

# WA Cancer & Palliative Care Health Network

## Thoracic Cancer Model of Care

29 December 2008



Government of **Western Australia**  
Department of **Health**



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## 1. Introduction

Cancer is the leading cause of death in Western Australia, representing 30.6 per cent of all deaths in 2006.

Population ageing will significantly increase the number of new cases of cancer over the next ten years, with an estimated 10,000 more cases per annum in Western Australia by 2016. In 2006, 950 Western Australians were diagnosed with lung cancer and there were 792 deaths due to this type of cancer in 2006.

Cancer is a complex disease to diagnose and treat, and represents a significant burden to patients and their families, the health system, and the community at large. Western Australia's strategic and planned approach to cancer reform includes the establishment of a Ministerial Taskforce for Cancer, and implementation of the Fighting cancer policy and a cancer services framework for Western Australia. Two significant directions of the Cancer Services Framework are the establishment of integrated cancer services in metropolitan and regional Western Australia, and the development of service delivery and improvement through a tumour streams model.

Since 2004, eight integrated cancer services have been established in metropolitan and regional Western Australia, based on specified geographic populations. The philosophy of an integrated cancer service is that hospitals and primary and community health services develop integrated care and defined referral pathways for the populations they serve. This requires effective collaboration between hospitals and community-based services, including general practitioners. This will promote more effective local coordination of care for cancer patients, and a more rational, evidence-based approach to cancer service planning and delivery.

The Cancer Services Framework also recommended that organ or system-specific tumour streams be adopted to support the delivery and improvement of care. The reasoning behind the tumour streams is that a consistent approach to clinical management based on evidence-based practice will reduce unacceptable variations in care across the state.

### Data Collection and Audit

Data collection regarding treatment and outcomes is essential to monitor the quality and safety of care. An appropriate clinical database for thoracic cancer treatment and outcomes should be available and adequately resourced. Treatment outcomes including morbidity and survival data should be readily available in the public domain.

### Thoracic malignancies<sup>(Appendix 1-5)</sup>

Thoracic oncology includes all tumours that arise within the thorax. The commonest such tumours are non-small cell lung cancer, small cell lung cancer and mesothelioma. In Western Australia in 2007 there were 920 new cases of lung cancer, predicted to rise to 1174 new cases by 2014. Although the incidence of lung cancer in men is gradually falling, the incidence continues to rise in women and has become the commonest cause of death from cancer in women, exceeding breast cancer in this regard. Unfortunately lung cancer and mesothelioma have a very poor prognosis, with lung cancer having an overall 5 year survival of about 14%, whilst mesothelioma has a median survival of about 9 months. Lung cancer is a high volume tumour with a poor outcome, mainly because presentation is relatively late and thus surgical excision frequently not possible. Depending on the patient's location in WA, there will be varying issues with regard to accessing the necessary resources to diagnose and treat thoracic malignancies.<sup>(Appendix 6)</sup>



## Model of Care

The WA CPCN Model of Care for Cancer 2008.

([http://www.healthnetworks.health.wa.gov.au/modelsofcare/docs/Cancer\\_Model\\_of\\_Care.pdf](http://www.healthnetworks.health.wa.gov.au/modelsofcare/docs/Cancer_Model_of_Care.pdf)) provides the basis for this tumour site specific model of care.

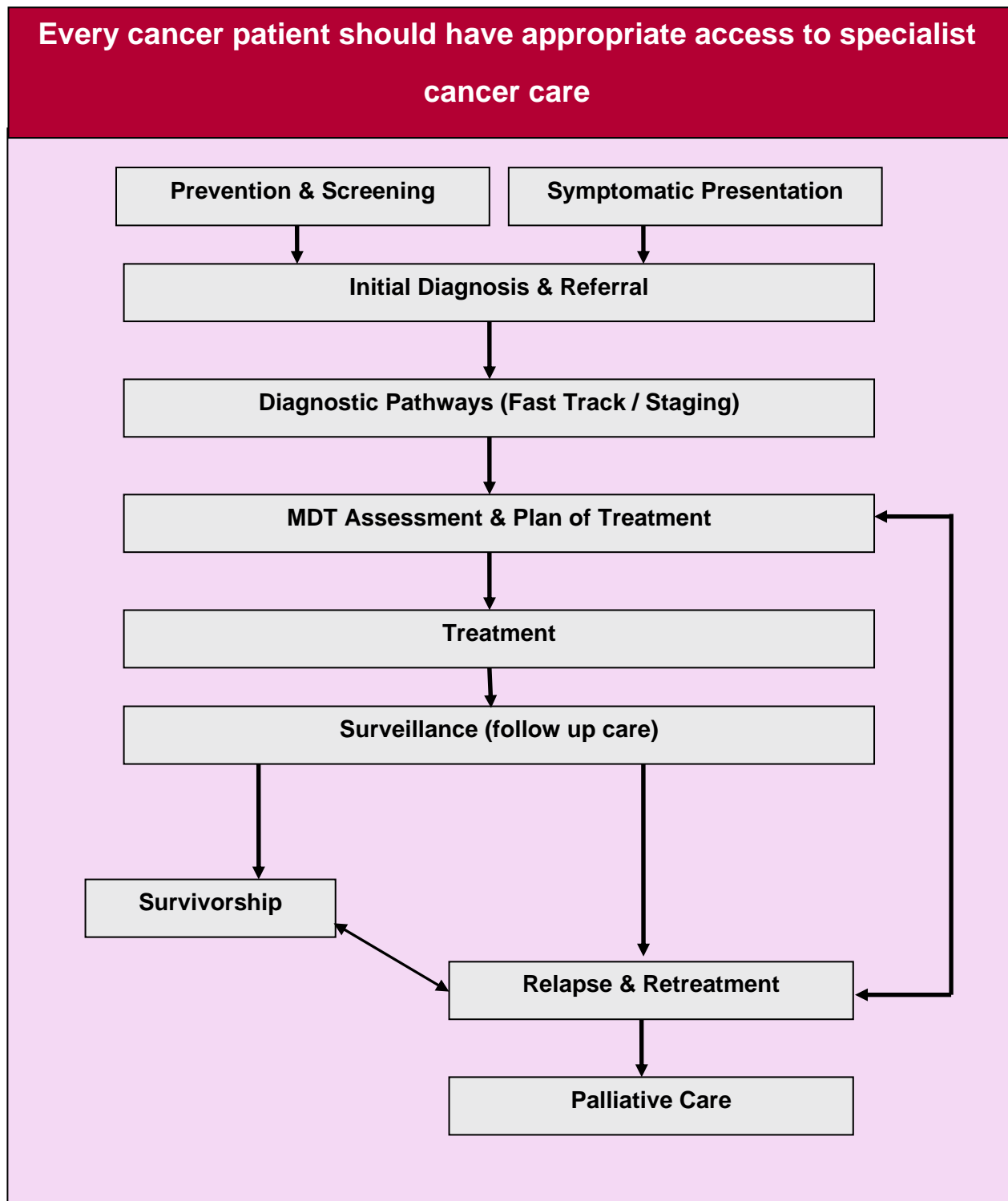
This document describes how Thoracic Cancer care should be delivered in WA.

The eight steps in figure 1 describe the patient centred journey that provides safe, quality, evidence based, and multidisciplinary care resulting in optimum outcomes.

Underpinning this journey is the integration of primary care, supportive care, psycho-oncology and palliative care. Models of Care can be accessed at <http://www.healthnetworks.health.wa.gov.au/modelsofcare/>.



Figure 1. The Patient Centred Journey





## 2. Screening and Prevention

This step identifies screening programs, the types of people who may be at higher than average risk of developing cancer, and the types of symptoms that require further investigation. A history of smoking is of particular relevance in the development of lung cancer.

### 2.1 Screening

No form of population screening for lung cancer has yet been shown to improve outcomes.<sup>1</sup> Two large randomized controlled trials of low dose CT scanning (LDCT scanning) for the detection of lung cancer in subjects at high risk are currently in progress in the USA and in Europe. These trials should establish whether screening would be a cost effective strategy for the future; the results should be available in 2011 or 2012. Other approaches include the use of volatile organic compounds in the breath as a means of identifying subjects at particular risk of lung cancer requiring subsequent further investigation. These studies are only just commencing.

#### Those at higher risk

Risk factors include:<sup>4</sup>

- Current and previous smoker
- Previous cancer of the lung or head and neck
- Asbestos exposure, particularly with tobacco exposure
- Family history of lung cancer
- Emphysema.ii iii

For those at risk:

- Encourage involvement in current international trials of screening 3,5
- Support and encourage strategies for smoking cessation1-7
- Support and encourage strategies for smoking prevention in at-risk groups.1-7

### 2.2 Prevention

The single greatest risk factor for lung cancer is smoking. Avoidance of smoking and smoking cessation therefore remain the most important preventative steps to take. Other avoidable risk factors include asbestos exposure (which increases the risk of both mesothelioma and lung cancer), arsenic, radon, cadmium, and chromates. Occupations which are liable to expose subjects to these substances should take precautions to minimise exposure and risk.





### 3. Initial Diagnosis and Referral

#### 3.1 Signs and symptoms that should lead to general practitioner consultation<sup>4</sup>

The following should be investigated:

- Local symptoms: persistent cough or change in nature of cough, coughing up blood, shortness of breath, hoarse voice
- Non-resolving pneumonia
- Systemic symptoms: weight loss, cachexia or fatigue, particularly in a smoker or ex-smoker
- Unexplained bone pain or chest wall pain
- Significant neurological signs (for example, ataxia [poor coordination] weakness).

#### 3.2 Timeframe for general practitioner consultation<sup>3</sup>

- Patients should be seen immediately if there is a single episode of haemoptysis or the person is generally unwell.
- For other symptoms, consultation should be within two weeks.

#### 3.3 General practitioner<sup>3</sup>

- General practitioner examinations/investigations should include:
  - Chest x-ray. If cancer is suspected, refer on as soon as possible.
  - Spiral CT with contrast (unless specifically contraindicated) of chest and upper abdomen. If the CT is abnormal, refer on as soon as possible.
  - Sputum cytology if cough is productive of sputum or blood (beware infected sputum, as “atypical squames” may be reported which may confuse diagnosis).
- Aim to communicate test results to the patient within one week.
- If possible, the patient should retain all x-rays and imaging.
- Prior discussion with a specialist is not critical.

#### 3.4 Referral to a Specialist<sup>3-7</sup>

All patients with suspected lung cancer should be seen by or discussed with a respiratory physician, physician or thoracic surgeon. Referral for suspected lung cancer should include:

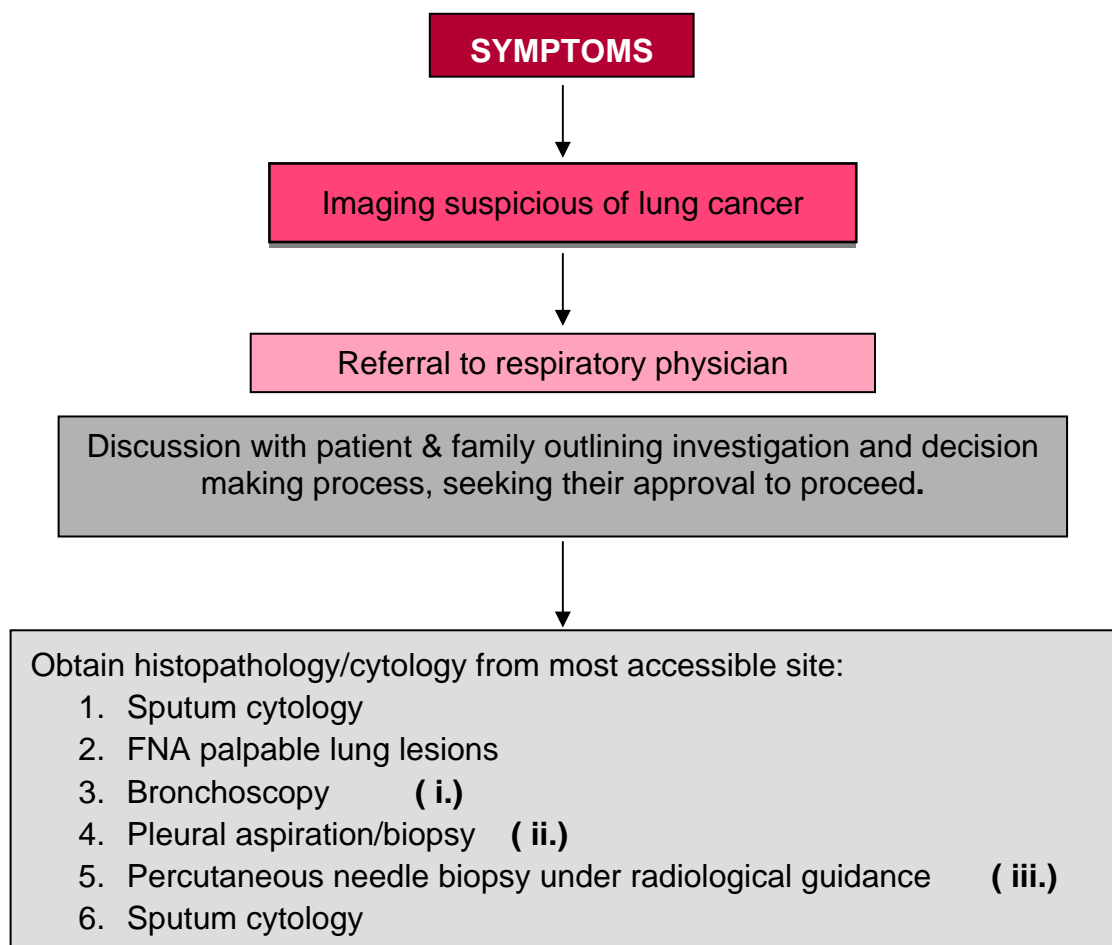
- The patient should be referred for diagnosis and further management to a respiratory physician. These specialists should be affiliated with or have access to a multidisciplinary team.
- A letter and fax to specialist service including medical and relevant psychosocial history.
- A CD of radiology (or hard copy if CD unavailable) and any previous chest x-rays or imaging
- A copy of all radiology and sputum cytology reports and other relevant pathology.



## 4. Diagnostic Pathway

A patient referred for diagnosis of a potential thoracic tumour should be seen by a respiratory physician, or other investigative specialist with expertise in bronchoscopic procedures or interventional radiology, within two weeks of that referral. Cytological or histological samples should be obtained in a timely manner so as not to delay therapy for a potentially curable cancer, preferably within two weeks of initial consultation with the specialist.

Figure 2. Diagnostic Pathway



1. Bronchoscopy may also require:
  - TBNA (trans-bronchial needle aspiration)
  - EBUS (endobronchial ultrasound) +/- miniprobe
2. This may involve
  - simple aspiration
  - medical pleuroscopy
  - surgical thorascopy
3. Requires interventional radiologist with Ultrasound Scan/CT capable of FNA.



## Staging<sup>(Appendix 7)</sup>

- Staging, initially based on CT imaging, is the cornerstone of treatment planning.
- The extent of disease must be assessed before a treatment plan can be made. Staging protocols vary according to the histology.
- Further tests may include biopsy, bronchoscopy, endobronchial ultrasound (EBUS), EUS fine needle, trans-bronchial needle aspiration (TB-NA), mediastinoscopy and Positron Emission Tomography (PET) scanning.
- Thoracoscopy and post resection pathology may be necessary for final pathological staging.
- Time from initial presentation to initial treatment decision should be no more than four weeks.

### Where should this be done?

Some staging investigations, such as PET scanning, require expensive specialised equipment in the form of a PET scanner and a cyclotron, together with staff with the requisite expertise to operate it. This limits the site to a Cancer Centre, usually co-located in a tertiary hospital.

Mediastinoscopy requires a cardio-thoracic unit with thoracic surgeons and the necessary facilities for this procedure.

EBUS guided and EUS hilar and mediastinal lymph node sampling is likely to be increasingly utilised in future in the staging process. This also requires relatively expensive equipment and skilled proceduralists.

**For these reasons, proper staging is likely to require the patient to be assessed in a Cancer Centre.**

Staging algorithms for the main histological tumour types are contained in Appendix 7.



## 5. MDT Assessment and Plan of Treatment

This step identifies the members of the multidisciplinary team who need to be involved in initial treatment planning for lung cancer. The guiding principle is that interaction between appropriate multidisciplinary team members should determine the most appropriate treatment plan.

### MDT Assessment and Plan of Treatment:

All patients should have access to a MDT to plan the management of their cancer.

It is essential that a cancer specialist lead the MDT approach and that this be available to all patients no matter where they live. It is expected that patients in rural and remote areas will have access to this care and that this will be co-ordinated by their GP, local specialist or cancer nurse coordinator using video-conferencing or assisted travel where appropriate.

### 5.1 Multidisciplinary team meeting

A multidisciplinary team meeting should, wherever possible, include:

- thoracic cancer nurse
- medical oncologist \*
- palliative care
- pathologist \*
- radiation oncologist \*
- radiologist/imaging specialist \*
- nuclear physician
- respiratory physician \*
- thoracic surgeon \*

\*with subspecialist expertise in thoracic oncology.

The lead role in the multidisciplinary team will be determined by the team and must take responsibility for the activity of the team.

- All patients with thoracic cancer should be discussed in a multidisciplinary team meeting.
- Results of all relevant tests and imaging must be available for the multidisciplinary team discussion.
- The primary specialist who makes the referral to the multidisciplinary team is responsible for the patient until care is passed to another practitioner.
- Progression of care within the multidisciplinary team should be coordinated, ensuring the patient, general practitioner and multidisciplinary team members are clear on their responsibilities for coordination of care.

### 5.2 Assessment of Patient Fitness

The patient's fitness for therapeutic intervention must be assessed by taking into account the following:

- ECOG performance status
- Weight loss
- Standard haematological and biochemical tests
- Lung function



- Cardiac status
- Other significant medical co-morbidities.

This may require the following investigations:

- Lung function assessment with spirometry, gas transfer and, occasionally, cardio-pulmonary exercise test.
- Differential lung perfusion studies if physiology is borderline.
- ECG and myocardial perfusion studies in selected patients.

### **MDT Treatment Care Plan**

Treatment will be planned after all relevant investigations have been reviewed.

Objectives of a multidisciplinary team meeting (MDT):

1. Confirm staging
2. Determine treatment plan
3. Document the MDT recommendations
4. Convey the recommendations to the referring physician and primary care provider

Subsequent referral and coordination of care remains the responsibility of the referring physician, who is in the best position to discuss the implications of the treatment options with the patient.

The patient, and (with the patient's consent) the family, should be involved in all discussions regarding investigations and treatment options.



## 6. Treatment

This step is concerned with the scope of clinical practice to deliver quality and safe practice. Scope of practice reflects both the expertise and experience of the individual as well as the organisational capability for the provision of safe, high quality cancer services<sup>1</sup>.

The practitioners comprising the multidisciplinary care who may be involved in the delivery of cancer services are as follows:

**Table 1. Practitioners Comprising Multidisciplinary Care**

CANCER CENTRE	CANCER UNIT *
Medical oncologist	supervising medical oncologist
Radiation oncologist	cancer nurse
Thoracic surgeon	access to imaging services
Radiologist/imaging specialist	palliative care service
Respiratory physician with interventional skills	
Thoracic cancer nurse	
Palliative care service	
<b>NB all of the above with subspecialty expertise in thoracic oncology</b>	* as a minimum

With access to:

- allied health services where appropriate
- psycho-oncology services where appropriate (psychologist/psychiatrist).

A Cancer Unit is able to deliver chemotherapy - and manage its associated possible complications – and palliative therapy.

### 6.1 Surgery **CANCER CENTRE ONLY**

#### 6.1.1 Patients who may benefit from surgery

- Patients who are fit and have early stage non-small cell lung cancer will be offered surgery. <sup>iv</sup>
- Surgery may be required for diagnosis, for curative resection, or for palliation.

#### 6.1.2 Training and experience of surgeon

- Surgeon (FRACS or equivalent) with adequate training and experience in thoracic surgery that enables institutional credentialling and agreed scope of practice within this area

#### 6.1.3 Hospital or treatment unit characteristics

##### Staff

Staffing includes:

- surgeon as specified in 6A.2
- full thoracic anaesthetic services
- respiratory medicine and infectious disease services.



## Facilities

The following are available:

- intensive care unit
- appropriate nursing and theatre resources to manage complex thoracic surgery
- in-house access to interventional radiology
- access to nutritional support and advice
- access to physiotherapy service, including chest physiotherapy.

## 6.2 Radiotherapy

### 6.2.1 Patients who may benefit from radiotherapy

- Patients who may benefit are those who are fit, who have loco-regional disease, and:
  - who are unsuitable for or unwilling to have surgery; or
  - for whom radiotherapy may form part of combined modality therapy.
- Patients require radiotherapy for palliation of chest and extrathoracic symptoms.
- The best available evidence suggests that radiotherapy is indicated for 76 per cent of patients with non-small cell lung cancer.<sup>v</sup>

### 6.2.2 Training and experience of radiation oncologist

- Radiation oncologist (FRANZCR or equivalent) with adequate training and experience that enables institutional credentialling and agreed scope of practice within this area.<sup>vi</sup>

### 6.2.3 Hospital or treatment unit characteristics

#### Staff

Staffing includes:

- nurses
- radiation oncologist as specified in 6.2.2
- radiation oncology medical physicist
- radiation therapist.

#### Facilities

The following should be available:

- dual modality linear accelerators (LINACS)
- CT planning facilities
- treatment planning system
- Access to PET and electronic transfer of PET data for planning process.

## 6.3 Medical Oncology

### 6.3.1 Patients who may benefit from drug therapy include:

- those with advanced disease and good performance status
- patients having either neoadjuvant or adjuvant therapy in conjunction with complete resection of loco-regional disease
- patients with inoperable but localised non-small cell lung cancer who are considered suitable for combined modality definitive chemoradiation.



### 6.3.2 Training and experience of medical oncologist

- Medical oncologist (FRACP or equivalent) with adequate training and experience that enables institutional credentialling and agreed scope of practice within this area <sup>vii</sup>

### 6.3.3 Hospital or treatment unit characteristics

#### Staff

Staffing includes:

- medical oncologist as specified in 6.3.2
- nurses with adequate training in chemotherapy administration, handling and disposal of cytotoxic waste
- If chemotherapy is prepared on site, then a pharmacist with adequate training in chemotherapy medications, including dosing calculations according to protocols, formulations and/or preparation is required.

Some components of less complex therapies may be delivered in a setting, such as a Cancer Unit, where no medical oncologist is locally available, by another medical practitioner with training and experience that enables credentialling and agreed scope of practice within this area. This should be in accordance with a detailed treatment plan or agreed protocol and with supervision by the medical oncologist.

#### Facilities

- The facility has a clearly defined path to emergency care and advice after hours.
- The facility is able to care for neutropenic patients.
- There is ready access to haematology testing and transfusion services.
- Cytotoxic drugs are prepared in a pharmacy with appropriate facilities.
- Occupational health and safety guidelines are followed in relation to handling of cytotoxic drugs, including preparation, waste procedures and spill kits. <sup>viii</sup>
- Guidelines and protocols, in the case of extravasation of drugs are available and understood.

There is access to a radiology service.

#### Palliative Care

It is recognised that palliative care may be incorporated into the treatment plan during active treatment for symptom control, depending on the assessed level of need of the patient. Such palliative care may be provided by general practitioners, respiratory physicians, medical oncologists and palliative care physicians.





## 7. Surveillance (Follow-Up Care)

This step concerns the monitoring of the patient following initial treatment. The aim is the early detection of disease relapse and /or the management of symptoms arising from treatment or the disease. It also provides reassurance to patients who appear to be free of disease. A clear documented plan of surveillance should be established and be available to the patient. This should avoid multiple visits to multiple specialists.

### 7.1 Plan for follow-up

There is no high level evidence as to the appropriate follow up. Current guidelines would suggest the following:

- As per the clinical practice guidelines <sup>ix</sup>, follow-up should be in three to six months following treatment to detect and manage complications, followed by six-monthly clinical assessments for five years with an annual check thereafter.
- Patients treated with radiotherapy should be reviewed in the first six months to detect toxicity.

### 7.2 Persons involved in follow-up care

- Not all disciplines need to be involved in longer term follow-up.
- The surgeon should follow surgical patients. Follow-up with the respiratory physician may be appropriate, particularly in the longer term.
- Follow-up care can be provided at a Cancer Unit by visiting specialists from a Cancer Centre.
- In selected patients, this could be provided by videoconference.
- A coordinated approach needs to be offered to patients who have had combined modality treatment.-
- The general practitioner has a role in the management of any underlying respiratory disease, and in coordination of follow-up, particularly in rural areas.
- Responsibility for follow-up investigations needs to be agreed between the designated lead clinician, the general practitioner and the patient, with an agreed plan documented, including notification to the general practitioner or lead clinician if the patient does not attend.
- Access may be required (for example, for rehabilitation, symptom management) to allied health, including physiotherapy, occupational therapy and social work, and to palliative care.



## 8. Survivorship

The transition from active to post treatment care is critical to long term health. Care should be planned and coordinated. Survivors should have knowledge of their increased risk of second/ recurrent cancers or treatment related morbidities. This encourages them to actively participate in their continuing post treatment care. This approach is essential so that routine follow up visits become opportunities to promote a healthy life style, check for cancer recurrence and manage lasting effects of the cancer experience.

Survivorship may be medically led, particularly through primary care, nurse-led or patient-led. Cancer councils across Australia are developing and evaluating approaches that are patient centred.

### 8.1 Supportive Care Needs

The supportive care needs of patients with lung cancer will vary in severity and complexity along the disease trajectory. Identifying and assessing the supportive care needs of people with lung cancer involves a general assessment of the physical, psychological, social, information and spiritual needs of patients.

In addition to these general needs, all members of the multidisciplinary team should be aware of the particular needs related to lung cancer detailed below which may require intervention from specific members of the multidisciplinary team.

### 8.2 Physical needs

- Breathlessness and coughing are commonly experienced and are a source of anxiety among people with primary lung cancer. <sup>xxi</sup> Strategies such as exploring the meaning of breathlessness for patients, breathing retraining exercises, teaching relaxation and distraction techniques, and encouraging planning and pacing activities may assist. Referral to physiotherapy and occupational therapy or pulmonary rehabilitation may also be required. If oxygen is required, this can be arranged through Domiciliary Oxygen Supply or Silver Chain.
- Dysphagia can occur as a result of radiation therapy <sup>xii</sup> and generally requires dietitian referral. The benefits of enteral nutrition should also be considered.
- Because malignant pleural effusions are common complications of advanced lung cancer <sup>xiii</sup>, patients need to be alerted to possible symptoms and to seek medical attention if such symptoms develop.
- Because halitosis can occur if there is a necrotic tumour in the oropharynx or lungs <sup>xiv</sup>, patients need to be alerted to possible symptoms and what to do.
- Alteration of cognitive functioning in patients treated with chemotherapy and radiation therapy <sup>xv</sup> requires strategies to help manage cognitive impairment, such as maintaining written notes or a diary and repetition of information.
- Hoarseness, experienced by 11 per cent of lung cancer patients <sup>xvi</sup>, may require referral to a speech therapist.
- More than one-third of patients experience haemoptysis <sup>xvii</sup>; therefore, specific information on how to manage this symptom should be provided to the carer, including how to contact medical support if required.
- Chest pain is experienced by 37 per cent of lung cancer patients in their last 12 months <sup>xviii</sup> and brachial plexopathy pain can be severe and may require pain management or palliative care referral.



## 8.3 Psychological needs

### Sexuality

- Loss of libido, change in sexual activity, and decreased satisfaction<sup>xix</sup> requires sensitive discussion and possible referral to a counsellor with expertise in the area.

### Anxiety

- Moderate to severe anxiety has been reported<sup>xx</sup> and can be related to breathlessness<sup>xxi</sup>. Patients should be screened to identify those at high risk of anxiety or depression at each visit. Strategies such as information provision, relaxation techniques, meditation<sup>xxii</sup> and a referral to a psychologist or psychiatrist as required may be helpful.

### Depression

- Loss of independence with activities because of poor performance status and poor prognosis can increase risk for depression. Referral to physiotherapy and occupational therapy may restore some independence and therefore assist with the experience of depression. Referral to a psychologist or psychiatrist may also be required to manage the depression.

### Social/practical help needs

- The additional costs related to assistance with activities of daily living, equipment such as home oxygen and other equipment to assist with activities of daily living<sup>xxiii</sup> may have financial impact. Referral to a social worker for further assessment and identification of appropriate funding support may be necessary.
- Significant restrictions to social activities<sup>xxiv</sup> can impact on emotional issues and may require referral to a social worker or a psychologist.

### Information needs

- Information about and assistance with smoking cessation specifically prior to surgery is needed to reduce the likelihood of post-operative complications if the patient is a smoker.<sup>xxv</sup>



## 9. Relapse and Retreatment

This step concerns the diagnosis and management of patients who have recurrence of the disease (local or metastatic) and who need assessment regarding further treatment. This assessment may be made by the GP initially with subsequent involvement of the specialist and the MDT. Clinical evaluation and patient discussion will determine the most appropriate treatment which may be curative or palliative in intent. **In lung cancer, the intention is rarely curative and in most situations disease control is palliative.** Treatment for relapse may require drug therapy, radiation therapy or surgery.

### 9.1 Investigative tests

One or more of the following investigations may be indicated:

- chest x-ray/CT/other appropriate imaging (for example, spine, brain CT)
- bronchoscopy if local recurrence is suspected
- PET scan as appropriate
- tests related to general medical, respiratory or cardiac assessment.

### 9.2 Multidisciplinary team

Management options should be discussed by the multidisciplinary team as described above.

- The team is likely to be led by the specialist taking the lead follow-up role, which may be a respiratory physician, thoracic surgeon, medical or radiation oncologist in the assessment phase, with involvement of others depending on the type/site of recurrence.
- General practitioner and palliative care participation is essential.

### 9.3 Treatments that a patient is most likely to have for recurrence

Treatment will depend on the location and extent of the recurrence, and on previous management. Treatment may include:

- surgery (for bronchoscopy, stents, laser therapy, VATS pleurodesis)
- radiotherapy (for localised symptomatic recurrences, including cerebral metastases) including brachytherapy and radio frequency ablation
- chemotherapy
- interventional pulmonology
- supportive care.



## 10. Palliative Care

This step is concerned with quality of life for the patient and his or her family through care that addresses physical, psychological, emotional and spiritual needs. This is a particular concern for lung cancer patients where a poor outlook is common. For the family and carers, this may include bereavement support.

The WA Palliative Care model defines the appropriate approach to symptom management and end of life care.

It is important that patients and their families receive optimal palliative care and early referral for assessment and advice is recommended.

It is also important to recognise that a major component of palliative care involves symptom relief and this may require surgical intervention, radiation therapy or chemotherapy.

[http://www.healthnetworks.health.wa.gov.au/modelsofcare/docs/Palliative\\_Care\\_Model\\_of\\_Care.pdf](http://www.healthnetworks.health.wa.gov.au/modelsofcare/docs/Palliative_Care_Model_of_Care.pdf)



## 11. Recommendations

1. In view of staff shortages in health, predicted increases in patient numbers and the increase in expected waiting times, the role of the nurse practitioner, although presently in its infancy, should be incorporated into future planning in providing cancer care services.
2. A change in practice to facilitate and streamline the use of technology for alternative methods of follow up, such as videoconferencing, is required.
3. Clinical pathways for the management of these conditions have been described, using evidence based national and international guidelines.
4. Early referral and accurate staging of thoracic malignancies, together with appropriate therapeutic interventions, should be streamlined with the aim of improving outcomes in these poor prognosis cancers.
5. Diagnostic and staging procedures require specialised and expensive equipment and facilities, as well as specialists with the appropriate expertise. It is likely that these limited resources will be confined to Cancer Centres.
6. All patients should have their case discussed at a Multi-Disciplinary Team meeting comprising sub-specialty physicians, medical oncologists, radiation oncologists, cardio-thoracic surgeons, radiologists, nuclear medicine physicians, pathologists and thoracic cancer nurses. Such specialised teams are likely to be confined to Cancer Centres, since it is clear that current human resources are insufficient for the demands, and that the situation is likely to worsen in the foreseeable future.
7. There is a critical need for improved information technology to collect pertinent data, to facilitate communication between specialists and with general practitioners, and to allow audit of outcomes.
8. Patients with thoracic malignancies should have equitable access to the resources required for the proper management of their condition. Since it is clear that there are constraints to these resources, both in terms of infrastructure and staffing, it is likely that part of the patients' journey will need to be within a properly equipped Cancer Centre. Therefore adequate provision will need to be made for the transport of rural patients and for the accommodation of these patients and their carers. Consideration may need to be given by the Health Department to developing the appropriate 'hotel' facilities to allow this to occur.



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(cited in Victorian Patient Management Framework Lung cancer stream: non-small cell lung cancer)

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- XIII. As per 10. above.
- XIV. As per 10. above.
- XV. As per 11. above.
- XVI. As per 11. above.
- XVII. As per 11. above.
- XVIII. As per 11. above.
- XIX. As per 10. above.
- XX. As per 10. above.
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- XXII. Kearney, N & Richardson, A, 2006, *Nursing patients with cancer: principles and practice*, Elsevier Limited, Edinburgh.
- XXIII. As per 11. above.
- XXIV. Junor, EJ, Hole, DJ & Gillis, CR, 1994, 'Management of ovarian cancer: referral to a multidisciplinary team matters', *British Journal of Cancer*, Volume 70, pp. 363–370.
- XXV. As per 11. above.

### Reference Key: Organisations and Health Authorities

1. Commonwealth Department of Health
2. Department of Health of Western Australia
3. WA Cancer & Palliative Care Network: Thoracic Oncology Collaborative
4. NH&MRC Clinical Practice Guidelines
5. Thoracic Society of Australia and New Zealand (TSANZ)
6. NICE Guidelines
7. Victorian Patient Management Framework Lung tumour stream: non-small cell lung cancer

### Acknowledgement

The Thoracic Collaborative of the WA Cancer & Palliative Care Network acknowledges the Victorian Patient Management Framework, which has informed much of this document.



## Appendices

### Appendix 1

#### LUNG, BRONCHUS AND TRACHEA CANCER WESTERN AUSTRALIA, 2004

REGIONS	MALE	FEMALE
GOLDFIELDS	6	5
GREAT SOUTHERN	9	8
KIMBERLEY	4	2
MIDWEST	18	10
PILBARA	8	4
SOUTH WEST	31	22
WHEATBELT	23	9
NORTH METRO	222	135
SOUTH METRO	207	125
METRO	429	260
COUNTRY *	101	60
WA	530	320

**TOTAL                    850**

From the Cancer Registry Projections Data 1996 – 2036

\* Both male and female country patients represent 18-19% of overall patients.





## Appendix 2

<b>NON SMALL CELL LUNG CANCER: 2004</b>							
<b>SCGH</b>	<b>TOTALS</b>	<b>% No treatment</b>	<b>% Surgery only</b>	<b>% Chemo only</b>	<b>% Radiotherapy only</b>	<b>% Combined &amp; Other</b>	<b>% of total</b>
Stage I	29	7	45	3	31	14	20.5
Stage II	10	0	20	0	10	70	7.1
Stage III	40	8	8	8	22	50	28.3
Stage IV	62	15	3	19	15	48	44
<b>TOTAL</b>	<b>141</b>	<b>ie. 83% of total</b>					
<b>SMALL CELL LUNG CANCER</b>							
<b>SCGH</b>	<b>TOTALS</b>	<b>% No treatment</b>	<b>% Surgery only</b>	<b>% Chemo only</b>	<b>% Radiotherapy only</b>	<b>% Combined &amp; Other</b>	<b>% of total</b>
Stage I	1	0	0	0	0	100	3.4
Stage II	1	0	0	0	0	100	3.4
Stage III	17	6	0	47	0	47	59
Stage IV	10	10	10	30	30	20	35
<b>TOTAL</b>	<b>29</b>	<b>ie. 17% of total</b>					
<b>MESOTHELIOMA</b>							
<b>SCGH</b>	<b>TOTALS</b>	<b>% No treatment</b>	<b>% Surgery only</b>	<b>% Chemo only</b>	<b>% Radiotherapy only</b>	<b>% Combined &amp; Other</b>	<b>% of total</b>
Stage I	19	16	0	37	16	26	
Stage II	3	33	0	33	0	33	
Stage III	10	20	0	20	0	40	
Stage IV	8	25	0	50	0	25	
<b>TOTAL</b>	<b>40</b>						



### Appendix 3

## PROJECTIONS COMPARED TO 2004 DATA

	2004	2011	2014
SCGH Non Small Cell Lung Cancer	141		
WA Non Small Cell Lung Cancer	721	846	939
SCGH Small Cell Lung Cancer	29		
WA Small Cell Lung Cancer	142		
SCGH Lung Ca Total	170	212	235
<b>WA Lung Ca Total</b>	<b>863</b>	<b>1058</b>	<b>1174</b>
SCGH Mesothelioma	40		
WA Mesothelioma	79 *	Not available	Not available

2011 predicted total represents 22.5% increase from 2004.

2014 predicted total represents 36% increase from 2004.

\* Actual WA mesothelioma patient numbers provided by Cancer Registry are as follows:

2000 61  
 2001 79  
 2002 73  
 2003 74  
 2004 79  
 2005 92  
 2006 75



Appendix 4

**2007 WA PATIENT TREATMENT PROJECTIONS EXTRAPOLATED  
FROM 2004 SCGH FIGURES**

n		SURGERY	CHEMO	RADIATION THERAPY (RT)	SURGERY & CHEMO	SURGERY & RT	CHEMO & RT	SURGERY CHEMO & RT	NO TREATMENT
	<b>NSCL C</b>	20	16	28	7	3	38	5	-
	<b>SCLC</b>	1	12	3	0	6	12	0	-
	<b>TOTAL</b>	21	28	31	7	9	50	5	16
	<b>%</b>	12.3	16.5	18	4	5	29	3	9.4
863	<b>2004</b>	106	142	155	34.5	43	250	26	99
1058	<b>2011</b>	130	175	190	42	53	307	32	110
1174	<b>2014</b>	144	194	211	47	59	340	35	81



## Appendix 5

### EXTRAPOLATED PATIENT NUMBERS BY STAGE

STAGE	I	II	III	IV	Limited	Extensive
2004 SCGH	29	10	40	62	1	28
2011 WA	173	60	239	372	7	205
2014 WA	192	83	332	517	8	227



## APPENDIX 6

### LUNG CANCER PATIENT JOURNEY IN WA

PATIENT JOURNEY	RESOURCES REQUIRED	North Metro	South Metro	Great Southern (Regional centre: Albany)	South West (Regional centre: Bunbury)	Wheatbelt (Regional centre: Northam)	Midwest (Regional centre: Geraldton)	Goldfields (Regional centre: Kalgoorlie)	Pilbara (Regional centres: Port Hedland/Karratha)	Kimberley (Regional centre: Broome)
RECOGNITION of signs & symptoms; abnormal results from screening	Awareness of signs and symptoms at Primary Care level No screening tools currently considered effective									
REFERRAL	Private consulting rooms Public outpatients - all through Respiratory Physicians Rapid Access Clinics									
DIAGNOSIS	Chest X-ray Sputum Cytology Bronchoscopy Trans Thoracic Needle Aspiration (TTNA) CT Scan Fluoroscopy	Chest X-ray Bronchoscopy Sputum Cytology Trans Thoracic Needle Aspiration (TTNA) CT Scan Fluoroscopy	Chest X-ray Bronchoscopy Sputum Cytology Trans Thoracic Needle Aspiration (TTNA) CT Scan Fluoroscopy	Chest X-ray Bronchoscopy SC? FNA 16 slice CT	Chest X-ray Bronchoscopy SC? FNA ? slice CT	Chest X-ray SC? 16 slice CT	Chest X-ray SC? Trans Thoracic Needle Aspiration (TTNA) <sup>1</sup> Single slice CT	Chest X-ray SC? Single slice CT	Chest X-ray SC? FNA? 16 slice CT	Chest X-ray SC? 16 slice CT
ASSESSMENT OF PATIENT FITNESS	Lung Function Tests Spirometry Gas Transfer ECG Haematology Biochemistry Lung Perfusion	Lung Function Tests Spirometry Gas Transfer ECG Haematology Biochemistry Lung Perfusion	Lung Function Tests Spirometry Gas Transfer ECG Haematology Biochemistry Lung Perfusion							
DETERMINATION OF TREATMENT	Bone Scan PET MRI Mediastinoscopy Endobronchial Ultrasonography (EBUS) Guided FNA (TB-NA) Discussion at MDT	Bone Scan PET MRI Mediastinoscopy Endobronchial Ultrasonography (EBUS) Guided FNA (TB-NA) Discussion at MDT	Bone Scan PET MRI Mediastinoscopy Endobronchial Ultrasonography (EBUS) Guided FNA (TB-NA) Discussion at MDT	Lung Function Tests	Lung Function Tests CT Scan MRI		Lung Function Tests	CT Scan	Spirometry	Lung Function Tests
TREATMENT <sup>2</sup>	- Thoracic Surgery - Surgery - Chemotherapy - Radiotherapy - Combined - Palliation	- Thoracic surgery - Chemotherapy - Radiotherapy - Combined - Palliation	- Thoracic surgery - Chemotherapy - Radiotherapy - Combined - Palliation	Chemotherapy (Albany)	Chemotherapy (Bunbury)	Chemotherapy	Chemotherapy (Geraldton)	Chemotherapy (Kalgoorlie)		
FOLLOW-UP CARE		Radiation Therapy Peripheral Clinic Joondalup/PMH <sup>3</sup>	Radiation Therapy Peripheral Clinic Peel/Mandurah/ Rockingham <sup>4</sup>	Radiation Therapy Peripheral Clinic <sup>2</sup>	Radiation Therapy Peripheral Clinic <sup>4</sup>	Radiation Therapy Peripheral Clinic <sup>3</sup>	Radiation Therapy Peripheral Clinic <sup>3</sup>	Radiation Therapy Peripheral Clinic <sup>3</sup>		

<sup>1</sup> Dr Paul Drury, Radiologist at Geraldton Regional Hospital, regularly performs lung FNA and biopsy if required. Prefers patient is given the option for further investigation at a tertiary centre if procedure is considered high risk.

<sup>2</sup> Includes access to Clinical Trials.

<sup>3</sup> SCGH Radiation Oncology Peripheral Clinics: Dr Sean Bydder: Kalgoorlie General Hospital, Peel Health Campus; Dr Richard Kuan: Osborne Park Hospital, Geraldton Hospital, Rockingham Hospital; Dr David Joseph Albany (clinic held in Urologist's Rooms); Dr Nigel Spry: Peel Health Campus, Joondalup Health Campus; Dr John Niblett: Northam Hospital

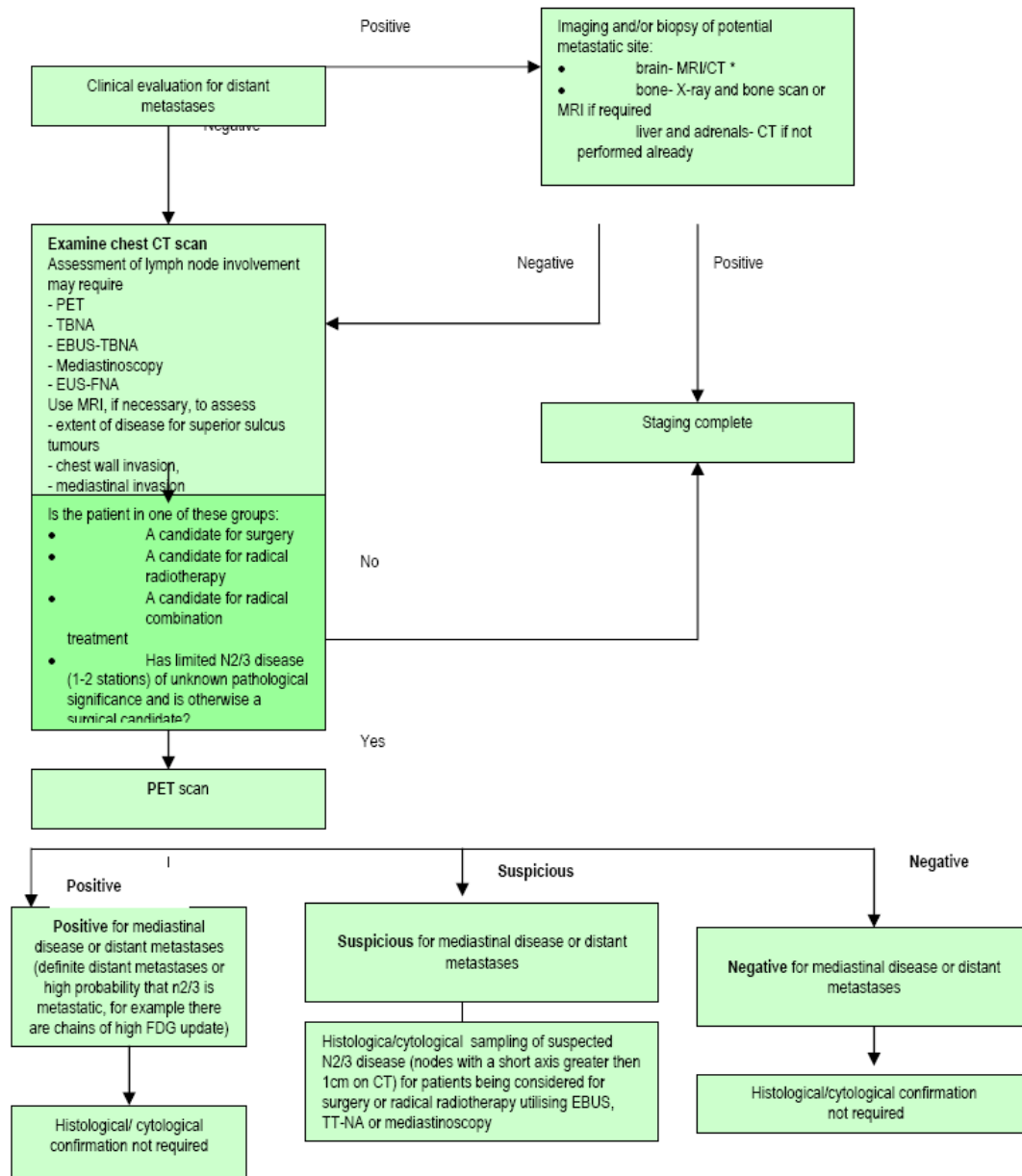
<sup>4</sup> Perth Radiation Oncology provide Radiation Oncology Peripheral Clinics to Bunbury



## Appendix 7

# Staging of non-small-cell lung cancer

For full details, see the NICE guideline: [www.nice.org.uk/CG024NICEguideline](http://www.nice.org.uk/CG024NICEguideline)

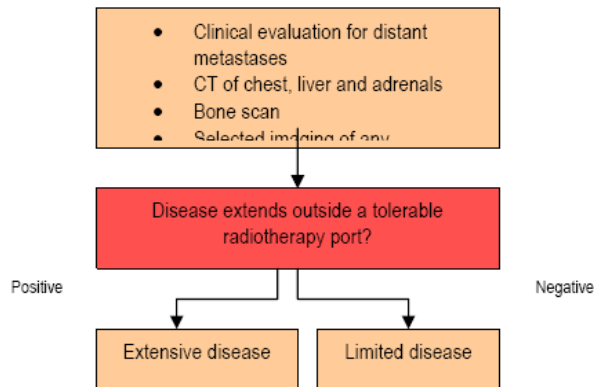


\* In the case of a single resectable brain metastasis, with no evidence of metastatic disease elsewhere, radical therapy to the thoracic tumour, including surgery, may be considered.



## Appendix 8

### Staging of small-cell lung cancer

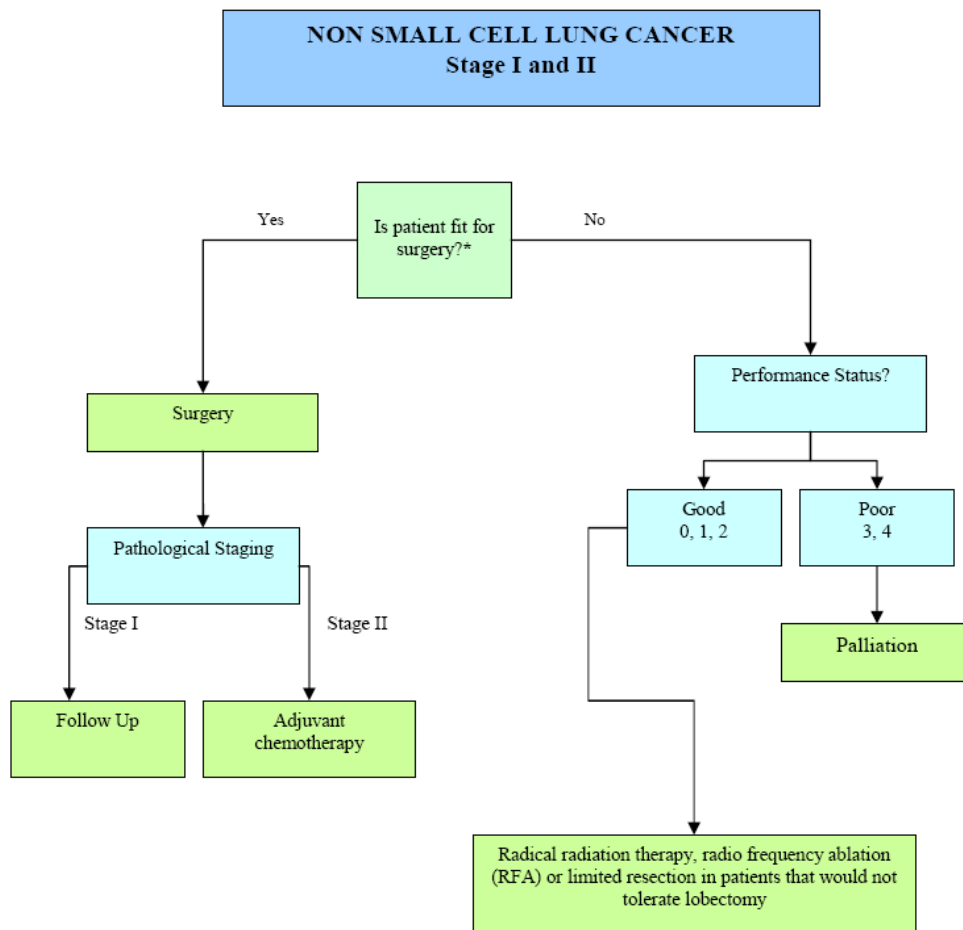


### Staging of Mesothelioma

Examination of CT chest is the cornerstone of staging for mesothelioma. Further investigations eg. thoracoscopy and PET, may be required if surgical treatments are considered (see Treatment).



## Appendix 9

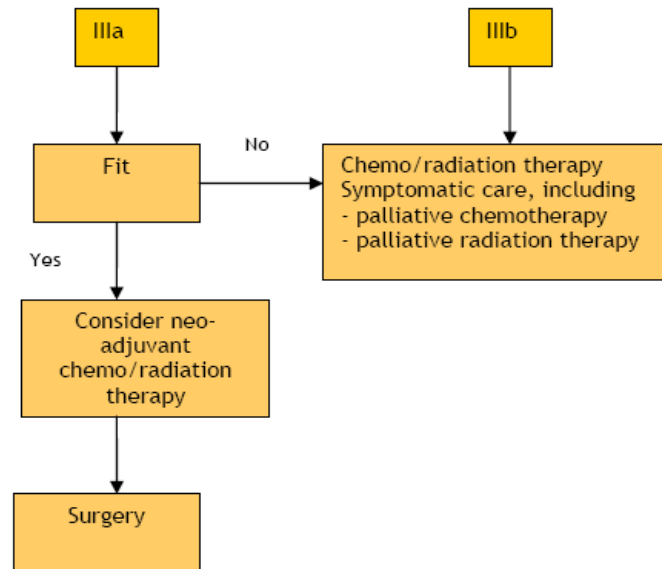




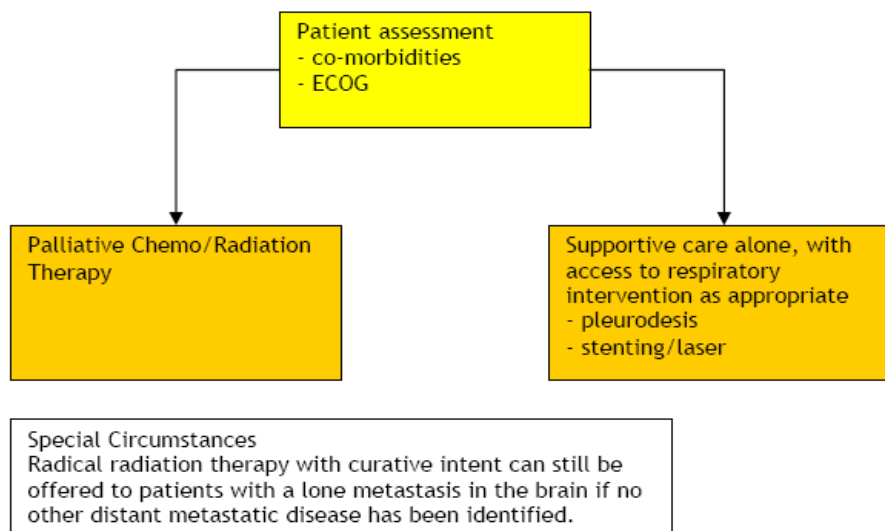


## Appendix 10

### LUNG CANCER STAGE IIIa and IIIb

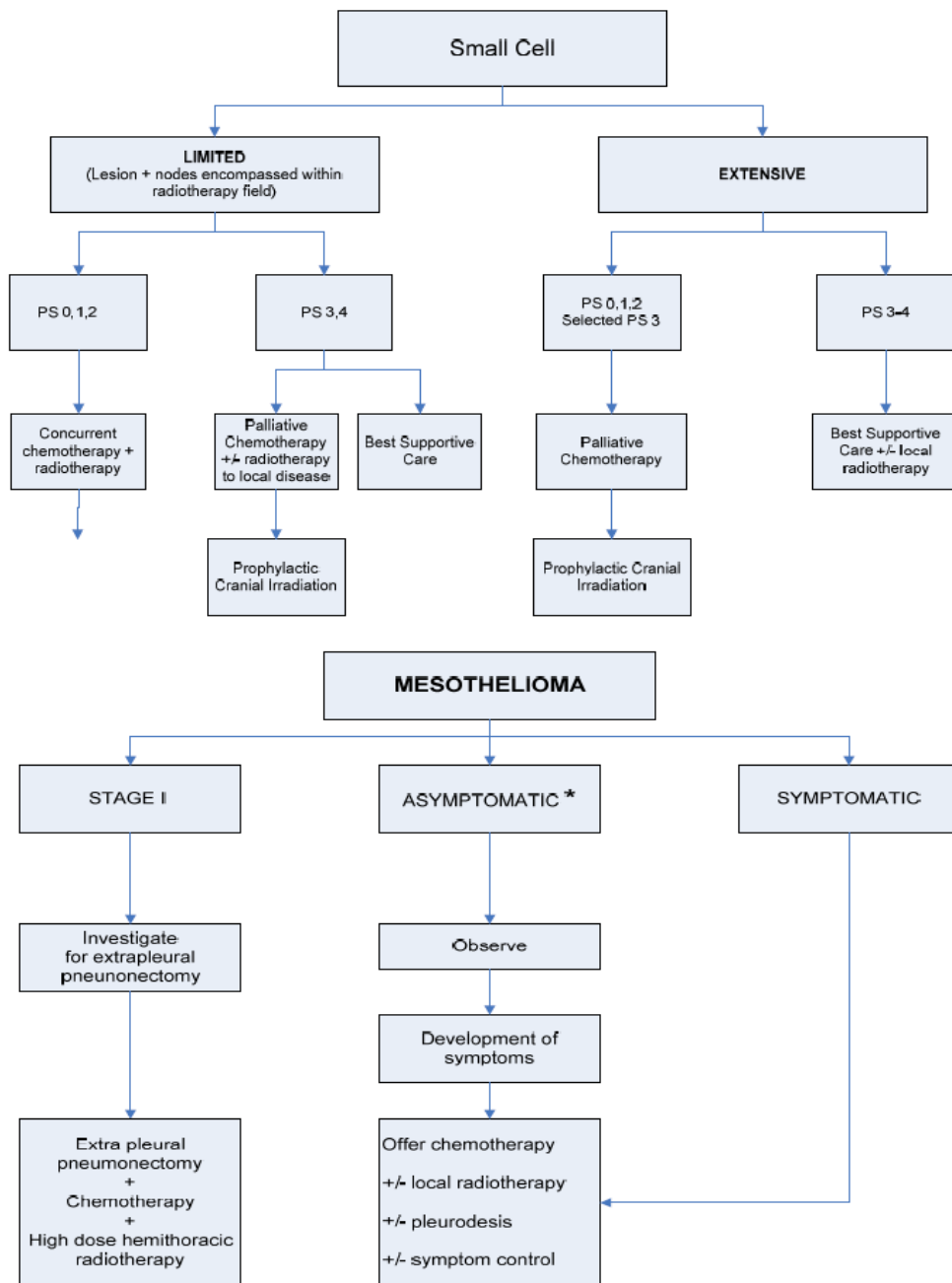


### LUNG CANCER STAGE IV






## Appendix 11



\* In high risk patients, i.e. where large volume of disease, treatment may be considered beneficial prior to symptom development.

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