The diagnosis and treatment of lung cancer

Information for the public
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About this information

NICE clinical guidelines advise the NHS on caring for people with specific conditions or diseases and the treatments they should receive. The information applies to people using the NHS in England and Wales.

This information explains the advice about the diagnosis and treatment of lung cancer that is set out in NICE clinical guideline 121.

This is an update of advice on lung cancer that NICE produced in 2005. The advice has been updated on:

- information and support
- diagnosis and staging
- giving up smoking
- surgery
- chemotherapy with surgery
- chemotherapy with radiotherapy
- treatments for small-cell lung cancer
- treatments for breathlessness and cancer that has spread to the brain and
follow-up appointments.

The advice on deciding whether you need tests for lung cancer has been removed. This is because it has been replaced by new advice on suspected cancer. See recognising, investigating and referring people with symptoms of suspected cancer for details.

Does this information apply to me?

Yes, if you are an adult (18 years and older) with lung cancer who is being treated in secondary or tertiary care.

No, if you are:

- an adult with a type of cancer called mesothelioma
- an adult with cancer that started in a different part of the body and then spread to the lungs
- a child (younger than 18) with lung cancer.

Your care

In the NHS, patients and healthcare professionals have rights and responsibilities as set out in the NHS Constitution (http://www.dh.gov.uk/en/DH_132961). All NICE guidance is written to reflect these. You have the right to be involved in discussions and make informed decisions about your treatment and care with your healthcare team. Your choices are important and healthcare professionals should support these wherever possible. You should be treated with dignity and respect.

To help you make decisions, healthcare professionals should explain lung cancer and the possible treatments for it. They should cover possible benefits and risks related to your personal circumstances. You should be given relevant information that is suitable for you and reflects any religious, ethnic, or cultural needs you have. It should also take into account whether you have any physical or learning disability, sight or hearing problem or language difficulties. You should have access to an interpreter or advocate (someone who helps you put your views across) if needed.

Your family and carers should be given their own information and support. If you agree, they should also have the chance to be involved in decisions about your care.

You should be able to discuss or review your care as your treatment progresses, or your circumstances change. This may include changing your mind about your treatment or care. If you
have made an 'advance decision' (known as a 'living will' in the past) in which you have already given instructions about any treatments that you do not wish to have, your healthcare professionals have a legal obligation to take this into account.

All treatment and care should be given with your informed consent. If, during the course of your illness, you are not able to make decisions about your care, your healthcare professionals have a duty to talk to your family or carers unless you have specifically asked them not to. Healthcare professionals should follow the Department of Health's advice on consent (www.dh.gov.uk/en/DH_103643) and the code of practice for the Mental Capacity Act. Information about the Act and consent issues is available from www.nhs.uk/CarersDirect/moneyandlegal/legal In Wales healthcare professionals should follow advice on consent from the Welsh Government (www.wales.nhs.uk/consent).

In an emergency, healthcare professionals may give treatment immediately, without obtaining your informed consent, when it is in your best interests.

### Lung cancer

In lung cancer, cells in the lungs start to multiply in an uncontrolled way, forming a growing area called the primary cancer or primary tumour. This is a malignant cancer that can cause symptoms such as a persistent cough, coughing up blood, and shortness of breath.

There are two main types of lung cancer:

- **small-cell lung cancer**
- **non-small-cell lung cancer**.

The different types of lung cancer develop in different ways, and the treatments are also different.

Like other cancers, lung cancer can spread to other parts of the body to form secondary cancers. Depending on where they are, secondary cancers can cause problems such as pain in the bones, headaches, nausea or vomiting.

### Information and support

If you have been told that you have lung cancer, you may be feeling worried about your treatment and what will happen to you. Your healthcare team will talk to you about your concerns and feelings about the diagnosis.
If you have lung cancer, or are having tests for lung cancer, you may be worried about having the tests, what they will show and the possible treatments. Your doctor, lung cancer specialist nurse and other healthcare professionals caring for you should explain the tests, and what the results mean. They should talk to you about possible treatments, and give you the chance to discuss these in private with the support of carers, and your family if you wish. They should give you information that you find easy to understand. They should also offer you copies of any letters to other healthcare professionals about your condition.

The information you are given should help you to weigh up the pros and cons of possible treatments and feel supported in making decisions about your care. Your healthcare team should discuss your care with you at all stages and should give you opportunities to make your wishes clear. A lung cancer specialist nurse should be available at all stages to support you and your carers. You should be told how you can contact this nurse between hospital visits.

Questions you might like to ask your healthcare team

- What are the chances I have lung cancer?
- Can you treat lung cancer?
- Can you tell me more about lung cancer and provide information for my family/carers?
- What support can you offer me now?

Diagnosing and staging lung cancer

If you have had a chest X-ray that shows you could have lung cancer or a chest specialist thinks you may have lung cancer, you will be offered other tests. These will give information about the site and size of any cancer and how much it has spread (the stage). While these tests are being carried out your healthcare team will assess how well your lungs and heart are working (your fitness). This will help them to decide which treatments to offer you.

*Having a CT scan*

Often you'll be offered an appointment to have a CT scan before you see the chest specialist. If you have kidney problems the way the scan is done may be slightly different. The results of the CT scan
can help the specialist decide what further tests you need. The CT scan also helps to determine the stage of the lung cancer.

### Questions about finding out what is wrong (diagnosis)

- Can you give me more details about the tests/investigations you are recommending?
- What do these tests involve? Are there side effects or risks?
- If I have a scan, what will you be scanning?
- Can you tell me more about the CT scan and how long it will take?
- Where will the tests be carried out? Will I need to have them in hospital?
- How long will I have to wait until I have these tests?
- How long will it take to get the results of these tests?

### Having a PET-CT scan

If the CT scan suggests you have cancer at an early stage and you are fit enough for treatment, you should be offered another type of scan called a PET-CT scan. A PET-CT scan can show areas of active cancer or inflammation. If the PET-CT scan confirms that the cancer has not spread, you will probably be offered surgery or radiotherapy to cure the cancer (see 'Treatments for non-small-cell lung cancer'). If the PET-CT scan shows that the cancer has spread to lymph glands in the chest (local spread) you should be offered a biopsy of the glands. This will help doctors find out the stage of the cancer and decide which treatments to offer (see 'Treatments for non-small-cell lung cancer' and 'Treatments for small-cell lung cancer').

### Having a bronchoscopy and biopsy

If the CT scan shows signs of cancer in the central part of your chest, you should be offered a test called a bronchoscopy if this is likely to help your doctors to advise you on the best treatments. If possible, the healthcare team will take a tiny sample of the affected area (by bronchial biopsy or bronchial wash) so that lung cells can be checked under a microscope in the laboratory. You should be given information about bronchoscopy before the procedure.
If the CT scan shows that it’s likely the cancer has spread to the glands in your chest or neck, you might be offered another type of scan (an ultrasound scan) of your neck with a biopsy of neck glands instead of a bronchoscopy and bronchial biopsy.

If you don't want or can't have a bronchoscopy and biopsy and there are signs of possible cancer in the central part of your lung, you should be offered sputum cytology. You'll be asked to provide samples of phlegm (sputum), which will be checked in the laboratory for cancer cells. This is a less reliable way of detecting lung cancer.

**Other types of biopsy**

If the CT scan shows signs of cancer near to the edges of the lung, you should be offered another type of biopsy (called a transthoracic needle biopsy) rather than a bronchoscopy. This involves passing a special needle through the skin of the chest – under a local anaesthetic – to remove a small piece of the lung. This is done while the person is having a CT or ultrasound scan to help the doctor to guide the needle to the tumour.

If you’re not able to have the biopsies described above or you've had one (or more) but it didn't give a clear answer, you might be offered a surgical biopsy. This is an operation under a general anaesthetic where an opening is made in the chest so that the surgeon can remove a small piece of lung tissue for testing.

If there are signs that the cancer has spread outside the lung, you may be offered a biopsy of these areas rather than from the lung itself.

**Other types of imaging**

MRI is another type of scan sometimes used for staging a particular type of lung cancer.

If there are signs that the cancer may have spread to the brain, you should be offered MRI or a CT scan of your head.

If there are signs that the cancer may have spread to the bones, you should be offered an X-ray first. If nothing shows up, you should be offered either a bone scan or MRI.

**Giving up smoking**
If you have lung cancer and you smoke, you'll be advised to stop.

This is particularly important if you're offered surgery because people who give up are less likely to have complications after lung cancer surgery.

You should be offered aids (for example, nicotine patches) to help you quit.

Your surgery should not be delayed to allow you time to give up.

**Treatments for non-small-cell lung cancer**

Some treatments may not be suitable for you, depending on your exact circumstances. If you have questions about specific treatments and options, please talk to a member of your healthcare team.

The most suitable next steps will depend on the stage of the cancer – whether you have early-stage cancer, local spread or metastasis. The lung cancer multidisciplinary team will discuss your care at their team meeting and your doctor or lung cancer specialist nurse will discuss possible treatments with you.

**Questions about the treatment**

- Why have you decided to offer me this type of treatment?
- What are the pros and cons of this treatment?
- What will the treatment involve?
- How will the treatment help me? What effect will it have on my symptoms and everyday life? What sort of improvements might I expect?
- How long will it take to have an effect?
- Are there any risks or side effects with this treatment?
- Are there any other treatments I could have?
- Can I have a leaflet about the treatment?
- What might happen if I decide not to go ahead with treatment?
Surgery to remove the cancer

If the cancer has not spread outside the lung and tests show you are fit enough for surgery, you should normally be offered an operation to remove the cancer. You won't be offered surgery if you've had a heart attack in the past 30 days or if the tests show you are not well enough. If you have chronic stable angina you may be offered treatment for this before surgery to remove the cancer.

Surgery for lung cancer is usually done by removing part of one lung (called lobectomy). The exact operation will depend on where the cancer is and how well your lungs are working. If your lungs aren't working well, a smaller part of the lung will usually be removed, to leave as much of the lung as possible. During the operation, samples of cells should be taken from the lymph glands near the lungs, so that they can be checked for signs of cancer.

Having other treatments with surgery

Chemotherapy involves giving people drugs that kill cancer cells. If you're having surgery to try to remove the cancer, you should not normally be offered a course of chemotherapy before the operation unless you are taking part in a clinical trial.

However, you may be offered chemotherapy after surgery. The aim of this chemotherapy is to destroy any cancer cells that might still be in the body. There are advantages and disadvantages to chemotherapy and these should be explained before you decide whether to go ahead.

Other types of treatment if surgery is not possible

Radiotherapy to remove the cancer

If surgery is not possible, and you have a small tumour that has not spread or has spread only to the nearby lymph glands, you may be offered radiotherapy to try to cure the cancer. This is called radiotherapy with curative intent. You may also be offered this type of radiotherapy if the cancer has spread to other lymph glands in the chest and to parts of the body near the lungs, if the area that needs to be treated is not too big.

Before you have radiotherapy, you should have tests to check how well your lungs are working. If your lungs aren't working well, you should still be able to have the radiotherapy as long as only a small part of the lung needs to be treated.
You may be offered an intensive type of radiotherapy known as CHART, which is given three times a day over 2 weeks. If CHART isn't available in your area, you will be offered 'standard' radiotherapy, which usually means having 32–33 daily treatments over 6 to 7 weeks, or 20 daily treatments over 4 weeks.

**Radiotherapy and chemotherapy for cancer that's spread inside the chest**

If the cancer has spread to lymph glands in the chest and your doctors are recommending radiotherapy with curative intent instead of surgery, you may be offered chemotherapy as well as radiotherapy. This is called chemoradiotherapy.

If you don't want or can't have chemoradiotherapy, you should be offered CHART if it is available in your area.

**Chemotherapy for cancer that has spread to other parts of the body**

If the lung cancer is large or has spread to lymph glands some distance away or to other places in the body, surgery and radiotherapy with curative intent are not useful. If you are generally well, chemotherapy may help control the disease and improve your symptoms.

There are a number of different options for chemotherapy and your doctor or specialist nurse will discuss these with you. If the cancer starts to grow again after a first course of chemotherapy your doctor may suggest a second course to help your symptoms.

**Treatments for small-cell lung cancer**

After the cancer has been diagnosed and staged, your doctor will arrange for you to see a specialist (called a thoracic oncologist) within 1 week. During this assessment your doctor or specialist nurse will discuss with you options for treatment. You should be offered four to six cycles of combination chemotherapy. Your doctor will check your condition before each cycle.

If your cancer has not spread outside the lung and nearby lymph nodes, you will be offered radiotherapy while you are having chemotherapy. This is called concurrent chemoradiotherapy. If you are not able to have concurrent chemoradiotherapy but chemotherapy has shrunk the main cancer, your doctor should offer you radiotherapy after the chemotherapy.

If treatment seems to have worked, your doctor should offer you radiotherapy to the brain to stop the cancer cells from developing there. This is called prophylactic cranial irradiation (or PCI).
If you have already had chemotherapy and it shrunk your cancer, you should be offered another course if the cancer starts growing again. However, if a first course of chemotherapy hasn’t helped you, there is very little evidence that a second course would be of benefit. You may be offered radiotherapy to help with your symptoms.

Occasionally small-cell lung cancer is found at an early stage. If this is the case, you may be offered an operation to remove it.

**Help with pain, discomfort and other possible effects of cancer**

If you think your care does not match what is described in this information, please talk to a member of your healthcare team in the first instance.

If you have symptoms such as breathlessness, pain or discomfort, you should be offered an appointment as soon as possible with a healthcare professional who specialises in reducing these symptoms (palliative care).

**If you’re short of breath**

If you’re finding it hard to breathe, your doctor should consider whether radiotherapy might help. If the cancer involves one of your large airways, your doctor should check regularly whether the cancer is growing and blocking the airway. If this happens you might be offered radiotherapy or a procedure using bronchoscopy to remove some of the cancer.

You might also be offered a stent. This is a piece of tubing that can be used to strengthen the airway and help keep it open.

You should also be offered other types of help for breathlessness. You should be given the opportunity to learn how to control your breathing and some ways of coping with the effects of breathlessness. This may be done at a breathlessness clinic.

**If the breathlessness is caused by a build up of fluid between the lungs and the rib cage (pleural effusion)**

With lung cancer, fluid can sometimes build up between the lungs and the rib cage making it hard to breathe. This called a pleural effusion. If you have a pleural effusion that is causing problems, you should be offered treatment to remove the fluid. This will be done by drawing the fluid away under local anaesthetic.
If this helps, you should be offered something called talc pleurodesis. Talc will be injected between your lungs and rib cage to stop the build up of fluid.

**If you’re coughing or coughing up blood**

If you’re coughing or coughing up blood, your doctor should consider whether radiotherapy might help. An opioid drug such as codeine or morphine may also help with a troublesome cough.

**If your voice is hoarse**

If the cancer is affecting your voicebox (larynx), your voice may keep going hoarse. If this is happening, you should be offered an appointment with an ear, nose and throat specialist.

**If the cancer is blocking one of the major blood vessels**

Sometimes the cancer can press on and block a major blood vessel in the upper chest called the superior vena cava. The face, neck and arms can become puffy and swollen. If you have this, you should be offered radiotherapy and chemotherapy if appropriate given the type and stage of the cancer and your general health.

If the blockage is having serious effects, or if you've had other treatment but it hasn't helped, your doctor should consider putting a stent into the superior vena cava.

**If the cancer has spread to the brain**

If the cancer has spread to your brain and is causing symptoms, your doctor should offer you a steroid called dexamethasone. You may be offered radiotherapy of your brain if this could help your symptoms and you are in good general health.

**If cancer has spread to the bones**

If the cancer has spread to your bones, you may need painkillers. If these don't ease the pain, you should be offered a single dose of radiotherapy.
Other effects of cancer

If you are having other problems because of the cancer – for example, if you've lost weight or lost your appetite, you have trouble swallowing or you have depression, you should be offered appointments with other healthcare professionals who have training and expertise in these areas.

Follow-up appointments

You and members of your healthcare team should agree a plan for your future appointments and check-ups, called a follow-up plan. You should be offered an appointment to discuss this plan within 6 weeks of finishing treatment. You should be offered regular follow-up rather than having to make your own appointments when you need to.

Seeing the specialist nurse rather than the doctor

When you've had your treatment, you may be given the option of nurse-led care. This would involve seeing a specialist nurse regularly rather than a hospital doctor.

Your opinions and experiences of lung cancer treatment

Your opinions and experiences are important and can help to improve services. You should be given the opportunity to pass them on. If any changes to services are a result of patient surveys, you should be told about them.

Words and terms used in this information

Biopsy

Taking a tiny or small piece of tissue to be tested – which in this case means checking for cancer cells under the microscope.

Bronchial wash

Washing of the airways during bronchoscopy to collect lung cells for examination in the laboratory.
**Bronchoscopy**

Using a narrow, flexible tube containing a small video camera to look down into the lung. The tube is passed through the mouth or nose under local anaesthetic into the windpipe, and the moving images can be seen on a TV screen in front of the doctors. A bronchial biopsy may be taken at the same time, through a channel in the tube, using tiny pincers or a fine needle at the end of the tube.

**CHART**

An intensive type of radiotherapy that is given three times a day over 2 weeks. CHART stands for continuous hyperfractionated accelerated radiotherapy.

**Chemoradiotherapy**

Both chemotherapy and radiotherapy are given. You may have chemotherapy and radiotherapy together (concurrent chemoradiotherapy) or you may have radiotherapy after you have finished chemotherapy (sequential chemoradiotherapy).

**Chemotherapy**

Treatment with drugs designed to kill cancer cells. Most chemotherapy drugs are injected into a vein, but some are taken as tablets.

**Combination chemotherapy**

Chemotherapy is often given as a combination of several anti-cancer drugs. This is called combination chemotherapy.

**CT scan**

A type of scan that uses X-rays to obtain images of inside the body – the images show internal organs more clearly. The scan takes only a few minutes.

**Cycle**

Chemotherapy is usually given in cycles. A cycle includes the time you are given treatment and then a break before the next treatment to allow you to recover.
Local spread

If a cancer has spread locally, this means that it has spread to places near to the main cancer (such as the nearby lymph glands) but it hasn't spread to different parts of the body (see 'Metastasis').

Lymph gland (or lymph node)

Area of the lymph system that filters out particles and cells (including cancer cells) from the fluid collected from tissues (lymph fluid).

Metastasis

Spreading of cancer to different places around the body. The cancers that develop are called metastases or secondary cancers, but they're still related to the main cancer (so if lung cancer spreads to the bone, the cancer in the bone is described as 'secondary to lung cancer', not as bone cancer).

MRI

A type of scan that uses magnetism instead of X-rays to obtain images of inside the body. Like CT scans, the images show 'slices' through the body. MRI stands for magnetic resonance imaging.

Multidisciplinary team

A healthcare team of different types of healthcare professional – such as doctors, nurses and physiotherapists – who specialise in caring for people with particular medical conditions. A person with lung cancer would see several different members of a lung cancer multidisciplinary team.

Non-small-cell lung cancer

Squamous cell carcinoma, adenocarcinoma and large-cell carcinoma are types of non-small-cell lung cancer.

PET-CT scan

A type of scan that can give a good idea of whether there are areas of the body with active cancer.
Radiotherapy

Using X-rays and other forms of radiation to target and destroy cancer cells. Some patients have radiotherapy instead of surgery, to try to cure the cancer. This is called radiotherapy with curative intent, and the treatment is divided up into small doses that are given over many days. It may be given after surgery or at the same time as chemotherapy. Some patients have palliative radiotherapy, where the dose is given on one or a few days only, to relieve symptoms.

Small-cell lung cancer

A type of lung cancer in which the cancer cells are smaller than in other types. It is also sometimes called 'oat cell' cancer.

Sputum cytology

This involves sending a sample of sputum (phlegm) away to the laboratory so that any lung cells in the phlegm can be checked under a microscope.

Stage

The stage of a cancer is a way of describing how far the cancer has spread locally and whether it has affected the lymph nodes or spread to other parts of the body.

Ultrasound scan

A type of scan that uses ultrasound waves to obtain images of inside the body.

More information

The organisations below can provide more information and support for people with lung cancer. NICE is not responsible for the quality or accuracy of any information or advice provided by these organisations.

- British Lung Foundation, 03000 030 555 [www.lunguk.org](http://www.lunguk.org)
- CancerHelp UK (the patient information website of Cancer Research UK), 0808 800 4040 [www.cancerhelp.org.uk](http://www.cancerhelp.org.uk)
- Macmillan Cancer Support, 0808 808 0000 [www.macmillan.org.uk](http://www.macmillan.org.uk)
The Roy Castle Lung Cancer Foundation, 0333 323 7200 www.roycastle.org

You can also go to NHS Choices (www.nhs.uk) for more information.

Accreditation

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