 

1.8.7 Second-line chemotherapy should be offered to patients at relapse only if their disease responded to first-line chemotherapy. The benefits are less than those of first-line chemotherapy. 

From NICE Guideline: Treatment matrix for non-small-cell lung cancer. 


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1. Aims

The principal aim of the Lung Tumour Group is to facilitate collaboration between all providers of lung cancer service in the network in order to deliver structured and seamless care based on best available practice. Specific aims include:

i) To review and agree on the most appropriate configuration of lung cancer services in the network and to establish operational policies for the smooth transfer of care across the network

ii) To develop common guidelines for clinical management

iii) To agree on network-wide audit

iv) To co-ordinate through the development of appropriate operational policies the implementation of national and local guidelines in relation to cancer services

v) To develop clinical and laboratory research

vi) To try and involve primary care, patients and carers in its deliberations

2. Multidisciplinary Team and Meeting

The multidisciplinary team (MDT) provides a forum at the multidisciplinary meeting (MDM) to agree staging and plan treatment for all new patient referrals to the Centre and to individual Units. In exceptional circumstances, treatment of patients may commence without prior discussion at the MDM. As an example of such a circumstance, an ill patient with small cell lung cancer (SCLC) might proceed directly to urgent chemotherapy, but management should subsequently be discussed at the next MDM. There will also be occasions during the course of some patients’ management when clinical problems will arise that require interdisciplinary decision making. The MDM provides an opportunity for discussion of these clinical problems.

A treatment plan is formulated for each new patient at discussion in the MDM, but these treatment plans are finalised only following further discussion with the patient in the subsequent multidisciplinary outpatient clinic.

2.1 Review of pathology

If a patient is to be referred to the MDM at Guys’ and St Thomas’, consideration should be given as to whether the pathology needs to be sent for central review. All cases of mesothelioma, cases where there is a degree of diagnostic difficulty or uncertainty, cases to be entered into trials and any other cases at the discretion of the referring team should be reviewed. The review takes place weekly, the afternoon before the MDM, currently Thursday afternoon.

In order for cases to be reviewed, histology and cytology should be sent to the Guy’s Lung Cancer MDM coordinator to arrive no later than 2pm on Thursday. The cases will be reviewed along with all the Guy’s and St Thomas’ MDM cases by up to three specialist thoracic pathologists. After review and discussion at the MDM, slides and blocks will be returned to referring hospitals along with a copy of the review report. The report will also be made available on the hospital EPR for Guy’s clinicians. In some cases, where it is felt that a diagnosis of cancer cannot be safely reached on the original material, further pathological assessment of the tissue sample may be required or further biopsy may be recommended before definitive treatment is commenced.
3. National Lung Cancer Diagnostic, Staging and Treatment Guidelines

A clinical practice guideline on Lung Cancer is being developed for use in the NHS in England and Wales and the details are available online on the NICE website:

The following documents are available:

- Guidelines for pathology diagnosis are provided in the Royal College of Pathologists minimum datasets: http://www.rcpath.org/resources/pdf/g048datasetlungapril11.pdf

The “Full guideline” is dated 11th April 2011 and addresses all aspects of the diagnosis and treatment of lung cancer. This describes the evidence and views that have been considered, and set out the provisional guideline recommendations that have been developed. The (NICE) “short version” presents the guideline recommendations with some brief supporting information only.

The British Thoracic Society (BTS) has published guidance for respiratory physicians on the management of patients with lung cancer:


The BTS has also published guidance for selecting patients with non-small cell lung cancer for surgery:


and on the management of malignant pleural mesothelioma:

4. Network Referral Guidelines and Diagnostic and Staging Investigations

Referral Guidelines:

Early referral is central to the management of all lung cancer patients. All patients with suspected lung cancer must be seen at an appropriate clinic within 2 weeks of referral by the general practitioner. In order to achieve this objective, operating policies have been established across the network to expedite and facilitate the process of referral from primary care to hospital services. Details of these policies across the network are provided in the accompanied Standard Operating Policies document.

Referral from primary care:
1. have a lower threshold for requesting CXRs in light of symptoms persisting for 3 weeks, particularly in high risk groups
2. ensure sufficient clinical information is on cxr request forms to allow the radiologist to identify high risk patients and modify their recommendations where appropriate
3. to ensure that best practice is implemented with regard to reporting of CXRs (for example, I understand in some Trusts, A&E CXRs are not routinely reported by radiologists and we have anecdotal evidence that this has given GP and patient false reassurance and led to a delayed diagnosis of lung cancer)
4. to promote a consistent approach across the Network in managing abnormal CXR results in order to minimise delay of diagnosis

The above is extracted from experience from work such as the Doncaster Cough Campaign, and the anticipated national guidance for primary care about access to CXR which will recommend that GPs

Diagnostic and Staging Investigations

Histological or in some instances cytological diagnosis should be established in all patients, unless specific indications or circumstances suggest that this might not be possible. Diagnostic tests include:

1. Bronchoscopy with pathology assessment of appropriate specimens (tissue, bronchial washings, and brushings).
2. Transbronchial Needle Aspiration (TBNA) of enlarged mediastinal lymph nodes for diagnostic/staging purposes. It is advised that staging CT scan of chest and abdomen is performed before bronchoscopy to maximize output from the investigation and to allow TBNA to be performed for staging as well as diagnostic purposes
3. Percutaneous needle biopsy/FNA (CT, ultrasound or fluoroscopy). This is reserved for patients with peripheral lesions, or in whom bronchoscopy is non-diagnostic. Caution should be exercised in patients on anti-coagulant therapy requiring biopsy. Anticoagulants should be stopped and the INR<1.4. The guidance for stopping clopidogrel and other newer anti-platelet agents is unclear. Until firm BTS guidelines have been established we would recommend that these agents should be stopped for 5-7 days prior to biopsy.
4. Endoscopic ultrasound. This may be indicated for diagnostic purposes and as a staging investigation EBUS-guided TBNA is indicated for biopsy of paratracheal and peri-bronchial intraparenchymal lung lesions.

5. Mediastinoscopy/Mediastinotomy should be performed early if staging investigations suggest that this is the best method to obtain tissue diagnosis (for example, mediastinal lymphadenopathy without a primary lesion accessible bronchoscopically or percutaneously).

6. FNA of palpable lymph nodes or skin deposits

7. Ultrasound guided FNA of supraclavicular lymph nodes or lymph nodes detectable only by ultrasound.

8. Pleural fluid aspiration and/or biopsy

9. Biopsy of distant metastases

4.1. Biopsy and cytology specimens for diagnosis and staging

Histology and/or cytology provide the basis for diagnosis of lung cancer and also plays a role in staging and determination of treatment.

Specimens are obtained as follows:-

- **Bronchoscopy specimens** should include biopsies of any visible lesions, direct brushings and washings. Brushings contaminated with blood and may not be interpretable. Brushings must be rolled gently on slides and immersed immediately in fixative. Fixation is improved by spreading a drop of fixative on the slide before spreading the material. Special fixatives are available for liquid-based cytology techniques in which brushes may be rinsed in fixative before sending to the laboratory. Slides should be labelled in pencil (on the same side of the slide as the cellular smear) with the patient’s full name and date of birth. Specimen pots should be labelled and sent with the request form in an appropriate bag or container.

- The information gained from **fine needle aspirates and endoscopic ultrasound-guided biopsies** is improved by pathologists and / or cytology biomedical scientists being available at the procedure to prepare the direct smears and assess their adequacy and these persons should be present during the procedure where possible. If such help is not available, one, or at most two, direct slides should be rapidly air-dried and one (or at most two) should be immediately fixed in 95% alcohol from each pass. The needle should then be rinsed in optical saline solution. A new needle should be used for each pass but may be rinsed in the same pot of formalin. These procedures are dealt with in detail in the British Society for Clinical Cytology Codes of Practice for FNA cytology, which are available on the website [www.clinicalcytology.co.uk](http://www.clinicalcytology.co.uk)

- **Wide bore needle core biopsies** should be immersed immediately in formalin, as should any punch biopsies or other biopsies.

- **Peri-operative frozen section** (if it is not possible to make a diagnosis of cancer prior to thoracotomy). At the Centre, Consultants are based at St Thomas’ Hospital and frozen sections must be booked in advance, preferably 24 hours in advance. A biomedical scientist is available at Guy’s on extension 82592 or 82590 and on a pager 07625 215863. After booking the procedure the timing should be discussed nearer the time in direct consultation.
with the pathologist concerned. Similar arrangements are available at King’s College Hospital, where thoracic surgery is also performed.

• Requirements for sending histology and cytology specimens to the laboratory are provided on the GSTT website for Histopathology.

• Pleural effusions in newly diagnosed patients should be diagnostically tapped and sent for cytology if this will significantly alter staging. Fluid should be sent to the laboratory without delay in a plain universal pathology specimen bottle without fixation. A separate specimen should be submitted for Microbiology culture if this is indicated. Natural fibrin clots are extracted in the laboratory and processed as for histological biopsies and may be used for immunocytochemistry. Samples are mixed by gentle agitation and a sample is kept separate for cellblock sections (for immunocytochemistry). A diagnosis of malignancy can usually be made on cytomorphology but the site of origin and the tumour and its distinction from mesothelioma requires a panel of immunocytochemical markers.

4.1.1 Histology and cytology results

A number of key advances in the therapeutic management of lung cancer have indicated the need for substantial changes in the diagnostic pathway and techniques for patients with suspected lung cancer drug treatment of NSCLC. Rather than using a combination that fits all patients, there is now evidence that shows different prognostic outcomes associated to histological subtypes and presence of tumour specific mutations. Tissue samples of sufficient size and quality are required to enable pathologists to classify non-small cell lung cancer into squamous cell carcinoma or adenocarcinoma wherever possible. In addition, further tests, requiring additional tissue or cells, may also be needed to detect specific markers that predict whether targeted treatments are likely to be effective, for example epidermal growth factor receptor mutations. As more targeted therapies become available it is likely that further tests will need to be performed to detect the relevant predictive markers. Pathologist must therefore make efforts to sub-classify non-small cell carcinoma using morphological criteria and, if necessary, immunohistochemistry as described in the 3rd edition of the RCPath Lung Cancer Dataset and order predictive markers where appropriate.

Cytology may provide a firm diagnosis of malignancy in the absence of a histological biopsy but it should be understood that invasion cannot be determined from cytology alone. This may be an issue in squamous cell carcinomas and mesothelioma, even on biopsy if clear evidence of invasion is not seen. It is usually possible to make a diagnosis of cancer in these cases if the cytology / histology is unequivocally malignant and there is clear radiological evidence of a tumour mass.

4.2 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:

• Routine haematology and biochemistry (including calcium)

• CT scan of the chest and abdomen (to include the liver and adrenals) with IV contrast 100-
150ml at 3 ml/s. Scan in arterial phase for chest (20-25 second delay) and portal venous phase for liver (60 second delay) should be taken. Slice acquisition depends on type of scanner but ideally the viewing slice thickness should be a minimum of contiguous 5mm slices.

- Pulmonary function tests (in patients who are candidates for surgery or radical radiotherapy)

- PET/CT scan should be performed in all patients who may be candidates for curative treatment with either surgery or radical radiotherapy including patients with limited (1-2 stations) N2/3 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 10 mm in size.

- 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.

- Pleural cytology and supraclavicular biopsy (ultrasound guided if nodes are not palpable)

- Assessment of performance status and fitness for treatment

- Octreotide or MIBG scans may be used in staging of carcinoid tumours, but should be discussed with the Nuclear Medicine Physicians and Thoracic Surgeons.

- 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 suspected for brachial plexus involvement. STIR sequences may be helpful. MR angiography should be performed for vessel assessment if required

- 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. Do not perform Bone scan when PET/CT has excluded bone metastases.

- Imaging of the brain (MRI or CT pre and post contrast; Routine technique) should be requested when indicated by symptoms or signs or in the staging of stage II-III non-small cell cancer prior to curative chemoradiation treatment.

- **4.2.1 Assessment of mediastinal lymph node involvement:**

- If the PET/CT scan of a surgical candidate shows no activity in mediastinal lymph nodes with an FDG avid primary tumour, the patient should proceed to surgery without further tests.

- If mediastinal lymph nodes are enlarged on CT but the PET scan shows no activity in the mediastinum, patients may proceed to surgery.
• If PET/CT is positive for mediastinal disease, EBUS /mediastinoscopy should be performed to exclude a false positive result, particularly if this represents the only evidence that precludes surgery. When CT and PET/CT findings are in agreement in relation to the presence of mediastinal disease, histological confirmation of nodal status should still be sought unless there is compelling evidence of malignant lymph node involvement (e.g. chain of multiple, bulky, FDG lymph nodes with high uptake) and agreed at MDM.

• PET evidence of single site extra-pulmonary disease should be confirmed histologically or by other imaging modality, if this is the only evidence for inoperability.

4.2.2 Pathological staging of resected specimens

Requirements for dissection and reporting lung resections are provided in the Royal College of Pathologists tissue pathways and Lung cancer minimum dataset:

http://www.rcpath.org/resources/pdf/g063tissuepathwaypulmonaryfinal_may08.pdf
http://www.rcpath.org/resources/pdf/g048datasetlungapril11.pdf

5. Non-small Cell Lung Cancer (NSCLC)

5.1. Staging

The TNM classification is used to stage non-small cell lung cancer patients. 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 multi-disciplinary meeting.

Change to include new TNM 7th edition. Main changes:

- T1 reclassified as T1a < 2cm and T1b 2-3 cm
- T2 reclassified as T2a 3-5 cm and T2b 5-7 cm
- T3 to include > 7 cm and separate nodules in the same lobule
- T4 includes separate nodules in the same lung
- M1 reclassified as M1a pleural disease and contralateral lung nodules and M1b distant metastases

Changes in Stage:

- Stage Ia : T1a, T1b N0M0
- Stage Ib: T2a N0M0
- Stage IIa: T2b N0M0, T1-2a N1 M0
- Stage IIb: T3 N0M0, T2b N1M0
- Stage IIIa: T4 N0M0, T3N1M0, T1-3 N2 M0
- Stage IIIb: T1-4 N3 M0, T4 N2
- Stage IV: AnyT, Any N, M1a,b
5.2. Surgery


Surgery should be offered to patients with NSCLC who are medically fit and suitable for treatment with curative intent. This includes stage Ia (T1a,N0 and T1bN0), stage Ib (T2a,N0), stage IIA (T2bN0 and T1-2aN1), stage IIb (T3 N0 and T2b N1), and stage IIIA/N1 (T3,N1) and selected patients with IIIA disease as a part of bi- or tri-modality therapy.

Lobectomy (either open or thoracoscopic) is the treatment of first choice. Offer more extensive surgery (bronchoangioplastic surgery, bilobectomy, pneumonectomy) only when needed to obtain clear margins.

For patients with borderline fitness, impaired lung function and smaller tumours (T1a–b, N0, M0), consider lung parenchymal-sparing operations (preferably anatomic segmentectomy rather than wedge resection) if a complete resection can be achieved, and if alternative local control (radiation) is not feasible.

Surgery should also be considered in carefully selected patients with operable disease in the lung and a single extra-pulmonary metastasis, particularly to the brain or an adrenal gland.

Complete hilar and mediastinal lymph node sampling or radical en-bloc mediastinal dissection should be performed in all patients undergoing curative resection for NSCLC.

Fitness for surgery is judged by FEV1 and TLCO which should be performed in all patients being considered. In borderline cases this may be supplemented by an assessment of VO2 max, or by clinically supervised exercise testing. In patients outside the BTS guidelines on fitness for surgery, resection may still be offered if the patient is fully advised of the increased risks of short and long term risks, and of alternative treatments. Thoracoscoring may be used to further assess peri-operative risk.

Patients with T3N0-1M0 disease that involves the chest wall should be considered for surgery and this should involve en-block resection of the tumour together with chest wall.

In selected patients with T4N0M0 disease due to tumour invasion of SVC, main carina, heart or great vessels, surgery may be considered if there is no associated co-morbidity. Mediastinal lymphadenopathy precludes surgery in such patients. Pre-operative induction chemotherapy or chemoradiation may be discussed in these patients but requires discussion at the mdm.

Regarding resection in patients at increased risk of cardiovascular complications:

We seek to avoid surgery within 30 days of myocardial infarction.

Where feasible, we seek a cardiology review in patients with an active cardiac condition, or three or more risk factors, or poor cardiac functional capacity. However the pressing need for urgent cancer treatment may sometimes preclude a full risk assessment, and a pragmatic approach must be taken.

Offer surgery without further investigations to patients with two or fewer risk factors and good cardiac functional capacity.

Optimise any primary cardiac treatment and begin secondary prophylaxis for coronary
disease as soon as possible. Continue anti-ischaemic treatment in the perioperative period, including aspirin, statins and beta-blockers. If a patient has a coronary stent, discuss perioperative anti-platelet treatment with a cardiologist. It may be appropriate to continue aspirin in the peri-operative period, accepting a possible increased bleeding risk but a reduced risk of ischaemia. Consider revascularisation (percutaneous intervention or coronary artery bypass grafting) before surgery for patients with chronic stable angina and conventional indications for revascularisation.

5.3. Radiotherapy

5.3.1. Radical radiotherapy for stages I and II

Primary radiotherapy (with curative intent) should be offered to patients with:

- T1-3 N0 M0 disease, with WHO performance status of 0-1 but are inoperable because of co-morbidities or poor lung function FEV1 <1.0.

- Poor lung function. FEV1 < 1l/min is not a contra-indication to radical radiotherapy provided the volume of irradiated lung is small and peripheral. This should be discussed with a clinical oncologist.

- For patients with T1/2 N0 peripheral tumours the radiation treatment of choice is stereotactic body radiotherapy (SBRT). Patients will receive between 3 and 8 treatments to a biological effective dose (BED) of >100Gy as per SBRT protocol (refer to SBRT protocol in Q-pulse dataset in radiotherapy for details).

- For patients not suitable for SBRT conventional radical radiotherapy should be given to a dose of 55 Gy in 20 fractions over four weeks is delivered using CT planned conformal radiotherapy. For stage I disease the clinical target volume (CTV) is the primary tumour; for stage II disease, CTV is the primary tumour and ipsilateral hilum.

All patients should undergo pulmonary function tests (including lung volumes and transfer factor) before having radical radiotherapy for NSCLC.

5.3.2. Locally Advanced Disease

Concurrent Chemoradiotherapy

Consider concurrent chemoradiotherapy for patients with stage II (by virtue of positive nodes) or III NSCLC who are not suitable for surgery. Balance potential benefit in survival with the risk of additional toxicities.

Patients in this category should be discussed at the MDM at first presentation. Those with a good performance status should receive chemotherapy in conjunction with radical radiotherapy. Several randomised trials have directly compared concurrent with sequential treatment and suggest
improved survival with the concomitant approach at the expense of increased toxicity. (Curran et al 2000 Proc ASCO 19:484a, Furuse et al 1999 JCO).

Well-motivated patients suitable for radical treatment should be considered for IDEAL-CRT trial and FLT-PET trial. (Appendix 4)

Patients who are of poor performance status (WHO >/=2) or over 75 years of age and have multiple medical comorbidities may not be suitable for concurrent treatment. These patients may be considered for sequential chemotherapy followed by radical or high dose palliative radiotherapy (to be decided by clinical oncologist).

**Primary chemoradiotherapy:**

A small cohort of patients have locally advanced disease that following concurrent chemoradiotherapy may be candidates for surgery. These patients should be identified at the start of their treatment as being potential surgical candidates and should have concurrent chemoradiotherapy. The radiation dose should be 46Gy in 23 fractions with chemotherapy and the patient should have a CT scan at 46Gy. If still operable the chemoradiotherapy stops at that point and the patient is referred to surgery. If however the patient is considered inoperable they should continue to 64Gy in 32 fractions to ensure that a radical treatment is achieved. Therefore 2 simultaneous radiotherapy plans should be constructed for these patients to both total doses.

**Radiotherapy technique**

**Set-up and immobilisation**

Supine with arms up and supported in thoracic board. All radical patients will have a 4D CT planning scan to assess tumour motion with respiration as per 4D CT protocol. Patients will be assessed by radiographers at this session and further immobilised with vacuum bags if necessary.

**Localisation:**

CT planning and PET images

**Target definition:**

Gross tumour volume (GTV) - Tumour
Clinical target volume (CTV) - GTV + 0.5cm
Internal target volume (ITV) – created by clinician using the 8 phases and Maximum intensity projection (MIP) images from 4D CT.
Planning target volume (PTV) – ITV + 1.0cm

NB: If 4D CT acquisition was not possible or patient unable to tolerate scan then conventional 3D CT scan can be used to plan treatment.
For these patients: PTV = CTV + 1.0cm (Ant/Post/Lat)
+ 1.5cm (Sup/Inf)

**Normal tissue tolerances and dose organ limits:**

Lung: V20 < 32 – 35% if using 2 Gy per fraction regime
  Mean lung dose ideally should not exceed 18 Gy

Spinal Cord: 42 – 44 Gy for 2 Gy per fraction regime

Oesophagus (chemo-radiotherapy patients only): V60 < 30%, total length treated < 13.5cm, maximum total oesophageal dose ideally should not exceed 58Gy. Percentage of oesophageal circumference receiving >50 Gy should not ideally exceed 32%.
Heart: The whole heart should not receive more than 40 Gy, and no more than 1/3 of the heart should receive 60 Gy.

**Energy and Modality:**

6MV photons
Daily on-line imaging with conebeam CT.
For clinician review of images in weekly XVI review clinic.

- CT planned conformal radiotherapy: **64 Gy in 32 daily fractions over 6 and a half weeks**
- It is recommended this group of patients are referred early as planning of treatment may take several weeks.

### 5.3.3. Post-operative radiotherapy

Patients with positive resection margins or unexpected N2 disease, should be considered for CT planned radiotherapy if the region at risk is clearly delineated. Patients with pN2 disease should be offered prophylactic adjuvant mediastinal radiation.

- **60-64 Gy in 30-32 daily fractions**
- **50Gy in 25 daily fractions for prophylactic mediastinal treatment**

Adjuvant radiotherapy following complete resection of stage I disease is associated with a detrimental effect on survival.

### 5.3.4. Palliative radiotherapy

Patients with symptomatic chest disease (e.g. haemoptysis, cough, pain or breathlessness) should receive palliative thoracic radiotherapy when appropriate. This group includes those with unresectable disease and patients who are inoperable because of poor performance status. Patients with symptomatic disease receive a fractionation regimen according to their performance status. If possible palliative thoracic radiotherapy should be planned using virtual simulation. Toxicity with each cycle should be assessed according to WHO grade at each outpatient review. See also section on Supportive Care.

**Set up and immobilisation:**
Supine and arms down

**Localisation:**
Virtual Simulation or Conventional Simulator

**Target Definition:**
Main tumour and involved lymph nodes and 1 – 2 cm margin.

**Field Arrangement:**
Parallel opposed pair, fields covering defined target. A single direct field can be applied to targets near surface or adjacent to chest wall.

**Normal tissue tolerances and dose organ limits:**

Spinal cord: avoid 17 Gy in 2 fractions to the spinal cord for patients expected to survive > 9 months

Lung: minimise normal lung dose using MLCs or shielding

**Dose Prescription:**

**PS 0 – 1:**
39Gy in 13 fractions – CT plan with multiple beam arrangement if indicated by clinician on radiotherapy request form to minimise normal tissue toxicity (normally lung dose).
39 Gy 13 fractions in two phases planned in virtual simulation with parallel opposed fields
Phase I: 33Gy/11 fractions; Phase II: 6Gy/2 fractions (gantry change to come off spinal cord) or conformal CT plan at clinician’s discretion if large volume, poor lung function etc.

**PS 2 – 3:**
17 Gy in 2 fractions 7 days apart, or 10 Gy single fraction

**PS 3 – 4, or any metastatic disease:**
10 Gy single fraction

*If large field on single 10 Gy fraction, consider 17 Gy in two fractions (fields >150cm²)*

Haemostasis or pain: 8 Gy single fraction

Superior venal caval obstruction or stridor: 20 Gy in five fractions over one week.

**Energy and modality:**

6MV photons

**Palliative Brain Metastases:**

**Set Up:**
Supine with arms by side and head immobilised with thermoplastic shell.

**Localisation:**
Conventional Simulator

**Target Definition:**
Supraorbital Ridge to External Auditory Meatus or C2 vertebral process

**Field Arrangement:**
Lateral parallel opposed fields, with light field reviewed on patient to ensure off lens.

**Dose Prescription:**

PS 0 – 1: 20 Gy in 5 fractions.
PS 1 – 3: 12 Gy in 2 fractions, given 7 days apart.
**Energy and Modality:**

6MV photons

Patients with solitary brain metastases and disease controlled at other sites should be referred for a neurosurgical opinion. These patients would normally receive post-operative radiotherapy after surgical resection. See Section 8.6 for steroid and anti-convulsant therapy in patients with brain metastases.

Patients with locally advanced disease and SVC obstruction (where stenting is not possible; see Supportive care) should receive 17 Gy in 2 fractions 1 week apart, or 20 Gy in 5 fractions over 1 week.

Palliative radiotherapy for bone, brain and spinal cord metastases should also be offered when appropriate. A single fraction of 8Gy is used for patients with painful bone metastases.

Thoracic re-treatment with radiotherapy may be considered:

- in patients who previously experienced a symptomatic response
- in an area off cord and small in volume.

See Appendix xy for radiotherapy references

### 5.4. Chemotherapy

Chemotherapy now has roles in the adjuvant setting, as induction treatment of locally advanced disease and as palliative treatment of advanced non small cell lung cancer. It should be offered in a clinical trial where possible. Chemotherapy in the neo-adjuvant setting, prior to surgery for a resectable lung cancer, is considered experimental and should only take place in the context of a clinical trial.

Each patient considered for chemotherapy should be assessed fully, both prior to commencing chemotherapy and following each cycle of chemotherapy, as follows:

- Record clinically apparent disease and baseline symptoms
- Record performance status (ECOG or Karnofsky if required for specific trials).
- Patients should have appropriate supportive medication in conjunction with chemotherapy including apprepitant as anti-emetic for platinum based treatments
- Assess toxicity from each cycle of chemotherapy according to WHO grade and record on the notes or assessment page of CIS at each outpatient review. Assessment of toxicity should include assessment of nadir performance status and blood counts where required (see Appendix 5 for details).

Each outpatient or inpatient visit should be detailed in a dictated letter to the referring doctor and copied to any relevant health care personnel (e.g. key worker, general practitioner, palliative care team or clinical nurse specialists).
5.4.1. Adjuvant chemotherapy

1. Offer to patients with good performance status (WHO 0 or 1) and T1–3 N1–2 M0 NSCLC
2. Consider in patients with good performance status (WHO 0 or 1) and T2–3 N0 M0 NSCLC with tumours greater than 4 cm in diameter.

The field of adjuvant chemotherapy for resected NSCLC has evolved remarkably in the recent past. Randomised trials, including two in homogeneous patient populations, support the role of adjuvant chemotherapy as do three separate meta-analyses with an absolute improvement in five-year survival around 5 percent favouring adjuvant chemotherapy.

According to current data it is appropriate to offer adjuvant platinum-based combination chemotherapy to patients following resection of stage II or III NSCLC in patients with good performance status.

Evidence for chemotherapy benefit following resection of stage IB NSCLC is not clear at present: the evidence initially suggested a clear benefit for these patients that was the same order of magnitude as for stage II patients. However after longer follow-up the beneficial effect has faded. With current evidence, patients with tumours smaller than 4 cm and negative nodes do not benefit from adjuvant chemotherapy.

Our standard regimen is Vinorelbine plus Cisplatin for 4 cycles (see Appendix 5 for details of the regimen). Chemotherapy should start no later than 8 weeks after resection. Careful consideration should be taken when treating who would not have been eligible for adjuvant trials: poor PS, co-morbidities. Ensure eligible patients have the benefit of detailed discussion of the risks and benefits of adjuvant chemotherapy.

5.4.2. Locally advanced disease (Stage IIIa[N2] and IIIb)

Combination treatment with chemotherapy in conjunction with radical radiotherapy should be considered for fit patients with locally advanced disease. There continues to be debate as to whether these modalities should be given simultaneously or sequentially; the latter is our practice, and radiotherapy is administered sequentially after the third or fourth cycle of chemotherapy (see Section 5.3.2).

Our standard regimen for induction chemotherapy for locally advanced disease is Vinorelbine and Cisplatin (see Appendix 5 for details of the regimen). Carboplatin should be substituted for cisplatin in patients whose performance status or comorbidities preclude treatment with cisplatin, particularly those with renal or hearing impairment.

5.4.3. Metastatic disease (Stage IV)  First line systemic treatment

Most patients in our network 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 their recommendations (planned for 2011).

Key points from recent studies are:

- First line therapy with an EGFR-TKI improved response rate and PFS in patients with advanced NSCLC that harboured a sensitizing EGFR mutation (15% of non-squamous lung
In patients with non-squamous histology, Cisplatin and Pemetrexed regimen was associated with a superior median survival than 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 the NICE approval of the Cisplatin and Pemetrexed regimen for patients with nonsquamous NSCLC (www.nice.org.uk/guidance/TA192).

The use of maintenance Pemetrexed in patients who have not received this agent in the first line and are not progressing is associated to a prolonged PFS and OS (www.nice.org.uk/guidance/TA181).

Patients with an EML4-ALK mutation (4-7% of all NSCLC) benefit from the use of Crizotinib; this agent is only available through research protocols.

The choice of systemic agent requires analysis of the following factors:

- Performance Status (PS)
- Histological subtype.
- Presence of a sensitizing mutation in the EGFR gene.
- Co-morbidities

Until the new Updated NICE recommendation for systemic therapy is published, our policy will maintain the following advice:

1. Patients with sensitizing mutations in the EGFR gene will receive GEFITINIB 250 mg p.o. until PD or toxicity. A few mutations in the EGFR are TKI resistant. Those patients should receive chemotherapy as first systemic therapy. To check the sensitivity of mutation check the database: www.somaticmutations-egfr.info

2. Patients with wildtype EGFR should receive chemotherapy as first systemic option. Chemotherapy is preferably offered as part of an appropriate clinical trial. Combination chemotherapy should be offered to all patients with stage 4 and performance status 0 or 1, especially those with systemic symptoms. Selected patients with PS 2 might also benefit from combination of single agent chemotherapy, ensuring that adequate home support and follow up is available. Single agent vinorelbine and gemcitabine (Appendix 5) both have activity and are well tolerated by patients, including those older than 70 years of age.

3. Patients with non squamous histology are treated with a third generation drug (Pemetrexed, gemcitabine, vinorelbine, paclitaxel or docetaxel) in combination with platinum agent (cisplatin or carboplatin). Our current standard treatment for PS 0 and 1 outside a clinical trial is Cisplatin Pemetrexed.

4. Patients with squamous histology are treated with a third generation drug (gemcitabine, vinorelbine, paclitaxel or docetaxel) in combination with platinum agent (cisplatin or carboplatin). Our current standard treatment for PS 0 and 1 outside a clinical trial is Cisplatin Gemcitabine or Vinorelbine.
5. In the elderly and in the presence of co-morbidities, especially poor renal function, carboplatin should be used rather than cisplatin.

6. Duration of treatment. Patients progressing to treatment should stop treatment immediately. Stop after 4 cycles if there is no objective response. Stop after 6 in all cases. Pemetrexed is recommended as an option for the maintenance treatment of people with locally advanced or metastatic non-small-cell lung cancer other than predominantly squamous cell histology if disease has not progressed immediately following platinum-based chemotherapy in combination with gemcitabine, paclitaxel or docetaxel.

7. Radiotherapy to bone, brain or cutaneous metastases should be considered to palliate symptoms.

8. Supportive and palliative care input is essential in these patients (see below).

### 5.4.4. Second and third line treatment

If performance status allows, recurrent disease following first line combination chemotherapy should be considered for second line treatment. If the patient is eligible for a clinical trial within the thoracic oncology portfolio or with the Early Phase Clinical Trials Unit that will be our preferred option. Other options for second line treatment include Pemetrexed, Docetaxel and Erlotinib. 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. The receptor tyrosine kinase inhibitor Erlotinib has been approved by NICE as second line treatment as an alternative to Docetaxel. The guidance advises:

- Erlotinib is recommended, within its licensed indication, as an alternative to docetaxel as a second-line treatment option for patients with non-small-cell lung cancer (NSCLC) only on the basis that it is provided by the manufacturer at an overall treatment cost (including administration, adverse events and monitoring costs) equal to that of docetaxel.
- 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. In other patients current data should be discussed with the patient to make the decision.

NICE guidelines do not discuss the options for third line treatment. In the absence of contraindication, those patients progressing after Erlotinib/Docetaxel and maintaining good PS can be considered for third line treatment. As before our favoured option would be a clinical trial.
5.4.5. Neo-adjuvant/Induction chemotherapy

There is some evidence to suggest a benefit for neo-adjuvant chemotherapy, but this approach is still considered experimental except in patients with stage IIb (T3N0M0 with chest wall involvement) or IIIa disease as described in section 5.4.2 above.

5.5. Management of local/regional recurrence after curative treatment

The differential diagnosis between recurrent disease and second primary tumour should be carefully considered in patients previously treated with surgical resection. This may require, when appropriate, bronchoscopy or percutaneous lung biopsy to obtain histological diagnosis. Local recurrence with mediastinal lymph node involvement should be treated as stage IIIB disease (see above).

5.6. Pancoast Tumour and other Locally Advanced Tumours

The MDT should consider management of these patients carefully. Radiotherapy (64Gy in 32 fractions over 6 weeks) combined concurrently with chemotherapy and followed by surgery should be considered in all such patients.

Patients with T3N0M0 disease that involves the chest wall should not be denied surgery if their pulmonary function and performance status is appropriate. Surgery should involve en-block resection of the tumour together with chest wall. Pre-operative chemotherapy should be discussed in these patients.

In selected patients with T4N0M0 disease due to tumour invasion of SVC, main carina, heart or great vessels, surgery may be considered if there is no associated co-morbidity or chemoradiotherapy should be discussed in these patients (see Section 5.3.2).

6. Small cell lung cancer

6.1. Staging

Patients are staged as limited (LS, confined to the thorax) or extensive (ES). Routine staging of SCLC includes the following:

- History and physical examination,
- CBC counts and comprehensive chemistry panel
- CT scan of the chest and abdomen or CT of the chest with cuts going through the entire liver and adrenal glands,
- CT or MRI of the brain, and bone scan in cases of limited disease fit for radical treatment.
6.2. Surgery

Surgery should be offered in-patients with histologically proven T1 small cell lung cancer without hilar lymph node involvement (the merits of each case should be discussed at the MDM). 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. Post-operative chemotherapy, and radiotherapy if mediastinal lymph nodes are involved, should also be given.

6.3. Chemotherapy

The response rate to platinum-based combination chemotherapy in SCLC approaches 90%, and this should be offered to most patients with limited and advanced disease. Recommended first line treatment is 4-6 cycles of cisplatin and etoposide (see Appendix 5). Unlike NSCLC, poor performance status is not a contra-indication to chemotherapy in this context, although carboplatin should be substituted for cisplatin in these patients. Single agent carboplatin at reduced dose should be considered for initial treatment of elderly patients with poor performance status. Details of platinum prescribing are given in Appendix 6. Second line treatment, if appropriate, can be offered with CAV or Topotecan.

6.3.1. Limited stage disease

Recommended first line treatment is 6 cycles of carboplatin combined with etoposide. Etoposide should be given intravenously on days 1, 2 and 3 (see Appendix 5).

Prophylactic growth factor support should be used for the first cycle of treatment. This can be lenograstim, filgrastim or pegfilgrastim according to local practice. Current practice is to use lenograstim 263 mcg daily from days 5 – 12 of cycle 1 or Pegfilgrastim 6mg sc od day + 4 of cycle 1.

Prophylactic ciprofloxacin should be used in the first cycle for patients aged 65 or over and / or of ECOG performance status 3 or 4: ciprofloxacin 250mg twice daily from days 4 – 13 inclusive. Prophylactic antibiotics may be used in other circumstances dictated by physician assessment of individual risk.

Response to treatment should be assessed after three cycles of chemotherapy. Patients with limited disease should be considered for concurrent thoracic (see Section 6.4.1).

6.3.2. Extensive stage disease

Recommended first line treatment is 6 cycles of carboplatin or cisplatin combined with etoposide. Etoposide should be given intravenously on day 1 and orally on days 2 and 3 (see Appendix 5). Response to treatment should be assessed after three cycles of chemotherapy. Responding patients proceed to complete 6 cycles. PCI is recommended for patients that achieve a good response to treatment.
6.4. Radiotherapy

6.4.1. Limited stage disease

SCLC is a chemosensitive disease. Nevertheless, up to 80% of patients treated with chemotherapy develop local recurrences. There is evidence (from 2 meta-analyses) that thoracic radiation in patients who have limited stage disease improves survival (5% at 2 years) and doubles local control (Pignon JP, Arriagada R, Ihde DC et al. A meta-analysis of thoracic radiotherapy for small-cell lung cancer. N Engl J Med. 1992; 327: 1618-1624; Warde P, Payne D. Does thoracic irradiation improve survival and local control in limited-stage small-cell carcinoma of the lung? A meta-analysis. J Clin Oncol. 1992 10: 890-95). The benefits of radiotherapy are greatest in patients who have achieved a complete response to chemotherapy and are of good performance status. The optimum dose for thoracic radiation in SCLC patients is controversial. Studies show that there is a major advantage in increasing the dose from 35 to 40 Gy; a further small benefit can be achieved up to 50 Gy but no real benefit in increasing the dose further.

Response to treatment should be assessed after three cycles of chemotherapy. Patients with limited disease should be considered for concurrent thoracic radiotherapy beginning with the fourth or fifth cycle of chemotherapy. This cohort of patients should be discussed at the MDM at first presentation to assess suitability for chemoradiotherapy (confirmed after cycle 3) to avoid delays in planning and treatment.

Standard treatment is defined as:

- **A tumour dose of 40 Gy in 15 fractions over 3 weeks** during cycles 5 and 6 chemotherapy. Concomitant radiotherapy improves absolute 3 year overall survival from 8.9% to 15.3% (Pignon 1992) and improves local control from 23% to 48%.

- **Prophylactic cranial irradiation a mid plane dose of 25 Gy in 10 fractions over 2 weeks** should be offered to those in complete remission after chemotherapy and thoracic radiotherapy. Available data has confirmed an improvement in survival from 15.3% to 20.7% at 3 years and a reduction in risk of cerebral metastases from 58% to 33%.

6.4.2. Extensive stage disease

Those patients who have experienced a complete response at extrathoracic sites could be offered consolidation radiotherapy 40 Gy in 15 fractions over 3 weeks.

Palliative radiotherapy should be offered to patients with extensive disease and symptoms from intrathoracic disease that fails to respond to chemotherapy. Fractionation regimen is dependent on the patient's performance status:

- **30Gy in 10 fractions over 2 weeks** for WHO PS 0-1

- **20Gy in 5 fractions over 1 week or 17Gy in 2 fractions a week apart** for WHO PS 2-3

- **10 Gy single fraction** for WHO PS 3-4

- **Prophylactic cranial irradiation a mid plane dose of 20Gy in 5 fractions over 1 week** should be offered to those in have demonstrated a response to chemotherapy as this has been shown to confer a survival advantage in these patients. (see appendix xy)
7. Malignant pleural mesothelioma (MPM)

7.1 Pathological diagnosis

The histological diagnosis of malignant mesothelioma is not always straightforward and sufficient material must be available to allow its distinction from benign pleural fibrosis, other soft tissue tumours and metastatic carcinoma. This requires a well-orientated full thickness biopsy such as may be obtained by VATS procedures but wide-bore needle core biopsies may be sufficient. Abram’s needle biopsies seldom provide sufficient tissue. A second opinion should be sought where there is any doubt about the diagnosis.

Cytology with sufficient material for immunocytochemistry can provide an accurate diagnosis of metastatic carcinoma, often with information about likely site of origin, but for mesothelioma cytology alone cannot assess the presence or absence of invasive tumour. Mesothelial cells in an effusion may demonstrate a malignant morphological appearance and immunoprofile but the presence of invasion can only be assessed histologically. In some circumstances it may be possible to make a diagnosis of malignant mesothelioma by a combination of malignant cytology and radiological imaging. However it should be recognised that a pre-invasive stage of mesothelioma in situ exists and may not always progress to invasive malignancy.

7.2 Staging

The New International Staging System for Diffuse Malignant Mesothelioma is being used to formally stage mesothelioma patients (see appendix 8).

7.2.1 Radiological assessment for malignant pleural mesothelioma

Chest and abdomen should be obtained as a single acquisition. Contrast should be given at 100-150ml at 3 ml/s. Patient should be scanned in arterial phase for chest (with 50 second delay between giving contrast and beginning of scan) and portal venous phase for liver. Slice acquisition depends on type of scanner but ideally the viewing slice thickness should be minimum of contiguous 5mm slices. Sagittal and coronal reformats are helpful for adequate assessment of the diaphragm.

7.3 Surgery (Stages I and II)

Surgery should be considered in all patients with early stage disease (stages I and II) and in carefully considered patients with T3N0-1M0 disease.

7.4 Chemotherapy

7.4.1 Neoadjuvant chemotherapy (stages I and II)

Phase II studies have shown neoadjuvant chemotherapy for MPM to be a possible modality of treatment in stage I and II MPM patients. The benefit of neoadjuvant chemotherapy in MPM has not
been proven in a randomised controlled trial. Neoadjuvant chemotherapy is accepted as a standard of care in the national MARS trial.

Pemetrexed in combination with cisplatin is the agent of choice for treatment of all patients with MPM and is now approved locally and by NICE. Local practice is to use 3 cycles of combination pemetrexed and cisplatin (see Appendix 5 for details of regimen). Some patients have been treated with gemcitabine and cisplatin prior to Pemetrexed gaining approval for routine use. Gemcitabine and cisplatin has not been assessed by NICE and is an off-label use but has local approval based on available evidence.

Following 3 cycles of chemotherapy patients should undergo reassessment imaging. Those patients who do not proceed to surgery (as a result of their MARS trial randomisation or their or their physician’s preference) but who have non-progressive disease (i.e. complete response, partial response or stable disease) should continue to 6 cycles of chemotherapy.

7.4.2. Palliative chemotherapy (stages III and IV)

Chemotherapy has been shown to palliate symptoms in stage III and IV MPM patients in phase II studies. Combination chemotherapy with Pemetrexed and Cisplatin has been shown to be superior to treatment with Cisplatin alone for duration and quality of life in a randomised phase III trial.

We routinely offer combination chemotherapy with pemetrexed and cisplatin which is approved by NICE and also has local approval for first line use in this indication (see Appendix 4). Locally approved alternate regimens for palliative chemotherapy in MPM are gemcitabine and cisplatin or single agent vinorelbine. These regimens have not been assessed by NICE but have local approval.

7.4.3. Second line chemotherapy

Second line chemotherapy is not routinely given in MPM but should be considered on disease progression, particularly in symptomatic patients who retain a good performance status (ECOG 0 or 1) particularly if they responded to first line treatment. All such patients should be discussed in the MDM. Patients should be considered for clinical trials where available. Otherwise, the choice of regimen will depend on the treatment that the patient received in the first line setting but should be selected from the approved list.

7. 5 Radiotherapy

Following insertion of a chest drain, or medical or surgical pleural biopsy (VATS or open), radiotherapy to the port site should be offered within 4 weeks to minimise the risk of tumour extension along the drainage track. Patients receive 21 Gy in 3 daily fractions using 140kV or 300kV. Radiotherapy after percutaneous needle aspiration is not necessary. Palliative radiotherapy, including total hemithoracic radiotherapy, should be considered in all patients with pain and/or chest wall masses. The regimen used is determined by performance status and size of the treatment field. Breathlessness in MPM is rarely improved by radiotherapy.

8. Palliative and supportive care

8.1. SVC obstruction

First line treatment in superior vena caval 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 anticoagulation should be discussed with the interventional radiologist. Patients with SCLC and SVC obstruction should proceed instead directly to chemotherapy if possible.

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

8.2. Pleural effusion

Many pleural effusions in lung cancer patients occur secondary to lung collapse, and in these cases drainage is unlikely to provide symptomatic benefit. Where drainage is warranted, a Seldinger drain should be inserted according to the procedure described in Appendix 8. At this point, a talc pleurodesis may be considered if symptomatic relief has resulted:

8.2.1 Pleural fluid cytology:

Fluid should be sent to the laboratory without delay in a plain universal pathology specimen bottle without fixation. A separate specimen should be submitted for Microbiology culture if indicated. Natural fibrin clots are extracted in the laboratory and processed as for histological biopsies and may be used for immunocytochemistry. Samples are mixed by gentle agitation and a sample is kept separate for cell block sections (for immunocytochemistry). A diagnosis of malignancy can usually be made on cytomorphology but the site of origin and the tumour and its distinction from mesothelioma requires a panel of immunocytochemical markers.

8.2.2 Medical pleurodesis:

- Use a Seldinger drain if available
- Check for position of drain and full lung expansion with chest x-ray
- Premedicate with paracetamol 1g and Oramorph (avoid NSAIDs). Consider sedation using midazolam i.v. In 2mg boluses
- Give oxygen 35% and use pulse oximeter
- Ensure drain patent and in pleural space by instilling and withdrawing 10ml saline
- Instil 10ml 2% lignocaine for injection via a three-way tap
- Empty 5g of talc into a 50ml syringe barrel, replace the plunger and draw up 30ml normal saline to form a slurry
- Introduce talc and flush drain with 10ml saline
- Maintain frequent observations including oximetry
- Unclamp and allow free drainage for up to 24 hours; suction with ~5cm H₂O may be used
- Remove drain once draining <100ml/24 hours
- Failure of medical pleurodesis is an indication for a VATS pleurodesis; other suitable surgical candidates include those with extensive pleural disease, or effusions known to be loculated.
8.3. Breathlessness and cough

Exclude reversible causes of breathlessness and cough e.g. infection, pleural effusions.

Opiates may decrease the subjective sensation of breathlessness, principally by suppressing the cough reflex centre in the brain stem. For a dry cough prescribe pholcodine 5-10 mls t.d.s.-q.d.s. increasing to oral morphine e.g. Oramorph 5-10mg 4 hourly, titrating the dose as required. If the patient is already taking oral morphine for pain an increase in the opiate dose by up to 50% may be required.

Radiotherapy can be of use in improving both symptoms. Non-drug interventions such as including explanation, breathing exercises, a fan or open window may all help (refer also to the Hospital Palliative Care Team Guidelines Section 9.5.1 for non-pharmacological management of breathlessness e.g. an electric fan at the bedside, breathing control techniques).

8.4. Palliation of Central Endobronchial Tumours

The following treatment modalities are available at the Centre for the management of central airway obstruction. These are often combined to optimise outcome:

- Cryotherapy
- Airway Stent
- External Beam radiotherapy/endobronchial brachytherapy

Patients with symptoms from acute central airway obstruction require urgent evaluation and should be referred to a specialist centre, as appropriate, where management is in collaboration with Interventional Radiology. Endobronchial stenting, preceded by debulking as necessary, represents the most appropriate therapeutic approach in such patients. Stenting is indicated for obstruction in the trachea, right main bronchus, right bronchus intermedius and left main bronchus. Stenting of lobar or more distal airways is technically difficult and unlikely to have any major impact on shortness of breath. CT scan of the chest with IV contrast should be performed prior to stenting. Although stenting can be performed by fiberoptic bronchoscopy, the local policy is to use general anaesthesia and rigid bronchoscopy. Debunking of tumour causing complete occlusion of a main bronchus (of recent onset) may be necessary before stenting and endobronchial cryotherapy. In some cases endobronchial brachytherapy may be appropriate and can be discussed with clinical oncology. We currently do not offer this service at GSTT and patients should be referred to UCLH. Endobronchial brachytherapy is planned and will be set up at GSTT by 2012.

Referral protocols for patients with acute central airway are detailed in the operational policy.

Patients with significant but not critical major airway obstruction may require prophylactic stent insertion. This can be performed by bronchoscopist alone, or in collaboration with interventional radiologist. The development of retrievable endobronchial stents that can be inserted without the need of X-ray screening is likely to alter current practice in this area.

Radiotherapy should also be considered to improve localised symptoms. This should be fractionated therapy eg. 20 Gy in 5 daily fractions or 30 Gy in 10 fractions over two weeks. High dose dexamethasone should be prescribed to reduce reactive oedema.
8.5. 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 NaCl saline over 90 minutes (reduce dose if creatinine > 1.5x normal) or zoledronate 4mg in 100ml NaCl saline over 15 minutes (reduce dose in renal impairment according to approved algorithm (see Appendix 7). 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.

8.6. Brain metastases

Radiotherapy for brain metastases is discussed above (Sections 4.3.4 and 5.4). Steroid doses up to 16mgs daily are 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 lifelong phenytoin. 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, neurological symptoms.

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

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

8.7. Spinal Cord Compression

Patients should be referred immediately after an MRI scan of the whole spine has been performed, after commencing dexamethasone 8mg twice a day with gastric protection. Radiotherapy is delivered to the site of disease. An applied dose of 20 Gy in five fractions over 7 days is delivered, anticipating commencement of therapy within 24 hours of diagnosis. (See GSTT guidelines on spinal cord compression on intranet.)

8.8. Pain

Refer to Hospital Palliative Care Team Guidelines Sections 4 & 5

8.9. 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 and turbans in the clinic at the time treatment is started.

8.10. Anaemia and thrombocytopenia

Transfusion is generally offered when Hb <10g/dL. Anaemic patients should be considered for
participation in trials of recombinant erythropoietin (EPO). Platelet transfusions are required when platelets fall below 20 x10^9/L, or <40 in association with bleeding, purpura or extensive bruising.

8.11. 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 G-CSF in this setting.

8.12. Pneumonitis

Patients receiving high dose thoracic radiotherapy are at risk of developing pneumonitis, which should be treated with high dose 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.

8.13. Anorexia and cachexia

Look for and treat reversible causes e.g. dry or painful mouth, oral candida, nausea and vomiting. Refer to dietician for advice. Supplements such as Pro-Sure may be beneficial. (Also refer to Hospital Palliative Care Team Guidelines)

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. one week and discontinued if ineffective. If beneficial, the dose should be reduced after a period e.g. one month. Suggested doses are dexamethasone 4 mg o.d. or prednisolone 30mg o.d.

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 80-160mg b.d. or medroxyprogesterone acetate 400mg o.d.

9. Breaking bad news

The information below is taken from 'Breaking Bad News-Guidelines for Clinical Staff' from Guy's and St. Thomas' NHS Foundation Trust December 2002.

Key points:

A. Advanced preparation
   - Consider time available, put pager on silent mode, find a private setting.
   - Would it be helpful to have another member of staff?
   - Before seeing the patient review relevant clinical information, consider psychological/social issues, mentally rehearse words or phrases to use or avoid

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

C. Communication
   - Ask what the patient already knows
   - Warn the patient you do not have good news
• Proceed at the patients' pace  
• Be frank but compassionate  
• Avoid jargon  
• Allow for silence and tears  
• Check the patients' understanding  
• Repeat information if needed  
• Allow time for discussion  
• Outline next steps in treatment plan and provide written information  
• Offer a follow up meeting  

D. Dealing with reactions  
• Be aware of family/patient reactions and acknowledge their emotional needs  
• Be empathic  
• Offer support from other members of the multidisciplinary team if needed  
• Avoid confrontational scenarios  
• Be aware of own safety  
• Do not criticize or argue with colleagues  
• Deal with your own emotional needs and the needs of other colleagues  
• Allow time for reflection  

10. Palliative care referral  

Many palliative care issues are addressed in outline in Section 9 above. Referral procedures for palliative care advice and support from hospital and community teams are given in Appendix 10.  

11. Follow up of patients  

Following Pulmonary Resection  

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 for clinical evaluation and routine chest x-ray. Initial follow up should be at the centre by surgical team, subsequently at the referring unit unless special circumstances dictate otherwise.  

The recommended follow up is:  

• 1 month following discharge.  
• 3 monthly for 12 months.  
• 6 monthly for the next 2 years.  
• Longer follow up to the discretion of the Clinical Team and patient.  

Following Radical Radiotherapy  

• Patients should be seen routinely once during treatment and also on completion.  
• 3 monthly for the first 24 months because of greater risk of recurrence after radical radiotherapy than resection  
• 6 monthly for the next 2 years.  
• Longer follow up to the discretion of the Clinical Team and patient.  

Following Chemotherapy  

Patients should be reviewed four weeks following completion of treatment to assess toxicity, and thereafter returned to the referring consultant for follow-up, unless immediate further specialist treatment is planned. In general, follow-up of treated patients should be at 2-monthly intervals for the
first 6 months after treatment, then at 3-monthly intervals in the first three years, and 6-monthly thereafter.

Toxicity with each cycle should be assessed according to WHO grade and recorded on a green chemotherapy proforma at each outpatient review. Patient response should be assessed, usually with a repeat CT, after three cycles. In the presence of objective response, or symptom improvement with stable disease, a further cycle should be given. Patients down-staged by chemotherapy should be considered for surgery; this decision should be made on an individual basis after discussion at the MDT meeting.

**Following Palliative radiotherapy**

Patients receiving palliative radiotherapy alone are likely to have advanced disease or significant co-morbidity. The nature of follow up care in these patients should be individualised and it should be structured in such a way to provide seamless care between hospital, primary care and community services.

**12. Lung Cancer Nurse Specialist Service**

The Lung Cancer Nurse Specialists (LCNS) within the South East London Cancer Network will act in a key worker role for all patients diagnosed with Lung Cancer or Mesothelioma.

It is the responsibility of each LCNS to ensure that all newly diagnosed patients are allocated a key worker (appendices 12 and 13)

A key worker is a person who, with the patient’s consent and agreement, takes a key role in co-ordinating the patient’s care and promoting continuity, ensuring the patient and their families/carers know who to access for information and advice in relation to a cancer diagnosis.

It is essential that if patients are discharged from any Palliative Care Team that the appropriate Lung Cancer Nurse Specialist is informed.

**13. Admissions to the ward**

Admissions to the ward, whether from clinic, from home, or, in the case of the Centre, by transfer from another hospital, should be co-ordinated to minimise inconvenience and delays. Refer to operational policy for details of admission policies across the network.

**14. Research**

The network has interest in clinical trials for lung cancer and in basic research. It aims to include at 10% of eligible patients to appropriate trials.

At present, lung cancer clinical research is co-ordinated by Dr D Landau, tumour group lead for research in close collaboration with the Network Research Lead Dr S Ahmad. The network is involved in national trials but is also developing its own local research priorities. For example, Professor Treasure is National Lead for the MARS trial and Dr Santis leads the first study evaluating the feasibility, safety and efficacy of autologous HSPPC-96 vaccine administration in NSCLC. Laboratory research is currently investigating the biology of adenovirus infection as a prelude to the development of targeted, safe and effective Adenovirus vectors for gene transfer. More recent work is addressing the immunobiology of dendritic cells in draining lymph nodes of patients with resected NSCLC with the long term aim of overcoming tumour-related immune suppression.
15. Audit & Clinical Governance

Potential Network audits are discussed at the Tumour Group Meetings. Current network audit project:

1. Impact of new PET/CT facility at GSTT on time to surgery

2. Time to 2nd line chemotherapy after 1st line chemotherapy in NSCLC (GSTT)

Clinical Governance issues are dealt with according to individual hospital policies.

16. Date for Review of Guidelines

These guidelines will be formally reviewed in June 2013. If necessary, amendments dictated by significant change in NICE guidelines will be discussed and incorporated at an earlier meeting as appropriate.
Appendix 1.
South East Lung Cancer Referral Form

South East London Cancer Networks Lung Cancer Urgent Referral Form- Issue April 05

To make a referral FAX this form to the Urgent Referral Team at the relevant hospital clinic. Guidelines to be followed when filling in this form are given overleaf, nb. it is expected that a chest x ray will have been taken. If you wish to send an accompanying letter please do so.

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Fax:</th>
<th>Tel:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Princess Royal University</td>
<td>01689 863187</td>
<td>01689 865666</td>
</tr>
<tr>
<td>Queen Elizabeth</td>
<td>020 8836 4035</td>
<td>020 8836 5964/5</td>
</tr>
<tr>
<td>Guy's</td>
<td>020 718 80923</td>
<td>020 718 80902</td>
</tr>
<tr>
<td>Queen Mary's</td>
<td>020 8308 9264</td>
<td>020 8308 3230</td>
</tr>
<tr>
<td>St Thomas</td>
<td>020 718 80923</td>
<td>020 718 80902</td>
</tr>
<tr>
<td>King's</td>
<td>020 7346 1516</td>
<td>020 7346 1516</td>
</tr>
<tr>
<td>Lewisham</td>
<td>020 8333 3451</td>
<td>020 8333 3450</td>
</tr>
<tr>
<td>St Thomas</td>
<td>020 718 80923</td>
<td>020 718 80902</td>
</tr>
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From (use practice stamp if available):

<table>
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<tr>
<th>GP's name:</th>
<th>Tel No:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td>Fax No:</td>
</tr>
<tr>
<td>Post Code:</td>
<td></td>
</tr>
</tbody>
</table>

Patient Details:

Name: ___________________________ D.O.B.: ___/___/___ Age: ___________________________

- Address: ___________________________ Gender: M/F
  Tel (home): _________________ Postcode: _______________________

Hospital No (if known): ___________________________ New NHS No: ___________________________

Has the patient visited the hospital previously? Y/N

First language: ___________________________

Patient’s occupation: ___________________________

Referral Information (please 4 boxes):

History:

- Current or ex-smoker? ☐
- History of COPD? ☐

Symptoms:

Haemoptysis? None ☐ Once ☐ Persistent ☐

Unexplained or persistent (> 3 weeks)

- Cough ☐
- Breathlessness ☐
- Wheeze ☐
- Chest/shoulder pain ☐
- Weight loss ☐
- Hoarseness ☐

Clinical examination:

- Chest signs ☐
- Signs of SVCO ☐
- Cervical LNS ☐
- Stridor ☐
- Signs of metastases ☐
- Finger Clubbing ☐

Chest X-ray?

- Done ☐
- Abnormal, suspicious of cancer ☐
- Abnormal, follow-up recommended ☐
- Abnormal, other ☐

Comments/other reasons for referral: ________________________________________________________________
______________________________________________________________________________________________

To be completed by the Data Team:

Date received: ___/___/____ Date 1st appointment booked: ___/___/____ Date of 1st appointment: ___/___/____
Hospital No.: ___________________________ Date 1st seen: ___/___/____

Specify reason if not seen at 1st appointment offered: __________________________________________________

Appropriateness of referral : Yes ☐ No ☐ Final diagnosis: Malignant ☐ Benign ☐

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Appendix 1 contd.
South East Lung Cancer Referral Form for Thoracic Oncology

<table>
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<td>Referring Hospital:</td>
<td>……………………. Local Hospital Number:……………..</td>
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<tr>
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<td>………………………………. Stage: ........................................</td>
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<table>
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<tr>
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<th>Clinical Oncology / Medical Oncology / Both</th>
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</thead>
<tbody>
<tr>
<td>Path report included?</td>
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<tr>
<td>Recent FBC &amp; biochemistry included?</td>
<td>Y / N  Date……………….</td>
</tr>
<tr>
<td>Radiology report included?</td>
<td>Y / N  Date……………….</td>
</tr>
<tr>
<td>Radiology CD sent?</td>
<td>Y / N  Date……………….</td>
</tr>
<tr>
<td>Sent by?</td>
<td>Post / Courier  Date sent: .........................</td>
</tr>
<tr>
<td>PET scan performed?</td>
<td>Y / N  Date……………….</td>
</tr>
</tbody>
</table>

| Contact name for secretary at referring hospital: | ………………………………………….. |

<table>
<thead>
<tr>
<th>Contact phone number for secretary at referring hospital:</th>
<th>……………….</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central phone number for GSTFT Oncology referrals:</td>
<td>020 7188 0902</td>
</tr>
<tr>
<td>Central fax number for GSTFT Oncology referrals:</td>
<td>020 7188 8052</td>
</tr>
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Page 34 of 69
Appendix 2. Network Contact Details

GSTT.
Switchboard: 020 7188 7188

<table>
<thead>
<tr>
<th>Department</th>
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<th>Extension</th>
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<tr>
<td>Radiology</td>
<td>Dr Sheila Rankin</td>
<td>x 85561</td>
</tr>
<tr>
<td></td>
<td>Dr Rebecca Preston</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dr Zaid Viney</td>
<td></td>
</tr>
<tr>
<td>PET/Nuclear Medicine</td>
<td>Dr Sally Barrington</td>
<td>x 84988</td>
</tr>
<tr>
<td>Cardiothoracic Surgery</td>
<td>Mr Tom Routledge</td>
<td>x 81069</td>
</tr>
<tr>
<td></td>
<td>Mr Loic Lang-Lazdunski</td>
<td>x 81038</td>
</tr>
<tr>
<td></td>
<td>Miss Juliet King</td>
<td>x 81034</td>
</tr>
<tr>
<td></td>
<td>Mrs Karen Harrison Phipps</td>
<td>x 87943</td>
</tr>
<tr>
<td></td>
<td>Mr John Pilling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jason Simons, Sophia Holden,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(surgical CNS x 81020, bl.2786)</td>
<td></td>
</tr>
<tr>
<td>Respiratory Medicine</td>
<td>Dr George Santis</td>
<td>X85842</td>
</tr>
<tr>
<td></td>
<td>Dr Ronan Breen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sr Ali Quinn (CNS)</td>
<td>x85823, pager 62955</td>
</tr>
<tr>
<td>Clinical Oncology</td>
<td>Dr Shahreen Ahmad</td>
<td>x 84247</td>
</tr>
<tr>
<td></td>
<td>Dr David Landau</td>
<td>x 83761</td>
</tr>
<tr>
<td></td>
<td>Dr Simon Hughes</td>
<td></td>
</tr>
<tr>
<td>Medical Oncology</td>
<td>Dr Rohit Lal</td>
<td>x 84253</td>
</tr>
<tr>
<td></td>
<td>Dr James Spicer</td>
<td>x 84249</td>
</tr>
<tr>
<td></td>
<td>Dr Ana Montes</td>
<td>x 84253</td>
</tr>
<tr>
<td></td>
<td>Specialist Registrar</td>
<td>bleep via Switch</td>
</tr>
<tr>
<td>Histopathology</td>
<td>Dr Emma McLean</td>
<td>x 82926</td>
</tr>
<tr>
<td></td>
<td>Dr Paul Cane</td>
<td>x 82933</td>
</tr>
<tr>
<td></td>
<td>Dr Amanda Murphy</td>
<td>x 89192</td>
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<tr>
<td>Palliative Care</td>
<td>Dr Irene Carey</td>
<td>x 87549</td>
</tr>
<tr>
<td></td>
<td>Dr Teresa Beynon</td>
<td>x 84721</td>
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<tr>
<td>Clinical Nurse Specialists</td>
<td>Paula Tindale-Paul</td>
<td>x 84758, bleep 2468</td>
</tr>
<tr>
<td></td>
<td>Sarah Compton</td>
<td>x 84739, bleep 2171</td>
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<tr>
<td></td>
<td>Rachel Thomas</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marrika Colvin</td>
<td></td>
</tr>
<tr>
<td>Research Nurses</td>
<td>Rebecca Thomas</td>
<td>x 87752, bleep 2826</td>
</tr>
<tr>
<td></td>
<td>Sharon Delena</td>
<td>x 82006, bleep 0625</td>
</tr>
<tr>
<td>MDM Coordinator</td>
<td>María Jones</td>
<td>x 80899</td>
</tr>
</tbody>
</table>
Kings College Hospital
Switchboard 020 3299 9000

Lead Clinician for Lung MDT & MDT Service Improvement
Dr Surrinder Birring
Surinder.birring@nhs.net
x 4630

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x 4711

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Cardiothoracic Surgeon
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Mr Donald Whitaker
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Mr Ranjit Deshpande
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x 4365

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x 4849

Clinical Oncologist
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Air Call via CT
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x 3005

Page 36 of 69
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x4060

MDT Co-ordinator  Ms Sue Hayward
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Secretary to Dr Barker  Ms Mary Holder
x4292

User issues & Patient Information  Ms Jane Kelly  pager KH4060
Ms Chaira De-Biasie
Macmillan support center
Cicley Saunders Institute
Kings College Hospital  020 3299 5229

Cancer Data Team –
Two Week Wait Office  phone 0203 299 1516 or fax 0207 346 1515
Queen Elizabeth Woolwich

Lead Lung Cancer Clinician  Dr K Satkunam
Oncologist:  Dr S Ahmad
Radiologist:  Dr R Nagendran
Pathologist:  Dr T Pinto
CNS:  Caroline Gousy, Nayomi Wickramasinghe
Palliative Care:  Barbara Griggs
MDT Co-ordinator:  Jo Walker

Member responsible for users' issues & Keyworker: Caroline Gousy

Queen Mary's Sidcup

Switchboard 020 8308 2678

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Histopathology
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Clinical Nurse Specialist/Key Worker
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Cancer Data/MDM Coordinators
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Linda Purkis  x 4756  linda.purkis@qms.nhs.uk

Clinical Oncologist
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Princess Royal University Hospital, Farnborough
Switchboard – 01689 863000

Dial Direct – 01689 8 & Extension

**Lead Lung Cancer Clinician**
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**Consultant Chest Physician**
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Dr Shahid Hamid  x 65875  shahid.hamid@bromleyhospitals.nhs.uk

**Radiologists**
Dr Adrian Thomas  x 63638  adrian.thomas@bromleyhospitals.nhs.uk

**Histopathologists**
Dr Jane Norton  x 64294/5  jane.norton@bromleyhospitals.nhs.uk
Dr Rashida Goderya  x 64294/5  rashida.goderya@bromleyhospitals.nhs.uk
Dr Andrew Giles
Dr Adam Coombes

**Lung Cancer CNS**
Nicky De Lobel  x 64713  nicola.delobel@bromleyhospitals.nhs.uk

**Palliative Care Consultants**
Dr Sharon Ife
Dr Louise Exton  x 65667

**Palliative Care CNS**
Anna Wooder  x 65667  palliative.team@bromleyhospitals.nhs.uk

**Medical Oncologist**
Dr Ana Montes  x 63297
Or via GSTFT switchboard (020 7188 3026)

**Chartwell Inpatient Area**  x 63170

**Chartwell Treatment Suite**  x 63154/5
UNIVERSITY HOSPITAL LEWISHAM
Switchboard 020 8333 3000

Lead Lung Cancer Clinician, Chest Physician  
Dr Peter Luce  
peter.luce@uhl.nhs.uk

Oncologist  
Dr Rohit Lal  
rohit.lal@uhl.nhs.uk

Radiologist  
Dr Rajeev Gupta  
rajeev.gupta@uhl.nhs.uk

Histopathologist  
Dr Isabelle Meiers  
isabelle.meiers@uhl.nhs.uk

Clinical Nurse Specialist  
Connie Jackson  
connie.jackson@uhl.nhs.uk

MDT Co-ordinator  
Claire Woods  
claire.woods@uhl.nhs.uk

Palliative Care Consultant  
Dr Katie Emmitt  
katie.emmitt@uhl.nhs.uk
Appendix 3. Current NICE guidelines in lung cancer

- The following is taken straight from the current NICE guideline for Lung Cancer published 23rd February 2005.

- 1.6 Chemotherapy for patients with NSCLC
   A matrix summarising the treatment of NSCLC can be found in Appendix F.

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

   1.6.2 Chemotherapy for advanced NSCLC should be a combination of a single third-generation drug (docetaxel, gemcitabine, paclitaxel or vinorelbine) plus a platinum drug. Either carboplatin or cisplatin may be administered, taking account of their toxicities, efficacy and convenience. 

   1.6.3 Patients who are unable to tolerate a platinum combination may be offered single-agent chemotherapy with a third-generation drug. 

   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 previous chemotherapy. 

- 1.7 Combination treatment for NSCLC
   A matrix summarising the treatment of NSCLC can be found in Appendix F.

   1.7.1 Patients with stage I, II or IIIA NSCLC who are suitable for resection should not be offered preoperative chemotherapy unless it is part of a clinical trial. 

   1.7.2 Preoperative radiotherapy is not recommended for patients with NSCLC who are able to have surgery. 

   1.7.3 Postoperative radiotherapy is not recommended for patients with NSCLC after complete resection. 

   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 who have had a complete resection, with discussion of the risks and benefits. A

1.7.6 Patients who are pathologically staged as II and III NSCLC following resection should not receive postoperative 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 offered sequential chemoradiotherapy. A

1.8 Treatment of small-cell lung cancer

1.8.1 Patients with SCLC should be offered an assessment that includes evaluation of the major prognostic factors: performance status, serum lactate dehydrogenase, liver function tests, serum sodium, and stage. D

1.8.2 All patients with SCLC 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 whose disease responds. Maintenance treatment is not recommended. A

1.8.4 Patients with limited-stage SCLC should be offered thoracic irradiation concurrently with the first or second cycle of chemotherapy or following completion of chemotherapy if there has been at least a good partial response within the thorax. For patients with extensive disease, thoracic irradiation should be considered following chemotherapy if there has been a complete response at distant sites and at least a good partial response within the thorax. A

1.8.5 Patients undergoing consolidation thoracic irradiation should receive a dose in the range of 40 Gy in 15 fractions over 3 weeks to 50 Gy in 25 fractions over 5 weeks. D(GPP)

1.8.6 Patients with limited disease and complete or good partial response after primary treatment should be offered prophylactic cranial irradiation. A

1.8.7 Second-line chemotherapy should be offered to patients at relapse only if their disease
responded to first-line chemotherapy. The benefits are less than those of first-line chemotherapy. D(GPP)

**From NICE Guideline: Treatment matrix for non-small-cell lung cancer**

This table is a summary of – but not a substitute for – the recommendations on treatment.

<table>
<thead>
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<th>Stage II</th>
<th>Stage IIIA</th>
<th>Stage IIIB</th>
<th>Stage IV, PS 0–1</th>
<th>Stage IV, PS 2</th>
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**Key:**

- **First choice for eligible patients**
- **Suitable for some patients (see recommendations)**
- **Not recommended**

*Except within a clinical trial.  
*May be first choice of treatment for patients with good performance status and localised disease that can be safely encompassed in a radical radiotherapy treatment volume.

for NSCLC in Section 1, and should be read in conjunction with them.
### Appendix 4. Current trials: Chemotherapy and Radiotherapy

The following are trials open as of July 2007. These summaries of eligibility criteria are provided to aid identification of trials that might be suitable for a particular patient, but the trial protocol should also be consulted before discussing any trial with a patient.

<table>
<thead>
<tr>
<th>Trial Acronym</th>
<th>Status</th>
<th>Summary</th>
<th>Prior Treatment required</th>
<th>Comments</th>
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<tr>
<td>Peto</td>
<td>Open throughout network</td>
<td>A Population Based Case-Control Study Of Mesothelioma And Lung Cancer In Relation To Occupation Among British Men And Women Under The Age Of 60</td>
<td>None</td>
<td>Questionnaire format</td>
</tr>
<tr>
<td>MARS</td>
<td>GSTT</td>
<td>Mesothelioma and Radical Surgery trial. MARS pilot study - to determine the feasibility and acceptability of performing a randomised trial comparing extra-pleural pneumonectomy (EPP) against no EPP surgery within the context of trimodality therapy (chemotherapy, surgery, post-operative radiotherapy).</td>
<td>1st line chemotherapy x3 cycles</td>
<td>Negative lymph nodes on PET and mediastinoscopy</td>
</tr>
<tr>
<td>BTOG 2</td>
<td>GSTT, QE</td>
<td>BTOG2 a phase III randomised trial of gemcitabine plus cisplatin at 80mg/m2 versus gemcitabine plus cisplatin at 50mg/m2 versus gemcitabine plus carboplatin AUC6 in stage IIIB/IV non-small cell lung cancer (NSCLC)</td>
<td>None</td>
<td>1st line (prior surgical resection allowed), no brain mets, one measurable lesion</td>
</tr>
<tr>
<td>TOPICAL</td>
<td>GSTT</td>
<td>Tarceva or Placebo in Clinically Advanced Non-small Cell Lung Cancer</td>
<td>None</td>
<td>1st line pts unsuitable for chemotherapy</td>
</tr>
<tr>
<td>Mesothelioma and Radical Surgery trial. MARS pilot study - to determine the feasibility and acceptability of performing a randomised trial comparing extra-pleural pneumonectomy (EPP) against no EPP surgery within the context of trimodality therapy (chemotherapy, surgery, post-operative radiotherapy).</td>
<td>None</td>
<td>Questionnaire format</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTOG 2</td>
<td>GSTT, QE</td>
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<td>None</td>
<td>1st line (prior surgical resection allowed), no brain mets, one measurable lesion</td>
</tr>
<tr>
<td>TOPICAL</td>
<td>GSTT</td>
<td>Tarceva or Placebo in Clinically Advanced Non-small Cell Lung Cancer</td>
<td>None</td>
<td>1st line pts unsuitable for chemotherapy</td>
</tr>
<tr>
<td>Mesothelioma and Radical Surgery trial. MARS pilot study - to determine the feasibility and acceptability of performing a randomised trial comparing extra-pleural pneumonectomy (EPP) against no EPP surgery within the context of trimodality therapy (chemotherapy, surgery, post-operative radiotherapy).</td>
<td>None</td>
<td>Questionnaire format</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zolendronate study – bone mets</td>
<td>GSTT</td>
<td>Phase III Randomised to evaluate efficacy of Zometa in preventing or delaying bone metastases in stage III NSCLC</td>
<td>Primary treatment either surgery, radiotherapy or chemotherapy</td>
<td>Must be randomised within 6 months diagnosis, no pleural effusions</td>
</tr>
<tr>
<td>Pfizer A3671015</td>
<td>GSTT</td>
<td>Phase II non-comparative study of ticilimumab or best supportive care in stage IIb or IV NSCLC after at least 4 cycles chemotherapy</td>
<td>1st line platinum based chemotherapy x4 with stable disease or response</td>
<td>Within 6 weeks of 1st line chemotherapy, no brain mets, must have measurable disease</td>
</tr>
<tr>
<td>IDEAL-CRT</td>
<td>GSTT</td>
<td>Phase II study for Stage II and III NSCLC looking at radiation dose escalation in the context of concurrent chemoradiation.</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>FLT-PET study</td>
<td>GSTT</td>
<td>Trial studying the role of FLT-PET scans in patients having radical radiotherapy</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>ERASER (pending)</td>
<td>GSTT</td>
<td>Phase I study looking at the combination of SBRT and RFA in NSCLC patients suitable for radical treatment</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>MAGE-3</td>
<td>Pending</td>
<td>Phase I/II study to assess the safety and immunogenicity of rchMAGE-A3+AS15 cancer immunotherapeutic given as adjuvant therapy, with or without adjuvant chemo(-radio) therapy, to patients with MAGE-A3-positive Non-Small Cell Lung Cancer (stage IB,II or III).</td>
<td>Resected stage IB, II, IIIA or unresectable stage III tumours post chemotherapy +/-radiotherapy</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 5. Chemotherapy doses and scheduling

**Gemcitabine/cisplatin:**
gemcitabine 1,250mg/m² D1 & 8 of a 21 day cycle
cisplatin 75mg/m² D1

**Gemcitabine/carboplatin:**
gemcitabine 1,250mg/m² D1 & 8 of a 21 day cycle
carboplatin AUC 6 (Cockcroft & Galt) or 5 (estimated clearance) D1

**Vinorelbine /cisplatin:**
cisplatin 75mg/m² D1 of a 21 day cycle
vinorelbine p.o.* 60mg/m² D1 & 8
*oral vinorelbine dose may be escalated to 80mg/m² D1 & 8 after the first cycle if well tolerated

**Vinorelbine /carboplatin:**
carboplatin AUC 6 (Cockcroft & Galt) or 5 (estimated clearance) D1
vinorelbine i.v. 30mg/m² D1 & 8, OR
vinorelbine p.o.* 60mg/m² D1 & 8

**Paclitaxel/carboplatin:**
paclitaxel 225mg/m² D1 of a 21 day cycle
carboplatin AUC 6 (Cockcroft & Galt) or 5 (estimated clearance) D1

**Vinorelbine single agent (ELVIS regimen):**
vinorelbine p.o.* 60mg/m² D1 & 8 of a 21 day cycle
*oral vinorelbine dose may be escalated to 80mg/m² D1 & 8 after the first cycle if well tolerated

**Docetaxel single agent:**
docetaxel 75mg/m² D1 of a 21 day cycle

**Cisplatin/etoposide (EP):**
cisplatin 80mg/m² D1 of a 21 day cycle
etoposide 120mg/m² i.v. D1, 2, 3 in limited disease; or 120mg/m² orally D1, 2, 3 in extensive Disease

**Carboplatin/etoposide (ECarbo):**
carboplatin AUC 6 (Cockcroft & Galt) or 5 (estimated clearance) D1
etoposide 120mg/m² i.v. D1, 2, 3 in limited disease; or 120mg/m² orally D1, 2, 3 in extensive Disease

**CAV:**
cyclophosphamide 600mg/m² D1 of a 21 day cycle
doxorubicin 50mg/m² D1
vincristine 2mg D1

**Pemetrexed/cisplatin:**
pemetrexed 500mg/m² D1 of a 21-day cycle
cisplatin 75mg/m² D1
Appendix 6. Platinum dosing

Creatinine clearance should be estimated using the Cockcroft and Galt formula for all patients due to receive platinum-based chemotherapy:

\[
\text{clearance (ml/min)} = \left[ F \times (140 - \text{age}) \times \text{body weight}\right] \times \frac{1}{\text{Cr}}
\]

- \( F = 1.04 \) for females, \( 1.23 \) for males
- weight in kg; age in years
- \( \text{Cr} = \text{creatinine in M} \)

Selecting Cisplatin or Carboplatin

1. Selection according to disease stage

In patients with locally advanced disease, cisplatin is preferred to carboplatin, provided performance status and comorbidities allow, because of superior survival shown in a meta-analysis.

Carboplatin is generally preferred in stage IV disease unless PS 0 or 1 and / or optimal and rapid response required for symptom control.

2. Selection according to renal function

Calculated C&G GFR:  
\[
\geq 60 \text{ mls / minute} \quad \text{Cisplatin acceptable}
\]

Calculated C&G GFR:  
\[
< 60 \text{ mls / minute} \quad \text{Carboplatin}
\]

Carboplatin dosing:

1st cycle:  
according to C&G GFR  
(usually dose at AUC 6)

2nd & subsequent cycles:  
EDTA required  
(usually dose at AUC 5)

Refer to individual prescribing protocols for details of dose calculations for cisplatin and carboplatin.
Appendix 7. Dosing of Zoledronic Acid in Renal Impairment

In patients with bone metastases presenting with mild to moderate renal impairment prior to initiation of therapy, which is defined for this population as CrCl 30-60 ml/min, the following Zoledronic acid dose is recommended (see also section 4.4, “Special warnings and special precautions for use”):

<table>
<thead>
<tr>
<th>Baseline Creatinine Clearance (ml/min)</th>
<th>Zoledronic Acid Recommended Dose*</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;60</td>
<td>4.0 mg</td>
</tr>
<tr>
<td>50-60</td>
<td>3.5 mg*</td>
</tr>
<tr>
<td>40-49</td>
<td>3.3 mg*</td>
</tr>
<tr>
<td>30-39</td>
<td>3.0 mg*</td>
</tr>
</tbody>
</table>

*Doses have been calculated assuming target AUC of 0.66 (mg*hr/l) (CrCl=75 ml/min). The reduced doses for patients with renal impairment are expected to achieve the same AUC as that seen in patients with creatinine clearance of 75 ml/min.

The website to use to look at SmPCs is [http://www.medicines.org.uk/](http://www.medicines.org.uk/)
Appendix 8. Staging of mesothelioma

New International Staging System for Diffuse MPM

T1  Tumour limited to the ipsilateral parietal pleura, including mediastinal and diaphragmatic pleura. No involvement of the visceral pleura,
T1a  Tumour involving the ipsilateral parietal pleura, including mediastinal and diaphragmatic pleura. Scattered foci of tumor also involving the visceral pleura
T1b  Tumour involving the ipsilateral parietal pleura, including mediastinal and diaphragmatic pleura with at least one of the following features:
• involvement of diaphragmatic muscle
• confluent visceral pleural tumour (including the fissures) or extension of tumour from visceral pleura into the underlying pulmonary parenchyma

T2  Tumour involving each of the ipsilateral pleural surfaces (parietal, mediastinal, diaphragmatic, and visceral pleura) with at least one of the following features:

T3  Describes locally advanced but potentially resectable tumour
Tumour involving all of the ipsilateral pleural surfaces (parietal, mediastinal, diaphragmatic, and visceral pleura) with at least one of the following features:
• involvement of the endothoracic fascia
• extension into the mediastinal fat
• solitary, completely resectable focus of tumor extending into the soft tissues of the chest wall
• nontransmural involvement of the pericardium

T4  Describes locally advanced technically unresectable tumor
Tumor involving all of the ipsilateral pleural surfaces (parietal, mediastinal, diaphragmatic, and visceral) with at least one of the following features:
• diffuse extension or multifocal masses of tumor in the chest wall, with or without associated rib destruction
• direct transdiaphragmatic extension of tumor to the peritoneum
• direct extension of tumor to the contralateral pleura
• direct extension of tumor to one or more mediastinal organs
• direct extension of tumor into the spine
• tumor extending through to the internal surface of the pericardium with or without a pericardial effusion; or tumor involving the myocardium

N-Lymph nodes
NX  Regional lymph nodes cannot be assessed
NO  No regional lymph node metastases
N1  Metastases in the ipsilateral bronchopulmonary or hilar lymph nodes
N2  Metastases in the subcarinal or the ipsilateral mediastinal lymph nodes, including the ipsilateral internal mammary nodes
N3  Metastases in the contralateral mediastinal, contralateral internal mammary, ipsilateral, or contralateral supraclavicular lymph nodes

M-Metastases
MX  Presence of distant metastases cannot be assessed
MO  No distant metastasis
M1  Distant metastasis present

Stage: Description:
Stage 1
1a  T1aNOMO
1b  T1bNOMO
<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage II</td>
<td>T2NOMO</td>
</tr>
</tbody>
</table>
| Stage III| Any T3MO  
          |   Any N1MO   
          |   Any N2MO   |
| Stage IV| Any T4                   
          |   Any N3       
          |   Any M1       |
Appendix 9. Guidelines for the insertion of a Seldinger chest drain

Choice of chest drain
No large studies have compared the use of smaller bore drains with large bore drains. However it is preferable to use Seldinger chest drains in patients with malignant effusions. The presence of a loculated effusion or of empyema are indications for cardiothoracic referral.

Site of insertion
The chest drain should be inserted within the ‘triangle of safety’ through the fifth intercostal space, typically just anterior to the mid-axillary line (figure 1) and level with the nipple in a man, and the root of the breast in a woman. Insertion through lower spaces carries the risk of entering the abdomen.

Figure 1: patient positioned showing ‘triangle of safety’
Confirming site of drain insertion

Prior to the procedure, the patient’s identity and the site and side of the planned insertion is confirmed by reviewing clinical signs and the chest X-ray. Additional imaging, especially ultrasound, can be used to indicate the site for chest drain insertion. If marked for later drainage, the position of the patient at the time of imaging should be clearly documented.

Types of drainage systems

The one bottle system is the most familiar and is usually suitable for the drainage of an uncomplicated pleural effusion (figure 2). The water in the bottle acts as a one-way valve and prevents backflow of air into the intra-pleural space. The bottle top has 2 ports, one for the sterile underwater chest drain tubing, and a second which usually has a detachable bung and acts as the venting end. The venting port should be exposed to air, or if necessary attached to an appropriate suction unit. Venting prevents the build-up of pressure in the chest drainage system that can prevent evacuation of air or fluid.

Figure 2: One bottle system

The drainage bottle should be filled with sterile water to the mark (usually 500ml) prior to insertion of the drain. The distal end of the first port can then be introduced and secured so that it is immersed below the level of the water. Sterility of the proximal chest drain tube can be maintained by leaving it in its sterile bag until it is handed to the scrubbed doctor for connection to the chest drain after insertion.

Use of analgesia, sedation and atropine

Analgesia such as Oramorph should be given before the procedure. In addition, the use of a short acting sedative such as i.v. midazolam is often appropriate. The insertion of a chest drain can be anxiety-provoking and painful, and a vasovagal response should be anticipated. The use of atropine 0.5 mg i.v. given as a pre-medication is usually not required routinely, but should be readily available.

Technique for insertion of chest drain using the Seldinger technique

1. Preparation
a. **Patient** – explain what is happening and give reassurance. Consent and i.v. access is obtained. Facemask oxygen may be necessary if the patient is compromised.

b. **Equipment & assistance** – check trolley and equipment necessary are available and prepared, including the under-water seal drain and tubing. Have an assistant (ideally a nurse or colleague experienced in chest drain insertion) present.

c. **Analgesia & sedation** – oral analgesia such as **Oramorph** can be given 20-30mins before. In addition, **midazolam 2-2.5 mg** IV can be given and is also titrated against patient response. Ensure atropine (given i.v. 0.5mg) is available.

2. **Positioning of patient**

Position the patient, ideally with the patient flat on the bed or at an incline of 45 degrees with the arm on the affected side placed behind his/her head away from the chest wall (see figure 1).

3. **Insertion of chest drain**

a. **Confirm side of insertion** – if available double-check chest X-ray and mark site of insertion (‘triangle of safety’)

b. **Skin preparation** – wash hands and use sterile gloves and gown. Prepare skin and drape the chest

c. **Local anaesthetic** – infiltration of 1% or 2% lignocaine 10-20 ml into the skin, raising a intradermal bleb, and deeper tissue (intercostal muscles, periosteum on the upper surface of the lower rib and parietal pleura) along proposed insertion site. Aspirate intermittently, looking for fluid in the syringe to confirm that the pleural space has been entered and it is safe to continue. Wait 2-3mins for the anaesthetic to take effect.

d. **Introducer needle insertion** – a 20 ml syringe is attached to the introducer needle, which is inserted into the pleural space with continuous aspiration. Pleural fluid is obtained as the space is entered.

e. **Guidewire insertion** – the Seldinger guidewire is introduced through the introducer needle which is then withdrawn over the wire.

f. **Dilator** – nick the skin adjacent to the guidewire entry point to aid passage of the dilator over the guidewire.

g. **Chest tube insertion** – the dilator is removed, and the drain passed over the guidewire. The drain can be guided basally for drainage of fluid to the desired length. The guidewire is then withdrawn.

h. **Connect to underwater drain** – The chest drain is connected to the underwater drain securely to prevent accidental disconnection or leakage. The clamp is removed immediately and the drain inspected for swinging of water in the bottle/drain tubing, and for drainage of pleural fluid.

i. **Secure drain** – the drain is secured with a suture. Untied or purse string sutures are not necessary.

j. **Dressing** – clean the site and apply a simple occlusive dressing.

k. **Safe disposal of instruments** – it is the doctor’s responsibility to remove and dispose of all sharps from trolley.
l. **Chest X-ray** - this should be taken within 4 hours of insertion and allows drain position to be checked and the degree of re-expansion or drainage to be assessed.

m. **Documentation** – details of the procedure including medications given, size of drain used and any difficulties encountered should be entered into the patient’s notes.

4. **Post drain procedure**

n. **Observations** - the patient should be observed for any change in respiratory or cardiovascular status. Ensure that tubing and connections are secured and that the drain bottle remains below the level of chest.

o. **Analgesia** - continued attention should be paid to adequate analgesia while the drain remains in position.

p. **Rate of drainage** - for chest drain insertion in the context of effusions, there are reports of re-expansion pulmonary oedema following rapid drainage of large volumes of pleural fluid. Though there is no evidence for the actual amounts of fluid that should be drained at one time, it has been suggested that drainage should limited to about 500 ml per hour.
Appendix 10. WHO analgesic ladder

<table>
<thead>
<tr>
<th>MILD PAIN</th>
<th>MODERATE PAIN</th>
<th>SEVERE PAIN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**STEP 1**
- **WEAK OPIOID**
  - e.g. codeine 30-60mg q.d.s.
- **NON OPIOID**
  - e.g. paracetamol 1g q.d.s.
  - +/- COANALGESICS

**STEP 2**
- **STRONG OPIOID**
  - e.g. morphine 5-10mg 4-hourly
  - + NON OPIOID
  - +/- COANALGESICS

**STEP 3**
- **STRONG OPIOID**
  - e.g. morphine 5-10mg 4-hourly
  - + NON OPIOID
  - +/- COANALGESICS

* Do not exceed total daily dose of paracetamol (4g) if e.g. compound weak opioids is combined with paracetamol
Appendix 11. Palliative care referral

SOUTH EAST LONDON CANCER NETWORK LUNG CANCER:
PATHWAY FOR REFERRAL FOR SPECIALIST PALLIATIVE CARE

Patient meeting criteria for referral

Hospital inpatient
Hospital outpatient clinic
Patient at home

Contact hospital palliative care team for assessment of palliative care needs
Complete and fax referral form for community palliative care team (CPCT)

Patient remains in hospital
Admission to specialist palliative care unit/hospice +/- palliative day care
Home with CPCT involvement +/- palliative day care

Criteria for Referral

• Any patient with lung cancer; the prognosis will usually be limited and focus of treatment will usually have changed from curative to palliative.
• A demonstrable need for specialist palliative care services must be established. Appropriate reasons for referral include:
  • pain control
  • control of other symptoms, e.g. vomiting
  • psychological distress of patient/family or carer
  • terminal care/dying (prognosis usually less than two weeks)
  • complex social needs
• The patient and/or their family/carer must be informed and agree to the referral
Criteria for Urgent Referral (assessment within 24 hours)

- Patient dying
- Difficult symptoms not responding to current management
- Severe psychosocial distress (patient or carer)

Telephone contact with the relevant palliative care team (community/hospital) will be required to facilitate urgent assessment

Please contact your local palliative care team to discuss any referral if you are unsure as to its appropriateness.

Mechanisms of Referral

Hospital Palliative Care Teams

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Contact Details</th>
<th>Method of Referral</th>
</tr>
</thead>
<tbody>
<tr>
<td>King’s College Hospital</td>
<td>Telephone 020 7346 4060</td>
<td>Telephone</td>
</tr>
<tr>
<td></td>
<td>Fax 020 7346 4713</td>
<td></td>
</tr>
<tr>
<td>GSTT</td>
<td>St Thomas’: 020 7928 9292 ext 3109/3648 Fax 020 7922 8253</td>
<td>Referral form</td>
</tr>
<tr>
<td></td>
<td>Guy’s 020 7378 1880 Fax 0207955 2725</td>
<td></td>
</tr>
<tr>
<td>Queen Elizabeth Hospital, Woolwich</td>
<td>020 8836 5442 Fax 020 8836 5428</td>
<td>Telephone</td>
</tr>
<tr>
<td>Queen /Mary’s Hospital, Sidcup</td>
<td>020 8308 3297 Fax 020 87308 3261</td>
<td>Telephone</td>
</tr>
<tr>
<td>Bromley Hospitals</td>
<td>01689 863000 Fax 01689 864070 Bleep 134/133</td>
<td>Telephone</td>
</tr>
<tr>
<td>Lewisham Hospital</td>
<td>020 8333 3017 Fax 020 8333 3270</td>
<td>Referral form</td>
</tr>
</tbody>
</table>

Community Palliative Care Teams

Copies of recent medical correspondence and relevant investigation results should accompany all referrals, made using a South London Palliative and Supportive Care Network referral form.
<table>
<thead>
<tr>
<th>Name of Team</th>
<th>Catchment area</th>
<th>Contact details</th>
<th>Method of referral</th>
</tr>
</thead>
<tbody>
<tr>
<td>St Christopher’s at Home</td>
<td>LSL, north Bromley</td>
<td>020 8776 5656 Fax 020 8776 5798</td>
<td>Referral form</td>
</tr>
<tr>
<td>Bexley Hospice Outreach Team</td>
<td>Bexley</td>
<td>020 8320 5837 option 1 Fax 020 8320 5839</td>
<td>Referral form</td>
</tr>
<tr>
<td>Greenwich Hospice Outreach Team</td>
<td>Greenwich</td>
<td>020 8320 5837 option 2 Fax 020 8320 57886</td>
<td>Referral form</td>
</tr>
<tr>
<td>Lewisham Macmillan Team</td>
<td>Lewisham</td>
<td>020 8333 3017 Fax 020 8333 3270</td>
<td>Referral form</td>
</tr>
<tr>
<td>St Thomas’ PCT</td>
<td>West Lambeth</td>
<td>020 7928 9292 ext 3109/3648 Fax 020 7922 8253</td>
<td>Referral form</td>
</tr>
<tr>
<td>Guy’s PCT</td>
<td>North Southwark</td>
<td>020 7378 1880 Fax 0207955 2725</td>
<td>Referral form</td>
</tr>
<tr>
<td>South Bromley HospisCare</td>
<td>South Bromley</td>
<td>01689 605300 Fax 01689 605303</td>
<td>Referral form</td>
</tr>
</tbody>
</table>

Specialist Palliative Care Units/Hospices (inpatient and day care)

All referrals made using appropriate referral form. Copies of recent medical correspondence and relevant investigation results should accompany all referrals.

<table>
<thead>
<tr>
<th>Name of Unit</th>
<th>Catchment Area</th>
<th>Contact details</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>St Christopher’s Hospice</td>
<td>All of SELCN</td>
<td>020 8768 4500</td>
<td>Inpatient and day centre</td>
</tr>
<tr>
<td>Greenwich and Bexley Community Hospice</td>
<td>Greenwich and Bexley</td>
<td>020 8312 2244</td>
<td>Inpatient and day centre</td>
</tr>
<tr>
<td>Trinity Hospice</td>
<td>LSL</td>
<td>020 7787 1000</td>
<td>Inpatient and day centre</td>
</tr>
<tr>
<td>South Bromley HospisCare</td>
<td>South Bromley</td>
<td>01689 605300 Fax 01689 605303</td>
<td>Day centre</td>
</tr>
<tr>
<td>Richard Dimbleby Cancer Information and Support Service</td>
<td>All of SELCN</td>
<td>020 7960 5682</td>
<td>Information centre and day care and psychological support service</td>
</tr>
</tbody>
</table>
Appendix 12. SELCN Key Worker Operational Policy

South East London Cancer Network

Identification and Implementation of the Key worker for Patients with Cancer

Introduction

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 a cancer diagnosis. (NICE, Improving Supportive and Palliative Care for Adults with Cancer, 2004)

A key worker:
- Is not a 24-hour emergency contact service, but should ensure that patients do have appropriate emergency contact details.
- May not be the person clinically treating the patient.

A Cancer Key worker will be available at key points in the patient’s cancer journey. This may be the same person throughout the journey with others providing input at key stages or responsibility may transfer at some point in the journey. The key stages of the journey may include:
- Around the time of diagnosis
- Commencement of treatment
- Completion of the primary treatment plan
- Disease recurrence
- The point of recognition of incurability
- The point at which dying is diagnosed
- At any other point the patient requests

Operational Policy

1. When the patient is having active treatment for their cancer and is under a multidisciplinary team (MDT), a cancer key worker will be identified at the MDT meeting when a cancer diagnosis is first discussed. This will be recorded on the MDT proforma, the key worker record chart and in the patient notes.

NB. The patient may have other key individuals involved in their care especially if they have pre-existing involvement with services due to comorbidities: if this is the case, the Cancer Keyworker should ensure that the other key individuals are kept well informed of developments, and discussions should take place about who will coordinate the other non-cancer specific aspects of care.

2. It is the responsibility of the core nurse member attending the meeting or in absence, the nominated deputy, to identify this key worker and to ensure that the name is recorded on the MDT proforma and key worker record chart, in the notes.
3. It is the responsibility of key workers to introduce themselves to the patient and to provide the patient with contact details.

4. The key worker will work in conjunction with the patient, the MDT and other appropriate services, including primary care, ensuring timely access to services and information and promoting continuity along the disease trajectory. (This may include early referral to District Nursing for first contact and assessment).

5. If a more appropriate person is identified as a key worker at / for a point in the patient’s journey, e.g. if the patient completes their treatment or is discharged, this will be discussed with and agreed by the patient and the new key worker and recorded on the key worker record chart in the patient notes.

6. At all stages, the key worker will have relevant information concerning the patient. It is their responsibility to hand this information over to any subsequent key worker.

7. At the completion of treatment and/or discharge it is important to re-establish a partnership with primary care so that the primary care provider and the patient know how to access the service should a problem develop. E.g., through GP contact or using current key worker contact details.

**Documenting key worker**

1. The name, designation and contact details of key worker will be recorded on the patient’s most recent MDT proforma and this will be signed and dated. Local key worker documentation should be completed and updated as appropriate.

2. The name of the key worker, designation and contact details will also be recorded in the patient hand-held record (PHR) if used, and other local documentation*. If the patient does not have a PHR with them they will be given written contact details

3. On transfer from one keyworker to another, the old keyworker will provide a summary for the new keyworker and other relevant professionals e.g., GPs.

4. When the key worker is changed outside the MDM setting, the outgoing key worker will be responsible for informing the patient’s consultant of the change and ensuring that this information is contained within the patients medical notes (it may be appropriate to use a proforma for this, see appendix 1)

**Agreed By:**  

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**Date of Policy:**  May 2007

**Review Date:**  May 2008

*Single Assessment Process documentation, generic PHRs, patient notes etc.
Mission statement

To improve the quality of care and health outcomes for patients and their families with lung cancer, mesothelioma and thymic cancer receiving care within SE Thames Cancer Network.

Philosophy

In light of information currently available about the needs of patients with lung cancer and their families, the following values underpin the Lung Cancer Nurse Specialist (LCNS) Service:

- **Equity**: Within the available resources, the service aims to work towards ensuring equity in service provision for all patients with lung cancer and their families regardless of gender, ethnicity, religion and social class.

- **Communication and information**: Patients with lung cancer and their families should have access to good communication, accurate and timely information (verbal, written, audio & visual, where available) about the disease, necessary investigations, proposed management and likely effects and side-effects of the disease and/or treatment.

- **Access to help and advice**: Patients with lung cancer and their families should have easy access to prompt and appropriate help and advice.

- **Psychological and social support**: The psychological and social needs of patients with lung cancer and their families should be assessed. Timely and appropriate interventions including referral to other agencies should be implemented in light of this assessment.

- **Expert advice on symptom management**: Patients with lung cancer require close assessment and monitoring of symptoms, advice on symptom management (both pharmacological and non-pharmacological) and early referral to, and liaison with, specialist palliative care teams both in the hospital and/or community setting.

- **Co-ordinated care**: Care for patients with lung cancer and their families should be as seamless as possible as patients move between community and hospital care, between units and the cancer centre, and within teams and departments in Guy's and St Thomas’ Hospital. Therefore, the MLCNS service should aim to ensure rapid and effective communication and liaison with the various teams involved.

- **Continuity of Care**: Seeing many different professionals is a source of dissatisfaction for patients with cancer. The MLCNS service should act as constant source of support as
patients move across different teams and departments to provide a level of continuity for patients and their families.

- **Role model and resource for other staff**: The LCNS service aims to act as a resource for other staff both within and outside the Trust by sharing experience and knowledge through informal and formal teaching, consultancy, role modelling, presentations and publication.

- **Service improvement**: The LCNS service is committed to improving care for patients with lung cancer both within and outside the Trust by working with other key stakeholders within the Trust and with National and International groups to enhance service delivery and quality of care.

**Team membership**

Across the SE Thames cancer Network the LCNS Service comprises of 11 nurses employed on a full time and part time basis. Contact details are available in appendix 2 of this document.

**Referrals**

The Lung Cancer Nurse Specialists (LCNS) will act in a key worker role for all patients newly diagnosed within SE Thames Cancer Network. Most referrals to the LCNS are therefore processed via the weekly multidisciplinary team meeting. Referrals are also accepted from any member of staff within or outside the network. Patients and carers may also self-refer into the service. If patients are referred to Community Palliative Care Teams, the responsibility of the key worker role is transferred to the appropriate team in a timely manner. If patients are discharged from any Palliative Care Team the LCNS should be informed.

**Availability of service**

The LCNS service can be contacted Monday – Friday, 9am – 5pm. There may be rare occasions when this is not possible but details of availability will be clearly stated on the LCNS’s answer-machines and via the ‘out of office’ system on e-mail.

There is no out-of-hours service.

All patients in contact with the LCNS service are given instructions about how and who to contact for emergency help and advice. Patients are clearly informed that the LCNS service is not an emergency service.

**Activities of the service**

Activities are varied and constantly evolving to meet the needs of the patient group, health professionals and the overall service. Current activities include:

- Core members of the Lung Cancer Multi-disciplinary Team
- Attendance at the multidisciplinary lung cancer out patient clinic
- Attendance at other clinics
- Weekly Nurse-Led Clinic for patients on Erlotinib or Vin/Cis who fit relevant criteria (GSTT)
• Attendance and active participation at the multidisciplinary lung cancer meeting
• Attendance at ward multidisciplinary meetings if appropriate or requested.
• Attendance on lung cancer ward rounds
• Participation in discharge planning with other members of the team.
• Telephone support/clinic support for patients and their families identified at need.
• Facilitation of Mesothelioma Support Group for patients and carers (GSTT)
• Facilitation of Lung Patient Group for patients and carers (KCH & GSTT)
• Development of service and support for Thymic Cancer patients (GSTT & KCH)
• Working with the Information Services (eg Richard Dimbleby Cancer Information & Support service) to ensure provision of accurate and up-to-date, written, audio and visual material for patients and carers.
• Financial benefits advice and referral to other agencies as required.
• Referral to other teams and outside agencies to ensure physical, social and psychological needs are met.
• One-off bereavement support and assessment of need for referral for formal bereavement counselling.
• Attendance at SE London Lung Cancer Tumour Working Group.
• Participation in relevant audit and research activity to monitor and evaluate the service for patients with lung cancer and their carers.
• Utilization of evidence based nursing and medical research to ensure that high standards of care for lung cancer patients and their carers are maintained.
• Involvement in informal and formal teaching and educational programmes.
• Membership of National and Regional Lung Cancer Forums for Nurses.
• Membership of the British Thoracic Oncology Group
• Linkage with the Nursing and Midwifery Department at King's College via the Cancer & Palliative Care Research Group to promote collaborative research/audit activity.
• Yearly review of the service and operational plan.

NB The term 'lung cancer' includes mesothelioma and Thymic cancer for the purpose of this document.
Appendix 14. Contact Details for Oncology at Guys’ & St. Thomas’ Foundation Trust

Referrals can be made to the generic contact point or directly to the appropriate team.

<table>
<thead>
<tr>
<th>MEDICAL ONCOLOGY</th>
<th>BLEEP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Generic contact point</strong></td>
<td><strong>0500</strong></td>
</tr>
<tr>
<td><strong>Monday – Friday, 9 – 5:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Out of hours:</strong></td>
<td><strong>On call SpR via switchboard</strong></td>
</tr>
<tr>
<td><strong>Breast:</strong></td>
<td><strong>1098</strong></td>
</tr>
<tr>
<td>Consultants: Dr P Ellis, Dr M Harries, Dr A Rigg, Dr J Mansi</td>
<td></td>
</tr>
<tr>
<td><strong>Lung:</strong></td>
<td><strong>1377</strong></td>
</tr>
<tr>
<td>Consultants: Dr J Spicer,</td>
<td></td>
</tr>
<tr>
<td><strong>Colorectal:</strong></td>
<td><strong>0465</strong></td>
</tr>
<tr>
<td>Consultants: Dr P Ross, Dr N Maisey</td>
<td></td>
</tr>
<tr>
<td><strong>Oesophagogastric &amp; Pancreatobiliary:</strong></td>
<td><strong>1068 or 0465</strong></td>
</tr>
<tr>
<td>Consultants: Dr P Ross</td>
<td></td>
</tr>
<tr>
<td><strong>Gynae:</strong></td>
<td><strong>1068 or 1377</strong></td>
</tr>
<tr>
<td>Consultants: Dr S Chowdhury,</td>
<td></td>
</tr>
<tr>
<td><strong>Urology and Germ Cell:</strong></td>
<td><strong>1068</strong></td>
</tr>
<tr>
<td>Consultant: Dr S Chowdhury</td>
<td></td>
</tr>
<tr>
<td><strong>Melanoma:</strong></td>
<td><strong>1098</strong></td>
</tr>
<tr>
<td>Consultant: Dr M Harries</td>
<td></td>
</tr>
<tr>
<td><strong>Lymphoma:</strong></td>
<td><strong>1377</strong></td>
</tr>
<tr>
<td>Consultant: Dr N Maisey</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CLINICAL ONCOLOGY</th>
<th>Junior SpR</th>
<th>Senior SpR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Generic contact point</strong></td>
<td><strong>0600</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Monday – Friday, 9 – 5:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Out of Hours:</strong></td>
<td><strong>On call SpR via switchboard</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Breast:</strong></td>
<td><strong>2709</strong></td>
<td><strong>2243</strong></td>
</tr>
<tr>
<td>Consultants: Dr S Harris, Dr A Tutt, Dr E Sawyer, Dr L Brazil</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lung:</strong></td>
<td><strong>0365</strong></td>
<td><strong>2243</strong></td>
</tr>
<tr>
<td>Consultants: Dr S Ahmad, Dr D Landau, Dr G Mikhail, Dr A Gaya</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Colorectal:</strong></td>
<td><strong>0314</strong></td>
<td><strong>2337</strong></td>
</tr>
<tr>
<td>Consultants: Dr M Leslie, Dr G Mikhail, Dr A Gaya</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Oesophagogastric &amp; Pancreatobiliary:</strong></td>
<td><strong>0365</strong></td>
<td><strong>2337</strong></td>
</tr>
<tr>
<td>Consultants: Dr D Landau, Dr M Leslie</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gynae:</strong></td>
<td><strong>0215</strong></td>
<td><strong>2323</strong></td>
</tr>
<tr>
<td>Consultants: Dr R Beaney, Dr A Winship,</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Urology and Germ Cell:</strong></td>
<td><strong>0215</strong></td>
<td><strong>2323</strong></td>
</tr>
<tr>
<td>Consultants: Dr D Landau, Dr S Morris, Dr S Harris, Dr R Beaney</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Melanoma / Skin:</strong></td>
<td><strong>2325</strong></td>
<td><strong>2337</strong></td>
</tr>
<tr>
<td>Consultant: Dr S Morris</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Head and Neck:</strong></td>
<td><strong>2325</strong></td>
<td><strong>0286</strong></td>
</tr>
<tr>
<td>Consultants: Dr T Guerrero-Urbano,</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CNS:</strong></td>
<td><strong>0215</strong></td>
<td><strong>0286</strong></td>
</tr>
<tr>
<td>Consultants: Dr R Beaney, Dr L Brazil</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lymphoma:</strong></td>
<td><strong>0367</strong></td>
<td><strong>2337</strong></td>
</tr>
<tr>
<td>Consultant: Dr G Mikhail</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For patients in whom primary consultant is known please contact the SpR for that team.

Otherwise, for chemotherapy-related problems, bleep Medical Oncology (unless Head and Neck, Gynae, CNS or non-melanoma skin cancer for which bleep Clinical Oncology).

For radiotherapy-related problems, bleep Clinical Oncology.
A dedicated radiographer is available for CORD COMPRESSION: Bleep 1720.
Appendix 15. GSTT Guidelines for the Management of Spinal Cord Compression

Oncology & Haematology Directorate
Department of Palliative Care

1. All patients referred for treatment of spinal cord compression should have a confirmed histological diagnosis of malignancy except when spinal cord compression is the presenting sign.

2. Patients with known malignancy, especially those with bone metastases should be advised to seek medical help if they develop:
   0 a. Back pain and/or nerve root pain
   1 b. Weakness, numbness of tingling in their limbs (particularly lower limbs)
   2 c. Urinary incontinence or painless retention
   3 d. Faecal incontinence or constipation

   Sphincter disturbance is a late sign (Evidence level 3)

3. Patients being referred to the cancer centre with known malignancy should EITHER:
   0 a. be accompanied by an MRI scan confirming spinal cord compression and have been started on Dexamethasone 8mg bd PO
   OR
   1 b. have been examined by an SpR/consultant in the referring speciality or a neurologist, to confirm the clinical signs

4. During working hours referral for suspected cord compression should be made to the treating Clinical Oncologist within 12 hours of diagnosis (Evidence level 4).
   Outside of normal working hours, at weekends or if the patient is not previously known to the service, contact the on call Clinical Oncology SpR via switchboard (0207 188 7188).

5. MRI of the entire spine should be made within 6 hours of presenting to the Cancer Centre (Evidence level 1-3).

   a. Ensure the patient does not have a pacemaker/cerebral clips before contacting the radiologist.
   b. Out of hours this is a consultant to consultant referral only.
   c. Record the MRI finding in the notes.

6. Corticosteroids should be given if there is a confirmed diagnosis or strong clinical suspicion of spinal cord compression.
   a. Prescribe Dexamethasone 8mg bd PO and Omeprazole 20mg OD. Halve the dose of steroids every 5 days, unless clinically contra-indicated.
   b. Discontinue Non steroidal anti-inflammatory drugs (NSAIDS) if possible.
   c. Prescribe laxatives but avoid those containing Danthron (codanthromer/codanthrusate) as these can cause superficial burns in catheterised or incontinent patients.

7. Discuss the following cases with a spinal surgeon (Evidence level 1):
   a. Diagnosis not previously known
   b. Rapid deterioration of neurology during radiotherapy
   c. Compression occurring at previously irradiated site
   d. Unstable spine
   i. severe pain on sitting or standing that inhibits normal movement and/or
   ii. neurology which worsens on standing or sitting
   e. Vertebral body collapse causing bone impingement on cord or nerve roots
   f. Single level of compression in a patient with a prognosis >3 months
   g. Rapid deterioration over 24 hours where some neurological function is preserved
   h. Tumour type radioresistant
4 i. Intractable pain

Patients who are:

- Performance status 3-4
- Have multiple levels of cord compression
- Severe or multiple comorbidities
- Paralysis for >48 hours
- Life expectancy of < 6 months

will usually not be suitable for surgery.

1 8. Radiotherapy

0 a. should be considered postoperatively for patients whose primary treatment is surgery.

1 b. should be commenced within 24 hours of diagnosis, if it is deemed the most appropriate first line treatment when the dose will normally be 20-30Gy in 5-10 fractions

2 c. palliative treatment for pain relief is 8Gy in a single fraction where there is no hope of neurological recovery (Evidence level 3-4)

3 1 9. Chemotherapy may be considered the most appropriate treatment option especially for lymphoma, germ cell tumours and small cell lung cancer.

2 1 10. Stability of the spine

0 a. A decision regarding stability of the spine should be made on admission by the medical team and recorded in the notes (see guidance on spinal stability above).

1 b. Refer to the Oncology Physiotherapist within 24 hours.

2 c. Nursing staff should be advised that ‘spinal precautions’ need to be taken if the spine is unstable (log rolling, regular turning and toileting etc.)

3 2 11. A decision regarding resuscitation status should be made and recorded at diagnosis

Supporting references


