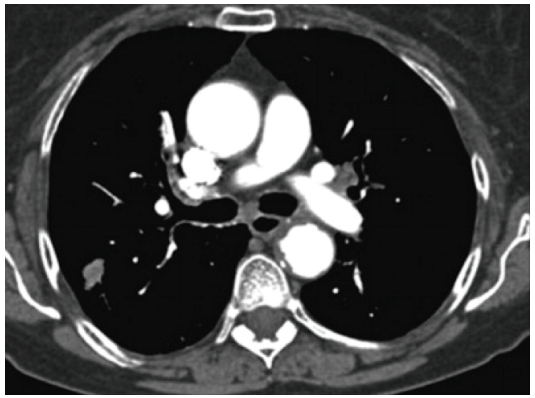
Commence prehabilitation and optimisation from first assessment – Ensure the three pillars of prehabilitation are covered:

Treat tobacco addiction	Physical activity	Prevention & management of malnutrition



GROUP 1: Peripheral tumour with normal hilar and mediastinum on staging CT with no disant metastases

For patients deemed suitable and fit enough for investigations and treatment. For those patients deemed unfit for investigations and treatment list straight for MDT discussion and confirm best supportive care decision.

Including: Solid pulmonary nodules ≥8mm diameter / ≥300mm3 volume and BROCK risk of malignancy ≥10% or persistent sub-solid nodules for ≥3 months and solid component ≥5mm

Excluding: Solid nodules <8mm / <300mm3 or BROCK risk <10%, pure ground glass nodules of any size (even if enlarging), and sub-solid nodules with solid component <5mm.
Ground glass nodules do not require further diagnostics and should continue under surveillance. MDTs should exercise extreme caution if considering further investigations or intervention on ground glass nodules.

Diagnostic tests

Option 1: PET first then consider additional investigations dependent upon PET result.
Note – Some MDTs may consider it appropriate to proceed directly to treatment without a biopsy if there is no upstaging on PET and the probability of malignancy is sufficiently high

Option 2: Request diagnostic test bundle

Option 1: PET first
If no upstaging on PET then request additional tests from option 2 diagnostic test bundle
If PET-CT upstages the tumour request additional tests from the appropriate algorithms as per below:

N1 M0 – Group 2
N2-3 M0 – Group 3
N0-3 M1 – Group 5

Option 2: Diagnostic test bundle
(requested in parallel)

PET-CT
Primary tumour biopsy: Percutaneous image-guided biopsy OR bronchoscopic guided biopsy (Fluoroscopy, radial EBUS, navigational bronchoscopy)

Physiology tests
(request simultaneously)

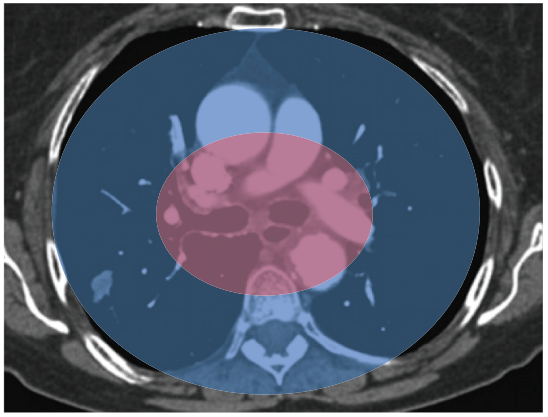
- Spirometry and transfer factor
- Shuttle walk or stair climbing test
- ECG

Request echocardiogram if:

- Heart murmur
- Abnormal ECG
- Known ischaemic heart disease / valvular disease
- Possibility of pneumonectomy

Notes and guidance

Peripheral tumour = positioned in the outer 2/3 of the thorax based on axial CT image (blue area):



Note: Percutaneous image-guided biopsy should be the preferred method of primary tumour biopsy where possible given the higher sensitivity. Bronchoscopic guided biopsy might be considered in cases where image guided is considered high risk (e.g severe emphysema) and /or in the presence of a bronchus sign (a bronchus leading directly into the tumour seen on CT imaging).

Mandatory dataset for MDT discussion:

- **PET-CT results**
- **Performance status, FEV_1 and DLCO, post-operative predicted FEV_1 and DLCO**

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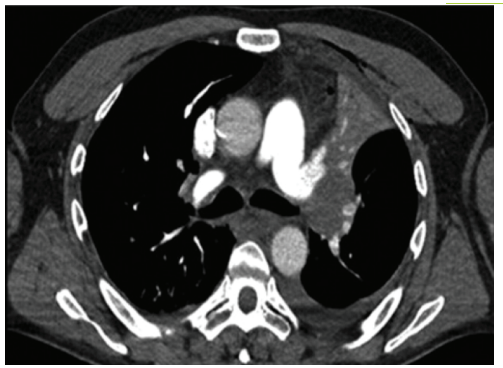
Ensure the three pillars of prehabilitation are covered:

Treat tobacco addiction	Physical activity	Prevention & management of malnutrition



GROUP 2: Central tumour or N1 lymphadenopathy with normal mediastinum on staging CT with no distant metastases

For patients deemed suitable and fit enough for investigations and treatment. For those patients deemed unfit for investigations and treatment list straight for MDT discussion and confirm best supportive care decision.

PET-CT has a 15% false positive rate and 25% false negative rate for N2/3 disease in this category, therefore EBUS is required regardless of PET findings

Prevalence of N2/3 disease in this category is 20-25%

Diagnostic tests

Option 1: PET first then consider additional investigations dependent upon PET result.

Option 2: Request diagnostic test bundle

Option 1: PET first

If no upstaging on PET then request additional tests from option 2 diagnostic test bundle
If PET-CT upstages the tumour request additional tests from the appropriate algorithms as per below:

N2-3 M0 – Group 3
N0-3 M1 – Group 5

Option 2: Diagnostic test bundle

(requested in parallel)

PET-CT
Diagnostic Bronchoscopy (if central tumour for biopsy)
Staging EBUS
(performed simultaneously to diagnostic bronchoscopy)
Contrast enhanced CT brain

Physiology tests

(request simultaneously)

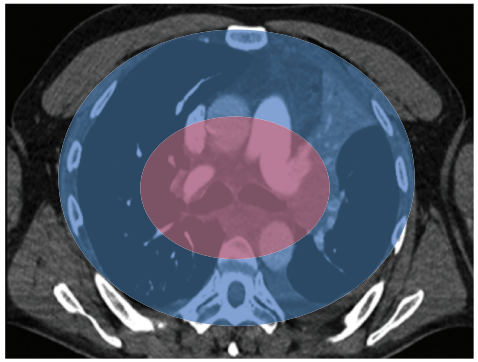
- Spirometry and transfer factor'
- Shuttle walk or stair climbing test
- ECG

Request echocardiogram if:

- Heart murmur
- Abnormal ECG
- Known ischaemic heart disease / valvular disease
- Possibility of pneumonectomy

Notes and guidance

Central tumour = positioned in the inner 1/3 of the thorax based on axial CT image (red area):



A systematic examination of the mediastinal and hilar lymph nodes beginning with N3 stations, followed by N2 stations and finally N1 (a suggested systematic approach is outlined in the table below). Any lymph node measuring >5mm in short axis, based on sonographic measurement, is sampled

N3	N2	N1
Contralateral station 11	Station 7	Ipsilateral station 10
Contralateral station 10	Ipsilateral station 2	Ipsilateral station 11
Contralateral station 4	Ipsilateral station 4	
Contralateral station 2		

Mandatory dataset for MDT discussion:

- **PET-CT, EBUS pathology & CT brain results**
- **Performance status, FEV_1 and DLCO, post-operative predicted FEV_1 and DLCO**

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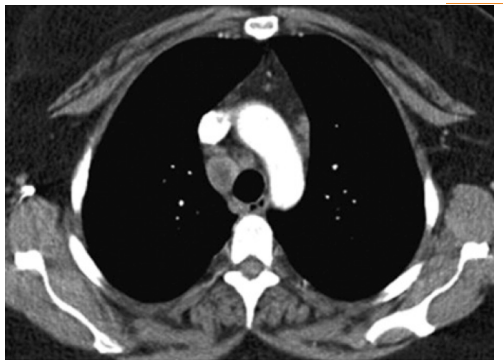
Commence prehabilitation and optimisation from first assessment –
Ensure the three pillars of prehabilitation are covered:

Treat tobacco addiction	Physical activity	Prevention & management of malnutrition



GROUP 3: Primary tumour and discrete mediastinal lymphadenopathy on staging CT with no distant metastases

For patients deemed suitable and fit enough for investigations and treatment. For those patients deemed unfit for investigations and treatment list straight for MDT discussion and confirm best supportive care decision.

PET-CT has a 15% false positive rate and 25% false negative rate for N2/3 disease in this category, therefore EBUS is required regardless of PET findings

Prevalence of N2/3 disease is this category is 60%

Diagnostic tests

Option 1: PET first then consider additional investigations dependent upon PET result.

Option 2: Request diagnostic test bundle

Option 1: PET first

If no upstaging on PET then request additional tests from option 2 diagnostic test bundle
If PET-CT upstages the tumour request additional tests from the appropriate algorithms as per below:
N0-3 M1 – Group 5

Option 2: Diagnostic test bundle
(requested in parallel)

PET-CT
Staging EBUS
Contrast enhanced MR brain

Note: If the CT or PET-CT also shows enlarged or FDG avid supraclavicular lymph nodes then replace EBUS with USS guided lymph node biopsy. EBUS would be needed if neck sampling was negative. If all nodal sampling is negative then biopsy of the primary tumour may be needed.

Physiology tests
(request simultaneously)

- Spirometry and transfer factor
- Shuttle walk or stair climbing test
- ECG
- Creatinine clearance / eGFR

Request echocardiogram if:

- Heart murmur
- Abnormal ECG
- Known ischaemic heart disease / valvular disease
- Possibility of pneumonectomy

Notes and guidance

Discrete mediastinal lymphadenopathy has well defined borders allowing easy measurement and is not conglomerate with other lymph node stations. It is non-bulky (<3cm).

Staging EBUS definition:

A systematic examination of the mediastinal and hilar lymph nodes beginning with N3 stations, followed by N2 stations and finally N1 (a suggested systematic approach is outlined in the table below). Any lymph node measuring >5mm in short axis, based on sonographic measurement, is sampled

N3	N2	N1
Contralateral station 11	Station 7	Ipsilateral station 10
Contralateral station 10	Ipsilateral station 2	Ipsilateral station 11
Contralateral station 4	Ipsilateral station 4	
Contralateral station 2		

Mandatory dataset for MDT discussion:

- **PET-CT results, EBUS pathology results, brain-imaging results**
- **Performance status, FEV_1 and DLCO, post-operative predicted FEV_1 and DLCO, renal function**

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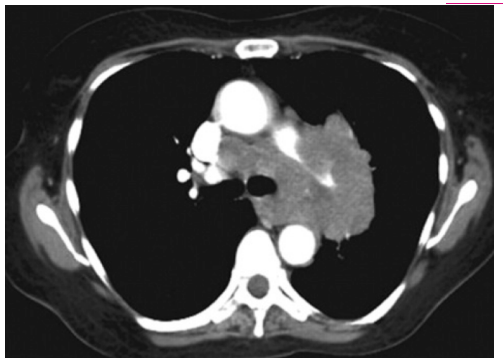
Commence prehabilitation and optimisation from first assessment –
Ensure the three pillars of prehabilitation are covered:

Treat tobacco addiction	Physical activity	Prevention & management of malnutrition



GROUP 4: Conglomerate and invasive nodal malignancy on staging CT with no distant metastases

For patients deemed suitable and fit enough for investigations and treatment. For those patients deemed unfit for investigations and treatment list straight for MDT discussion and confirm best supportive care decision.

Radiology is considered diagnostic for malignancy and pathological confirmation only required
Prevalence of N2/3 disease is this category is 100%

Diagnostic tests

Option 1: PET first then consider additional investigations dependent upon PET result.

Option 2: Request diagnostic test bundle

Option 1: PET first

If no upstaging on PET then request additional tests from option 2 diagnostic test bundle
If PET-CT upstages the tumour request additional tests from the appropriate algorithms as per below:
N0-3 M1 – Group 5

Option 2: Diagnostic test bundle
(requested in parallel)

PET-CT
Diagnostic bronchoscopy with conventional TBNA OR
Diagnostic EBUS
Contrast enhanced MR brain

Note: If the CT or PET-CT also shows enlarged or FDG avid supraclavicular lymph nodes then replace EBUS with USS guided lymph node biopsy. EBUS would be needed if neck sampling was negative.

Physiology tests
(request simultaneously)

- Spirometry and transfer factor'
- Creatinine clearance / eGFR

Notes and guidance

Invasive mediastinal lymphadenopathy has poorly defined borders and cannot be easily measured. It forms conglomerate disease with other nodal stations.

Diagnostic EBUS definition:

Targeted sampling of nodal disease for pathological confirmation, tumour sub-typing and molecular pathology.

Mandatory dataset for MDT discussion:

- **PET-CT results, EBUS pathology results, brain-imaging results**
- **Performance status, FEV_1 and DLCO, renal function**

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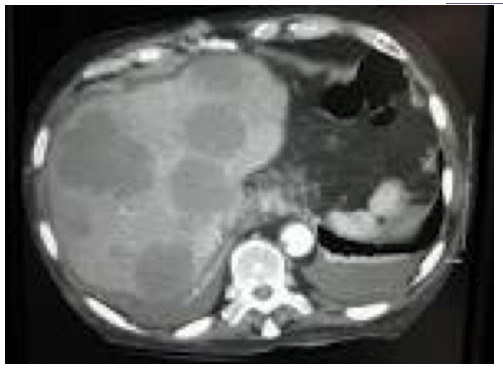
Commence prehabilitation and optimisation from first assessment –
Ensure the three pillars of prehabilitation are covered:

Treat tobacco addiction	Physical activity	Prevention & management of malnutrition



GROUP 5: Distant metastases on staging CT

For patients deemed suitable and fit enough for investigations and treatment. For those patients deemed unfit for investigations and treatment list straight for MDT discussion and confirm best supportive care decision.

Follow this algorithm in cases where there is clear evidence of stage 4 disease on CT. In cases of uncertain findings there may need to additional clarification tests e.g. liver USS/MR, triple phase adrenal wash out CT or PET-CT.

Early referral to specialist palliative care team is recommended regardless of diagnostic pathway or treatment plan

Diagnostic tests

Choose most appropriate sampling technique to yield adequate pathology for tumour sub-typing and targeted therapy assessment:

The core procedures are:
Diagnostic bronchoscopy (including conventional TBNA)
Diagnostic EBUS
Percutaneous image-guided biopsy
These are procedures performed by core lung cancer MDT members aware of the pathological requirements of sampling stage 4 disease

Consider:

Pleural aspiration ± Medical thoracoscopy if symptomatic pleural effusion.

Avoiding bone biopsy (lacking a significant soft tissue component) given time for decalcification and inability to do molecular pathology.

Ensure non-MDT clinicians performing biopsies are informed about tissue requirements for targeted therapy.

Mandatory dataset for MDT discussion:

- **Pathology results**
- **Performance status, renal function**

Physiology tests
(request simultaneously)

- Creatinine clearance / eGFR

Specific Notes

1 - Reflex testing in stage 4 NSCLC is recommended therefore it is critical the pathologist are provided with adequate information, including staging, on request forms.

Non-squamous NSCLC: EGFR, ALK, ROS-1, PDL-1
Squamous NSCLC: PDL1

2 – In patients deemed unfit for invasive investigations or chemotherapy, consider serum EGFR testing to inform role of TKI therapy

Workup of oligometastatic disease

Definition of oligometastatic disease = single metastases in a single organ

In patients that may be suitable for a high grade palliative approach request the following investigations in addition to those performed for Group 5 (either request PET first or request as a diagnostic text bundle):

PET-CT
Contrast-enhanced brain imaging
Staging EBUS
Spirometry and transfer factor
Shuttle walk or stair climbing test
Echocardiogram

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