



Lung Cancer Clinical Guidelines



Lung EAG on behalf of Northern Cancer Alliance

Document Information

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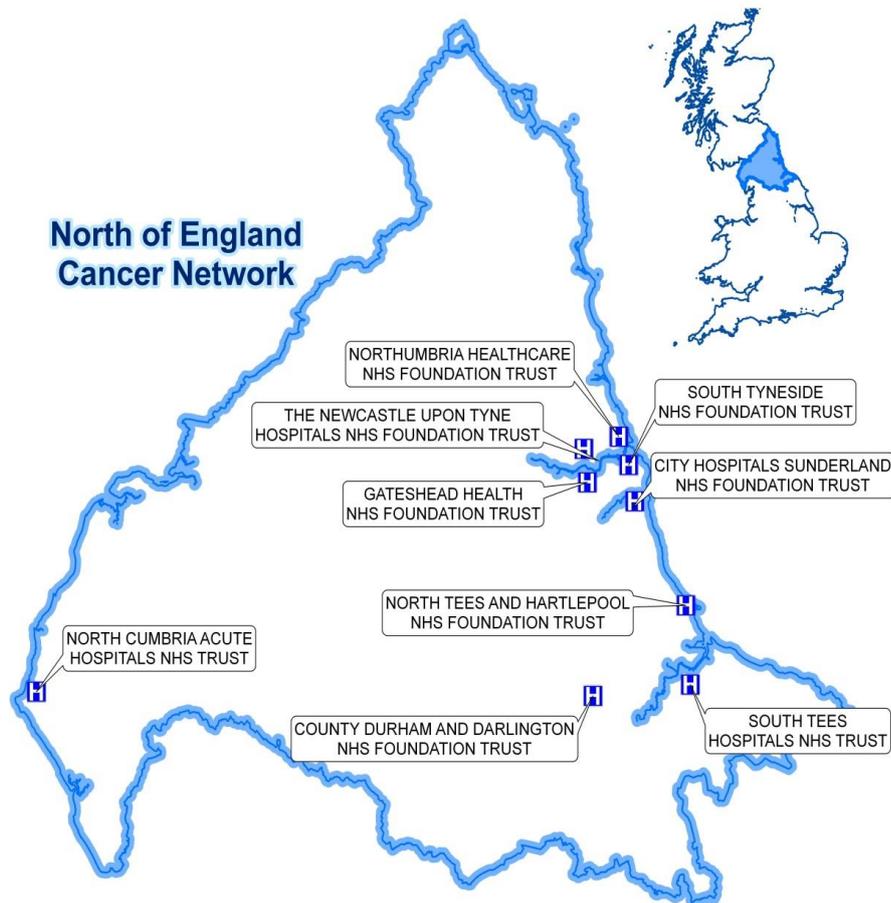
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Northern Cancer Alliance

Northern Cancer Alliance (NCA) was formed in March 2017 and covers a population of just over 3 million service users. The focus for the Cancer Alliance is to achieve high quality outcomes for cancer patients and to look at equitable access of treatments and care.



Terms of Reference

- These guidelines have been written by various members of the North of England Cancer Alliance. These guidelines update, have combined and have largely drawn from the previous Cancer Care Alliance guidelines which covered the Southern part of the Northern Region and the Northern Cancer Alliance guidelines which covered the Northern part of the Region. The guidelines have been circulated to all members of the lung cancer group within the Northern Region for comment before publication. Grateful thanks go to those members who contributed to the guidelines and who reviewed and checked the text.
- It should be noted that these are guidelines and not policy, and that across the region there may be some variation according to local arrangements. The guidelines have been compiled with reference to several national documents as detailed in the references but in particular the relevant National Institute for Clinical Excellence Lung Cancer Referral and Lung Cancer Diagnosis and Treatment Guidelines (NICE, 2005a; NICE, 2005b) and the “Lung Cancer The diagnosis and treatment of lung cancer”, NICE clinical guideline 121, April 2011

Introduction

Incidence

- Excluding non-melanoma skin cancer, the four commonest types of cancer are breast, lung, colorectal and prostate cancer and these four cancers account for over 50% of all new cases (CRUK, 2008c).
- Worldwide lung cancer is the most common cancer. In the UK breast cancer is overall currently the most common cancer despite it being rare in men. The second commonest cancer overall is lung cancer. Until the late 1990's lung cancer was the most common cancer in the UK.
- In men, lung cancer is the second commonest cancer after prostate cancer. In women, lung cancer is the second most common cancer after breast.
- Lung cancer accounts for approximately 1 in 7 of new cancer cases with about 38,000 (22,000 men, 16,000 women) cases/yr in UK with a crude incidence rate of 76.9/100,000 population in UK (CRUK, 2008d).
- Lung cancer is rare under the age of 40 years with 85% of cases occurring in those over the age of 60 years. The male:female ratio used to be 6:1 in the 1950's but with changes in smoking habit the ratio is now 1.4:1.
- There are two main types of lung cancer: small cell lung cancer accounts for about 20% of cases, and non-small cell lung cancer for 80% of cases. Adenocarcinoma is the most common type in non-smokers.
- There is a clear geographic variation with a high incidence in Northern England. Lung cancer is also strongly associated with social deprivation.
- Overall rates have fallen by more than 40% since a peak in 1970's due mainly to a fall in smoking rates in men. Between 1995 and 2004 the incidence of lung cancer in males fell by 23% whilst the incidence in women remained fairly static.

Mortality

- Despite the figures for incidence, lung cancer is the most common cause of death from cancer for men and women in the UK accounting for 24% of all male cancer deaths and 19% of all female cancer deaths.
- Lung cancer accounts for 6% of all deaths in UK and 22% of all cancer deaths in UK. There is a life time risk of lung cancer in men of 1in14 and in women of 1in17.
- For men lung cancer mortality rates fell steadily between 1992 and 2005 whilst over the same period the rates for women increased until the late 1990's and then have levelled off (CRUK, 2008e).

Survival

- Over two thirds of patients are diagnosed at a late stage when curative treatment is not possible. It is hoped that measures to improve this will make a significant difference to survival rates. Many patients have significant co-morbidity (CRUK, 2008b).

- At present about 27% (15% in 1975) of men diagnosed with lung cancer are alive at 1 year and 30% (13% in 1975) of women with lung cancer are alive at one year with 7% of men alive at 5 years and 9% of women alive at 5 years. There is a variation in survival rates within UK but even the best areas have survival rates which are well below the European and USA rates. In the USA five year survival rates are 13% for men and 17% for women.
- To address some of these differences and to try to collect national data a national lung cancer audit programme has been launched (NLCA) (Reference). In addition there is a National Awareness and Early Diagnosis Initiative (NAEDI) to try to diagnose lung cancer earlier and thereby improve outcome.

Risk Factors

- Smoking is by far and away the most significant risk factor for lung cancer. Approximately 90% of lung cancers in men and 83% of lung cancers in women are estimated to be due to smoking (CRUK, 2008a).
- In the UK about 25% of all adults aged >16 years smoke (11 million people). In children <1% of 11 and 12 year olds smoke but this figure rises to 20% of 15 years olds.
- Lifelong current smokers are 15x more likely to die from lung cancer than life long non-smokers. The duration and the level of consumption are related to the risk of lung cancer. Compared with non-smokers, for smokers of 1-14/day the risk of dying from lung cancer is 8x, and for those who smoke 25+/day the risk is 25x. Duration is however more significant than level of consumption. The risk of 20/day for 20 years may be more than 16x as hazardous as 20/day for 10 years. The earlier smoking starts the greater the danger.
- Smoking cessation has significant health benefits at whatever age and is to be strongly recommended. A lifelong male smoker has a risk of 15.9% for developing lung cancer by 75 years, but stopping at 60, 50, 40 and 30 years reduces this risk to 9.9%, 6.0%, 3.0% and 1.7%. Similar figures apply to women with a life time risk of lung cancer to age 75 years for smokers of 9.5%. Stopping smoking before middle age avoids the majority of the risk for lung cancer. A lifelong never smoker has a risk of 0.5% of developing lung cancer by 75 years.
- A further risk factor is radon gas which naturally occurs, and in some areas, can accumulate in houses. It may account for 9% of lung cancers in some circumstances. Other risk factors include industrial carcinogens including arsenic and some hydrocarbons and asbestos.
- A family history of a first degree relative with lung cancer is associated with a 2x increased risk independent of smoking, especially if the cancer was diagnosed at an early age. Previous treatment for cancers such as lymphoma is also a risk factor which can be present up to 30 years later.

Screening

- At present there is no proven effective screening test for lung cancer. Several large studies, using various combinations of x-ray and sputum

cytology, have failed to show any clinically significant benefit. Trials looking at CT screening have been completed and further trials are under way.

- The Network welcomes the pledge in the Cancer Reform Strategy to commission research on the feasibility of a UK trial of CT screening for lung cancer, working with the National Cancer Research Institute (DH, 2007).

Public Health and Prevention

The Alliance fully supports the drive to improve cancer care and services throughout the United Kingdom. In particular for England, the Alliance supports the NHS Cancer Plan (DH, 2000) and the NHS Cancer Reform Strategy (DH, 2007) and the NAEDI around lung cancer.

The Alliance supports the aims of the Cancer Reform Strategy to promote good Public Health and help to prevent cancer through improved awareness of risk factors and adoption of healthier lifestyles. In particular the Cancer Reform Strategy drive to reduce smoking. It is recommended that the Alliance and all individual units support all national and local anti-smoking measures wherever possible. It is strongly recommended that the Alliance support measures taken to try to prevent / reduce school children starting to smoke and to help them to stop smoking.

At the individual level health workers should enquire into smoking behaviour, emphasise the importance of stopping smoking and offer encouragement and support. All measures available to help stop smoking should be considered and made available wherever possible.

The Alliance supports the aims stated in the Cancer Reform Strategy to raise public awareness of cancer and the planned national audit in primary care of newly diagnosed cancers and the NAEDI around lung cancer throughout the UK.

The Alliance and the Lung EAG take note of the recommendation in the 2011 NICE guidance that “The public needs to be better informed of the symptoms and signs that are characteristic of lung cancer, through coordinated campaigning to raise awareness”.

Referral Guidelines for Suspected Lung Cancer

General Principles

- Lung cancer can present in a vast number of ways and a high index of suspicion should be held especially when treating those most at risk – long term smokers. It is recommended that General Practitioners, but also all hospital Consultants and those treating patients, should follow the national recommendations regarding referral. Link detailed below;

<https://www.nice.org.uk/guidance/conditions-and-diseases/cancer>.

Cancer Alliance Referral Pathways

Referral Pathways CCG		Hospital	Designated MDT	Named Lead/ Contact/Tel/Fax	Centres for Surgery
South Tees	276	South Tees Hospitals NHS FT	James Cook University Hospital (JCUH)	Dr V Dudzevicius T:01642 852192 F:01642 854692	Surgical Unit
Hambleton, Richmondshire & Whitby	153		(JCUH) - via VC from Friarage Hospital	FHN T 01609 779911 F 01609 762149	
Hartlepool & Stockton	288	North Tees & Hartlepool NHS FT	University Hospital of North Tees	Dr DN Leitch T:01642 617617 F:01642 624957	
Newcastle	249	Newcastle Upon Tyne Hospitals NHS FT	Freeman Hospital	Dr A Ward T:0191 2336161 F:0191 2231417	Surgical Unit
North Tyneside	203	Northumbria Health Care NHS FT	North Tyneside General Hospital	Mr D Cooper T:0191 2934124 F:0191 2934124	
Northumberland	316		Wansbeck General Hospital	Mr M Weatherhead T:01670 529304 F:01670 529305	
Gateshead	249	Gateshead Health NHS FT	Queen Elizabeth Hospital	Dr J Killen T:0191 4820000 F:0191 4820360	
Sunderland Easington (60%)	278 56	City Hospitals Sunderland	Sunderland Royal Hospital	Dr N Chamberlin T:0191 5656256 F:0191 5410515	
South Tyneside	149	South Tyneside NHS FT	South Tyneside District Hospital	Dr E Fuller T:0191 4041000 F:0191 2022191	
North Durham	248	County Durham and Darlington NHS FT	University Hospital of North Durham	Dr N Munro T:0191 3332309 F:0191 3332884	
Durham Dales, Easington & Sedgefield (excl Easington 60%)	219	County Durham and Darlington NHS FT	Darlington Memorial Hospital	Dr Abassi T:01325 743490 F:01325 743703	
Darlington	106		Dr Cowie		
North Cumbria	318	North Cumbria University Hospitals NHS Trust	Cumberland Infirmary	Dr P Plant T:01228 814142 F:01228 814819	

Source - Mid-2016 Population Estimates for Clinical Commissioning Groups (CCGs) in England - ONS.gov.uk

Urgent Referral Form for Suspected Cancer in Adults - LUNG

(Two-week wait)

Full Name Date of Birth (Age) NHS Number

If the patient has not heard back within 7 days, please contact the Department again

Attach this form to the e-referral within 24 hours

If the e-referral system is not available, please send BOTH the 'service form' AND the 'Referral header sheet' by secure email or FAX

- Patient has been informed that this is an urgent referral for suspected cancer
- The patient is available and willing to attend hospital for urgent tests/appointment within the next 14 days
- The patient has been given the Fast Track leaflet

Link to: [NICE GUIDANCE](#) [2WW Patient Information Leaflet](#)

Immediate Referral - DO NOT USE THIS FORM	
NICE Guidance	<p>Speak directly to a consultant respiratory physician or Consider acute admission for patient with:</p> <ul style="list-style-type: none"> Signs of superior venacaval obstruction (swelling of face/neck/fixed elevation of jugular venous pressure) Stridor
	Refer urgently for an appointment within 2weeks, patients with:
	<input type="checkbox"/> Unexplained haemoptysis aged 40 years and older
	<input type="checkbox"/> A chest X-ray where there is a high suspicion for lung cancer
	<input type="checkbox"/> A normal chest X-ray where there is a high suspicion of lung cancer
	<input type="checkbox"/> A history of asbestos exposure and recent onset of chest pain, shortness of breath or unexplained systemic symptoms where a chest X-ray indicates pleural effusion, pleural mass or any suspicious lung pathology
Before Referral	
<p>Offer urgent chest X-ray (to be performed within 2 weeks) to assess for lung cancer in patients over 40:</p> <p>If they have 2 or more of the following unexplained symptoms OR</p> <p>If they have ever smoked and have one or more of the following unexplained symptoms:</p> <p>> Cough > Fatigue > Shortness of breath > chest pain > weight loss > appetite loss</p>	
<p>Consider an urgent chest X-ray (to be performed within 2 weeks) to assess for lung cancer in people aged 40 and over with any of the following:</p> <p>> Persistent or recurrent chest infection > Finger clubbing > Thrombocytosis</p> <p>> Supraclavicular lymphadenopathy or persistent cervical lymphadenopathy</p>	

Title Given Name Surname

Date of Birth

NHS Number

Reason for Referral/Current Presentation

Please include reason why patient initially attended, relevant PMH and what they know
The clinical information is essential to safe and effective care of your patient

[Redacted]

(Note to Referrer: Extraneous/sensitive information **MUST BE DELETED** from the consultation/s below).

📌 Consultations

Recent CXR: Yes No If yes, Date: [Redacted]

Single Code Entry: Standard chest X-ray

Please attach the chest X-ray to this referral

Essential Information

as some patients will be directed to other investigations before the clinic appointment

Description	Y	N	Description	Y	N
Warfarin	<input type="checkbox"/>	<input type="checkbox"/>	Clopidogrel	<input type="checkbox"/>	<input type="checkbox"/>
Diabetic	<input type="checkbox"/>	<input type="checkbox"/>	Metformin	<input type="checkbox"/>	<input type="checkbox"/>
Renal impairment	<input type="checkbox"/>	<input type="checkbox"/>	NOAC e.g. Rivaroxaban	<input type="checkbox"/>	<input type="checkbox"/>

Blood tests results in last 2 months. If blood test results do not appear below but have been requested/not requested - please 'X' the appropriate boxes

FBC:

Haemoglobin: Single Code Entry: Haemoglobin estimation

Platelet: Single Code Entry: Platelet count

Total White cell count: Single Code Entry: Total white cell count

Requested Not requested [Redacted]

U&E's:

Serum Sodium: Single Code Entry: Serum sodium

Serum Potassium: Single Code Entry: Serum potassium

Single Code Entry: Serum urea level

Single Code Entry: Serum creatinine

Requested Not requested [Redacted]

Coagulation screen:

Prothrombin Time: Single Code Entry: Prothrombin time

APTT: Single Code Entry: APTT

APTTR: Single Code Entry: Activated partial thromboplastin time ratio

Fibrinogen level: Single Code Entry: Fibrinogen level

INR: Single Code Entry: International normalised ratio

Requested Not Requested [Redacted]

Any allergies (including contrast): [Redacted]

Allergies

Title Given Name Surname Date of Birth NHS Number

Performance Status	<input type="checkbox"/>	0	Fully active
	<input type="checkbox"/>	1	Cannot carry out heavy physical work
	<input type="checkbox"/>	2	Up and about more than half the day and can look after yourself
	<input type="checkbox"/>	3	In bed or sitting in a chair for more than half the day and need help in looking after yourself
	<input type="checkbox"/>	4	In bed or a chair all the time and need a lot of looking after

Additional Patient Information

Patient Gender:	Gender(full)	Date of Referral:	Short date letter merged	
Patient Address:	Home Full Address (single line)			
Patient Contacts	Home:	Patient Home Telephone	Mobile:	Patient Mobile Telephone
	Work:	Patient Work Telephone	Email:	Patient E-mail Address
	Carer/Advocate: The patient has confirmed the following person should be included in correspondence – Name: [] Contact Details: []			
Contact Consent:	<input type="checkbox"/> Can leave message on answer machine <input type="checkbox"/> Can contact by text <input type="checkbox"/> Can contact by Email NB: Not all services use Texts or Emails as a method of communication.			
Ethnicity:	Ethnic Origin			
Interpreter:	<input type="checkbox"/> Yes	Language: Single Code Entry: Main spoken language		[]
Accessibility Needs:	<input type="checkbox"/> Wheelchair access <input type="checkbox"/> Deaf <input type="checkbox"/> Registered Blind Single Code Entry: On learning disability register <input type="checkbox"/> Learning Disability <input type="checkbox"/> Other disability needing consideration [] <input type="checkbox"/> Accompanied by Carer			
Risks:	<input type="checkbox"/> Vulnerable Adult <input type="checkbox"/> Subject to Child Protection Plan <input type="checkbox"/> Lone worker risk Single Code Entry: Failed or difficult intubation Other: []			

: Military veteran...

: Is a carer...

Single Code Entry: Uses monitored dosage system
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Additional Referrer Information

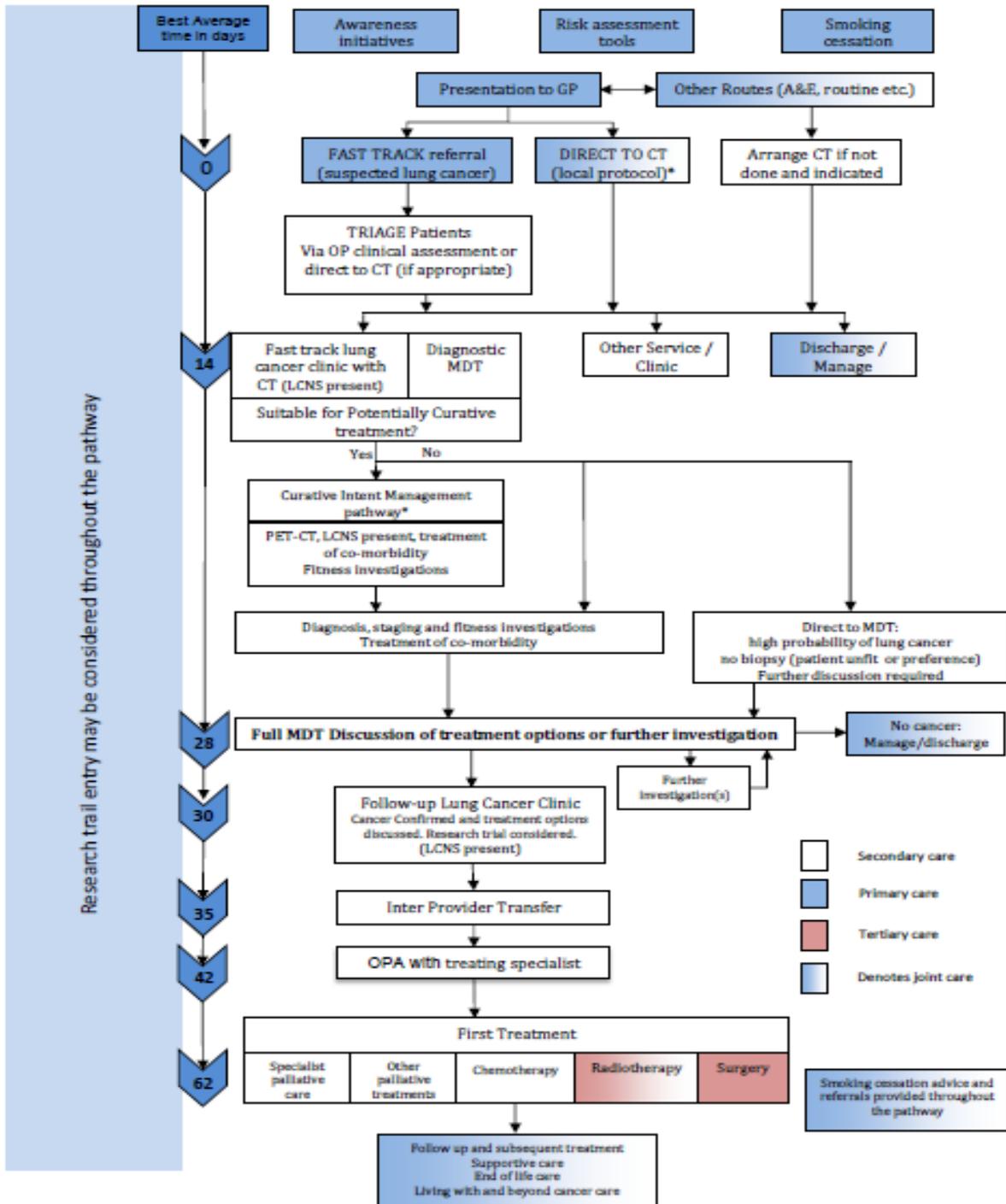
Accountable GP:	Usual GP Full Name		
Name of GP to address correspondence to, if different to accountable GP	[]		
Surgery Address:	Organisation Name, Organisation Full Address (single line)		
Surgery Tel No:	Organisation Telephone Number	Surgery Email	Organisation E-mail Address
Surgery Fax:	Organisation Fax Number		

2WW NE LUNG Referral Form – EMIS Web V6 Gateshead April 2016
 IF ANY CHANGES ARE NEEDED TO THIS FORM including contact details PLEASE EMAIL: Ngccg.informatics@nhs.net

To be completed by the Data Team (Insert Dates)			
Received:	/	/	First Appointment booked: / /
First Appointment date:	/	/	1st seen: / /
Specify reason if not seen on 1 st appointment:			
Diagnosis:	Malignant <input type="checkbox"/>	Benign <input type="checkbox"/>	

Pathway for patients with suspected lung cancer

Pathway for patients with suspected Lung Cancer



Patient Centred Care

- People being referred for suspected cancer should have the opportunity to make informed decisions about their care and treatment taking into account individual needs and preferences.
- Good communication is essential between healthcare professionals and patients with the provision of suitable evidence based information. The Network and the Lung EAG take note of the NICE Guidance that “A lung cancer clinical nurse specialist is available at all stages of care to support patients and carers”.
- Unless excluded by the patient, carers and relatives should have the opportunity to be involved.

Making a diagnosis

- Primary health care professionals should be familiar with typical presenting features of lung cancer and be alert to the possibility of lung cancer when there are unusual symptoms or where there is failure to improve from what is thought to be a benign condition. Discussion with a specialist should be considered if there is uncertainty.
- If diagnosis or referral has been delayed the patient should be offered the opportunity to see another healthcare practitioner.

Investigations

- Investigations in primary care should not delay referral where cancer is suspected.

The need for support and information

- Following referral the primary health care professional should assess the patient need for continuing support whilst awaiting their appointment noting that some patients may find the referral for suspected cancer particularly difficult and that both men and women may need support but display their need differently. Cultural differences should also be considered with appropriate action as necessary.
- Information given should include:
 - Where the patient is being referred
 - How long they will wait for an appointment
 - How to obtain further information about the suspected cancer
 - Who they will see
 - What to expect
 - What type of tests might be carried out
 - How long it will take to get a diagnosis.
- Patients being referred should normally be told that they are being referred to a cancer service.

Continuing education

Primary health care professionals should take part in education, peer review and other activities to improve or maintain clinical consulting, reasoning and diagnostic skills, and communication skills. Such awareness and understanding around lung cancer is important to earlier diagnosis and improved outcome.

Referrals

- There should be arrangements in place to ensure that letters about non-urgent referrals are seen by a specialist so that a change in priority can be made if needed.
- There should be local arrangements in place to ensure a maximum wait for non-urgent referrals in accordance with national targets and recommendations.
- There should be arrangements in place to ensure that those who miss their appointments are identified so that they can be followed up.
- When making a referral the healthcare practitioner should use local referral proformas when these are in use and include all relevant details.
- When a decision to refer has been made the healthcare practitioner should make the referral within 1 working day.

Specific Guidelines for Urgent Referral for Suspected Lung Cancer

- Definition: Urgent: The patient is seen within the national target for urgent referrals (currently 2 weeks). The following recommendations are those identified in the relevant NICE guideline (NICE, 2005b, NICE Clinical Guideline 121, 2011):

General

- A patient with symptoms suggestive of lung cancer should be referred to a member of a team specialising in the management of lung cancer. Very often this will initially be a respiratory physician.

Specific – Referral for Chest X-ray

- An urgent referral for a chest X-ray should be made when a patient presents with:
 - Haemoptysis or
 - Any of the following unexplained persistent (> 3 weeks) symptoms or signs
 - Cough
 - Chest and or shoulder pain
 - Dyspnoea
 - Weight loss
 - Chest signs
 - Hoarseness
 - Finger clubbing
 - Cervical or supraclavicular lymphadenopathy
 - Features suggestive of a metastasis from lung cancer (eg brain, bone, liver or skin).
- In addition, investigations should be arranged for those with chronic lung disease where there is a change in symptom complex e.g. changed cough in COPD / fibrosis.
- A report should be made to the primary healthcare professionals within 5 days of the referral for a chest X-ray.
- Where a CXR has been requested in primary or secondary care and is incidentally suggestive of lung cancer, a second copy of the radiologist's report should be sent to a designated member of the lung cancer MDT, usually the chest physician. The MDT should have a mechanism in place to follow up these reports to enable the patient's GP to have a management plan in place.

Specific - Referral to a Lung Cancer Unit

- An urgent referral should be made for either of the following:
 - Persistent haemoptysis in smokers or ex-smokers who are aged 40 years or older
 - A chest X-ray is suggestive of lung cancer (including pleural effusion and slow to resolve consolidation).
- In addition to these NICE recommendations it should also be noted that a CXR may be normal despite the presence of cancer and where there is clinical suspicion then a normal CXR should not be taken as false reassurance.
- Where there is suspicion of lung cancer a referral should be made even with a normal CXR.
- A referral should be made while awaiting the result of a CXR if any of the following are present:
 - Superior vena cava obstruction
 - Stridor
 - As clinical circumstances indicate
 - As indicated above in smokers and ex-smokers over 40 years who have persistent haemoptysis.
- Note a proportion of patient with lung cancer present as acute medical emergencies.
- In general a high index of suspicion should be held for those with particular risk factors although lung cancer can present in any patient with or without a risk factor. Risk factors include:
 - Current or ex smokers
 - Those with COPD
 - Previous asbestos exposure
 - Previous Cancer

EAG GUIDELINES FOR TEENAGE AND YOUNG ADULTS

Teenage and Young Adults Peer Review Measures Topic 11-1C (Functions of the Network Site Specific Groups for TYA)

1. Teenage and Young Adult Pathway for initial Management

The EAG has received the document named 'NCA' Teenage and Young Adult Cancer Pathway Guidance Paper' and agrees to follow the generic TYA Pathway with any site specific variations to be documented. Please see Appendix 1 for pathway.

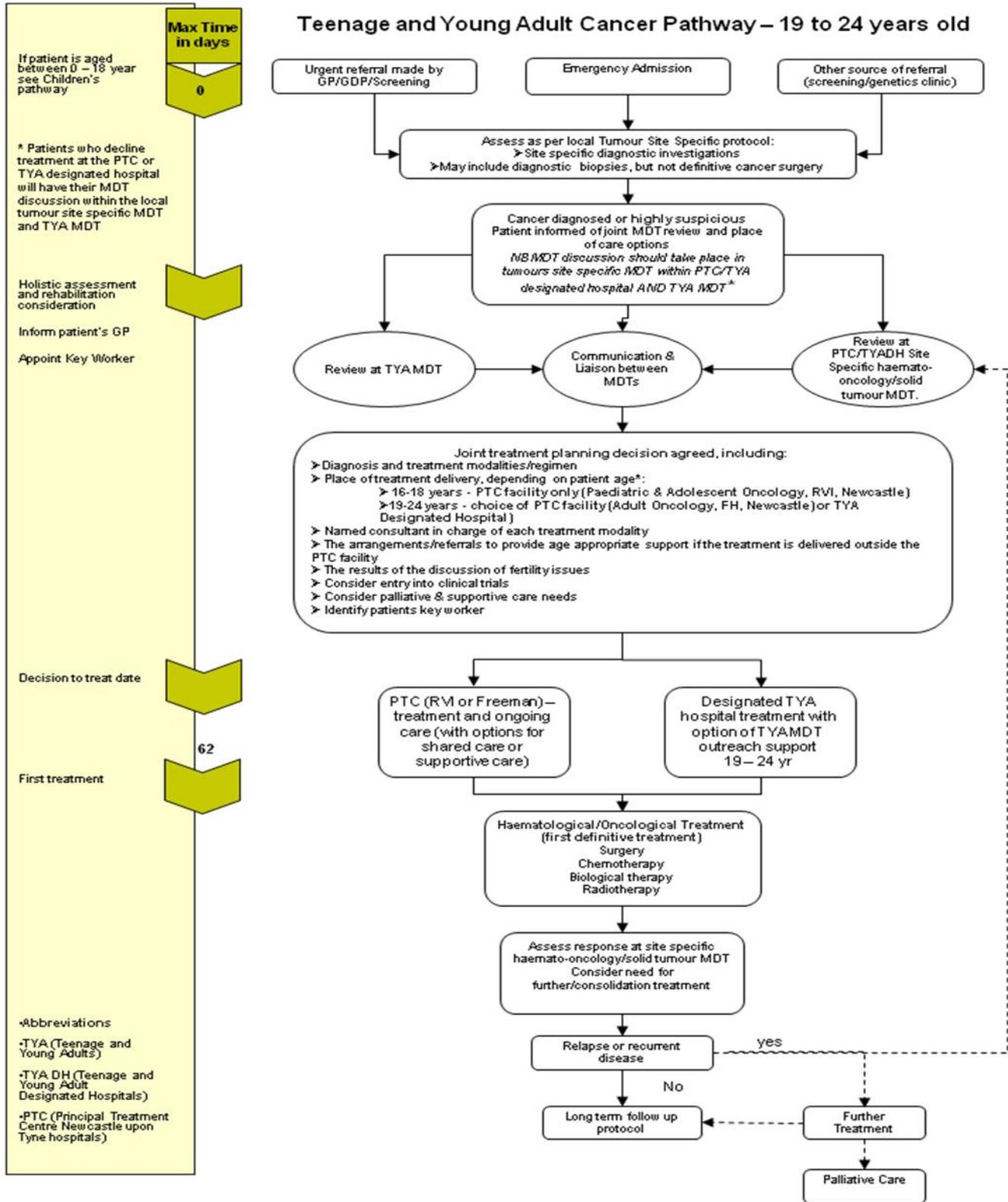
2. Teenage and Young Adult Pathway for Follow up on completion of first line treatment

The EAG has received the document named 'Teenage and Young Adult Cancer Pathway follow up on completion of first line treatment' and agrees to follow the generic TYA Pathway with any site specific variations to be documented. Please see Appendix 1 for pathway.

3. Pathways for cases involving Specialised NHS services (Only Gynae and Sarcoma)

The Gynae EAG and SAG reviewed and agreed the Specialised NHS Service pathway for patient's age 16-24 years. This is attached in Appendix 3

Appendix 1 – Teenage and Young Adult Pathway for initial Management and Follow up on completion of first line treatment



TYA Cancer Ideal Pathway Map version 1.7
 EL/TH/KJ/ST and acknowledgement to Wessex Cancer Network

Northern England Strategic Clinical Network CYPCG

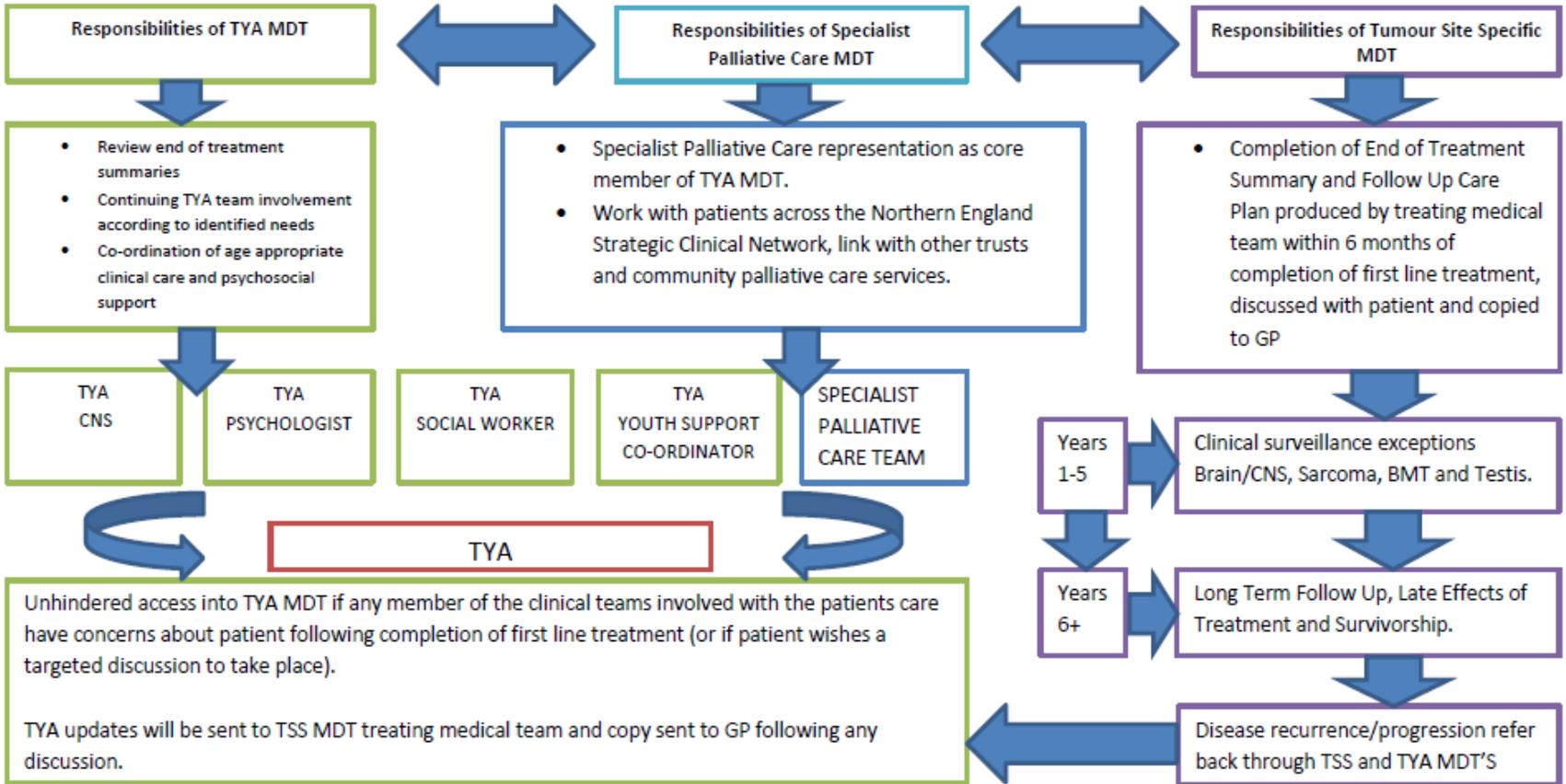
Follow Up on Completion of First Line Treatment (19-24)

Peer Review: 14-7A-207
 Version: V1
 Date: 10.03.2015

Principal Treatment Centre : Newcastle-upon-Tyne Hospitals NHS Foundation Trust
 Gateshead Health NHS Foundation Trust at Queen Elizabeth Hospital
 City Hospitals Sunderland NHS Foundation Trust at Sunderland Royal Infirmary
TYA Designated Trusts : North Tees and Hartlepool NHS Foundation Trust at University Hospital of North Tees
 South Tees Hospitals NHS Foundation Trust at James Cook University Hospital

Acknowledgment: NHS Improving Quality (NHS IQ)

Completion of first line treatment
 Including surgery, radiotherapy, chemotherapy, biological or endocrine therapy) Patients aged 19-24 years should have been offered the choice between PTC NuTH and a TYA designated hospital



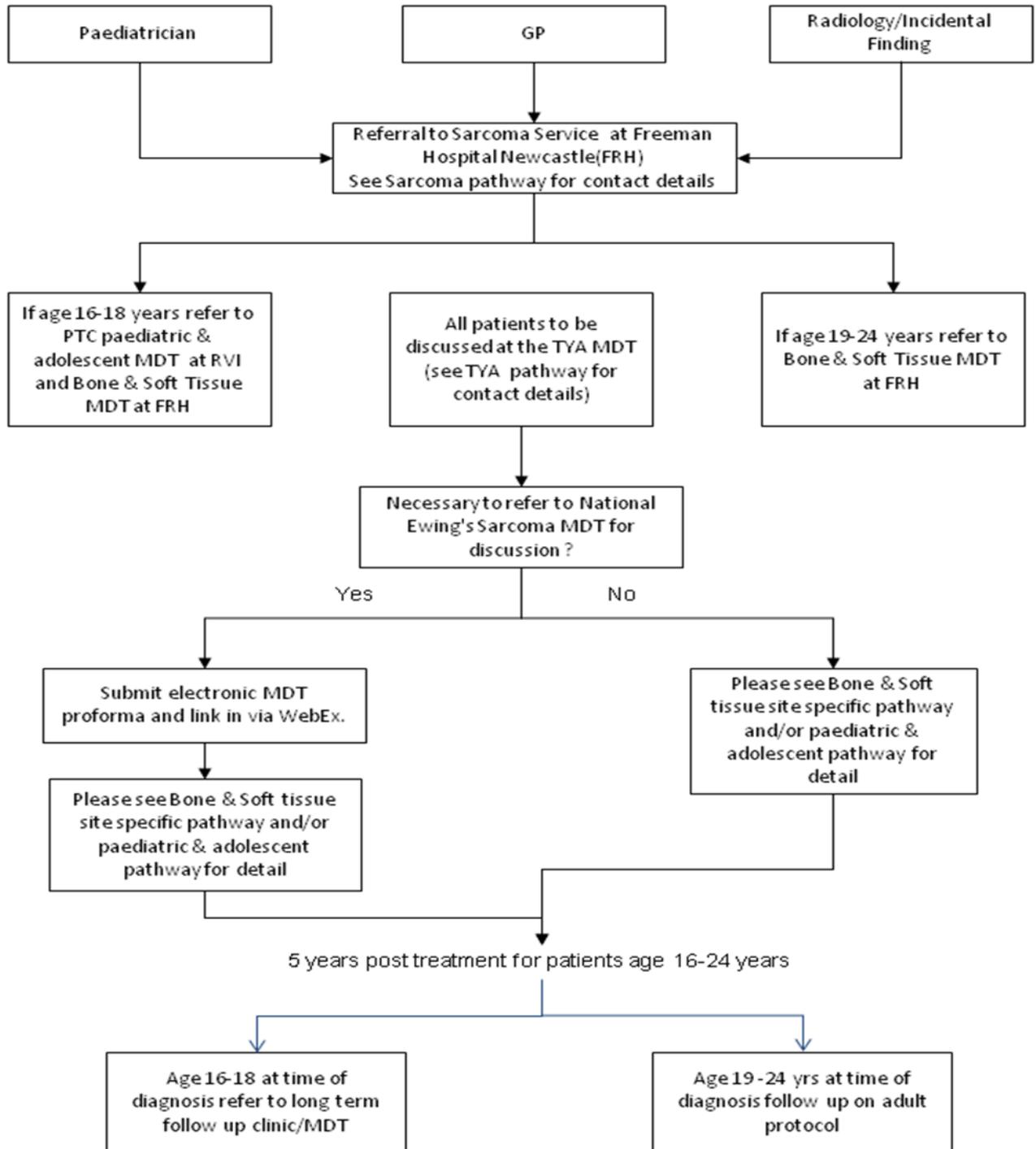
Contact Information	MDT RESPONSIBILITIES			Transition to TYA Transition to Adult
	TYA MDT	SPECIALIST PALLIATIVE CARE MDT	TUMOUR SITE SPECIFIC MDT	
<p>These are the trusts that are designated to treat TYA patients within the Northern Region Strategic Clinical Network:</p> <p>PTC: Newcastle-upon-Tyne Hospitals NHS Foundation Trust 16-18 Great North Children's Hospital. 19-24 Freeman Hospital</p> <p>Switchboard 0191 2336161</p> <p>DH: City Hospitals Sunderland Foundation Trust Sunderland Royal Infirmary Switchboard 0191 5656256</p> <p>DH: Gateshead Health NHS Hospitals Trust Queen Elizabeth Hospital Switchboard 0191 4820000</p> <p>DH: North Tees and Hartlepool NHS Foundation Trust University Hospital of North Tees Switchboard 01642 617617</p> <p>DH: South Tees Hospitals NHS Foundation Trust James Cook University Hospital Switchboard 01642 850850</p>	<p>Location: NuTH Time: Thursdays, 12:00-14:00 Lead Clinician: Dr Emma Lethbridge Lead Nurse: Mr David Short Coordinator: Sharon Buckley Phone: 0191 233 6161 email: tnu.tr.tyamdt@nhs.net</p> <p><u>TYA MDT</u> Review end of treatment summary</p> <p><u>TYA CNS</u></p> <ul style="list-style-type: none"> Co-ordination of clinical care. Acts as point of contact/reference <p><u>TYA Psychologist</u></p> <ul style="list-style-type: none"> Continue to provide level 3+4 support according to need. Involvement in end of treatment/ Survivorship clinic/event. <p><u>TYA Social Worker</u></p> <ul style="list-style-type: none"> Continue to provide support according to need Introductory letter sent with information and offer of grant at time of diagnosis and relapse More in depth service offered based on assessed need <p><u>TYA Youth Support Co-ordinator</u></p> <ul style="list-style-type: none"> Continue to invite patients to support activities for up to 2 years post first line treatment Involvement in end of treatment/ Survivorship clinic/event 	<p>Location: NCCC Freeman Hospital Time: Wednesdays, 09:30-11:30 Lead Clinician: Dr M. Comiskey Coordinator: Kerry Halliday Phone: 0191 2138606 email: kerry.halliday@nuth.nhs.uk</p> <ol style="list-style-type: none"> Specialist Palliative Care representation as core member of TYA MDT. All site specific MDT outcomes notified to palliative care lead clinician. Patients reviewed at any point along the pathway (diagnosis, relapse, long term follow up, end of life care). Holistic needs assessment to include family/carers. Work with patients across the Northern England Strategic Clinical Network, link with other trusts and community palliative care services. MDT outcomes documented on Somerset. 	<ul style="list-style-type: none"> Completion of end of treatment summary and follow up care plan produced by treating medical team within 6 months of completion of first line treatment, discussed with patient and copy to GP <p>Treatment Summaries should be assigned a level of care.</p> <ul style="list-style-type: none"> Level 1: Supported self-management with contact info about how to reconnect back into LTFU. Level 2: Planned coordinated care with support from the primary treatment centre and local services. Low level care required such as monitoring with echocardiograms. Level 3: Complex care requiring follow-up in the long-term follow up clinic usually requiring input from the multi-disciplinary team. <p>YEARS 1-5</p> <ul style="list-style-type: none"> Clinical surveillance for disease recurrence and treatment toxicity monitoring (including history, clinical examination, laboratory investigations, imaging studies and invasive procedures where indicated according to tumour site specific follow up protocols) <p>YEARS 6+</p> <ul style="list-style-type: none"> Long term follow up for late effects of treatment, consider survivorship issues Consider referral to long term follow up/late effects MDT if disease free after 5 years from completion of first line treatment Consider extended clinical follow up to 10 years+ in selected patient groups as defined by the TSS MDT's (e.g. brain/CNS, sarcoma, BMT, testis) 	<p>Transition into adult services is planned for and discussed with patients well in advance. Transition at a time of crisis e.g. relapse, intensive chemotherapy will be avoided wherever possible. Transition will be facilitated by the keyworkers</p>

Appendix 2 – Contact Details

List of designated MDTs at Principal Treatment Centre and TYA Designated Hospitals (19 - 24 years)				
Name of NHS Trust and designated hospital site	Name of MDT	TYA Lead Clinician	TYA Lead Nurse	Contact Number
Principal Treatment Centre	All MDTs: Breast Colorectal Gynaecology (diagnostic) Haematology Head & Neck Lung Neurooncology (Brain/Spinal, Pituitary, Skull Base) Sarcoma Specialist Skin Specialist pancreatic Supra T-cell Lymphoma Teenage and Young Adult MDT Testicular Thyroid Specialist Upper GI Specialist Urology	Dr Emma Lethbridge	David Short david.short@nuth.nhs.uk	0191 2448858 (Dect48858)
Gateshead Health NHS Foundation Trust - at Queen Elizabeth Hospital	Specialist Gynaecology	Ms Christine Ang	rachel.mugnai@ghnt.nhs.uk	0191 4456148
City Hospitals Sunderland NHS Foundation Trust - at Sunderland Royal Hospital	Haematology Specialist Urology (<i>testicular only</i>)	Dr Scott Marshall	Faye Laverick faye.armstrong@chsft.nhs.uk	0191 5656256
North Tees and Hartlepool NHS Foundation Trust - at University Hospital of North Tees	All MDTs: Haematology Local Urology Thyroid Breast Colorectal Lung Local Upper GI	Dr Padmaja Lokireddy	Kat Dawson Katherine.Dawson@nth.nhs.uk	01642 617617 ext 24697
South Tees Hospital NHS Foundation Trust - at James Cook University Hospital	All MDTs: Specialist Gynaecology Breast Colorectal Haematology Head & Neck Lung Neurooncology Specialist Skin Thyroid Specialist Upper GI Specialist Urology	Dr Dianne Plews	Jill Linton jill.linton@stees.nhs.uk	01642 854381

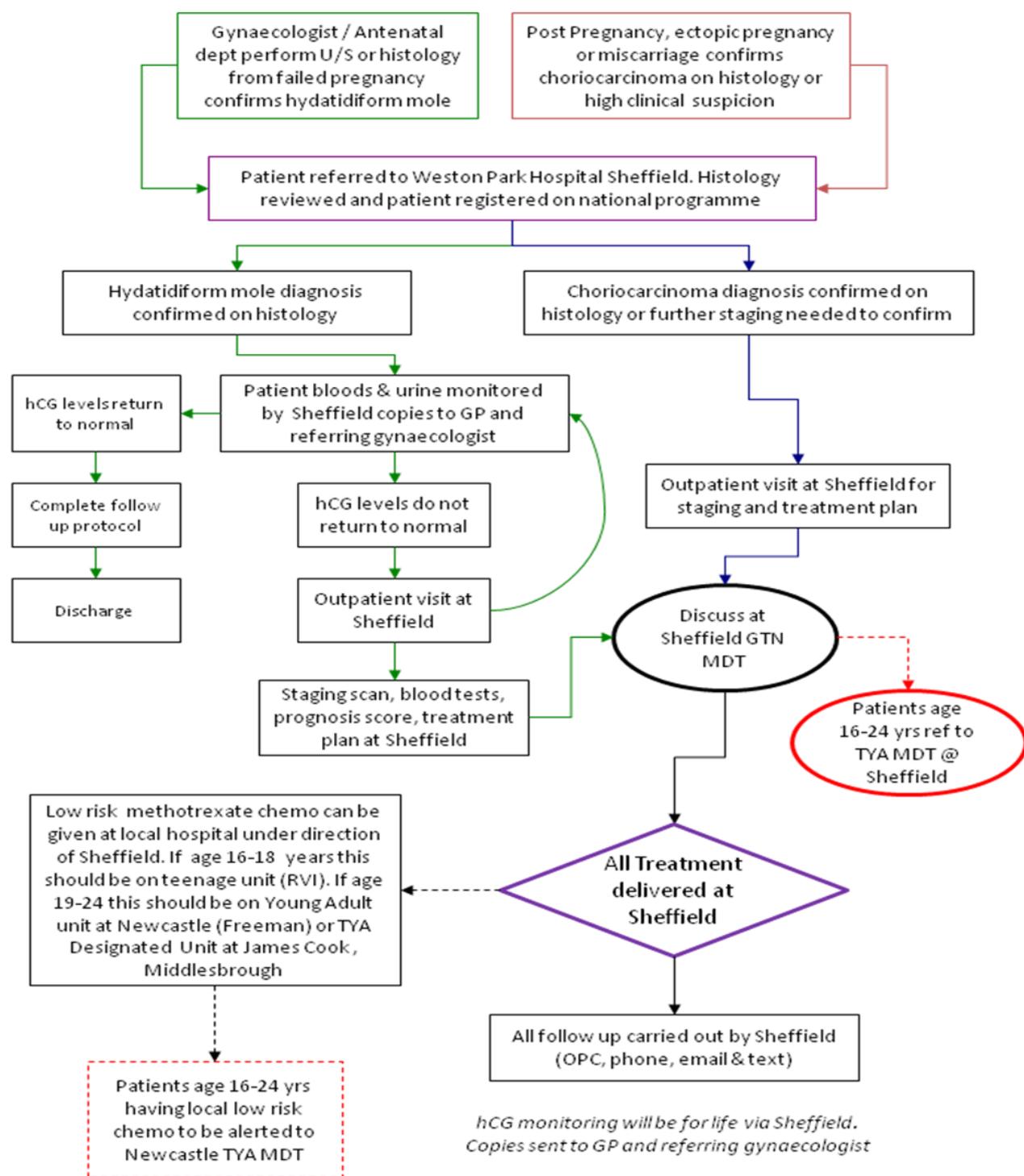
Appendix 3 – NHS Specialised Services Pathway

NHS Specialised Services - Referral Pathway for Primary Malignant Bone Cancer for patients age 16-24 years within the North of England



NHS Specialised Services

Referral Pathway for Hydatidiform Mole / Gestational Trophoblastic Neoplasm / Choriocarcinoma
Weston Park Hospital, Sheffield



Choriocarcinoma Pathway
Toni Hunt NECN Version 0.4 Aug 2012

Hospital Investigations

General Principles

- These guidelines are based on the NICE Lung Cancer guidelines. All those involved in the management of patients with lung cancer should be familiar with these guidelines (NICE, 2005a, NICE Clinical Guideline 121, 2011). The main points are summarised here with local recommendations.
- Local arrangements should be put in place to ensure that patients referred urgently are seen within the agreed national target (currently 2 weeks).
- Patients with suspected lung cancer who are identified by another hospital team or by chance, should be referred urgently to a member of the lung cancer team – usually a respiratory physician.
- Such referrals should be made within 1 working day of the decision to refer and the referral faxed to the receiving consultant. Such referrals should also be followed up with a telephone call to the respiratory physician to ensure that the referral has been received. Local arrangements may differ including the receipt of referral in a central 2 week rule booking office but the same principles should be followed.
- On receipt of referral from another hospital team then the respiratory physician should mark the referral as urgent (2 week rule) if an out patient appointment is requested and the patient should be seen as such and managed on the 62 day pathway. If an in patient referral is received then the patient should be seen as soon as possible and ideally within 2 working days.
- All lung cancer teams should be aware of the national targets for the diagnosis and management of lung cancer and work towards locally agreed pathways to promote patient care such that all patients are seen, diagnosed and treatment started with 62 days if the patient wishes.
- If a CXR has been performed and an incidental suspected cancer identified then a second copy of the radiologist's report should be sent to a designated member of the Multidisciplinary team (MDT) usually the respiratory physician.
- The MDT should have a mechanism to ensure that there is follow up of these reports to ensure a management plan has been instituted by the patient's GP.

Specific Considerations

- Only half of patients referred to a clinic with suspected lung cancer will turn out to have this pathology. Investigation therefore has diagnostic and staging goals. In order to prevent unnecessary delay these may be combined but care should be taken to ensure that the pathway is tailored to the individual patient to minimise unnecessary investigations. CT imparts a significant radiation dose and contrast has a small but significant morbidity and mortality.

- If the chest x-ray shows a mass a combined diagnostic/staging scan should be performed including the liver and adrenals (see below). If however there is no definite evidence of cancer, e.g. normal chest x-ray, a CT scan of the chest alone may be sufficient to exclude or confirm a lesion. Contrast is not usually necessary but may be used if there is uncertainty or the Radiologist is not confident reporting non-contrast scans. If the chest scan shows a lesion a full staging scan should be performed at the same attendance. If contrast has been given the liver and adrenal phase may be set up before the chest scan so the scan can be continued immediately.
- It is recognised that in some units a Radiologist is not always present when the scan is performed and the decision to do a diagnostic study or combined diagnostic and staging scan will need to be made at the time of protocolisation.
- When a patient with known or suspected lung cancer is seen in the clinic then they should be offered a contrast enhanced CT as an initial investigation to further the diagnosis and stage the possible disease. This should include the liver and adrenal glands.
- Local consideration should be made to specific arrangements in the investigation pathway such that the results of CT are available before deciding on the most appropriate next management step. For example, pre-arranged CT slots shortly after an initial clinic visit with rapid review of the patient. For example, CT before a clinic appointment provided this does not lead to unnecessary CT scans or delay in referral. Where there is a CT scan before a clinic appointment then there should be appropriate discussion with the patient.

Rapid Access Lung Clinics

- Rapid access clinics should be provided where possible for the investigation of patients with suspected lung cancer, because they are associated with faster diagnosis and less patient anxiety.
- Local arrangements should be in place with consideration given to concurrent investigation of suspected abnormalities such that tests are done in parallel rather in series. E.g. A patient with a potentially operable lung cancer might have CT biopsy and FDG-PET requested in parallel.
- With regard to the investigation of lung cancer it is important to identify cell type and stage wherever possible in order to identify the most appropriate management.

Sequence of 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.
- Chest CT should be performed before:
 - An intended fiberoptic bronchoscopy
 - Most other biopsy procedures

Peripheral Primary Tumour

- Offer CT or ultrasound guided transthoracic needle biopsy to patients with peripheral lung lesions when treatment can be planned on the basis of this test.
- Biopsy any enlarged mediastinal nodes (>10mm maximum short axis on CT) or other lesions in preference to the primary lesion if determination of stage affects treatment

Central Primary Tumour

- Offer fiberoptic bronchoscopy to patients with central lesions on CT where nodal staging does not influence treatment. Enlarged lymph nodes (>10mm maximum short axis on CT) may be simultaneously sampled with TBNA (non-ultrasound guided) if required for diagnosis.

Mediastinal Lymph Node Assessment

- Offer PET-CT as the preferred first test after CT showing a low probability of mediastinal malignancy (lymph nodes <10 mm maximum short axis on CT) for patients who are potentially suitable for treatment with curative intent.
- Offer PET-CT, or EBUS guided TBNA, or EUS guided FNA, or non ultrasound guided TBNA as the first tests for patients with an intermediate probability of mediastinal malignancy (lymph nodes between 10-20mm maximum short axis on CT) who are potentially suitable for treatment with curative intent.
- Offer neck ultrasound with sampling of visible lymph nodes or non-ultrasound guided TBNA to patients with a high probability of mediastinal malignancy (lymph nodes >20mm maximum short axis on CT). If neck ultrasound is negative, follow with non ultrasound guided TBNA, EBUS-TBNA or EUS guided FNA. If non ultrasound guided TBNA is negative follow with EBUS-TBNA or EUS guided FNA.
- Offer neck ultrasound with biopsy of visible lymph nodes to patients that have neck nodes detected by initial CT. If negative follow with non-ultrasound guided TBNA or EBUS-TBNA or EUS guided FNA.
- Evaluate PET-CT positive mediastinal nodes by mediastinal sampling (except where 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 FDG uptake).
- Consider EBUS and EUS for initial staging of the mediastinum as an alternative to surgical staging.
- Confirm negative results obtained by non—ultrasound guided TBNA using EBUS-TBNA, EUS guided FNA or surgical staging.
- Confirm negative results obtained by EBUS-TBNA and or EUS guided FNA using surgical staging if clinical suspicion of mediastinal malignancy is high.

Stage M1b

- Where metastatic disease is considered then CT, radiography, bone scan or MRI should be requested as necessary. Confirm the presence of isolated distant metastases / synchronous tumours by biopsy or further imaging (for example MRI or PET-CT) in patients being considered for treatment with curative intent.

- Consider MRI or CT of the head in patients selected for treatment with curative intent, especially in stage III disease.
- Offer patients with features suggestive of intracranial pathology CT of the head followed by MRI if normal, or MRI as an initial test.
- An X-ray should be performed in the first instance for patients with localised signs of symptoms of bone metastases. If the results are negative or inconclusive, either a bone scan or an MRI should be offered.
- Avoid bone scintigraphy when PET—CT has not shown any bone metastases.
- Sputum cytology is rarely indicated and should be reserved for the investigation of patients who have centrally placed nodules or masses and are unable to tolerate, or unwilling to undergo, bronchoscopy or other invasive tests.
- Ensure all patients potentially suitable for treatment with curative intent are offered PET-CT before treatment.
- The Cancer Alliance should have a system of rapid access to PET-CT for eligible patients.

Staging

With regard to staging the NICE guidelines recommend the following:

Non Small Cell Lung Cancer

- CT of the chest and abdomen is the investigation of choice to stage the primary tumour and to detect metastatic disease. Post contrast CT of the brain should be included in the initial staging if symptoms are present or if curative therapy, including surgery, radiotherapy, chemotherapy or a combination, is being considered. If any such patient has not had a head scan at the initial staging it should be performed separately before treatment. MRI is the investigation of choice if the CT is normal in the presence of neurological signs.
- Staging CT should include post-contrast scans through the chest (to include supraclavicular fossae) and upper abdomen (to include liver and adrenal glands). 100-150mls of intravenous iodinated contrast should be injected at 3-4ml/sec. The chest should be scanned during the arterial phase (20-30 sec delay), and the abdomen during the portal venous phase (60-70 sec delay).
- In the assessment of mediastinal and chest wall invasion:
 - CT alone may not be reliable
 - Other techniques such as ultrasound should be considered where there is doubt
 - Surgical assessment may be necessary if there are no contraindications to resection.
- Pancoast (superior sulcus) tumours are best visualised by multiplanar reconstructions, however the extent of these tumours is best demonstrated by MRI.
- All patients potentially suitable for treatment with curative intent should be offered PET-CT.
- Patients identified as N0 or N1 disease with M0 on CT and FDG-PET should proceed with surgery without further histological/cytological confirmation of lymph nodes.

- Where enlarged N2/N3 nodes are seen on CT but are negative on FDG-PET, it must be realised that FDG-PET has a false negative rate and biopsy should be undertaken, especially if the primary tumour has a low SUV.
- Clearly where there is any doubt then there should be MDT discussion and a fully informed discussion of the results and possible options with the patient.

Small Cell Lung Cancer

- The initial presentation of Small Cell Lung cancer (SCLC) is usually similar to that of all kinds of Lung Cancer except that progression is usually more rapid and Superior Vena Caval Obstruction is more common.
- Therefore the initial investigations will be the same as in the general imaging guidelines.
- The basics of additional Staging and follow up are also similar. Surgery is recommended By NICE IN t1-3,NO or N1 disease. All patient would require mediastinoscopy prior to surgery to verify that they did not have N2 disease.
- Specific variations in Imaging for Small Cell Lung Cancer are given below.

A. STAGING

- As with Non Small Cell Lung Cancer, CT of the chest and abdomen is the investigation of choice to stage the primary tumour and to detect metastatic disease.
- Post contrast CT of the brain should be included in the initial staging if symptoms are present or if localised therapy, including surgery or radiotherapy, usually in combination with chemotherapy, is being considered.
- If any such patient has not had a head scan at the initial staging it should be performed separately before treatment.
- MRI is the investigation of choice if the CT is normal in the presence of neurological signs.
- CT may not provide complete staging and other techniques e.g. ultrasound, with or without contrast, may be considered.
- An 18F-deoxyglucose positron emission tomography CT (FDG PET-CT) scan should be performed to stage disease in any patient who at diagnosis or after down staging is to be offered surgery or radiotherapy for other than local palliation.

B. Follow-up

- If response to treatment such as chemotherapy cannot be assessed adequately by CXR repeat CT scans may be required during the course of treatment.
- At the end of a treatment programme repeat staging may be necessary to plan further management.
- If the patient develops new or recurrent symptoms targeted imaging should be performed. Formal restaging may also be required.
- If PET-CT is used to assess residual disease then a gap of at least 6 weeks should be left after chemotherapy.

Multidisciplinary teams

- All patients with a working diagnosis of lung cancer should be discussed at the cancer unit MDT. The multidisciplinary team is now an established part of the management of patients with cancer.
- The MDT should be set up in accordance with the Manual of Cancer Standards (DH, 2004). Each cancer unit has been assessed as part of the Cancer Services Peer Review assessment exercise in recent years and the standards described should be regularly reviewed and understood by each cancer unit.
- In particular within each unit there should be a local lung cancer lead. This lead and the MDT as a whole should:
 - Ensure that designated core members at the meeting work effectively, in teams and that decisions regarding all aspects of diagnosis, treatment and care of patients, and decisions regarding operational policies, are true multi-disciplinary decisions.
 - Ensure that care is given accordingly to recognised guidelines with appropriate information being collected to inform clinical decision-making and to support clinical governance / audit.
 - Ensure that mechanisms are in place to support the entry of eligible patients into clinical trials, subject to the patient giving fully informed consent. The MDT should record the reasons for patients not being entered in to trials that are open.
- Each unit should have a team of members of the different disciplines involved in the investigation and management of lung cancer. This group should meet regularly most likely weekly but at least every two weeks, and attendance records kept. The core members should be:
 - Respiratory physician with an interest in lung cancer
 - Clinical and/or Medical Oncologist
 - Radiologist
 - Histopathologist/Cytologist
 - Thoracic surgeon
 - Lung cancer nurse specialist
 - Palliative care representative
 - MDT Coordinator /Tracker.
- Each newly diagnosed patient should be discussed by the group and plans made for further investigation and treatment.
- Decisions should be recorded for each patient. It is recommended that each unit determine its preferred mechanism for recording the treatment plan for each patient at the MDT but an example of good practice might include a summary sheet of all the key data items and the management

plan with brief explanation of key reasoning which could be filed in the patient's case notes.

- The group should have an operational policy, mutually agreed and reviewed at an annual meeting.
- It is recommended that each cancer unit establish a robust system for prospective data collection in order to allow for clinical audit. It is recommended that each unit should collect data in accordance with the National Lung Cancer Audit.
- It is recommended that each cancer unit is familiar with the NLCA reports and generates appropriate action plans in line with the key recommendations identified from the reports.
- In particular with regard to NLCA, each unit must strive to:
 - Submit data for 100% of cases
 - Collect data for the key casemix variables stage, performance status and co-morbidity
 - Note that histological and cytological confirmation rate is considered in the NLCA report as a marker for quality of care
 - Be aware of their own anti-cancer treatment rates in comparison with the national average.

Communicating the diagnosis

General Considerations

- The guidelines described here draw on guidance published by the British Thoracic Society (BTS, 2008) and the NICE Clinical Guideline 121, 2011.
- Find out what the patient knows about their condition without assuming a level of knowledge. Provide patients with the opportunity to discuss tests and treatment options in private environment, with the support of carers and time to make an informed choice.
- Ensure that a lung cancer clinical nurse specialist is available at all stages of care to support patients and carers.
- Offer accurate and easy to understand information to patients and their carers. Explain the tests and treatment options, including potential survival benefits, side effects and effect on symptoms.
- Consider tailor-made decision aids to help patients to:
 - Understand the probable outcomes of treatment options
 - Consider the personal value they place on benefits versus harms of treatment options
 - Feel supported in decision making
 - Move through the steps towards making

- Take part in decisions about their healthcare
- Offer patients a record of all discussions that have taken place with them and a copy of any correspondence with other healthcare professionals. Ensure all communications are worded in such a way to assist understanding.
- Respect the patient's choice if they do not wish to confront future issues.
- Avoid giving patients unexpected bad news by letter. Only give unexpected bad news by phone in exceptional circumstances.
- Offer to discuss end-of life care with the patient sensitively and when appropriate. Wherever possible avoid leaving this discussion until the terminal stages of the illness.
- Document decisions about the patient and end of life care. In particular document:
 - Specific concerns of the patient
 - Their understanding of their illness and its prognosis
 - Important values or personal goals for care.
 - Their preferences for the types of care or treatment that may be beneficial in the future and their availability.
- Share information between healthcare professionals about:
 - Any problems the patient has
 - The management plan
 - What the patient has been told
 - What the patient has understood (where possible)
 - The involvement of other agencies
 - Any advance decision made by the patient.
- Each unit should have a policy on the breaking of bad news. This should be discussed and agreed with patient representatives, and steps made to disseminate and use it throughout the unit. The points raised should include the following:
- Information should be given where possible in privacy, in comfortable surroundings and with no interruptions from phone or personnel. Where this is impossible because the patient is bed-bound and cannot be moved, every effort should be made to respect the patient's privacy by ensuring the other patients' relatives are not in the room, drawing the curtains round the bed, etc.
- The information should, where possible, be given by a consultant or senior member of the junior staff experienced or trained in the giving of bad news. In the event of the latter, the patient should have an opportunity to speak to the consultant as soon as possible afterwards.
- The person breaking the news should have as much information as possible about the patient's condition, although circumstances may dictate that the news is broken before all such information is available.
- The patient should be given the opportunity to have a relative or friend present.

- A member of nursing staff, preferably either a Lung Cancer Nurse Specialist or a member of the team caring for the patient, should be present and remain after the doctor has left.
- The information should be given sensitively (slowly and gently) using patient feedback and body language to assess the pace of information needed at this time. Simple terminology should be used, avoiding medical terminology.
- The patient should be given adequate time to ask questions both of the doctor and of the nurse.
- Treatment options should be discussed, including those not possible and why.
- The patient should be given adequate information to take part in the decision making process. Some patients may not wish or be able to take in all such information at the first session, and may require further discussion at a later date. Written information should be available to support the discussion and information regarding support groups should also be given at this time.
- The patient should receive a written plan outlining the proposed treatment and/or further investigations needed to decide on a plan of action. Wherever possible, the plan should include a date for the next step and an outline of the timescale for treatment.
- It should be made clear to the patient / relatives how to make contact with the team if questions arise after the consultation.
- The patient and family should have the opportunity to remain in privacy for a while after the interview if they need to do so. It is important to be sure that the patient or carer is in a fit state to drive home if applicable.
- The interview should be documented in the notes.
- It is imperative that those involved in a consultation around the diagnosis of lung cancer appreciate that this will often involve the delivery of bad news. It is vital that those who regularly break bad news to any cancer patient have appropriate training in communication skills. Fundamental frameworks exist in relation to the breaking of bad news and those involved should be familiar with such a framework. A recommended framework is described below:

Framework of Discussion with Patients

A Framework for Breaking Bad News – A Six Step Guide

Step 1: Getting Started

- Ensure you provide a suitable environment – privacy.
- Who does the patient want with them – this may not be the same as the people that are with them!
- Do you think it would be helpful to have a nurse sitting in to support the patient after the consultation?
- Allow time to do this.

Step 2: Finding out how much the patient knows

- Use open-ended questions (e.g. “It would help me to know what you understand about your illness so far”).

- Depending on their answers, check out the reasons why they have - thought things (e.g. “Why have you thought that?”).

Step 3: Finding out how much the patient wants to know

- The objective is to get a clear invitation to share knowledge (e.g. “would you like me to explain that in more detail?” “Would it help if you saw the X-rays?”)
- If the patient expresses a preference not to discuss the information, leave the “door open” for later.

Step 4: Sharing the information

- Plan a basic agenda – diagnosis, treatment plan, prognosis, support. NOTE – it may not be appropriate to cover all of these.
- Start from the patient’s level – what they already know – and build on this.
- Give the information in small chunks.
- Might be helpful to use the narrative of events “You coughed up some blood, and then you had a CXR”.
- Give the patient a WARNING SHOT – “I’m afraid this is a serious condition.
- Allow time to evaluate the verbal and non-verbal response then give more details as required.
- If the patient asks direct questions you should answer directly, provided you are clear what they are asking. The terms tumour, cancer, benign and malignant are often confused and may need explaining.
- It is useful to help patients recall information afterwards to use drawings, diagrams.
- Listen to the patient’s agenda.
- Allow frequent pauses; check that they understand what you are saying at regular intervals.

Step 5: Responding to the patients’ feelings

- Pause to allow the news to sink in.
- Acknowledge any distress (empathy).
- Explore the reasons for the distress by using probing questions – but move on if this is too difficult for the patient.
- Elicit feelings.
- Explore any other concerns and prioritise these.

Step 6: Planning and follow-through

- Demonstrate understanding of the patient’s problem list.
- Make a plan / strategy and explain it (“prepare for the worst and hope for the best”).
- Identify the patient’s coping strategies and reinforce.
- Establish if they have other sources of support.
- Summarise and allow time for questions.
- Encourage them to write down questions for the next consultation.

When to provide information

- It must be recognised that the patient pathway does not necessarily fall into discrete steps (e.g. referral – diagnosis – treatment). Many patients will therefore require a wide range of information.

- Provide information at different times. Some may never want to know anything whereas others may require detailed data even before a diagnosis has been confirmed. It is therefore essential to establish what a patient already knows and what they wish to know.

Discussion about treatment options

- Although any member of the MDT may deliver the first indication of treatment options, it is often the respiratory physician who does this first.
- It is recommended that discussion is kept to a minimum if the patient is to see another specialist who will actually be delivering the treatment e.g. surgeon, oncologist in order to minimise any confusion.
- Some patients may require some information and in these circumstances the message should be kept clear, and ensure that the patient understands that the treating specialist may alter the exact plan nearer the time. Basic information that might be communicated to a patient can be found in the British Thoracic Society Guidelines on giving information to lung cancer patients (BTS, 2008).
- Any information given to the patient must be accurate. It is recommended that each unit agree on local basic statistics which should be given to patients regarding treatment options. The patient may need to see more than one specialist in order to make their decision.
- Information may be given in one visit but it should be noted that very often several visits may be needed or other delivery methods.
- Arrangements should be made in each unit locally to determine the best methods for ensuring accurate information is given and that the patient receives all the information required.
- Provision of information should be offered in a form that is tailored to the needs of the individual patient. The treatment, care and information provided should be culturally appropriate and in a form that is accessible to people who have additional needs such as people with physical, cognitive or sensory disabilities and people who do not read or speak English.
- Unless specifically excluded by the patient, carers and relatives should have the opportunity to be involved in the decisions about the patient's care and treatment, although care should be taken to ensure that the patient is not sidelined in some circumstances.
- Carers and relatives should also be provided with the information and support that they need.
- Being Positive. It is important to endeavour to maintain hope by the provision of the diagnosis and a solid management strategy so that the patient feels supported. It is important not to say "there is nothing more that we can do." It is recommended instead to say that further surgery, radiotherapy or chemotherapy is not an option but supportive and palliative care is always available. "We can help you although we cannot cure the condition."

Prognosis

- Patients often ask “how long” without thinking clearly whether they are really ready for this level of information. Often little information is retained.
- Information about prognosis is often a source of distress especially when mixed messages are given. It is recommended therefore that an assessment is made of exactly what the patient wants to know and why. If a figure is requested then emphasis that any figures are the average (median) and some patients do worse and some do better. Clearly document any information given.

Documentation

- Since 2004 the Department of Health has recommended that all letters about patients should be copied to the patient unless there is an important reason not to. This can facilitate patient information and indicate to the patient what has been said to primary care, and indicate to primary care what has been said to the patient. Where letters are copied then the language used in such letters should be appropriate. It is recommended that locally agreed arrangements are put in place regarding this recommendation.

Survival Figures

The following figures in the table are given as general guideline figures which each unit may wish to consider.

Small cell lung cancer

	Limited Stage Disease	Extensive Stage Disease
No Treatment	12 weeks	6 weeks
chemotherapy	12 months	8 months
5 year survival	5-10%	0%

Non small cell lung cancer

Surgery Stage 1A (T1 N0 M0) Stage 1B (T2 N0 M0) Stage 2 (T1-2 N0 M0)	70% 5 year survival 40% 5 year survival 25% 5 year survival
Surgery - with adjuvant chemotherapy (ie post surgery)	Absolute benefit of additional 4% at 5 years and disease free survival 5% at 5 years
CHART Performance Status 0-1 FEV1 of 1.5 litres (There are exceptions where the predicted values are low or damage to useful lung is thought to be low)	75% 1 years survival 55% 2 years survival 18% 5 year survival Survival is better for N0/1
High Dose Palliative Radiotherapy	Improves median survival by 2 months By 6% at 1 year By 3% at 2 years
Chemotherapy Stage 4 Performance status 0 Performance status 1 Performance status 2	Median survival 10 months Median survival 7 months Median survival 4 months
Overall without chemotherapy	5% at 1 year survival
Overall with chemotherapy	25% 1 year survival (NB in those who are fit enough) On average chemotherapy extends life expectancy by 2 months
SABR	Local control – 95%. JCUH audit data of 167 patients confirms 3 year overall survival rate of 54% (all-causes mortality data included). This is consistent with international published studies. Presented data at ESTRO.

Informing the Primary Care Team

- Following communication of the diagnosis of lung cancer to a patient then the primary care physician should also be informed of the diagnosis.
- The general practitioner should be informed of the diagnosis by the end of the following working day, preferably by fax.
- The general practitioner should be made aware of the information which has been given to the patient and, if possible, an outline of the planned treatment.
- If the diagnosis is made as an inpatient, the Primary Care Team should be informed on discharge from hospital if communication has not already taken place.
- Hospital nursing staff / Lung Cancer Nurse Specialist should liaise with the relevant community teams if required and agreed with the patient i.e. District Nurses, Occupational Therapists, Physiotherapists, Dieticians, Care Homes, Benefits Advisor, Social Services, Hospice, Palliative Care Team.
- Major alterations to the management plan should be communicated to the general practitioner.
- Similarly, if alterations are made by the general practitioner these should be communicated to the hospital. A patient held record, where available, would be a suitable means of such communication.

Specialist Nursing

- The NICE Clinical Guideline states “Ensure that a lung cancer clinical nurse specialist is available at all stages of care to support patients and carers”.
- The Northern Cancer Alliance supports the recommendation within the Cancer Reform Strategy that Commissioners should work with providers to ensure that patients experience good continuity of care and that particular consideration should be given in this respect to the role of the Clinical Nurse Specialist.
- The Northern Cancer Alliance recognises that lung cancer specialist nurses and thoracic surgical specialist nurses are a fundamental part of the lung cancer team and it is recommended that each Trust involved in the management of patients with lung cancer supports and properly funds the required number of nurses.
- The value of site specific nurses has been highlighted over a decade ago and the role of site specific nurses has been endorsed within national guidelines.
- The NICE Clinical Guideline 121: The diagnosis and treatment of lung cancer (update) shows that the most common case load for a lung cancer nurse specialist is between 100-150 cases per year (1). It is thought that once a CNS has a bigger case load than this they are unlikely to be able to give patients the time they need to have a positive experience and to achieve the best possible outcomes.
- Lung cancer nurses help to facilitate the effective provision of high quality patient centred care.

- It is recommended that the lung cancer nurse specialist should be made aware of all patients diagnosed with lung cancer.
- In particular, it is recommended that each unit should have one or more trained lung cancer nurse specialists to see patients before and after diagnosis, to provide continuing support, and to facilitate communication between the secondary care team, the GP, the community care team and the patient.
- It is recommended that within the Alliance the lung cancer nurses meet regularly and form a mutually supportive group to develop the role.
- It is recommended that the lung cancer nurses provide:
 - Emotional and social support to patients and carers
 - Help with the provision of information
 - Facilitate communication with patients and carers
 - Facilitate communication within the health care teams
 - Co-ordinate services and investigations.
- It is recommended that local considerations are made with regard to the specific job plan arrangements of the lung cancer nurses. Different working arrangements are currently in place within different units, and within surgical centres, thoracic surgical nurse specialists should be employed.
- It is recommended that the nurses working together strive to determine the most appropriate model and work within each unit to deliver the highest standard of care. Models currently in place include hospital based nurses and nurses who work across both hospital and community.
- It is recommended that the lung cancer nurses work closely with the cancer pathway co-ordinator and cancer data managers in order to track patients.

Ref:

1. NICE, CG121: The diagnosis and management of lung cancer (update), April 2011
2. NHS Information Centre, National Lung Cancer Audit 2010, May 2011

Clinical Trials

The Cancer Reform Strategy states that “in order to ensure that we build for the future of cancer services there is a need for increased support for research.” This statement underpins the need for promoting research to fill the gaps in the evidence and spreading good practice.

The NCA Research Networks will work with the Service Network to promote integration of research into routine practice.

Both NCA Research Networks will be meeting the performance based working proposals for the National Cancer Research Network (NCRN). This includes maintaining overall accrual and improving accrual into randomised controlled studies, (RCT's) with the aim being to provide as wide reaching a portfolio as possible across the NCA. There is a need to ensure that the Networks portfolios are inclusive of trials for all disease groups and that there is an expansion of pre-malignancy and non-cancer screening trials. Both Networks believe it is important that patients within the NCA have equity of access to trials open.

- New initiatives to strengthen research into prevention of cancer are underway. The Research Networks will work with key stake holders and the Primary Care Research Networks to ensure that patients in the North East and Cumbria have access to these trials.
- The CRS states that there is funding for screening trials and the Research Networks will support the setting up and coordination of screening trials.
- The NCRN has an important role in identifying potential new therapies and making sure that clinical trials are undertaken in a timely manner. NCRN engages with Industry and NICE with the aim of maximising the impact of NCRN trials on subsequent NHS Practice. There will be further investment over the next 10 years into researching cures and treatments of the future. The Research Networks will ensure they maintain a wide reaching balanced portfolio and promote industry trials.
- Access to high quality information is a prerequisite for patients to be able to participate in decision making about their care and this includes research trials. All staff need to be aware of research portfolios so they can ensure they provide patients with relevant information.
- Reducing inequalities in equity of access to cancer trials.
- Promoting research proposals on cancer in equalities – encouraging more trials which include older people and ensuring that children and young adults are treated at centres where a complete portfolio of relevant trials is supported.

- NCRI will help fund research on data collected by the National Cancer Intelligence network (NCIN), facilitating a more informed analysis of cancer services.
- To ensure research is incorporated in World Class Commissioning for cancer.
- To work more closely with our Patient and Carer Group, particularly in relation to equity of access for patients to clinical trials. We hope they will be able to help us provide a patients perspective and help support us raise awareness.

The Cancer Reform Strategy supports the need for promoting integration of research into routine practice and the NCA Research Networks are keen to advance this concept.

To review the current National Cancer research Network portfolio of Lung trials access the following website: <http://public.ukcrn.org.uk/search/>

Audit

Hospitals in the Northern Cancer Alliance area have agreed to participate in the National Lung Cancer Audit (NLCA) <http://www.hscic.gov.uk/lung>.

NLCA data collection

The National Clinical Lung Cancer Audit has been established for several years with annual reports. It is expected that all units submit data to NLCA

- It is recommended that each cancer unit establish a robust system for prospective NLCA data collection in order to allow for clinical audit.
- It is recommended that each cancer unit is familiar with the NLCA reports and generates appropriate action plans in line with the key recommendations identified from the reports. Reports can be found on the Cancer Outcomes and Services Dataset Portal
- In particular each unit must strive to:
 - Submit data for 100% of cases.
 - Collect data for the key case-mix variables stage, performance status and co-morbidity.
 - Note that histological and cytological confirmation rate is considered in the NLCA report as a marker for quality of care, along with aspects of specialist nurse involvement.
 - Be aware of their own anti-cancer treatment rates in comparison with the national average.
- Data is submitted monthly in line with the Cancer Outcomes and Services Dataset (COSD) to the Cancer Registry Service – 25 working days after

the end of the reported month. There will be an opportunity to improve on and validate data submissions prior to the cut off point for national reporting.

National Cancer Waiting Times Targets & Data Collection

- Patients referred by general practitioners with suspected lung cancer should be seen within two weeks of referral in a respiratory physician's clinic.
- Inpatient referrals to a respiratory physician from other hospital consultants should be seen within two working days of receipt, and outpatient referrals within two weeks.
- National Cancer Waiting Times Targets require that no more than 31 days should elapse between the decision to treat and the start of treatment (of any modality).
- National Cancer Waiting Times Targets require that no more than 62 days should elapse between the date the GP referral is received in the Trust and the commencement of treatment (of any modality).
- National Cancer Waiting Times Targets require that all subsequent treatments be carried out within 31 days of decision to treat. This will include treatments for all cancers including metastasis and recurrence (any modality).
- National Cancer Waiting Times Targets require that any patient that is deemed suitable to be upgraded to 'two week rule' status should wait no more than 62 days from Date of Upgrade to first treatment (any modality).
- Patients presenting in ways other than by direct GP referral to the MDT should have similarly rapid diagnosis and treatment, and should not be disadvantaged by "target patients."

The Cancer Registry Dataset, information on National Cancer Targets and Alliance/National audits is available from Cancer Information Managers or Cancer Services Managers.

Treatment General Principles

- The management of lung cancer is complex and the treatment options available, offered and / or accepted by individual patients are often very different. It is therefore essential that all patients are carefully assessed and an individual treatment plan discussed with each patient.
- Information must be given sensitively and the information given suitable for each patient with the back up of written information appropriate to that individual. The guidelines described above should be followed in order to promote high quality clinical care.
- It is recommended that the patient is advised that their management is discussed at a multidisciplinary meeting and that it is not just one doctor who decides on the best course of action.
- It is recommended that the patient is advised that the multidisciplinary team is there in order to provide the patient with information and to assist in decision making, clearly describing options with associated risks and benefits.
- It is recommended that the patient understands that whatever decision is made by the patient, the multidisciplinary team will support that individual and that there is no pressure to accept any one type of treatment. Should the patient decide on no active treatment then they should be made aware that the team will continue to look after them.
- It is recommended that the patient should be able to see different members of the specialist team in order to make a decision regarding treatment. For example, the patient may see the respiratory physician, then an oncologist and a surgeon in order to make their final preferred treatment option.

Smoking Cessation

- Inform patients that smoking increases the risk of pulmonary complications after lung cancer surgery.
- Advise patients to stop smoking as soon as the diagnosis of lung cancer is suspected and tell them why this is important.
- Offer nicotine replacement therapy and other therapies to help patients stop smoking in line with smoking cessation services.
- Do not postpone surgery for lung cancer to allow patients to stop smoking.
- The management of lung cancer is described in more detail in terms of surgery, chemotherapy and radiotherapy for each of the following categories:
 - Non-Small Cell Lung Cancer
 - Small Cell lung cancer
 - Mesothelioma
 - Thymoma

Surgery

- When evaluating surgery as an option for patients with NSCLC, consider using a global risk score such as Thoracoscore to estimate risk of death. Ensure the patient is aware of the risk before giving consent for surgery.
- Suitable patients should be referred promptly for surgery, and cases in which there is doubt about operability should be discussed as soon as possible with a lung cancer surgeon. Performance status should be recorded in all patients.
- Patients may be clearly unsuitable for Lung cancer surgery by virtue of poor performance status, obvious metastases, recurrent laryngeal nerve palsy, malignant effusion, paralysed hemi-diaphragm, other significant life threatening illness or unwillingness to undergo surgery.
- Investigations performed at the initial assessment may also indicate unsuitability for surgery. Prior to surgical referral all patients should have:
 - full blood count
 - urea and electrolytes
 - liver and bone chemistry
 - spirometry
 - ECG

Cardiovascular function

- Avoid surgery within 30 days of myocardial infarction
- If the ECG is abnormal, or there is a clear history of angina, then an exercise test should be arranged.
- Seek a cardiological review in patients with an active cardiac condition, or three or more risk factors, or poor cardiac functional capacity.
- 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 betablockers.
- If a patient has a coronary stent discuss perioperative anti-platelet treatment with a cardiologist.
- Consider revascularisation (percutaneous or CABG) before surgery with chronic stable angina and conventional indications for revascularisation.

Lung Function

- Perform spirometry in all patients being considered for treatment with curative intent. Measure TLCO if breathlessness is disproportionate or there is other lung pathology (for example fibrosis).
- Offer patients surgery if they have FEV1 within normal limits and good exercise tolerance.
- Offer patients with predicted postoperative FEV1 and/or TLCO below the recommended limit of 30% the option of undergoing surgery if they accept the risks of dyspnoea and associated complications.

- When considering surgery perform a segment count to predict postoperative lung function.
- Consider using shuttle walk testing (using a distance walked of more than 400m as a cut off for good function) to assess fitness for patients with moderate to high risk of postoperative dyspnoea.
- Consider cardiopulmonary exercise testing to measure VO₂ max and assess lung function in patients with moderate to high risk of postoperative dyspnoea, using more than 15ml/Kg/minute as a cut off for good function.

General Considerations

- If FBC and Urea & electrolytes are abnormal, there may be other explanations for this and the case should be discussed in the MDT. Other investigations may be necessary in some cases including:
 - bone scan (if bone pain, or abnormal bone biochemistry).
 - mediastinoscopy may be necessary except those with peripheral stage I/II tumours with no demonstrable hilar or mediastinal lymphadenopathy on PET scan. Mediastinoscopy is strongly advised for central tumours even when the PET scan is negative in this area.
 - Endobronchial ultrasound can be used where available, but should be followed by a mediastinoscopy in the setting of a negative result.
 - Anterior mediastinotomy is the preferred invasive staging procedure in patients with left upper lobe tumours and enlargement of aortopulmonary window nodes.
 - pleural aspiration and biopsy (if effusion is present).
 - transfer factor and differential perfusion scan (if lung function is borderline): in general a post-operative predicted FEV₁ of 40% is required for surgery.
- All patients who are candidates for thoracotomy should have a staging CT scan and a separate PET scan and all patients undergoing radical surgery should have a CT head scan before surgery. The images should be available at the time of consultation with the thoracic surgeon. Performance status should be recorded in all patients. Patients with PET positive mediastinal nodes should have mediastinal staging with as needed a mediastinoscopy unless there is a chain of nodes and the primary tumour is known to be a NSCLC.
- Patients should be considered suitable for surgery if they are fit enough for operation and have a non-small cell tumour of stage I or II. Essentially this encompasses technically resectable primary tumours without spread beyond hilar lymph nodes and without distant metastases. Patients with evidence of metastases in the same lobe should be offered surgery.
- Patients with confirmed stage IIIA (N2) disease should not be offered surgery outwith a trial but surgery following chemotherapy can be considered in these patients. They should be discussed in an MDT. In general a pneumonectomy should be avoided in this class of patients and radiotherapy should be offered.
- Offer patients with NSCLC who are medically fit and suitable for treatment with curative intent lobectomy (either open or thoracoscopic, inc robotic surgery in the centres with appropriate experience) as the treatment of first

choice. For patients with borderline fitness and smaller tumours (T1a-b, N0, M0) consider lung parenchymal sparing operations (segmentectomy or wedge resection, if anatomical resection is not possible) if a complete resection can be achieved.

- For all patients with stage I or II NSCLC undergoing surgical resection – usually a lobectomy or a pneumonectomy – clear surgical margins should be the aim. Offer more extensive surgery (bronchoplastic surgery, bilobectomy, pneumonectomy) only when needed to obtain clear margins.
- Sleeve lobectomy offers an acceptable alternative to pneumonectomy for patients with stage I or II NSCLC who have an anatomically appropriate (central) tumour. This has the advantage of conserving functioning lung.
- For patients with T3 NSCLC with chest wall involvement who are undergoing surgery, complete resection of the tumour should be the aim by en bloc chest wall resection.
- All patients undergoing surgical resection for lung cancer should have systematic lymph node sampling to provide accurate pathological staging, with at least 3 different N2 lymph node stations sampled. (ESTS recommendation).
- Ensure that mechanisms are in place to support the entry of eligible patients into clinical trials, subject to the patient giving fully informed consent. The MDT should record the reasons for patients not being entered in to trials that are open.
- Offer patients with stage I-III NSCLC who are not suitable for surgery an assessment by a clinical oncologist specialising in thoracic oncology for radiotherapy with curative intent.
- Consider surgery in patients with early stage Small cell lung cancer (T1-3, N0/1, M0)

Non-Surgical Management of Lung Cancer

Radiotherapy

Non-Small Cell Lung Cancer (NSCLC)

Radical Radiotherapy

- A clinical oncologist specialising in thoracic oncology should determine suitability for radiotherapy with curative intent taking into account performance status and co-morbidities.
- When surgery has been excluded as an option, curative non-surgical oncological modalities should be considered for patients with stages IA to IIIA non-small cell lung cancer (NSCLC) and for selected patients with stage IIIB NSCLC.
- Combining chemotherapy with radical radiotherapy has been shown to have survival advantages for patients with stage III disease. In addition, chemotherapy prior to radiotherapy may be considered in patients with bulky stage IB and II disease.
- Radical radiotherapy will be 3-D conformally planned and guided by dose-volume histograms for both tumour volume and normal tissue tolerances. The percentage of normal lung receiving more than 20 Gy should not exceed 30% (V20 < 30%).
- CHART may be offered to patients considered for radical RT either as single modality treatment or after induction chemotherapy in a trial setting.
- Pre-treatment FEV-1 should be > 1.0 litre; kCO should be > 50% of predicted.
- All patients undergoing radical oncology treatment with curative intent should have a CT head scan before treatment commences.
- Wherever possible, patients should be considered for entry into clinical trials.
- Patients receiving radiotherapy with curative intent should be part of a national quality assurance programme.

Continuous Hyperfractionated Accelerated Radiotherapy (CHART)

This has been proven to provide an enduring survival advantage for patients with NSCLC when compared to the conventional dose of 60Gy in 30 fractions². CHART involves the administration of 54Gy in 36 doses of 1.5Gy each, delivered 3 times daily over a total of 12 days.

CHART has not been compared to 55Gy in 20 fractions in any clinical trials. In terms of BED in 2 Gy fractions, 55Gy in 20 fractions is equivalent to 66 Gy in 33 fractions. For this reason, 55Gy in 20 fractions is a very reasonable alternative to CHART and is widely used in the UK.

Conventional Radical Radiotherapy

This involves the administration of 55Gy in 20 fractions over 28 days. Where a cancer is peripherally situated, 55Gy in 15 fractions delivered over 21 days or 60Gy in 20 fractions delivered over 28 days may be chosen.

Stereotactic Ablative (Body) Radiotherapy (SABR/SBRT)

In the USA and Europe, this is fast becoming the standard of care for management of medically inoperable stage I and IIA disease situated in the lung periphery. The NCA now has the technology to deliver SBRT and it has been nationally commissioned by NHS England

Schedules are risk adapted and include 54Gy in 3 fractions, 55Gy in 5 fractions, 60Gy in 8 fractions and 50Gy in 10 fractions. Treatment is delivered according to departmental guidelines based on a nationally agreed protocol (UK SABR Consortium).

Indications for SABR in oligometastatic NSCLC as per NHS England Commissioning Through Evaluation (CTE) guidelines

<http://www.swscn.org.uk/wp/wp-content/uploads/2014/11/SABR-CtE-Service-Specification-2nd-Sept-2015-final.pdf>

1. Up to 3 metastases (3 max in lung, 2 max in other organs)
2. Less than 5cm in size
3. At least 6 month disease free interval from primary diagnosis
4. Agreed that treatment is feasible at SABR MDT

Post-Operative Radiotherapy

The routine use of adjuvant postoperative radiotherapy may confer a survival disadvantage⁴. However, in some situations, post-operative radiotherapy may reduce the risk of locoregional recurrence (e.g. following resection of N2 disease or, in those patients with macroscopic or microscopic residual disease). CHART or conventional RT doses as above should be considered.

Palliative Radiotherapy

- Palliative thoracic radiotherapy should be reserved for patients with metastatic disease or locally advanced disease not amenable to radical treatment. In general, short courses offer as good palliation as fractionated ones and are recommended for poor prognosis patients with chest symptoms. Selected patients with good performance status and no obvious evidence of metastases should be considered for higher dose regimens^{1,3}.

Technique (see Departmental Protocols for details)

- Treat as a parallel opposed pair. Dose regimens:

- 10Gy mid-plane dose (MPD) in a single fraction for patients with metastatic disease or WHO PS 2-4 and maximum field size <200 cm²
 - 20 Gy MPD in 4/5 fractions over 1 week where volume >200 cm², or where mediastinal obstruction exists (stridor or extrinsic oesophageal compression) OR 17 Gy in 2 fractions, one week apart.
 - 36 Gy MPD in 12 fractions over 2½ weeks without spinal cord shielding for patients with PS 0-1, in whom all macroscopic disease can be encompassed within radiotherapy portals. 39 Gy in 13 fractions over 2½ weeks is an alternative, but spinal shielding is required.
- Length of cord should not normally exceed 14 cm.
 - Regimens may be repeated (off cord) especially if there has been a good response to initial treatment and there is a reasonable period between treatments.
 - Patients with major airways obstruction may require urgent radiotherapy.
 - Palliative single fractions or short courses of radiotherapy may be prescribed to sites of distant metastatic disease (e.g. for bone pain, intracranial disease, spinal cord compression).
 - Patients with oligo-metastatic disease may be eligible for SABR as per CtE (Commissioning through Evaluation) guidance.

Small Cell Lung Cancer (SCLC)

There is increasing data supporting the earlier use of RT in SCLC. Recent North American studies have suggested that patients with good performance status and limited disease may gain improved disease free survival and overall survival if concurrent chemo-radiotherapy is employed as the induction therapy⁵. Patients with limited stage disease, normal biochemical and haematological parameters, of good performance status (WHO PS 0-1) and with sufficient respiratory reserve should be offered concurrent chemo-radiotherapy.

Otherwise patients with limited stage disease who attain a complete response with induction chemotherapy should then be offered consolidation thoracic irradiation and prophylactic cranial irradiation.

Patients with extensive stage disease who achieve a partial or complete response to chemotherapy are also eligible to receive palliative chest radiotherapy

Thoracic irradiation (TI) in SCLC

- Concurrent chemo radiation is administered following the RTOG study protocol. This uses Cisplatin and Etoposide plus 3-D conformally planned radiotherapy to a dose of 45 Gy in 25 fractions over 30 days. Where the V20 is less than 25%, 50Gy in 20 fractions may be used.

- Sequential consolidative thoracic irradiation is recommended for those patients with WHO performance status 0-2, with limited stage disease and who have achieved a complete response following induction chemotherapy. This is again 3-D conformally planned to a dose of 50-55Gy in 20-25 fractions over 30 days.
- Patients who have achieved less than a complete response following chemotherapy may be offered thoracic irradiation as an additional modality of treatment for symptomatic intra-thoracic disease (doses as for palliative treatment of NSCLC).
- Palliative thoracic irradiation may also be offered to patients who, for any reason have not received chemotherapy. These patients are frequently of poor performance status and require palliation of intra-thoracic disease.

Prophylactic Cranial Irradiation (PCI) in SCLC

- It is recommended that patients with small cell lung cancer in good prognosis categories who have achieved a complete response to chemotherapy receive whole brain irradiation at a dose of 25-30 Gy in 10-15 fractions over 2-3 weeks.
- PCI is also recommended for patients with extensive stage SCLC who have had a response to chemotherapy and have a PS of 0-2. A dose of 20 Gy in 5 fractions is the most commonly used schedule.
- PCI is delivered using parallel opposed, lateral fields. The field can be set up in the clinic. Use the surface anatomy for the base of skull as the inferior edge of the field (supra-orbital ridge to tragus of ear).

Toxicity of Treatment

Chest

- Acute side effects of thoracic irradiation may include fatigue, chest pain (usually with high doses per fraction), nausea, oesophagitis, altered taste, pneumonitis and skin reactions.⁶
- On the whole thoracic irradiation is relatively well tolerated although patients who have had previous chemotherapy may experience more pronounced acute side effects.
- Late side effects are inevitable if the patient lives long enough to experience them. They can be kept to a minimum by careful planning where appropriate, but may include fibrosis (lung, oesophagus, chest wall) or pericarditis.

Brain

- Acutely, patients may experience headache, nausea & vomiting, somnolence and alopecia. The long-term side effects of cranial irradiation at the doses employed for PCI are few. Reports of neuropsychological sequelae have generally been in patients receiving chemotherapy at the same time as radiotherapy, and recent studies^{7,8} have shown no significant difference in neurocognitive tests between a group of patients undergoing PCI in addition to chemotherapy and a group receiving chemotherapy alone.
- Prophylactic steroids may relieve the acute symptoms of cranial irradiation.

Endobronchial brachytherapy

Endobronchial brachytherapy may have a limited role in the retreatment of patients with symptoms due to endobronchial tumour or external compression of a bronchus by tumour. Suggested dose: 10-15 Gy at 1cm radius.

Trials

Where possible, important clinical questions should be addressed in the context of clinical trials. These areas of interest include the role of concurrent chemoradiotherapy in both NSCLC and SLCLC, the optimal fractionation regimen for thoracic and cranial irradiation for SCLC and the best regimen to achieve optimal palliation in patients of both good and poor prognosis status. Recommendations for approved studies should be made through the Cancer Alliance Expert Advisory groups and MDTs in collaboration with the National Cancer Research Network team.

Ensure that mechanisms are in place to support the entry of eligible patients into clinical trials, subject to the patient giving fully informed consent. The MDT should record the reasons for patients not being entered in to trials that are open.

Chemotherapy

General Principles

- Consideration should be given in the first instance as to whether or not chemotherapy is appropriate for the individual. This decision will be based on the extent and type of disease as well as performance status and will take into account the individual wishes of the patient.
- The aim of the chemotherapy (curative, neoadjuvant, adjuvant or palliative) should be defined prior to administration and this should be discussed with the patient together with the potential side effects of the treatment.
- Chemotherapy should be administered in accordance with the published recommendations of the JCCO using whenever possible protocols which have been agreed by the NCA lung group. Because chemotherapy is likely to cause significant toxicity in terms of bone marrow suppression, alopecia, nausea and vomiting and fatigue it should only be administered by teams which include Oncology Specialists, with the appropriate skills and training.
- The patient should be closely monitored while on treatment and every effort made to address quality of life issues.
- For patients receiving palliative or neoadjuvant chemotherapy, treatment should be discontinued if there is no evidence of a response after 2 cycles or after 1 cycle if there is evidence of progressive disease. Chemotherapy should also be discontinued if the patient has unacceptable toxicity even in the absence of progressive disease.
- Discuss the cases of patients with oligometastatic disease (up to 3 metastases, each potentially treatable with curative intent) and otherwise potentially curable (or possible to achieve long term control) primary tumor at the regional treatment centre MDT in order to explore appropriate multimodality treatment options available in the centres with appropriate experience.
- Ensure that mechanisms are in place to support the entry of eligible patients into clinical trials, subject to the patient giving fully informed consent. The MDT should record the reasons for patients not being entered in to trials that are open.

Small Cell Lung Cancer (SCLC)

Staging

- Staging using the limited/extensive disease categories as per the NICE guidelines is of prognostic value in patients with small cell lung cancer. Staging alone however should not be the only guide to the intensity of therapy as long term survival can occur in extensive stage patients. The patient assessment should include history and examination, performance status, CXR, FBC, Serum Biochemistry including LFT's & LDH and CT of chest, upper abdomen and head.

- The good prognosis group consists of patients with good performance status (WHO 0,1, Karnofsky greater than 70%) and not more than 1 of the following factors:
 - Extensive disease
 - Low serum sodium
 - Raised alkaline phosphatase
 - Raised AST
 - Raised LDH

Chemotherapy

- Arrange for patients with SCLC to have an assessment by a thoracic oncologist within 1 week of deciding to recommend treatment.
- Combination chemotherapy has been shown to increase survival and quality of life in patients with SCLC and is superior to single agent therapy even in poor prognosis patients.

Good Prognosis Patients

- The prognostic group studies have consistently shown that only the 'good' prognosis patients achieve long term survival.
- The recommended treatment in good prognosis patients with limited stage disease, normal haematological and biochemical parameters, good performance status and sufficient respiratory reserve is concurrent chemoradiation with Cisplatin and Etoposide (see chemotherapy protocols for details).
- All other good prognosis patients should be offered a combination of Carboplatin or Cisplatin and Etoposide (see chemotherapy protocols for details). Response should be assessed after 2 cycles and only continued if the tumour is responding. Dose modification may be required in the presence of unacceptable toxicity (See Alliance protocols for guidance). A total of 4-6 cycles should be given unless there is evidence of progressive disease or unacceptable toxicity.
- Good performance stage (PS 0,1,2) patients with limited stage disease who have not undergone concurrent chemoradiation but who achieve a complete response or good partial response should be offered consolidative thoracic radiotherapy on completion of their chemotherapy.
- Patients who achieve less than a complete response may be referred for consideration of palliative radiotherapy if symptomatic.
- Good prognosis patients (limited and extensive disease) who achieve a partial or complete response to chemotherapy should be referred prior to their penultimate cycle of treatment for consideration of prophylactic cranial irradiation (PCI).

Poor Prognosis Patients

- Patients should be treated with palliative intent using a combination of Carboplatin & Etoposide as per the good prognosis patients or a combination of Vincristine, Doxorubicin and Cyclophosphamide (see chemotherapy guidelines) in patients not suitable for platinum based chemotherapy. Response should be assessed after 2 cycles and chemotherapy only continued if the patient is responding and toxicity is acceptable. Responding, patients should receive between 4 – 6 cycles of treatment. The patient should be re-discussed at the multidisciplinary meeting regarding a referral for radiotherapy following completion of chemotherapy in the presence of symptomatic disease.

Clinical trials

- Ensure that mechanisms are in place to support the entry of eligible patients into clinical trials, subject to the patient giving fully informed consent. The MDT should record the reasons for patients not being entered in to trials that are open.

Disease Relapse

- In patients who relapse more than 3 months following completion of chemotherapy consideration should be given to retreating with their original chemotherapy regime, eg oral Topotecan, providing this is in accordance with patient wishes and their performance status is acceptable. Entry into ongoing clinical trials may be considered if the patient is agreeable. Palliative radiotherapy or symptomatic care however may be in the best interests of the patient.
- If relapse is less than 3 months following treatment these patients fall into a particularly poor category. These patients may be considered for treatment with an alternative chemotherapy regime, for example, oral Topotecan though response rates are likely to be low, or entry into an appropriate clinical trial. Again, palliative radiotherapy or symptomatic care may be more appropriate than further chemotherapy

Non-Small Cell Carcinoma

Neoadjuvant Chemotherapy

- Neoadjuvant chemotherapy is not routinely recommended in patients with surgically resectable disease, but downstaging neoadjuvant chemotherapy may be considered in patients whose initial staging precludes them from surgery or radical radiotherapy. This must be discussed at the thoracic MDT.

Adjuvant Chemotherapy

- The meta-analysis of 1995 has shown an absolute survival benefit for adjuvant therapy of 5% for Cisplatin based regimes, but the 95% confidence intervals are wide

making the actual benefit difficult to assess. Subsequent studies have confirmed a benefit for adjuvant chemotherapy in selected groups of patients. Adjuvant chemotherapy is therefore recommended in patients with stage T1-3, N1-2 M0 NSCLC and T2-3 N0 M0 NSCLC with tumours greater than 4cm in diameter who are of good performance status 0-1, preferably within 8 weeks of surgery. The proposed regimes are Carboplatin and Paclitaxel or Cisplatin and Vinorelbine (see chemotherapy protocols for details).

Combined Chemoradiation

- Consider chemoradiotherapy for patients with stage II or III NSCLC who are not suitable for surgery. Balance potential benefit in survival with the risk of additional toxicities.
- Combining chemotherapy and radiotherapy for patients with stage III disease has been shown to have survival benefits. All patients with good performance status who have stage IIIA disease who are not suitable for surgery and selected IIIB NSCLC patients should be offered combined chemoradiation treatment. Where the patient's PS, renal function and PFTs allow, concurrent chemoradiation using the SOCCAR regimen should be considered as standard.
- Ensure all patients potentially suitable for multimodality treatment (surgery, radiotherapy and chemotherapy in any combination) are assessed by a thoracic oncologist and a thoracic surgeon.

Palliative chemotherapy

- In patients with stage 3B (not suitable for radical treatment) & 4 disease, chemotherapy may have a role both in symptomatic benefit and possible prolongation of survival. Patients who fit into this category should be fit (PS 0, 1, 2) and be agreeable to treatment.
- NICE Lung clinical guidance recommends combination of a single third-generation drug (docetaxel, gemcitabine, paclitaxel or vinorelbine) plus a platinum drug (either carboplatin or cisplatin). If patients cannot tolerate a platinum combination, offer single-agent chemotherapy with a third-generation drug. The preferred protocol in practice for patients with non-squamous histology is a combination of a platinum drug (Cisplatin or Carboplatin) and Pemetrexed. Treatment is usually given for 4 cycles (see chemotherapy protocols for details).
- In patients with Stage 3B disease who have had a response to chemotherapy it may be appropriate to re-discuss the patient at the multidisciplinary meeting regarding referral for thoracic radiotherapy. Patients with stage 4 disease should be re-discussed at the multidisciplinary meeting regarding a referral for radiotherapy in the presence of persisting symptomatic disease.
- Patients who progress after first line treatment can be offered either nintedanib (Vargatef) in combination with docetaxel or single agent docetaxel.

All patients within this group should be considered for entry into appropriate clinical trials.

Tyrosine Kinase Inhibitors

1st Line Treatment

- Erlotinib (Tarceva), Gefitinib (Iressa) and Afatinib (Giotrif) are each recommended as option by NICE for treating adults with locally advanced or metastatic NSCLC only if:
 - tumour tests positive for the epidermal growth factor receptor tyrosine kinase (EGFR-TK) mutation and the patient has not previously had an EGFR-TK inhibitor. I.e. choose one only.
- After first line treatment with an EGFR inhibitor in patients with mutation positive disease, combination chemotherapy as above should be offered if patients are fit enough to tolerate treatment, e.g. gemcitabine plus platinum.
- In practice EGFR mutation testing should be undertaken on all suitable patients following MDT discussion. In addition EGFR mutation testing can be requested before MDT discussion at the discretion of the treating clinicians if it is highly likely that this treatment might be a possibility.

2nd Line Treatment

- (NICE Technology Appraisal Guidance TA374 December 2015)
This guidance states that Erlotinib (Tarceva) is recommended as a possible treatment for locally advanced or metastatic NSCLC that has already been treated with non-targeted chemotherapy because of delayed confirmation of epidermal growth factor receptor tyrosine kinase (EGFR TK) mutation status, ONLY if:
 - their cancer tests positive for the EGFR TK mutation **or**
 - it is not known if the cancer is EGFR TK mutation positive because of problems with the test, and the cancer is very likely to be EGFR TK mutation positive
- Erlotinib is no longer recommended for treating locally advanced or metastatic NSCLC that doesn't test positive for the EGFR TK mutation.
- Gefitinib is not recommended for treating NSCLC that has progressed after chemotherapy.
- The ALK (anaplastic lymphoma kinase fusion gene) inhibitor Crizotinib (Xalkori) is currently (June 2016) available on the Cancer Drug Fund for patients with who had received one prior treatment with platinum-based combination chemotherapy and have been shown to have anaplastic-lymphoma-kinase-positive disease.
- In good performance status patients who have had a durable response (more than 6 months) to first line chemotherapy it may be appropriate to consider retreatment with the original regime. The alternative recommendation is consideration of single agent Docetaxel as per the NICE guidelines. Again all patients should be considered for entry into appropriate clinical trials.
- Patients may be offered erlotinib (Tarceva) as an alternative to docetaxel. This decision will be at the discretion of the oncologist and will take into account patient preference. In patients with BAC, erlotinib should be considered the drug of choice.

Follow up and Patient Perspectives

- Offer all patients an initial specialist follow up appointment within 6 weeks of completing treatment to discuss ongoing care. Offer regular appointments thereafter, rather than relying on patients requesting appointments when they experience symptoms.
- Offer protocol driven follow up led by a lung cancer clinical nurse specialist as an option for patients with a life expectancy of more than 3 months.
- Ensure that patients know how to contact the lung cancer clinical nurse specialist involved in their care between their scheduled hospital visits.
- The opinions and experiences of lung cancer patients and carers should be collated and used to improve the delivery of lung cancer services. Patients should receive feedback on any action taken as a result of such surveys.

Managing endobronchial obstruction and the use of interventional bronchoscopy

- Up to 50% of patients with advanced stage thoracic malignancies present with signs of airway obstruction. In some cases this may cause deteriorating performance status and even life threatening condition. Therefore every cancer Alliance should ensure that patients have rapid access to experienced team, capable of cross covering and providing interventional endobronchial treatments. Management of malignant airway obstruction depends on the urgency of the need to restore the airway patency and type of the stenosis. When patients have large airway involvement, monitor (clinically and radiologically) for endobronchial obstruction to ensure treatment is offered early.
- The airway stenosis can be divided into intraluminal (the tumour mass is located mainly within the bronchial lumen), extraluminal (the tumor mass is outside the airway lumen and the stenosis is caused by external compression without breaching the airway wall and the mucosa) and mixed type (the combination of both intraluminal tumor growth and external compression).
- If the airway obstruction is not life threatening or causing significant distress, external beam radiotherapy or endobronchial brachytherapy is an option. Also, consider radiotherapy in cases when interventional bronchoscopy is not possible or the airway patency could not be restored.
- In urgent situation or if symptoms require rapid palliation consider modalities with immediate effect: laser resection, debulking with electrocautery or argon plasma coagulation, dilation or stent insertion. These techniques can be used during both flexible and rigid bronchoscopy. The rigid bronchoscopy is used for laser resection and silicone or bifurcational Y-stent insertion. Debulking with electrocautery or argon plasma coagulation, metallic stent insertion can be safely delivered during flexible bronchoscopy under local anaesthesia and sedation.
- For intraluminal stenosis preferred debulking techniques are argon plasma coagulation or electrocautery, followed by stent insertion if required. The use of flexible bronchoscope provides excellent access to the lobar and segmental bronchi, including the upper lobes. Laser resection using rigid bronchoscope can be used depending on clinical situation; however this technique is limited to the large airway area and requires general anaesthesia.

- For extraluminal stenosis stenting is the preferred technique. Dilation can also be used, however with temporary effect in most cases and usually followed by stenting. Depending on clinical situation, metallic covered (if the tumor is likely to progress rapidly and breach the airway wall and mucosa) or uncovered (if the tumor is slow growing and unlikely to breach the airway wall and the mucosa soon) stents can be used. Silicon stents can be used in cases when removal of the stent may be required, as they are easily removable even after prolonged period of time. Bifurcational Y-stents, metallic or silicone should be considered if the tumor is invading the lower trachea, the main carina and the main bronchi (in particular the right main bronchus) or causing broncho (tracheo)-oesophageal fistula in the same area. Covered metallic stents are preferably used for management of tracheo-oesophageal (or left main bronchus) fistula and followed by oesophageal covered stent insertion.
- In the NESCN the interventional bronchoscopy service is provided at Freeman Hospital (rigid and flexible bronchoscopy with dilation, laser resection, silicone, metal and bifurcational Y-stents) and at James Cook University Hospital (flexible bronchoscopy with argon plasma coagulation, electrocautery and metal stents; in selected cases - rigid bronchoscopy performed jointly by the Respiratory Physician and the Thoracic Surgeon). General referral rules should be followed.

References:

- British Thoracic Society guideline for advanced diagnostic and therapeutic flexible bronchoscopy in adults. Thorax 2011; Vol. 66, Suppl.3: iii6-11.
- Beamis JF, Mathur PN, Mehta AC, editors. Interventional pulmonary medicine. Marcel Dekker Inc. 2004
- Gibson GJ, editors. Respiratory Medicine. Elsevier Science Ltd. 2003

Malignant Mesothelioma

These guidelines are based on the ESMO Malignant Pleural Mesothelioma Clinical Practice Guidelines for diagnosis, treatment and follow-up (2015), Cancer Alliance Lung Cancer Clinical Guidelines (2014) and the British Thoracic Society statement on malignant mesothelioma in the United Kingdom (2007)

Epidemiology

Malignant pleural mesothelioma (MPM) is a relatively rare tumour. In Great Britain, the incidence in males is 3.4/100,000. Occupational exposure to asbestos accounts for more than 80% of cases. In the last 10 years, the incidence of MPM has increased slightly, mainly due to the lag time of 30-50 years after exposure to asbestos and the banning of handling and importing this product.

There is widespread variation in the incidence of MPM. The North East of England is an area with high incidence. Cases of MPM from specific high-risk industries such as ship-building and railway engineering appear to be levelling off, whereas cases following exposure from a wider range of occupations is increasing. The risk of MPM varies in relation to the type of asbestos with the highest risk associated with amphibole asbestos.

Recently, a germline mutation in the BAP1 gene has been linked to predisposition in some cases of MPM. Somatic mutations may also play a role in the development of MPM.

Diagnosis

Any patient in whom mesothelioma is expected should be promptly referred to a respiratory physician for further assessment. Patients typically present with symptoms of shortness of breath and chest pain. Symptoms, such as cough can also occur secondary to the development of a pleural effusion. Systemic features are often seen with weight loss and sometimes sweating. These symptoms can occur over a period of many months. It is of great importance that a detailed occupational history is obtained. During physical examination, unilateral pleural effusions are observed. MPM should be considered in any patient with either pleural fluid or pleural thickening especially if associated with chest pain. Symptomatic metastatic disease from malignant mesothelioma is generally unusual at presentation.

Pathological confirmation of the diagnosis is recommended unless the patient is frail or has advanced disease. A negative pleural biopsy and negative cytological results do not exclude mesothelioma and should lead to further investigation and/or follow up.

Standard work-up includes:

- Chest X-ray
- CT scan of chest and upper abdomen
- Thoracocentesis , with examination of the pleural effusion
- General lab blood tests

Plain chest X-ray lacks sufficient sensitivity and specificity. Significant volumes of pleural effusions can mask pleural/chest lesions.

- Where a chest radiograph is suggestive of malignant pleural disease it is recommended that a copy of the report is sent to a designated member of the lung multi-disciplinary team, usually the chest physician. The multi-disciplinary team should have a mechanism to follow up such faxed reports.
- In patients with suspected malignant pleural disease a chest CT scan should be performed before pleural biopsy and/or thoracoscopy. CT scanning cannot reliably differentiate malignant mesothelioma from other causes of malignant pleural disease.
- Ultrasound guided pleural aspiration should be used as a safe accurate method of obtaining fluid if there is a small or loculated effusion.
- MRI scanning has a limited role in patients with malignant mesothelioma beyond CT scan. Gadolinium enhanced MRI may improve delineation of the tumour with regard to the surrounding tissues. MRI can also help to visualise foci that may be present in the diaphragm, pericardium or chest wall.
- PET scanning may be useful in differentiating benign from malignant disease but this is not clear cut and PET scans done for pleural disease should be interpreted with caution. PET scanning can be used in the diagnostic work-up when PET-avid sites in the thoracic cavity need to be identified to obtain representative tissue. One of the caveats in the evaluation of PET scanning is the false-positive outcome after pleurodesis. This can result in high activity for a period of more than 6 months after pleurodesis.
- Radiological staging of patients with malignant mesothelioma should occur before radical surgery and/or clinical trial entry. CT scan features that in the past have been used to distinguish malignant from benign pleural disease include circumferential pleural thickening, nodular pleural thickening, parietal pleural thickening >1 cm and mediastinal pleural involvement. Whilst a positive predictive value of these features is high their absence does not exclude a diagnosis of pleural malignancy and CT scanning cannot reliably differentiate malignant mesothelioma from other malignancies. Some of the commonest features of malignant mesothelioma include circumferential nodular lung encasement, pleural thickening with irregular pleuro-pulmonary margins and pleural thickening with super-imposed nodules. Such features are often important for those patients with a poor performance status where a clinical diagnosis is made.
- When an occupational history indicates considerable asbestos exposure, or the radiology is suggestive of mesothelioma, cytology can be used to detect malignant cells but histological specimens must often be obtained (see 'pathology' section). If the patient is fit enough, thoracoscopy is recommended to obtain adequate histology, to optimally stage, and to allow pleural fluid evacuation (with or without pleurodesis). This can be performed as a medical (LA) thoracoscopy or as video-assisted thoracic surgery (VATS). MPM can be difficult to identify and it is therefore recommended to obtain biopsies from tissue of both abnormal and normal appearance. When a thoracoscopy is not feasible or contra-indicated, ultrasound-guided true-cut biopsies are a

good alternative. Besides a clinical reason to obtain a diagnosis, there are medico-legal reasons to confirm the diagnosis of MPM.

Pathology

Pathological diagnosis may be obtained through Histology / IHC or cytology. . Establishing the nature of mesothelial proliferation in samples is regarded as a challenging aspect of diagnosis.

The cellular origin of malignant mesothelioma is not clear, however it is suggested that tumours might arise from mesothelial cells that have the ability to differentiate along diverse lines.

Various histopathological sub-types have been described. Despite this wide variation, it is generally regarded that tumours should be classified into one of three main types: epithelioid, sarcomatoid (with desmoplastic mesothelioma being a particularly aggressive form of the latter), and biphasic. Pathologists should attempt to specify the histological type of mesothelioma. Immunohistochemistry may be used in differentiating mesothelioma from other tumours. Careful consideration of the diagnosis should be made at the multi-disciplinary team meeting with active pathology involvement and if necessary further referral for an additional pathology opinion including referral of cases to recognised national experts if appropriate. It should be noted that there are some other rarer specific types of mesothelial tumour including well-differentiated papillary mesothelioma, multi-cystic mesothelial proliferation and solitary fibrous tumour. Pathologists should be prepared to submit samples for expert opinion in cases of diagnostic difficulties. The pathological diagnosis of diffuse malignant mesothelioma is not always straight-forward and interpretation should always be taken in context with full knowledge of the clinical history, examination findings and radiological appearance.

The pathological diagnosis of MPM may be difficult for a number of reasons:

- MPMs are a heterogeneous group of tumours, with the ability to mimic almost any other form of malignant tumour
- The three main subtypes (epithelioid, biphasic and sarcomatoid) have numerous variants, as described in the WHO classification.
- The pleura is a common site for metastatic disease and reactive changes in the pleura may be confused with MPM
- There are other uncommon benign and malignant pleural tumours.

Samples for diagnosis may vary widely: pleural effusions, small (closed) pleural biopsies, image-guided needle core biopsies, larger open or VATS surgical biopsy samples or debulking specimens. Surgical resection (extrapleural pneumonectomy) is rarely performed. In some cases, samples may also be obtained through autopsy.

Significant sampling errors can occur in effusion cytology and small biopsy samples, but also with larger surgical samples (though less common). Blind biopsies are not recommended because of risk of complications and are no longer indicated since the introduction of thoracic ultrasonography. Cytological

features in effusions may permit a diagnosis of malignancy but reported sensitivities vary widely. When a biopsy is not possible, appropriate clinical and radiological features may assist in suggesting a diagnosis of MPM. Many mesotheliomas lack significant cytological atypia and it is impossible to distinguish between benign, reactive mesothelial proliferations and MPM. Cytology sample cells may show variable atypia (usually low grade) and exhibit a mesothelial immune phenotype, but malignancy cannot be confirmed. The term 'atypical mesothelial proliferation' is useful in this context, but is insufficient for a diagnosis of MPM. This does not confirm the diagnosis of MPM, but leaves the possibility open [see below for fluorescence in situ hybridisation (FISH) testing]. In the vast majority of cases, it is necessary to have adequate tissue biopsies and the use of appropriate immunohistochemistry (IHC) for definitive, primary diagnosis of MPM. Consequently, definitive diagnosis of mesothelioma by frozen section is not recommended. Tissue biopsy samples the abnormal (mesothelial) cell population and permits micro-anatomical assessment of the location of these cells. This is crucial to identify the extent of invasion.

IHC is pivotal in confirming the mesothelial nature of cells, but cannot confirm their biological potential (see below). The larger the tissue biopsy and the more targeted the sampling approach [radiological or surgical (VATS or open procedure)], the more reliable and definitive the diagnosis. Invasion may be difficult to recognise, especially when tissue sampling is limited, but identification may be assisted by IHC (see below). Early invasive mesothelioma is particularly difficult, often disguised by cutting artefacts or the malorientation of sections, but may be suspected if there is nodular mesothelial cell proliferation. If definitive invasion cannot be recognised, the diagnosis of 'atypical mesothelial proliferation' is appropriate, and further sampling may be indicated. Distinguishing MPM from organising fibrinous exudates (fibrinous/fibrous pleurisy) requires a full-thickness biopsy sample, with correct orientation of histological sections, perpendicular to the pleural surface. The most commonly used mesothelial markers are calretinin, cytokeratin 5/6, WT1 and podoplanin (D240). For (adeno)carcinoma, the most useful markers are TTF1, CEA and EP4. Some markers have been advocated for, due to their distinction of benign (desmin) versus malignant mesothelial cells (EMA, p53, GLUT1, IMP3), but these methods lack reliability and are generally not recommended. Other immunohistochemical markers may be appropriate, depending on the differential diagnosis in a particular case. It is worth noting that although pan-cytokeratin markers are not specific in any way for mesothelial cells, or malignancy, in the appropriate context, they can be extremely useful in the diagnosis of sarcomatoid mesothelioma, which often does not express the usual markers mentioned above. The use of in situ hybridisation (e.g., FISH) to detect homozygous deletion of p16 is strongly associated with malignancy; it is not specific to MPM, but may aid diagnosis. The role of this technique has yet to be defined and established.

Staging

Staging procedures are standard in all tumours. Staging correlates with prognosis and helps in treatment decision-making. Disease stage according

to the TNM system is an important predictor of prognosis in patients with MPM and the 7th edition is therefore currently used by the Lung EAG.

Stage	TNM	Comments
Ia	T1a N0 M0	Primary tumour limited to ipsilat parietal pleura
Ib	T1b N0 M0	As stage 1a plus focal involvement of visceral pleura
II	T2 N0 M0	As Ia or b plus confluent involvement of diaphragm or visceral pleura or involvement of the lung
III	Any T3 M0	Locally advanced tumour
	Any N1 M0	Ipsilateral bronchopulmonary or hilar LN involvement
	Any N2 M0	Subcarinal or ipsilat mediastinal LN involvement
IV	Any T4	Locally advanced, technically unresectable tumour
	Any N3	Contralat mediastinal, internal mammary and ipsilat or contralat supraclavicular LN involvement
	Any M1	Distant metastases

General Management

All patients with mesothelioma should be managed by a cancer and mesothelioma multi-disciplinary team and be under the care of a specialist (usually a respiratory physician).

Ongoing follow up by a member of the multi-disciplinary team is usually regarded as appropriate. All patients should be discussed at a multi-disciplinary team meeting.

Where there is diagnostic uncertainty, or where radical treatment is considered, cases should be referred to a specialist multi-disciplinary team.

Written information about the disease and its medico-legal aspects should be made available to the patient and family. It should be remembered by all involved that all deaths have to be reported to the HM Coroner.

Treatment Strategy

Due to the nature of mesothelioma and its rarity in certain areas, it is recommended that patients should have access to a specialist multi-disciplinary team when necessary. There is no one number of occasions which defines a specialist multi-disciplinary team however it is more defined by an expressed interest and evidence of special interest in the diagnosis and management. It is however regarded that teams diagnosing fewer than ten to fifteen cases per year are unlikely to develop and retain the required attributes. A typical specialist multi-disciplinary team meeting would be expected to discuss a minimum of 25 cases per year.

Management is orientated towards the following:

- Chemotherapy / Radiotherapy
- Suitability for radical surgery and/or clinical trial entry
- Management of the pleural effusion
- Supportive care requirements
- Prophylactic radiotherapy to intervention sites
- Compensation issues

Front-line chemotherapy for MPM

Front-line chemotherapy improves survival of patients with unresectable MPM. Combination doublet chemotherapy of cisplatin, with either pemetrexed or raltitrexed, has shown a longer survival compared with cisplatin alone in randomised phase III trials. Carboplatin is an acceptable alternative to cisplatin and may be better tolerated in the elderly population.

Second line therapy for MPM

There is currently no second-line standard of care.

Radiotherapy

Radiotherapy (RT) can be used for different indications in mesothelioma: as palliation, as preventive treatment and as part of a multimodality treatment. For patients suffering from pain (e.g., by chest wall invasion), RT, prescribing usually short course regimens, can be considered although the systematic review by Macleod et al. [37, 38] suggested that no high-quality evidence currently exists to support RT in treating pain in MPM.

In the case of palliation, the aim of RT is to relieve pain and it is recommended in cases of infiltration of the chest wall or permeation nodules by MPM. There is much debate whether a scar after thoracoscopy and/ or drainage procedures should be irradiated prophylactically in order to reduce the likelihood of seeding metastases. It is probably best to recommend refraining from this procedure unless in the setting of a clinical trial, such as the 'PIT' study (ClinicalTrials.gov Identifier NCT01604005).

Management of the pleural effusion

One of the central aims of mesothelioma management is early and successful pleurodesis improving symptom control and reducing the likelihood of a trapped lung. Thoracoscopy is an extremely useful early technique both for diagnosis and management of pleural effusions. If a patient is unable to undergo thoracoscopy, medical talc/pleurodesis via an intercostal drain is an option. The dose of talc in this case should not exceed 4 grams.

Some patients may suffer a trapped lung either at presentation or subsequent in the course of disease and in these circumstances rapid reaccumulation of pleural fluid can occur without the possibility for pleurodesis in which case indwelling pleural catheters may be inserted which can significantly improve the quality of life.

Surgery

The role of surgical resection in malignant mesothelioma is very uncertain. There are no randomised control trials to establish the role of surgery. Consideration of surgery for malignant mesothelioma should therefore be made with considerable care and the patient should be referred to a specialist surgeon in this area. MPM surgical centres will review imaging from potential patients if requested. Specialist surgical MDT's are located in Leicester and Sheffield

Surgery is used for staging procedures or with palliative or curative intent. Using VATS or thoracoscopy, large biopsy samples can be obtained for proper pathological, molecular and IHC analyses. During this procedure, the local extent of the tumour can be examined. Pleural effusions can be drained and, if required, a decortication or pleurodesis can be carried out.

Due to the intricate location and relation to other normal tissues, it is virtually impossible to obtain free resection margins. Therefore, the aim of this procedure is to obtain a macroscopic resection by removing as much visible tumour as possible, using different surgical procedures. Initially, terms like 'radical' pleurectomy and decortication were used without proper description, making comparison between reported studies difficult. The IASLC established a working group to recommend

uniform definitions for surgical procedures dealing with mesothelioma. Currently, a clear distinction is made between EPP and pleurectomy/decortication (P/D) with different subcategories:

- EPP implies a complete en bloc removal of the involved parietal and visceral pleura including the whole ipsilateral lung. If required, the diaphragm and pericardium can also be resected.
- Extended P/D is the same procedure but the lung is left in situ: macroscopic complete resection is still the goal.
- P/D refers to removal of all gross tumour, without resection of the diaphragm or the pericardium.
- A partial pleurectomy entails partial removal of parietal and/or visceral pleura leaving gross tumour behind.

A surgical study called MARS 2 has recently opened in the UK. The aim of the MARS2 study is to determine if it is feasible to enrol patients with mesothelioma into a study randomising them to chemotherapy only or chemotherapy and lung-sparing surgery. The MARS 2 study should be considered in patients who have disease confined to one hemithorax and are of performance status 0-1. If the MARS 2 trial is considered referral should be made for patient to be discussed at the surgical MDT in either Sheffield or Leicester. Suitable patients will have 2 cycles of chemotherapy before restaging, chemotherapy takes place within the local centre therefore all Trusts within the Alliance should consider opening this trial, where this is not possible discussion should take place with the nearest Trust offering the trial to determine if treatment can take place elsewhere. Ideally patient travel for treatments should be kept to a minimum.

Clinical Trials

In the absence of standard second-line or further-line therapy, it is recommended that patients are enrolled into clinical trials. The EAG should encourage Trusts to participate in available mesothelioma trials in order to give patients more choice about treatment. Patients should be informed of available clinical trials, where no suitable trial exists within the treating organisation referral to the local clinical trials unit at Freeman Hospital should be considered and where a suitable trial is not offered within the region, referral should be made to appropriate clinical team for consideration if the patient wishes. Mesothelioma UK maintain an up to date portfolio of specific mesothelioma trials, information about current availability of trials can be obtained from the Mesothelioma UK website and from the regional Mesothelioma Clinical Nurse Specialist.

Supportive and Palliative Care

- Support and palliative care for patients with mesothelioma and their families is very important.
- Supportive care includes: information giving, self-help and support, user involvement, symptomatic control, psychological support, social

support, spiritual support, rehabilitation, complementary therapy, palliative care and end of life bereavement care.

- Most patients with malignant mesothelioma need symptom palliation from time of diagnosis onwards.
- Symptomatic and palliative care aims to provide relief from pain and other physical symptoms and to respond to emotional, psychology, social and spiritual needs.
- Clinical nurse specialists have an essential role in providing and co-ordinating care of patients and their carers. Lung cancer clinical nurse specialists act as a key worker facilitating the pathway of care for the patient and family throughout the illness. Patients with malignant mesothelioma and their carers should have access to a lung cancer clinical nurse specialist.
- The clinical nurse specialist should provide help and guidance to patients and their carers concerning entitlement to benefits and allowances.
- Physical, psychological, social and spiritual assessment may need to be repeated at several key times during the illness.
- Patient preference is particularly relevant when making treatment decisions about malignant mesothelioma.
- Timely access to the health care team is vital.
- Early involvement of a pain relief specialist is indicated if pain is not controlled after initial measures.
- Dyspnoea, cough and other symptoms should be managed according to palliative care guidelines.

Patients with malignant mesothelioma and their carers should have access to a lung cancer clinical nurse specialist or, where the local incidence of the disease is high, a mesothelioma clinical nurse specialist. In 2015 Mesothelioma UK and Mick Knighton Mesothelioma Research Fund (MKMRF) funded a part time Mesothelioma Clinical Nurse Specialist for the North East of England, the regional remit of the role is to support the local lung cancer nurse specialists in the provision and development of services for patients with mesothelioma. The regional Mesothelioma Clinical Nurse Specialist (MCNS) is based within Northumbria Healthcare NHS Foundation Trust at North Tyneside Hospital. The MCNS can be contacted by patients, carers and health professionals from other Trusts within the Alliance for advice and information.

Patients should be directed to an appropriate cancer support group such as the Lung Cancer Support Group. Where there is a sufficient number of patients with malignant mesothelioma, the development of a local Mesothelioma Support Group is recommended. Patients' carers should be offered information about carer support when required. There are four mesothelioma support groups within the North East of England located in North and South Tyneside, Darlington & Morpeth. Patients and carers should be given the details of these groups by the lung cancer nurse specialist. The MCNS is actively involved with all of the regional support groups.

Peritoneal Mesothelioma

Peritoneal mesothelioma is related to asbestos exposure but is less common than pleural mesothelioma. Little information exists about the incidence of peritoneal disease and there are no nationally approved guidelines for treating this disease. The management of peritoneal mesothelioma should also include multidisciplinary patient care and patients should be discussed at MDT; it is appropriate for those diagnosed with peritoneal mesothelioma also to have access to the lung cancer clinical nurse specialist. Cytoreductive surgery and hyperthermic intraperitoneal chemotherapy is performed in Basingstoke Hospital for patients with early stage disease, referral can be made for a surgical opinion and this should be considered in patients who are of good performance status. There is a lack of evidence regarding treatment for peritoneal mesothelioma however patients should be referred to a medical oncologist to discuss systemic treatments. Mesothelioma UK are developing information resources specifically for patients with peritoneal disease including an online support group, patients should be signposted to these by the healthcare team. Information can be sought from the regional Mesothelioma Clinical Nurse Specialist.

Benefits and Compensation for Mesothelioma

- Patients may be entitled to claim compensation in two ways:
 1. Claim for Industrial Injuries Disablement Benefit from the Department of Work and Pensions or through the War Pension Scheme. Other benefits for incapacity and disability may also be payable.
 2. Common law claim for damages from the firm/firms where exposure to asbestos occurred.
- Industrial injuries benefit is awarded if the person is suffering from a prescribed disease or personal injury which developed after 4th July 1948. The claimant must be an employee and they should have worked in a scheduled occupation where they had been exposed to asbestos. A claim is pursued by contacting the local job centre plus/or the Department for Work and Pensions and obtaining the relevant form.
- Providing the claimant qualifies the individual should obtain 100% disability and have it backdated to the date of diagnosis.

- Mesothelioma caused by exposure to asbestos during service in the defence forces is compensated under the War Pension Scheme. Since December 2015 veterans will be able to choose between a lump sum compensation payment or a traditional war pension.
- In addition to the above Industrial Injuries Benefit and War Pension Scheme patients may obtain additional benefits. Additional benefits may include income replacement such as statutory sick pay or occupational sick pay and incapacity benefit. In addition help with excess cost of disability can come from attendance allowance and personal independence payments.
- Benefit schemes often change and the above may not be complete or have changed and it is recommended that where there is any doubt, the specialist lung cancer nurse should seek the advice of a benefit specialist to ensure that the individual receives the most appropriate benefits.
- In addition to the above, patients can also consider seeking common law compensation. Clinicians seeing any patients with asbestos related lung disease should promptly advise the patients to consider seeking legal advice to reduce the risk of subsequent claims from mesothelioma being statute barred.
- For patients in whom neither an employer nor insurer can be identified a claim can still be made to the Department of Work and Pension under the Pneumoconiosis Act 1979.

Mesothelioma References

These Alliance guidelines have been based on the ESMO Malignant Pleural Mesothelioma Clinical Practice Guidelines for diagnosis, treatment and follow-up (2015) and the British Thoracic Society Statement on Malignant Mesothelioma in the UK.

Thymic Tumours

Introduction

Thymic tumours are uncommon (incidence 0.15/100 000) and are broadly classified into thymomas and thymic carcinomas. Thymic tumours are the most common tumours of the anterior mediastinum, accounting for 20% of mediastinal tumours and 35% of all anterior mediastinal tumours. Over 90% of all thymic tumours occur in the anterior mediastinum, the remainder occurring in the neck or other mediastinal areas. Thymic carcinomas are much rarer comprising 1% of thymic malignancies and are not covered in detail in this guideline. Thymomas are epithelial tumours generally considered to have an indolent growth pattern but malignant nonetheless because of potential for local invasion, pleural dissemination, and even systemic metastases. Most patients are between the ages of 40 and 60 years at the time of diagnosis with an equal gender distribution.

Thymomas often present incidentally, but may also present with pressure related symptoms such as chest pain and dyspnoea, or with associated autoimmune disorders (most commonly myasthenia gravis - approx 30%).

Overall prognosis for lower grade thymomas is excellent with cure rates in excess of 95%. Higher grade thymomas and thymic carcinomas have a poorer outlook. The 5 year survival for thymic carcinomas is 20-30%.

This version of the guideline was reviewed and updated by searching the Pubmed database using keywords "thymoma" and other currently available guidelines.

The differential diagnosis of anterior mediastinal masses

- Lymphoma
- Carcinoid
- Germ Cell tumour
- Thyroid tumours
- Parathyroid tumours
- Thymic cysts
- Lymphangioma
- Aortic Aneurysm

Histological Classification

Thymic tumours are classified histologically according to the WHO system, which is important for management and prognosis:

WHO classification of thymomas

WHO type	Traditional nomenclature
Type A	Medullary, spindle cell
Type AB	Mixed
Type B1	Organoid, Predominately cortical, Lymphocyte predominant
Type B2	Cortical
Type B3	Well-differentiated thymic carcinoma, Epithelial predominant, squamoid
Type C	Thymic carcinoma

From Nakagawa et al

WHO classification of thymomas and the relationship of histologic type with invasion, stage, recurrence and survival (*n* = 273)

WHO type	A	AB	B1	B2	B3
Invasive (%)	11	42	47	69	85
Complete resection (%)	100	99	95	91	92
Average stage	1.2	1.5	1.7	2.3	2.5
Recurrence (%)	0	5	9	18	29
20-Year survival (%)	100	87	91	59	36

From Okumura et al

Staging

The modified Masaoka staging system is useful for management and prognosis and remains a standard for routine management of the patients. This anatomical classification assesses the degree of invasiveness of the tumour, including macro- and microscopic invasion of the capsule and surrounding structures. However, the Masaoka-Koga staging is surgical pathological system and is accessible only after surgical resection of the tumor.

Modified Masaoka staging system	
I	Macroscopically and microscopically completely encapsulated.
II.	A) Microscopic transcapsular invasion <3mm B) Macroscopic invasion into surrounding fatty tissue or grossly adherent to, but not through mediastinal pleura or pericardium
III	A) Macroscopic invasion into neighboring organs i.e pericardium,

	great vessels, lung) B)With invasion of great vessels
IV	A) Pleural or pericardial dissemination B) Lymphogenous or haematogenous metastasis

From Masaoka et al, Eur J Cardiothoracic Surg 1994; 251-3

Influence of Masaoka stage on complete resection, recurrence and survival
(n = 1320)

Masaoka stage	I	II	III	IVA
Complete resection (%)	100	100	85	42
Recurrence (%)	1	4	28	34
5-Year survival (%)	100	98	89	71

From Kondo et al

The International Association for the Study of Lung Cancer and The International Thymic Malignancies Interest Group recently proposed a new Tumor-Node-Metastasis staging system based on overall survival analyses of more than 10 000 patients. It will be incorporated in the 8th edition of the TNM staging system expected in 2016-17.

Proposed IASLC-ITMIG TNM stage	TNM descriptors
T1a	Encapsulated or unencapsulate, with or without extension into the mediastinal fat.
T1b	Extension into the mediastinal pleura.
T2	Direct invasion of the pericardium.
T3	Direct invasion of the lung, the brachiocephalic vein, the superior vena cava, the chest wall, the phrenic nerve and/or hilar (extrapericardial) pulmonary vessels.
T4	Direct invasion of the aorta, arch vessels, the pulmonary artery, the myocardium, the trachea or the oesophagus.
N0	No nodal involvement.
N1	Anterior (perithymic) nodes.
N2	Deep intrathoracic or cervical nodes.
M0	No metastatic pleural, pericardial or distant sites
M1a	Separate pleural or pericardial nodule.
M1b	Pulmonary intraparenchymal nodule or distant organ metastasis.

Stage grouping	TNM stage	Corresponding Masaoka-Koga stage
I	T1a N0 M0 T1b N0 M0	I, IIA, IIB, III
II	T2 N0 M0	III
IIIA	T3 N0 M0	III
IIIB	T4 N0 M0	III
IVA	Tany N0/1 M0/1a	IVA, IVB
IVB	Tany N0/2 M0/1b	IVB

From Girard et al. and Detterbeck et al.

Diagnostic Pathway

Investigations at the referral to the rapid access 2 Week Wait specialist clinic:

- Baseline bloods including FBC, renal and liver function tests and coagulation screen to be performed by the referring General Practitioner or other clinician.
- CT chest and upper abdomen with contrast (if not arranged by the referring team and performed before - to be requested when vetting the referral).

Investigations at the specialist clinic:

- Pulmonary function tests. If baseline spirometry is abnormal, pre-operative assessment should include gas transfer, lung capacity and six minute walk test (6MWT).
- CT guided biopsy of the anterior mediastinal mass only if recommended by the Surgeon or the Radiologist (the recommendation to be included in the CT report) * in non-resectable disease cases.
- Optional bloods include β -HCG and AFP if germ cell tumor is likely differential diagnosis, also TFTs.

Investigations planned at the MDT discussion and further referrals:

- MRI may be helpful in demonstrating vascular invasion if CT findings are suspicious (MDT decision). Also, distinguishes between cysts, thymic neoplasm, and thymic hyperplasia.
- Any symptoms or signs of myasthenia gravis should prompt referral to a Consultant Neurologist with an interest in the condition. This may have important anaesthetic implications.
- PET CT and/or Octreoscan optional (decide at MDT) in the case of aggressive tumours and suspected advanced disease to complete the staging.

- PET CT can be useful in patients with myasthenia gravis to differentiate between thymic hyperplasia and thymoma when CT findings are unequivocal. PET CT is also useful in selected follow-up cases complimenting CT findings (MDT decision). Octreoscan is also sometimes useful in detecting relapses (MDT decision).

*- If the likelihood of thymoma is felt to be high by the reporting Radiologist or at the Multi-disciplinary team (MDT) meeting and the tumour appears to be completely resectable (i.e. stage I-III), then proceeding to upfront surgery for complete excision without biopsy is recommended. The biopsy is necessary when anterior mediastinal mass appears infiltrative or invasive, which would require neo-adjuvant therapy.

The risk of tumour seeding from core needle biopsy has been reported as negligible and this should not therefore not deter the MDT from requesting a pre-op histological diagnosis, however breaching pleural space generally should be avoided. Other options for obtaining a histological diagnosis include anterior mediastinotomy (Chamberlain procedure), mini-thoracotomy and video-assisted thoracic surgery (VATS) biopsy, especially if pleural metastases are suspected.

Histopathology should be reviewed by a pathologist with an interest in this disease and who is a core member of the MDT.

Management

All patients should be discussed in the regional lung cancer MDT meeting. Thymic tumours are uncommon and there is a relative lack of data in the literature to make firm management recommendations. The treatment strategy is primarily based on whether the tumour can be resected upfront or not. The assessment of respectability is mostly based on surgeon's expertise.

Resectable disease

Surgical Approaches

Thymectomy in resectable Masaoka-Koga stage I-III (TNM stage I-III A) disease should involve the en bloc removal of the tumour and all of the thymus. This may require the removal of lung, pericardium, left brachiocephalic vein, one phrenic nerve, SVC and even the aorta with the specimen. The value of a debulking procedure is controversial.

The standard approach is via median sternotomy. A limited upper sternotomy, a transcervical approach, video-assisted thorascopic surgery or robotic surgery is appropriate for Masaoka-Koga stage I-III (TNM stage I-II) disease in the centres with appropriately trained surgeons.

Some texts recommend that the transcervical approach should only be used for myasthenia gravis patients without a thymoma. The final choice of approach depends on the CT findings, the surgeon's preference and the patient's preference.

All post-operative cases should be discussed again at the MDT to decide on potential further adjuvant management options and follow up plan.

No further treatment is required for completely resected Masaoka-Koga stage I-III (TNM stage I-II) tumours (type A-B1).

R1 resections (when completion surgery is not possible), Masaoka-Koga stage IIA type B3, Masaoka-Koga stage IIB type B2-B3 or Masaoka-Koga stage III (TNM T1-3) thymoma warrant referral for a discussion of post-operative radiotherapy (50-54 Gy)*.

(* - see Appendix 1)

Unresectable and metastatic disease

Patients with good performance status (WHO PS 0-1) should be offered chemotherapy**. Some patients may then be candidates for radiotherapy or possibly surgery depending on response and stage. Further discussion at the MDT should be considered following completion of chemotherapy and re-imaging.

Also consider referral to Bobby Robson Unit for experimental clinical trials in patients who remain of good PS and who have exhausted all other treatment options

(** - see Appendices 2 and 3)

Follow-up imaging

In thymoma stage I-II completely resected disease cases study overall 10 years survival rate was reported 83-84%. In other large study overall survival rate was 92.8% at 5 years and 90.5% at 10 years. The 5- and 10-year disease-free survival was 87.9 and 82.1%, respectively. Baseline CT scan after the surgery is recommended in 3-4 months and subsequently a yearly follow-up with CT scan is recommended until 5 years after surgery. Then – CT scan every 1-2 years for 10-15 years after the surgery.

Because of the high relapse rates in stage III (large cohort study recently cited 10-year overall and disease-free (in R0) survival rates of 80.2% and 51.6%, respectively) and IV disease and cases of R1-2 resection further regular follow-up with CT every 6 months for 2 years, then – annual CT for 10-15 years (additional PET CT or Octreoscan in selected cases) is suggested.

Recurrent disease

Patients with local recurrence may be candidates for salvage surgery or radiotherapy and should be managed according to the same strategy as newly diagnosed tumours.

Patients with metastatic disease should be considered for chemotherapy and palliative radiotherapy.

The Role of Thymectomy in the management of Myasthenia Gravis.

The severity of myasthenia gravis has been classified using the Modified Osserman Classification for Myasthenia Gravis – see table.

Modified Osserman Classification for Myasthenia Gravis

Class	Distribution of Symptoms
I	Ocular
II	Mild general weakness, usually with ocular muscle weakness
III	Predominantly bulbar involvement, usually with mild general weakness
IV	Moderate generalised weakness
V	Severe generalised weakness

A thymoma is present in 10-20% of patients with myasthenia gravis. The benefits of thymectomy were first recorded in 1910. 80-90% of patients with myasthenia gravis improve by at least one Osserman classification following thymectomy. 50-70% of these patients have drug free remission after thymectomy.

A review of the available literature reveals that the indications for thymectomy in myasthenia gravis vary between units. Thymectomy should be considered in patients with

- Osserman class II – V disease
- Osserman class I disease refractory to medical treatment
- All patients with a thymoma. The presence of a thymoma correlates with a poorer response to thymectomy compared to those who have a thymectomy without the presence of a thymoma.

The anaesthesia for thymectomy involves the minimal use of muscle relaxants and opiates. Anticholinesterases should be continue post operatively and managed by the patient's neurologist as an outpatient.

Thymoma Appendix 1

Radiotherapy

Due to lack of clinical trials, there is no gold standard for the use of radiotherapy in the curative, adjuvant or palliative settings. An individual case based approach should be taken.

Suggested regimens for radical radiotherapy:

- 60-66 Gy in 30-33 fractions
- 50-55 Gy in 20 fractions

Suggested regimens for Adjuvant radiotherapy:

- 50Gy in 25 fractions
- 40Gy in 15 fractions

Thymoma Appendix 2

Suggested First Line Chemotherapy regimens

There are no randomised phase III trials in this disease so no firm recommendations can be made. Platinum based regimens should be considered for first line primary/induction and definitive chemotherapy for non-resectable thymic tumors. There is a significant amount of data in the literature based on phase II clinical trials supporting the use of the following regimens:

CAP – Cyclophosphamide 500mg/m² (day 1), Adriamycin (doxorubicin) 50mg/m² (day 1), Cisplatin 50mg/m² (day 1). Administered every 3 weeks.

PE- Suggest as per small cell chemotherapy protocols, but the following schedule has also been used: Cisplatin 60mg/m² (day 1), Etoposide 120mg/m² (day 1-3). Administered every 3 weeks.

ADOC - Cisplatin 50mg/m², Adriamycin (doxorubicin) 40mg/m² (day 1), Vincristine 0.6 mg/m² (day 3), Cyclophosphamide 700mg/m² (day 4). Administered every 4 weeks.

VIP - Etoposide 75 mg/m² × 4 days/3 weeks, Ifosfamide 1.2 g/m² × 4 days/3 weeks, Cisplatin 20 mg/m² × 4 days/3 weeks

CODE - Cisplatin 25 mg/m²/1 week, Vincristin 1 mg/m²/2 weeks, Doxorubicin 40 mg/m²/2 weeks, Etoposide 80 mg/m² × 3 days/2 weeks

Carbo-Px - Carboplatin AUC 5–6/3 weeks, Paclitaxel 200–225 mg/m²/3 weeks

CAP-GEM - Capecitabine 650 mg/m² b.i.d. 14 days/3 weeks, Gemcitabine 1000 mg/m² × 2 days/3 weeks

(from Girard et al.)

Thymoma Appendix 3

Suggested 2nd line regimens

- Octreotide and prednisolone
- PE or Carboplatin/Etoposide
- Etoposide
- Carboplatin and Taxol is another option for 2nd/3rd line treatment

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Lung carcinoid tumours

This section of the NESCEN Lung EAG guideline is based on the ESMO clinical practice guidelines for diagnosis, treatment and follow-up of neuroendocrine bronchial and thymic tumors published in 2015 and the British Thoracic Society and the Society for Cardiothoracic Surgery in Great Britain and Ireland Guidelines on the Radical Management of Patients with Lung Cancer published in 2010.

Lung carcinoid tumours belong to a heterogeneous group of neuroendocrine tumours (NETs), ranging from well differentiated bronchial NETs to poorly differentiated small cell lung carcinoma (SCLC) and large cell neuroendocrine carcinoma (LCNEC). They are described by different levels of necrosis and mitotic count (table 1). Ki67 can also be used. The incidence is low, although increase reported in recent decades. Of all NETs approximately 25% is located in the respiratory system. Typical carcinoid (TC) comprises 1-2% and atypical carcinoid (AC) – only 0.1-0.2%. The thoracic NETs (including thymic) can be part of MEN-1 syndrome in approximately 1-5% of cases. In majority of cases (~70%) bronchial NETs are located in the main bronchi. The rest is mostly detected in the peripheral parts of the lungs. 90% of the patients with the central NETs present with respiratory symptoms – cough, localised wheeze (or stridor), haemoptysis, breathlessness and recurrent infections. Peripheral NETs usually are incidental finding detected on thoracic imaging. The carcinoid syndrome is very rare in bronchial NETs cases. Nevertheless, a carcinoid crisis can be provoked by the biopsy procedures or surgical intervention.

Patients with suspected NETs of the lung (and thymus) should be referred under the 2 week wait rule to a centre with particular interest in and knowledge of the disease for investigations and treatment. In the NESCEN general referral guidance applies as described in the relevant section of this guideline.

Diagnosis and investigations.

Imaging for the bronchial NETs could include CXR as an initial investigation; however this should be followed by staging CT scan of the thorax. CT scan should be performed before the biopsy procedures. Since about 80% of TCs express somatostatin receptors, octreotide scan may be informative. FDG PET is more informative in more aggressive forms of NETs such as SCLC and LCNEC.

Diagnosis of the lung carcinoid tumour should be confirmed by means of biopsy. Pathological report should describe the presence of necrosis and mitotic activity. Immunohistochemistry should include neuroendocrine markers: synaptophysin and chromogranin A; other markers helpful to define a neuroendocrine phenotype include PGP 9.5, NSE and CD56. the proliferation index as detected by Ki-67 immunostaining is also an extremely useful tool to better classify a bronchial NET although actually not included in the WHO classification criteria.

Table 1. Classification of bronchial NETs.

Histological type	Necrosis	Mitotic count
TC	Absent	<2/10 HPF
AC	Present, focal	2-9/10 HPF
LCNEC	Present, extensive	>9/10 HPF
SCLC	Present, extensive	>50/10 HPF

In ~5% of patients with Cushing's syndrome the ectopic ACTH can be produced by bronchial NETs. Biochemical evaluation for both bronchial and thymic NETs include plasma chromogranin A and plasma neuron-specific enolase. In selected cases: U-5-hydroxy indol acetic acid with clinical symptoms of carcinoid syndrome; urine cortisol with Cushing's disease, plasma ACTH; in those with signs of acromegaly - plasma GHRH (growth hormon – releasing hormone) and insulin growth factor (IGF)-1.

A tumor–node–metastasis (TNM) staging is recommended for bronchial NETs and is included in the 7th edition of the Union for International Cancer Control/American Joint Committee on Cancer (UICC/AJCC) TNM staging system. The TNM descriptors are similar to those used for lung carcinoma.

Management of localised disease.

Surgical resection is the primary therapeutic option, with the procedure of choice being sleeve resection or lobectomy (pneumonectomy should be avoided). The surgical procedure should include systemic nodal dissection. Endobronchial debulking should be performed only in inoperable cases or as preoperative procedure in order to optimise patient condition and to assist resolving post obstructive pneumonia.

Management of advanced and metastatic disease.

Currently available chemotherapy has demonstrated generally poor effect for carcinoid tumours. Treatment with somatostatin analogues and alpha interferon may benefit the patients with functional tumours and clinical symptoms. Some effect of everolimus and TKI (sunitinib) has been reported in small series. Other available chemotherapy regimens for TC and AC include a combination of streptozotocin plus 5-fluoro-uracil/doxorubicin. Treatment decision should be a subject of the MDT meeting and provided by the experienced Oncology specialist.

Follow up.

After the surgery for the AC patients should be monitored at least in yearly intervals for up to 15 years. CT scan is the preferred imaging option. The patient who underwent surgery for TC should be followed up with CT scan performed in every 2-3 years. For those with abnormal biochemistry at the baseline biochemical markers should be repeated every 3-6 months during the follow up, especially in patients with advanced disease during or after treatment with cytotoxic or biological agents.

Referral Guidelines

All the constituent MDT's within the Northern Cancer Alliance recognise that referral to another MDT, or specialist centre for specific treatment might be necessary. Examples of such treatment might include major airway stenting, radical surgery for mesothelioma.

When a local MDT or cancer team feel that such referral is indicated then the following are agreed:

- The MDT will follow the pathology guidelines regarding specialist MDT referral
- The MDT will provide all data to the receiving MDT including radiology, pathology and clinical information.
- The clinician in charge of the patient or a responsible member of their team will write a formal referral letter to the receiving team.

On return of the patient the specialist MDT team will be expected:

- To provide written information regarding the treatment delivered
- Indicate the need for any follow up
- Contact the primary team on discharge

At all times the members of the Northern Cancer Alliance agree to the need for comprehensive and good communication.

Sources of Information and Patient Support Groups

Roy Castle Lung Foundation

Patient support and information centre – www.roycastle.org

Tel: 0333 323 7200 (Monday – Thursday 9am-5pm / Friday 9am-4pm)

Macmillan Cancer Support Line

Tel: 0808 8080000 (Monday –Friday 9am-8pm) – www.macmillan.org.uk

British Lung Foundation

Tel: 0333 030555 – www.blf.org.uk

Mesothelioma UK

Tel: 0800 1692409 – www.mesothelioma.uk.com

Newcastle

3rd Tuesday of the month; 1:30pm

Maggie's Centre, Freeman Hospital

For further details contact: Macmillan Lung Cancer Nurse Specialists

Christine Rushton, Angela Walton (Freeman) Vicki Anderson (RVI) – 0191 2448566

North Tees Lung Cancer Support Group

1st Wednesday in the month; 2:00pm – 4:00pm

Lung Health Seminar Room, within the University Hospital of North Tees.

For further details contact: Macmillan Lung Cancer Nurse Specialists
Tessa Fitzpatrick, Jeanette Draffan, Lisa Cockling, Gill Overton – 01642
624106
Amanda McNeany, Moira McHugh (Hartlepool) – 01429 522764

Darlington Lung Cancer Support Group

Last Wednesday of every month; 2:00pm – 4:00pm
Walworth Castle Darlington

For further details contact: Respiratory Oncology Nurse Specialist
Delphine Brown - 01325 743424

Bishop Auckland Lung Cancer Support Group

First Wednesday of every month; 2:00pm – 4:00pm

For further details contact: Respiratory Oncology Nurse Specialist
Karen Capenhurst - 01388 455784

North Cumbria

GroupAppleby and District Cancer Support Group

Contact: 017683 54918 (Mondays 9am – 12 noon) or Rosie 017683 52263 or
Nita 01931 714546

Who for: Anyone affected by cancer including family and carers

Where: The Voluntary Sector, Bolton Lounge, Riverside Building,
Appleby.

When: 1st and 3rd Monday of each month (excl. Bank Holidays) from
10am – 12 noon

Speakers / Activities Gentle exercise class from 10.30am to 11am and
Reflexology and Massage therapy can also be arranged

Comments Talk in confidence over coffee or tea

GroupCopeland Cancer Support Group

Contact: Enid Blake 0782 1177 513

email: copelandcancersupport@hotmail.com

Who for: A self -help group for people whose lives have been affected by
cancer

Where: The Howgill Family Centre, Birks Road, Cleator Moor, CA25
5HR

When: 2nd Tuesday of the month 1.30 – 3.30 pm

GroupHospice at Home West Cumbria Social/Friendship Group

Contact Eric on 01900 873173

Who for: Anyone affected by cancer and other life limiting illnesses –
including carers, family members and those bereaved

Where: Senhouse Centre, Whitehaven

When: Every Monday 1.30 – 3.30pm

Comments: A volunteer led mixed group offering mutual support following a
palliative care diagnosis. Please ring Eric to discuss attendance.

GroupHospice at Home West Cumbria Social/Friendship Group

Contact Eric on 01900 873173

Who for: Anyone affected by cancer and other life limiting illnesses – including carers, family members and those bereaved

Where: United Reformed Church, Cockermouth

When: Every Tuesday 10.00am – 12.00pm

Comments: A volunteer led mixed group offering mutual support following a palliative care diagnosis. Please ring Eric to discuss attendance

Group Hospice at Home West Cumbria Social/Friendship Group

Contact Eric on 01900 873173

Who for: Anyone affected by cancer and other life limiting illnesses – including carers, family members and those bereaved

Where: Bradbury Centre, Millom

When: 2nd and 4th Wednesday of every month 10.00am – 12.00pm

Comments: A volunteer led mixed group offering mutual support following a palliative care diagnosis. Please ring Eric to discuss attendance.

Group Hospice at Home West Cumbria Carers Support Group

Contact Michelle on 01900 705200

Who for: Any carers whose family member are affected by cancer and other life limiting illnesses

Where: Finkle Street, Workington and Senhouse Centre, Whitehaven

When: Alternate Fortnightly Groups

Speakers/Activities Varied, at group request

Comments: A support group specifically for carers whose family member has received a palliative care diagnosis. Please ring Michelle to discuss attendance.

Group Stronger Together Support Group

Contact: Sam Pollen 077708766201, Sharon Reynolds 07736796392. Ian Andrew 07738135386 or Ruth Smitham 07522011472

Who for: A friendship and Cancer Support Group for Sellafield Ltd employees affected by cancer

Where: West Lakes Science Park, Whitehaven

When: 1st Tuesday of each month from 1300 – 1500

Speakers / Activities Various Topics

Comments: Employees are welcome to bring along a family member/carer or a friend for additional support

Group Wigton Cancer Support Group

Contact: Gill Edmondson on 016973 408690/07837 408690 or e-mail: gill@flecy.orangehome.co.uk or Carole Storey on 016973 44410

Who for: Anyone affected by cancer

Where: Wigton Bowling Club - West Road Wigton CA7 9RG

When: The 2nd Wednesday of each month from 2pm – 5pm

Speakers / Activities Various informal speakers and activities to support and enhance life after cancer

Comments: Informal drop in session for a chat and refreshments

North Tyneside Support Group – Mesothelioma

Where: Meets at Walkerville Community Centre, Pinewood Close,
Walkerville, Newcastle Upon Tyne NE6 4SZ
When: Last Friday of each month (except August and December)
between 11.00 - 13.00.

South Tyneside Support Group – Mesothelioma

Where: Woodbridge Gardens, Oxclose Road, Washington NE38 7NZ
When: 1st Thursday of each month between 10.30 am and 12.30pm

PRASAG – Mesothelioma Support Groups

Where: Blackwell Grange Hotel, Darlington, DL3 8QH
When: 1st Tuesday of each month from 11am - 1pm.
Where: Morpeth Golf Club, Morpeth, NE61 2BT
When: 2nd Tuesday of each month from 11am - 1pm.

Cumbria Asbestos Related Disease Support (CARDS)

CARDS provides information and support concerning asbestos-related diseases and asbestos issues at our monthly meetings, or by email or telephone .

Contact telephone number: 01423 206570 - please leave your number and we aim to return your call within 2 days; OR send an email to: cardsinfo@gmail.com (we aim to reply within 2 days).

Meetings are held on the 3rd Monday of each month at Barrow and District Disability Association, Margaret Burrow Centre, 71-77 School Street, Barrow in Furness, Cumbria, LA14 1EI.

Website www.cumbria-ards.co.uk has more details of asbestos-related diseases, useful references, and meeting dates.

Continuing Care

- Before discharge from hospital the consultant and the nursing staff should ensure that the patient and carers have been given all the information about their condition and its treatment that they wish to know.
- They should be referred to the Lung Cancer Nurse Specialist, who if at all possible, should meet with the patient and family/carer prior to discharge or very shortly after.
- Information should be given to the patient in the company of a spouse, relative or friend if possible. A record should be made in the case notes of the information given, and this information should be made available to the general practitioner.
- All patients should be referred to the District Nursing Service regardless of their needs to continue to care in the community.

- If the patient is in need of symptom control/Palliative care then the appropriate referral should be made to the Macmillan team and/or Palliative Care team.
- A Referral to the Hospice could be sought after discussions with the patient for further support/care i.e. Day Support, Respite, End of Life care.
- Patients should be aware of who to call for urgent problems and how best to contact them. Cancer units and centres should begin to name a key worker for every patient.
- The patient's wishes should be sought when there are major decisions to be made about changes in care pattern. Any changes should be made known to the General Practitioner.

Follow Up:

- Ideally follow up might be supervised in a multi-disciplinary clinic with input available from respiratory and palliative care physicians, oncologists, lung cancer specialist nurses and other Multiprofessional team members such as Dietitian, Physiotherapist, Occupational Therapist, Social Worker etc. It is acknowledged that lack of personnel may preclude such an arrangement in some units.
- Hospital follow up should be continued whilst there is a reasonable prospect of hospital treatment or specialist advice being needed. It may also be appropriate to continue hospital follow up in other circumstances, for instance where this is perceived to be important to sustain a patient's morale or where follow up is necessary for the purpose of a clinical trial.
- Hospital follow-up may be in a nurse-led clinic.
- An explicit follow up policy should be developed for each patient, taking note of the wishes and interests of the patient and general practitioner. It should be clear to the patient and general practice who is supervising follow up i.e. who to contact if problems arise.
- Follow up in multiple clinics should be avoided.

Supportive Care and Palliative Care

Attention needs to be paid to patients' symptoms and concerns in all respiratory disease, but this is particularly true in lung cancer where, in the majority of cases, the patient will die from the condition. Below are listed definitions of approaches to this type of care.

- **Palliative care:** It is an approach that focuses on the total care of the patient and family who are facing life-threatening illness. It embraces symptom control, psychological, social, and spiritual support and aims to optimise quality of life in those with an incurable illness. This type of care should be offered by all healthcare professionals.
- **Specialist palliative care:** It is care provided by clinicians who have specialist training and skills in palliative medicine, working within specialist multidisciplinary teams.
- **Supportive care:** It is a broader concept, which includes the provision of support and palliation to patients at an earlier stage of their illness when outcomes, such as cure, are still possible.
- **End of Life Care:** An approach that enables the supportive and palliative care needs of both patient and family to be identified and met throughout the last phase of life and into bereavement.
- **Key features of end of life care:**
 - Anticipation and management of deterioration in the patient's condition
 - Advance care planning in accordance with patient preferences
 - Patient choice about place of care and death
 - Effective co-ordination of care across all teams and providers of care (in statutory, voluntary and independent sectors) who are involved in the care of patient and family
- **Care of the Dying:** Care of the patient and family in the last week, days and hours of life
 - Incorporates four key domains of care, physical, psychological, social and spiritual
 - Supports the family through this phase and into bereavement.
 - This is often documented and supported by use of the Liverpool Care Pathway (LCP)

Supportive care

- The need for supportive care will vary immensely between patients. The principle is that all patients and their families should be offered support as early in their cancer journey as is needed, even if they may be going to have potentially curative treatment.

- Supervision of supportive care is the responsibility of the relevant general practitioner (GP) and/or hospital specialist, depending on the needs of the particular patient. If the patient is undergoing active anti-cancer treatment, then it is likely that this will be coordinated by the hospital Clinical Nurse Specialist (CNS).
- Patients receiving supportive care should have regular follow up by their GP, respiratory physician, oncologist or CNS, depending on the circumstances and the wishes of the patient and their carers.
- Although supervision of supportive care may be undertaken by the professionals listed above, immediate liaison with the patient may be best conducted by a district nurse (DNS). The patient and his/her carers should be aware of the names of both the doctor and nurse responsible for their care.
- Supportive care includes:
 - Self help and support
 - User involvement
 - Information giving
 - Psychological support
 - Symptom control
 - Social support
 - Rehabilitation
 - Complementary therapies
 - Spiritual support

Palliative care

- In patients in whom curative treatment is not possible, palliative care becomes more relevant. All healthcare professionals should offer this.
- If the needs cannot be met by the hospital clinical team, GP or DNS then the patient should have access to specialist palliative care.
- Specialist palliative care teams are now available throughout the Northern Cancer Alliance in both community and hospital, with the backup of specialist palliative care inpatient hospice beds in most areas.
- Help can vary from telephone advice (often available out of hours via the Palliative Care Consultant on call or from hospices), single visits (domiciliary, outpatient or ward consultation), to regular community involvement or an inpatient admission to a specialist palliative care hospice bed

The role of specialist palliative care early after diagnosis

In a study from the USA, Temel described how early input from specialist palliative care (SPC) could improve symptom control and facilitate decision making about treatment preferences. More surprisingly, the group randomised to receive this support lived longer. This led to the recommendation that early specialist palliative care should be offered to all new lung cancer patients. It must be said however that the organisation of lung cancer services in the UK is different, and here the lung CNS will fulfil some of roles undertaken by SPC in the Temel study.

Alliance wide guidelines exist for the management of certain core symptoms and situations in palliative care. These have been incorporated into a small A5 sized booklet and are distributed across the Alliance. They are also available on the North of England cancer Alliance website where other guidelines and links will be available: <http://www.nescn.nhs.uk/>

Supportive and Palliative Care References

1. Great Britain. Department of Health (2007) Operating Framework 2007/08: PCT baseline review of services for end of life care [Online]. Available at http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_074108 (Accessed: 21 December 2012).
2. National Council for Palliative Care (2012) Palliative Care Explained [Online]. Available at: <http://www.ncpc.org.uk/palliative-care-explained> (Accessed: 21 December 2012).
3. National Institute for Health and Clinical Excellence (2004) Improving supportive and palliative care for adults with cancer. The Manual. London [Online]. Available at <http://www.nice.org.uk/CSGSP> (Accessed: 21 December 2012).
4. Marie Curie Palliative Care Institute. (2009) Liverpool care pathway for the dying patient [Online]. Available at: <http://www.liv.ac.uk/mcpcil/liverpool-care-pathway/> (Accessed: Apr 2012).
5. Temel JS, Greer JA, Musikansky A, et al. (2010) Early palliative care for patients with metastatic non-small-cell lung cancer. *New England Journal of Medicine*, 363, pp. 733–42.

Palliative Care and End of Life Care

Ambitions for Palliative and End of Life Care: A national framework for local action [2015-2020) states:

*Death and dying are inevitable. Palliative and end of life care must be a priority.
The quality and accessibility of this care will affect all of us and it must be made consistently better for all of us. The needs of people of all ages who are living with dying, death and bereavement, their families, carers and communities must be addressed, taking into account their priorities, preferences and wishes. As people, professionals and local leaders within the health and social care system and our communities, we must commit to these ambitions and to the framework that will enable their delivery. This framework is not a new strategy. It builds on the 2008 Strategy for End of Life Care and the improvements that have followed.*

The Northern England Clinical Networks have published the fourth edition of the Palliative and End of Life Care Guidelines, 2016. The guidelines booklet continues to be small, simple and accessible, and presents a consensus view on symptom management based on available evidence and expert opinion. The guidelines are not intended to replace excellent textbooks and formularies that already exist.

The guidelines have been written for any clinician responsible for the management and treatment of patients with palliative and end of life care needs, regardless of diagnosis.

The Palliative and End of Life Care Guidelines are available on the Northern England Clinical Networks website at: <http://www.nec.nhs.uk/>

We also feel it can be helpful to give an explanation of some of the different terms often encountered when 'palliative care' is discussed.

Supportive Care

"Umbrella" term for all services which help patient and family to cope with the condition and its treatment – from pre-diagnosis, through diagnosis and treatment, to cure, continuing illness or death and into bereavement

Aims to help patient maximise benefits of treatment and to live as well as possible with the effects of the disease and should be given equal priority alongside diagnosis and treatment.

Supportive care includes:

- Self help and support
- User involvement

- Information giving
- Psychological support
- Symptom control
- Social support
- Rehabilitation
- Complementary therapies
- Spiritual support
- End of life and bereavement care

Palliative Care

Part of, and embraces many elements of, supportive care.

Defined (NICE 2004) thus: *“the active holistic care of patients with advanced progressive illness. Management of pain and other symptoms and provision of psychological, social and spiritual support is paramount. The goal of palliative care is achievement of the best quality of life for patients and their families. Many aspects of palliative care are also applicable earlier in the course of the illness in conjunction with other treatments”*.

Key features of palliative care

- Affirm life and regard dying as a normal process.
- Provide relief from pain and other distressing symptoms.
- Integrate the psychological and spiritual aspects of patient care.
- Offer a support system to help patients live as actively as possible until death.
- Offer a support system to help the family cope during the patient's illness and in their own bereavement.

General Palliative Care is that care delivered by health professionals whose main role is not working with palliative care patients but who necessarily come across these patients in their work. This care is therefore delivered by a majority of healthcare professionals.

Specialist Palliative Care is delivered by professionals for whom the majority of their working role is in managing patients with palliative care needs. These professionals would therefore manage, or be advising in the care of, patients and their families whose needs are more complex, challenging, time consuming and refractory to usual input, and where this demand exceeds that which can reasonably be expected to be delivered by a professional whose main role is in another discipline.

End of Life Care

An approach that enables the supportive and palliative care needs of both patient and family to be identified and met throughout the last phase of life and into bereavement.

Key features of end of life care

- Anticipation and management of deterioration in the patient's condition
- Advance care planning in accordance with patient preferences
- Patient choice about place of care and death

- Effective co-ordination of care across all teams and providers of care (in statutory, voluntary and independent sectors) who are involved in the care of patient and family

Care of the Dying

The Leadership Alliance for Care of Dying People published One chance to get it right: Improving people's experience of care in the last few days and hours of life (2014). This document sets out the approach to caring for dying people that health and care organisations and staff caring for dying people in England should adopt in

future. The approach should be applied irrespective of the place in which someone

is dying: hospital, hospice, own or other home and during transfers between different settings.

The Alliance recommends five Priorities for Care for the dying person and puts people and their families at the centre of decisions about their treatment and care, and follows the recommendation made by the 2013 independent review of the Liverpool Care Pathway (LCP), More Care, Less Pathway a Review of the Liverpool care pathway that recommended the LCP be phased out by 2014. These recommendations make the dying person the focus of care in the last few days and hours of life and exemplify the high-level outcomes that must be delivered for every dying person.

The Five new Priorities for Care are

1. This possibility is recognised and communicated clearly, decisions made and actions taken in accordance with the person's needs and wishes, and these are regularly reviewed and decisions revised accordingly.
2. Sensitive communication takes place between staff and the dying person, and those identified as important to them.
3. The dying person, and those identified as important to them, are **involved** in decisions about treatment and care to the extent that the dying person wants.
4. The needs of families and others identified as important to the dying person are actively explored, respected and met as far as possible.
5. An individual plan of care, which includes food and drink, symptom control and psychological, social and spiritual support, is agreed, co-ordinated and delivered with compassion.

The Priorities for care are supported by duties and responsibilities of health and care staff to deliver the Priorities for care (2014) and implementation guidance for service providers and commissioners (2014) outlined in the Leadership Alliance document.

The Northern England Clinical Networks have developed a regional "Care for the Dying Patient" document which takes into account the issues raised within the Neuberger report and the recommendations in "One Chance to Get it Right", 2014, which sets out the priorities for care when a person is dying.

References

- Department of Health 2008; *End of Life Care Strategy: Promoting high quality care for all adults at the end of life.*
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/136431/End_of_life_strategy.pdf
- Neuberger, J. 2013 *Independent Review of The Liverpool Care Pathway: More Care, Less Pathway A Review of The Liverpool Care Pathway.*
- Leadership Alliance for the Care of Dying People (2014) *One chance to get it right: Improving people's experience of care in the last few days and hours of life.* <https://www.england.nhs.uk/ourwork/qual-clin-lead/lac/>
- National Palliative and End of Life Care Partnership; 2015: *Ambitions for Palliative and End of Life Care: A national framework for local action 2015-2020*
<http://endoflifecareambitions.org.uk/wp-content/uploads/2015/09/Ambitions-for-Palliative-and-End-of-Life-Care.pdf>
- National Council for Palliative Care *Palliative Care Explained*
<http://www.ncpc.org.uk>
- National Institute for Clinical Excellence (2004) *Improving supportive and palliative care for adults with cancer. The Manual.* London

Northern Cancer Alliance Lung Cancer Teams

Northern Cancer Alliance Lung Cancer Physicians, supporting non-surgical Oncologists, supporting Cardiothoracic Teams and Lung Cancer Clinical Nurse Specialists in the cancer units are as follows:

SOUTH TEES HOSPITALS ACUTE NHS TRUST:			
Chest Physician	Clinical Nurse Specialist	Oncologists	Thoracic Surgical Team
James Cook University Hospital, Middlesbrough			
Dr. V. Dudzevicius Dr. G. Antunes Dr. Mustafa Dr. Sathyamurthy	Jan Hughes- Clinical SR Andrea Lynas- Clinical SR Hayley McNaught- Clinical SR Tel no: 01642 282526 Bleep 07699625012 Emails: Jan.Keld@stees.nhs.uk andrea.lynas@stees.nhs.uk Hayley.mcnaught@stees.nhs.uk	Dr. C. Peedell Dr. N. Wadd (brachytherapy) Dr. E. Aynsley Dr.S.Lawless Dr. T Mansy Dr. L Li	Mr. Jonathan Ferguson Mr. Joel Dunning Thoracic Nurse Specialists Leanne Connelly Rachel Calvert Emails: leanne.connelly@stees.nhs.uk Rachel.calvert@stees.nhs.uk
The Friarage Hospital			
Dr. D. Spence Dr T Ward	Jan Hughes Andrea Lynas- Clinical SR Hayley McNaught- Clinical SR Tel: No: 01609 764211 Email: Jan.Keld@stees.nhs.uk andrea.lynas@stees.nhs.uk Hayley.mcnaught@stees.nhs.uk	Dr. C. Peedell Dr N. Wadd (brachytherapy) Dr. Van der Voet Dr.E.Aynsley Dr T Mansy	Mr. Jonathan Ferguson Mr. Joel Dunning Mr. Simon Kendall Thoracic Nurse Specialists Leanne Connelly Rachel Calvert Emails: leanne.connelly@stees.nhs.uk Rachel.calvert@stees.nhs.uk
NORTH TEES & HARTLEPOOL FOUNDATION NHS TRUST:			
Chest Physician	Clinical Nurse Specialist	Oncologists	Thoracic Surgical Team
University Hospital of Hartlepool			
Dr. K. Elmer Dr. E.Poyner	June Etherington Amanda Corbett Moira Mchugh Bleep No: 1147 via switchboard Tel No: 01429 522764 Emails: June.etherington@nth.nhs.uk Amanda.Corbett@nth.nhs.uk Moira.mchugh@nth.nhs.uk	Dr. C. Peedell Dr. N. Wadd (brachytherapy) Dr. Van der Voet Dr.E.Aynsley	Mr. Jonathan Ferguson Mr. Joel Dunning Thoracic Nurse Specialists Leanne Connelly Rachel Calvert Emails: leanne.connelly@stees.nhs.uk Rachel.calvert@stees.nhs.uk
University Hospital of North Tees			
Dr. R. Harrison Dr. N. Leitch Dr V Jeebun Dr B Prudon	Tessa Fitzpatrick Jeanette Draffan Tel No: 01642 624106 Bleep No: 4106 via switchboard: 01642 617617 Emails: Tessa.fitzpatrick@nth.nhs.uk Jeanette.draffan@nth.nhs.uk	Dr. C. Peedell Dr. N. Wadd (brachytherapy) Dr. Van der Voet Dr. E. Aynsley	Mr. Jonathan Ferguson Mr. Joel Dunning Thoracic Nurse Specialists Leanne Connelly Rachel Calvert Emails: leanne.connelly@stees.nhs.uk Rachel.calvert@stees.nhs.uk

COUNTY DURHAM AND DARLINGTON HOSPITALS FOUNDATION TRUST:			
Chest Physician	Clinical Nurse Specialist	Oncologists	Thoracic Surgical Team
Darlington Memorial Hospital			
Dr. R. Abassi Dr.Wyn-Jones Dr I Molyneaux Dr.P.De (Associate Specialist)	Delphine Brown Tel No: 01325 743424 Bleep No: 2265 via switchboard Email: delphine.brown@cddft.nhs.uk Karen Capenhurst Tel No: 01325 743425 Bleep No: 2263 via switchboard Emails: karen.capenhurst@cddft.nhs.uk	Dr C Peedell Dr N Wadd (brachytherapy)	Mr J Ferguson Mr Joel Dunning Thoracic Nurse Specialists Leanne Connelly Rachel Calvert Emails: leanne.connelly@stees.nhs.uk Rachel.calvert@stees.nhs.uk
Bishop Auckland General Hospital			
Dr R Abassi Dr I Molyneaux Dr.P.De (Associate Specialist)	Karen Capenhurst Tel No: 01325 743425 Bleep No: 2263 via switchboard Emails: karen.capenhurst@cddft.nhs.uk Delphine Brown Tel No: 01325 743424 Bleep No: 2265 via switchboard Email: delphine.brown@cddft.nhs.uk	Dr C Peedell Dr N Wadd (brachytherapy)	Mr J Ferguson Mr Joel Dunning Thoracic Nurse Specialists Leanne Connelly Rachel Calvert Emails: leanne.connelly@stees.nhs.uk Rachel.calvert@stees.nhs.uk
University Hospital of North Durham			
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NORTH CUMBRIA ACUTE HOSPITALS NHS TRUST:			
Chest Physician	Clinical Nurse Specialist	Oncologists	Thoracic Surgical Team
West Cumberland Hospital (Whitehaven)			
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Cumberland Infirmary Carlisle			
Dr M Hewson Dr J Atkinson	Kim Robinson/ Chris Bowman Tel No: 01228 814391 Bleep 209 via switchboard Email: kim.robinson@ncumbria-acute.nhs.uk	Dr S Singhal	Mr S Clark Mr S Barnard Thoracic Nurse Specialist Jackie Trinder Email: Jackie.Trinder@nuth.nhs.uk

CITY HOSPITALS SUNDERLAND NHS FOUNDATION TRUST			
Chest Physician	Clinical Nurse Specialist	Oncologists	Thoracic Surgical Team
Sunderland Royal Hospital			
Dr I Taylor Dr H Clague Dr K Sridharan	Sue Pollock Tel No: 0191 5656256 Ex 47521 Bleep 52510 via switchboard Joanne Anderson Tel No: 0191 5656256 Ex 47521 Bleep 52237 via switchboard Emails: susan.pollock@chsft.nhs.uk joanne.anderson@chsft.nhs.uk Michelle Scott (Chemo-support nurse) Tel No: 0191 5656256 Ex 47521 Bleep 52069 via switchboard	Dr Chris Jones	Mr S Stamenkovic Jackie Trinder Thoracic Nurse Specialist Jackie Trinder Email: Jackie.Trinder@nuth.nhs.uk
NEWCASTLE UPON TYNE HOSPITALS NHS FOUNDATION TRUST			
Chest Physician	Clinical Nurse Specialist	Oncologists	Thoracic Surgical Team
Freeman Hospital			
Dr A Ward Dr. B.Higgins	Christine Rushton (vacant post) Tel: 0191 2448566 Emails: Christine.rushton@nuth.nhs.uk	Dr J Gardiner (Medical Oncologist) Dr P Mulvenna	Mr S Clark Mr S Stamenkovic Mr J Forty Mr S Barnard Thoracic Nurse Specialist Jackie Trinder Email: Jackie.Trinder@nuth.nhs.uk
RVI			
Dr A Ward Dr I Forrest	Vicki Anderson Tel: 0191 2821875 Email: Victoria.Anderson@nuth.nhs.uk	Dr J Gardiner (Medical Oncologist) Dr P Atherton	Thoracic Nurse Specialist Jackie Trinder Email: Jackie.Trinder@nuth.nhs.uk
GATESHEAD HEALTH NHS FOUNDATION TRUST			
Chest Physician	Clinical Nurse Specialist	Oncologists	Thoracic Surgical Team
Queen Elizabeth Hospital			
Dr. J. Killen Dr. S. Elarbi Dr. R. Allcock	Sue Longstaff Bleep 1451 via switchboard Bleep 2770 via switchboard Tel No: 0191 4452881 Emails: susan.longstaff@northumbria-healthcare.nhs.uk	Dr R McMenemin Dr F McDonald	Mr S Clark Mr S Stamenkovic Mr J Forty Mr S Barnard Thoracic Nurse Specialist Jackie Trinder Email: Jackie.Trinder@nuth.nhs.uk

SOUTH TYNESIDE NHS FOUNDATION TRUST			
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South Tyneside General Hospital			
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NORTHUMBRIA NHS FOUNDATION TRUST			
Chest Physician	Clinical Nurse Specialist	Oncologists	Thoracic Surgical Team
Hexham General Hospital			
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Pathology Guidelines for the Examination and Reporting of Lung Cancer Specimens

Introduction

These guidelines for the examination and reporting of lung cancer specimens are supplementary to the following national guidance:

- Dataset for lung cancer histopathology reports issued by the Royal College of Pathologists (**May 2014**).
- ***Tissue Pathways for Pulmonary Pathology issued by the Royal College of Pathologists (2013)***.

All lung cancer cases should be reviewed by a Lung Cancer multidisciplinary team. There should be a nominated Lead lung pathologist for the service but all pathologists reporting lung cancer specimens should participate in lung MDT/CPC meetings, in an appropriate EQA scheme and in local audit (including an assessment of consistency of reporting, as appropriate to the site). If there is a significant discrepancy with the clinical/radiological findings the pathological material from diagnostic lung specimens should be reviewed, if possible by a second pathologist with an interest in lung cancer.

Specimens should be reported to an agreed timeframe so as to allow appropriate clinical decision making at a planned lung MDT meeting.

Specimen Types

Diagnostic:

Bronchial biopsies
Pulmonary cytology (brushings, washings, transbronchial FNA etc)
Needle core biopsy
VATS biopsy/Open lung biopsy
Mediastinal biopsy
Lymph node biopsy
Pleural biopsy
Pleural fluid cytology
Frozen sections

Therapeutic:

Segmentectomy (VATS or open)
Lobectomy (VATS or open)
Sleeve resection
Pneumonectomy (intra or extra pericardial)
Chest wall resection
Pleurectomy
Pleuropneumonectomy
Metastasectomy

Specimen Examination

Each pathology service should establish a defined protocol for each type of diagnostic and therapeutic lung specimen type received by the laboratory, taking into account the above guidance. The protocols should be regularly reviewed and updated by the Lead lung pathologist in consultation with other pathologists who participate in service delivery.

Access to specimen radiography and specialist radiological opinion should be available for relevant cases.

Lung tissue should only be removed and stored for the purposes of research if it is surplus to the requirements of the diagnostic process. Appropriate patient consent and ethical approval should be obtained.

Dataset For Reporting

Diagnostic specimens:

For lung

- Tumour type (small cell or non-small cell; ***if NSCLC further tumour subtyping for patient tailored therapy whenever possible is also required, along with due consideration also for conservation of suitable tumour material for molecular testing***).

For pleura

- Tumour type

Therapeutic resections:

- Relevant RCPATH Dataset with local modifications
- Specimen type (or procedure where relevant)
- Laterality
- Specimen dimensions
- Location of tumour
- Tumour size
- Distance from bronchial or other relevant resection margin
- Extent of atelectasis or obstructive pneumonitis
- Tumour type
- Tumour grade
- Local invasion (pleura, chest wall, mediastinal structures etc)
- Lymph node spread (by node station group)
- Resection margins (bronchial, mediastinal, vascular and chest wall)
- Other relevant pathology
- TMN staging system

Departments and MDTs should work towards recording and storing the dataset items as individually categorised items in a relational database, so as

to allow electronic retrieval and to facilitate the use of pathology data in clinical audit, service planning and monitoring, research and quality assurance.

Laboratories should use an agreed diagnostic coding system (e.g. SNOMED). All malignancies must be reported to the Northern and Yorkshire Cancer Registry, in accordance with the service level agreement with their host Trust.

Grading and Staging Conventions

Tumour grading:

- WHO invasive carcinoma grade system (4th edition)

Tumour staging:

- TNM classification of malignant tumours (**7th edition**)

Use of Ancillary Laboratory Techniques

All laboratories providing a Pathology service in the Alliance must have at least conditional laboratory (eg CPA/UKAS) accreditation and ensure participation an appropriate external quality assurance programme which demonstrates satisfactory laboratory performance.

Tissue conservation should be exercised in view of expanding indications for molecular testing. If sectioning small biopsies at multiple levels ***is required***, care should be taken to ensure that adequate numbers of spare sections are retained to allow immunostaining of tumour that may “cut out” in the deeper levels.

Immunohistochemical procedures which may be of value include the following:

Diagnostic scenario	Immunohistochemical markers	Notes
Neuroendocrine Differentiation	CD56, Synaptophysin Chromogranin Ki67	
Primary or metastatic Carcinoma	TTF-1, ER, CK7, CK20, CA125, PSA, CA19-9, S100, Melan A, CD15, thyroglobulin	
Adenocarcinoma v Mesothelioma	CK5, Calretinin, Thrombomodulin, CEA, AUA1, BerEP4, WT1, D2-40, CD15.	
Small cell carcinoma v Lymphocytes/lymphoma v metastatic tumour	CD56, CD45, Cytokeratins, TTF1	

Audit

All pathologists reporting lung cancer specimens should participate in a relevant EQA scheme and in local audit (including an assessment of consistency where more than one pathologist participates in service provision). Audit may take the form of:

- review of compliance with procedures for specimen examination and reporting
- completeness of datasets
- systematic logging of diagnostic agreement/disagreement during review of cases for MDTMs
- review of diagnostic consistency between pathologists using data from cases in EQA circulations or blind circulations.

The results of the audit process should be discussed with all pathologists who participate in service delivery and used to inform the development of reporting protocols.

Referral for Review or Specialist Opinion

Referral for treatment

All patients referred for treatment at a hospital within the Northern Cancer Alliance following diagnosis elsewhere must be reviewed and discussed at the treating hospital's multidisciplinary team meeting (MDTM).

The complete diagnostic pathology report must be available at the MDTM, and where considered relevant, the histological/cytological material should be reviewed. Situations when review is important include when there is a significant discrepancy with the clinical/radiological findings, or when the original pathologist expressed diagnostic uncertainty or when a rare type of tumour is diagnosed. Pathological material should be requested at least 5 working days before and received at least 3 working days before the relevant MDTM to allow sufficient time for review.

A formal report should be issued by the reviewing pathologist to the responsible clinician at the treating hospital. The results of the review should be sent to the original pathologist, either by copy of the review report or by letter.

Where patients have been referred for oncology treatment, requests for specialist biomarker studies will be co-ordinated between the treating oncology service, their local pathology service and the referring hospital's pathology service, as appropriate. The oncology service must agree a mechanism for requesting tests and the relevant pathological material with their local pathology service. Requests for pathological material should be made in good time to ensure that results are available at the MDTM where the patient is to be discussed.

Referral for Specialist Opinion

All lung lymphomas should be referred to the Haematological Malignancy Diagnostic Service for phenotypic analysis and confirmation of diagnosis.

In cases of diagnostic difficulty, referral will usually be made to the lead pathologist of the relevant specialist MDT in the Alliance, although referral to other specialists within or out with the Alliance may be appropriate in individual cases. Cases referred for individual specialist or second opinion will be dealt with by the individual pathologist and a report issued by them. Where relevant, tissue blocks should be made available to allow any further investigations that are deemed appropriate. The result of the review should be communicated to the referring pathologist by letter and also by fax/telephone as appropriate.

In instances when the patient is referred for a opinion by a specialist multidisciplinary team the case should be referred to the Lead Pathologist of the appropriate MDT and dealt with according to specialist team/Cancer Centre MDT guidelines.

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- Guidelines on inter-departmental dispatch of samples from patients sent to another hospital or centre for assessment and/or treatment.
- The Royal College of Pathologists (2014)
- NICE. Lung cancer: the diagnosis and treatment of lung cancer (February 2005)

These guidelines were initially developed by Dr Fiona Black in 2005 on behalf of the Histopathology Group of the Northern Cancer Alliance and histopathologists in the Northern Cancer Alliance. They were agreed by the Histopathology Group of the Northern Cancer Alliance. The group are indebted to the Pathology Group of the Yorkshire Cancer Alliance who kindly agreed to allow us to adopt, with modifications, their original document. These guidelines have subsequently been imported into the current Northern Cancer Alliance Guidelines with very minor formatting changes carried out by Dr Leitch Chair Lung EAG June 2009.

Version	Produced by	Review date	Responsible for review
1.1	Dr F Black/NCN Pathology Group	Jan 2013	NCN Pathology Group
1.2	Dr F Black	May 2018	Lung EAG

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- NICE (2010) NICE Technology Appraisal Guidance 192, Gefitinib for the First Line Treatment of Locally Advanced or Metastatic Non Small Cell Lung Cancer. National Institute for Health and Clinical Excellence, July 2010.
- The Royal College of Radiologists, Issue 2, August 2006: Recommendations for Cross Sectional Imaging in Cancer Management, Issue 2,
- NCA Policy Statement December 2008: Guidelines and Indications for PETCT in the North of England Cancer Network, Dr J Wilsdon

Appendix 1- Summary of Lung Cancer Imaging - as submitted to the Radiology group

IMAGING GUIDELINES FOR LUNG CANCER.

A. Diagnosis

1. Primary Care- referral for Chest X-ray
2. Specialist Unit
3. Unexpected finding of suspected cancer.

B. Staging.

1. Non small cell lung cancer.
2. Small cell lung cancer.

C. Follow up.

A. Diagnosis

1. Primary Care- referral for Chest X-ray

An urgent referral for a chest X-ray should be made when a patient presents with:

- Haemoptysis or
- Any of the following unexplained persistent (> 3 weeks) symptoms or signs
 - Chest and or shoulder pain
 - Dyspnoea
 - Weight loss
 - Chest signs
 - Hoarseness
 - Finger clubbing
 - Cervical or supraclavicular lymphadenopathy
 - Cough with or without any of the above
 - Features suggestive of a metastasis from lung cancer (e.g. brain, bone, liver or skin).

In addition, investigations should be arranged for those with chronic lung disease where there is a change in symptom complex e.g. changed cough in COPD / fibrosis.

A report should be made to the primary healthcare professionals within 5 days of the referral for a chest X-ray.

It should also be noted that a CXR may be normal despite the presence of cancer and where there is clinical suspicion then a normal CXR should not be taken as false reassurance.

2. Specialist Unit.

Only half of patients referred to a clinic with suspected lung cancer will turn out to have this pathology. Investigation therefore has diagnostic and staging goals. In order to prevent unnecessary delay these may be combined but care should be taken to ensure that the pathway is tailored to the individual patient to minimise unnecessary investigations. CT imparts a significant radiation dose and contrast has a small but significant morbidity and mortality.

If a patient presenting to a specialist unit with suspected Lung Cancer has not had a Chest X-ray this should be performed at the time of the first visit.

When a patient with suspected cancer is seen in the clinic then they should be offered a CT as an initial investigation to further the diagnosis and stage the possible disease.

This CT scan should be performed before:

- An intended fibreoptic bronchoscopy
- Most other biopsy procedures.

Local consideration should be made to specific arrangements in the investigation pathway such that the results of CT are available before deciding on the most appropriate next management step. For example, pre-arranged CT slots shortly after an initial clinic visit with rapid review of the patient. For example, CT before a clinic appointment provided this does not lead to unnecessary CT scans or delay in referral. Where there is a CT scan before a clinic appointment then there should be appropriate discussion with the patient.

If the chest x-ray shows a mass a combined diagnostic/staging scan should be performed including the liver and adrenals (see protocol below). If however there is no definite evidence of cancer, e.g. normal chest x-ray, a CT scan of the chest alone may be sufficient to exclude or confirm a lesion. Contrast is not usually necessary but may be used if there is uncertainty or the Radiologist is not confident reporting non-contrast scans. If the chest scan shows a lesion a full staging scan should be performed at the same attendance. If contrast has been given the liver and adrenal phase may be set up before the chest scan so the scan can be continued immediately.

It is recognised that in some units a Radiologist is not always present when the scan is performed and the decision to do a diagnostic study or combined diagnostic and staging scan will need to be made at the time of protocolisation.

3. Unexpected finding of suspected cancer.

If a CXR has been performed and an incidental suspected cancer identified then a second copy of the radiologist's report should be sent to a designated member of the Multidisciplinary team (MDT) usually the respiratory physician. The MDT should have a mechanism to ensure that there is follow up of these reports to ensure a management plan has been instituted by the patient's GP.

B. Staging:

1. Non Small Cell Lung Cancer

CT of the chest and abdomen is the investigation of choice to stage the primary tumour and to detect metastatic disease. Post contrast CT of the brain should be included in the initial staging if symptoms are present or if curative therapy, including surgery, radiotherapy, chemotherapy or a combination, is being considered.

If any such patient has not had a head scan at the initial staging it should be performed separately before treatment.

MRI is the investigation of choice if the CT is normal in the presence of neurological signs.

Staging CT should include post-contrast scans through the chest (to include supraclavicular fossae) and upper abdomen (to include liver and adrenal glands). 100-150mls of intravenous iodinated contrast should be injected at 3-4ml/sec. The chest should be scanned during the arterial phase (20-30 sec delay), and the abdomen during the portal venous phase (60-70 sec delay).

CT may not provide complete staging and other techniques e.g. ultrasound may be considered.

Pancoast (superior sulcus) tumours are best visualised by multiplanar reconstructions, however the extent of these tumours is best demonstrated by MRI.

An 18F-deoxyglucose positron emission tomography CT (FDG PET-CT) scan should be performed to stage disease in any patient who at diagnosis or after down staging is to be offered radical treatment, surgery, radiotherapy, chemotherapy or a combination. Most cases will be for NSCL. It may also be used in cases of indeterminate chest mass– where biopsy is difficult or has failed.

Local arrangements should be in place with consideration given to concurrent investigation of suspected abnormalities such that tests are done in parallel rather in series. E.g. A patient with a potentially operable tumour might have CT biopsy and FDG-PET requested in parallel.

Where metastatic disease is considered then CT, radiography, bone scan or MRI should be requested as necessary.

All patients who are candidates for thoracotomy should have a staging CT scan and a separate PET scan. The images should be available at the time of consultation with the thoracic surgeon.

2. Small Cell Lung Cancer

SCLC should be staged primarily with CT and imaging of any symptomatic area. The scan should cover the chest and abdomen as above and should include the head. (See PET-CT above).

C. Follow-up

Repeat staging should be undertaken after downstaging with chemotherapy prior to surgery. Repeat staging is also required for patients who develop symptoms of SVC obstruction.

If response to treatment such as chemotherapy cannot be assessed adequately by CXR repeat CT scans may be required.

At the end of a treatment programme repeat staging may be necessary to plan further management.

If the patient develops new or recurrent symptoms targeted imaging should be performed. Formal restaging may also be required.

If PET-CT is used to assess residual disease then a gap of at least 6 weeks should be left after chemotherapy.

Appendix 2 – CANCER ALLIANCE CHEMOTHERAPY ALGORITHM

CANCER ALLIANCE CHEMOTHERAPY TREATMENT ALGORITHM FOR LUNG

“Quality and safety for every patient every time”

Document Control

Prepared By	Issue Date	Approved By	Review Date	Version	Contributors	Comments/ Amendment
EAG	11.2012	Chemotherapy group	12.2014	1.1	Network Pharmacists	
EAG	06.2016	Chemotherapy group	06.2017	1.2	Chair of the Chemotherapy Group	

For more information regarding this document, please contact:

EAG Chair:

INTRODUCTION

The 2011 Peer Review Chemotherapy Measures require each Network Site Specific group (EAG) to agree in consultation with the Network Chemotherapy Group (NCG) a set of site specific chemotherapy treatment algorithms for the Network.

Peer Review Definitions

Chemotherapy treatment algorithm

A guideline which specifies the acceptable ranges of regimen options for named steps on the patient pathway. Treatment algorithms are cancer site-specific. Thus, the treatment algorithm for the Lung EAG includes a statement of the range of regimens agreed as acceptable.

Chemotherapy

The term 'chemotherapy' refers to the use of those cytotoxic agents commonly understood and accepted as being covered by this term and includes other agents such as, biological therapy and small molecule tyrosine kinase inhibitors used for the systemic treatment of cancer.

In NCA Treatment Algorithms are included in each ERG Clinical Guidelines which can be found under the tumour specific page of the guidelines section of the website, [Lung Expert Advisory Group Chemotherapy Protocols and Prescriptions](#)

SUPPORTING DOCUMENTS

As new regimens are approved by NICE protocols for use of the new treatment will be uploaded to the chemotherapy site specific pages. The EAG will be asked to update their algorithm with each new treatment approval.

The availability of the Cancer Drug Fund (CDF) has increased the number of treatments potentially available to patients. CDF funded drugs may not be included in the EAG clinical guidelines due to the dynamic nature of CDF funding (i.e. treatments can be removed as well as added).

Any deviation from the algorithm should be recorded by the local Trust clinical chemotherapy service and brought to the NCG for discussion. The Network Policy on managing deviations from approved protocols/ algorithms is on the website: [Lung Expert Advisory Group Chemotherapy Protocols and Prescriptions](#)

LIST OF APPROVED REGIMENS

The Cancer Alliance website provides the most up to date list of approved regimens and should be regularly checked. Appendix One below summarises the Lung regimens on the website.

LUNG ALGORITHM

Chemotherapy General Principles

- Consideration should be given in the first instance as to whether or not chemotherapy is appropriate for the individual. This decision will be based on the extent and type of disease as well as performance status and will take into account the individual wishes of the patient.
- The aim of the chemotherapy (curative, neoadjuvant, adjuvant or palliative) should be defined prior to administration and this should be discussed with the patient together with the potential side effects of the treatment.
- Chemotherapy should be administered in accordance with the published recommendations of the JCCO using whenever possible protocols which have been agreed by the NCA lung group. Because chemotherapy is likely to cause significant toxicity in terms of bone marrow suppression, alopecia, nausea and vomiting and fatigue it should only be administered by teams which include Oncology Specialists, with the appropriate skills and training.
- The patient should be closely monitored while on treatment and every effort made to address quality of life issues.
- For patients receiving palliative or neoadjuvant chemotherapy, treatment should be discontinued if there is no evidence of a response after 2 cycles or after 1 cycle if there is evidence of progressive disease. Chemotherapy should also be discontinued if the patient has unacceptable toxicity even in the absence of progressive disease.
- Ensure that mechanisms are in place to support the entry of eligible patients into clinical trials, subject to the patient giving fully informed consent. The MDT should record the reasons for patients not being entered in to trials that are open.

Small Cell Lung Cancer (SCLC)

Chemotherapy

- Arrange for patients with SCLC to have an assessment by a thoracic oncologist within 1 week of deciding to recommend treatment.
- Combination chemotherapy has been shown to increase survival and quality of life in patients with SCLC and is superior to single agent therapy even in poor prognosis patients.

Good Prognosis Patients

- The prognostic group studies have consistently shown that only the 'good' prognosis patients achieve long term survival.
- The recommended treatment in good prognosis patients with limited stage disease, normal haematological and biochemical parameters, good performance status and sufficient respiratory reserve is concurrent

chemoradiation with Cisplatin and Etoposide (see chemotherapy protocols for details).

- All other good prognosis patients should be offered a combination of Carboplatin or Cisplatin and Etoposide (see chemotherapy protocols for details). Response should be assessed after 2 cycles and only continued if the tumour is responding. Dose modification may be required in the presence of unacceptable toxicity (See protocols for guidance). A total of 4-6 cycles should be given unless there is evidence of progressive disease or unacceptable toxicity.
- Good performance stage (PS 0,1,2) patients with limited stage disease who have not undergone concurrent chemoradiation but who achieve a complete response or good partial response should be offered consolidative thoracic radiotherapy on completion of their chemotherapy.
- Patients who achieve less than a complete response may be referred for consideration of palliative radiotherapy if symptomatic.
- Good prognosis patients (limited and extensive disease) who achieve a partial or complete response to chemotherapy should be referred prior to their penultimate cycle of treatment for consideration of prophylactic cranial irradiation (PCI).

Poor Prognosis Patients

- Patients should be treated with palliative intent using a combination of Carboplatin & Etoposide as per the good prognosis patients or a combination of Vincristine, Doxorubicin and Cyclophosphamide (see chemotherapy guidelines) in patients not suitable for platinum based chemotherapy. Response should be assessed after 2 cycles and chemotherapy only continued if the patient is responding and toxicity is acceptable. Responding, patients should receive between 4 – 6 cycles of treatment. The patient should be re-discussed at the multidisciplinary meeting regarding a referral for radiotherapy following completion of chemotherapy in the presence of symptomatic disease.

Clinical trials

- Ensure that mechanisms are in place to support the entry of eligible patients into clinical trials, subject to the patient giving fully informed consent. The MDT should record the reasons for patients not being entered in to trials that are open.

Disease Relapse

- In patients who relapse more than 3 months following completion of chemotherapy consideration should be given to retreating with their original chemotherapy regime, eg oral Topotecan, providing this is in accordance with patient wishes and their performance status is acceptable. Entry into ongoing clinical trials may be considered if the patient is agreeable. Palliative radiotherapy or symptomatic care however may be in the best interests of the patient.

- If relapse is less than 3 months following treatment these patients fall into a particularly poor category. These patients may be considered for treatment with an alternative chemotherapy regime, for example, oral Topotecan though response rates are likely to be low, or entry into an appropriate clinical trial. Again, palliative radiotherapy or symptomatic care may be more appropriate than further chemotherapy

Non-Small Cell Carcinoma Neoadjuvant Chemotherapy

- Neoadjuvant chemotherapy is not routinely recommended in patients with surgically resectable disease, but downstaging neoadjuvant chemotherapy may be considered in patients whose initial staging precludes them from surgery or radical radiotherapy. This must be discussed at the thoracic MDT.

Adjuvant Chemotherapy

- The meta-analysis of 1995 has shown an absolute survival benefit for adjuvant therapy of 5% for Cisplatin based regimes, but the 95% confidence intervals are wide making the actual benefit difficult to assess. Subsequent studies have confirmed a benefit for adjuvant chemotherapy in selected groups of patients. Adjuvant chemotherapy is therefore recommended in patients with stage T1-3, N1-2 M0 NSCLC and T2-3 N0 M0 NSCLC with tumours greater than 4cm in diameter who are of good performance status 0-1, preferably within 8 weeks of surgery. The proposed regimes are Carboplatin and Paclitaxel or Cisplatin and Vinorelbine (see chemotherapy protocols for details).

Combined Chemoradiation

- Consider chemoradiotherapy for patients with stage II or III NSCLC who are not suitable for surgery. Balance potential benefit in survival with the risk of additional toxicities.
- Combining chemotherapy and radiotherapy for patients with stage III disease has been shown to have survival benefits. All patients with good performance status who have stage IIIA disease who are not suitable for surgery and selected IIIB NSCLC patients should be offered combined chemoradiation treatment. Where the patient's PS, renal function and PFTs allow, concurrent chemoradiation using the SOCCAR regimen should be considered as standard.
- Ensure all patients potentially suitable for multimodality treatment (surgery, radiotherapy and chemotherapy in any combination) are assessed by a thoracic oncologist and a thoracic surgeon.

Palliative chemotherapy

- In patients with stage 3B (not suitable for radical treatment) & 4 disease, chemotherapy may have a role both in symptomatic benefit and possible prolongation of survival. Patients who fit into this category should be fit (PS 0, 1, 2) and be agreeable to treatment. The recommended protocols are a combination of a platinum drug (Cisplatin or Carboplatin) and

Pemetrexed for patients with non-squamous histology and for those with squamous cell cancer or non small cell lung cancer not otherwise specified and a 3rd generation drug (Vinorelbine, Gemcitabine, Paclitaxel or Docetaxel) (usually 4 cycles) with single agent Vinorelbine or Gemcitabine reserved for those not suitable for platinum based regimes (see chemotherapy protocols for details). Note patients with non-squamous histology should now be offered Pemetrexed and a Platinum drug.

- In patients with Stage 3B disease who have had a response to chemotherapy it may be appropriate to re-discuss the patient at the multidisciplinary meeting regarding referral for thoracic radiotherapy. Patients with stage 4 disease should be re-discussed at the multidisciplinary meeting regarding a referral for radiotherapy in the presence of persisting symptomatic disease.
- All patients within this group should be considered for entry into appropriate clinical trials. Current trials include the following:
 - FRAGMATIC
- In patients not suitable for chemotherapy, consideration should be given as to whether they may be suitable for the TOPICAL study, which is looking at the role of Tarceva, an EGFR inhibitor, in the management of patients with advanced NSCLC.

Tyrosine Kinase Inhibitors

(NICE Technology Appraisal Guidance 192, 2010)

- This guidance states that Gefitinib is recommended as a treatment option for the firstline treatment of people with locally advanced or metastatic non small cell lung cancer (NSCLC) if
 1. They test positive for epidermal growth factor receptor tyrosine kinase (EGFR-TK) mutation and
 2. The manufacturer provides gefitinib at the fixed price agreed under the patient access scheme. Gefitinib is given as an oral 250mg tablet daily, and is being supplied by the manufacturer at a fixed price under a patient access scheme. Under this scheme there is a fixed cost of £12200 per patient once the third pack is provided, so assessment of response to treatment before the end of the 2nd month is essential.”
- The NCA Lung EAG recommends that this guidance is followed. Current policy which is regularly reviewed (July 2011) is to request EGFR mutation testing on all suitable patients following MDT discussion. In addition EGFR mutation testing can be requested before MDT discussion at the discretion of the treating clinicians if it is highly likely that this treatment might be a possibility. EGFR mutation testing can also be requested at any later stage if the clinicians feel that this would be clinically beneficial to the patient. Second Line Chemotherapy and TKIs

- In good performance status patients who have had a durable response (more than 6 months) to first line chemotherapy it may be appropriate to consider retreatment with the original regime. The alternative recommendation is consideration of single agent Docetaxel as per the NICE guidelines. Again all patients should be considered for entry into appropriate clinical trials.
- Patients may be offered erlotinib (Tarceva) as an alternative to docetaxel. This decision will be at the discretion of the oncologist and will take into account patient preference. In patients with BAC, erlotinib should be considered the drug of choice.

APPENDIX ONE: NCA APPROVED LIST OF REGIMENS FOR LUNG

Doc No.	Title
LOO1	Oral vinorelbine
L002	NP (Cisplatin – vinorelbine)
LOO3	CAV (or VAC) (Cyclophosphamide, vincristine & doxorubicin)
LOO4	Carboplatin – vinorelbine
LOO5	MVP (Mitomycin, vinblastine, cisplatin)
LOO6	MVCarbo (Mitomycin, vinblastine, carboplatin)
LOO7	CEQ4W (Carboplatin – Etoposide 4 weekly)
LOO8	CEQ3W (Carboplatin- Etoposide 3 weekly)
LOO9	Carboplatin & Gemcitabine
LOO10	Docetaxel
LOO11	Gemcitabine
LOO12	Docetaxel & Cisplatin
LOO13	Turrisi Cisplatin, Etoposide
LOO14	Carboplatin & Paclitaxel
LOO15	Oral Topotecan
LOO16	Cisplatin – Pemetrexed
LOO17	Carboplatin – Pemetrexed
LOO18	Erlotinib
LOO19	Document not in use
LOO20	Nintedanib and Docetaxel