Introduction

This leaflet tells you about surgery to remove all or part of your lung. It includes the different types of surgery and so not all of it will apply to you. Ask if you are not sure which type of surgery you are being offered.

We hope this leaflet will answer some of the questions that you or those who care for you may have at this time. It is not meant to replace discussion between you and your doctor, but is a guide to be used along with what is discussed.

Why do I need lung surgery?

Lung surgery may be able to cure early lung cancer (non-small cell) by cutting out the affected area of the lung. It can also be used to cure non-cancerous conditions and to remove destroyed or scarred areas of the lung.

Are there any alternatives to lung surgery?

Generally, there are other treatments for cancer including Radiotherapy and Chemotherapy. However, your healthcare team use many factors when considering which treatment would be best for you personally. They can explain this to you. If you have non-small cell lung cancer which is only in one lung, lung surgery may offer the best chance of curing it.

What would happen if I decide not to have lung surgery?

You would be referred to another cancer specialist who specialises in other treatments, for example Radiotherapy and Chemotherapy. It is important that you understand, however, that surgery may offer you the best chance for cure. If you are worried about surgery, then you should discuss it with your surgeon.

What are the types of lung surgery?

a) **Wedge resection** – this means removing a very small part of the lung. It is used when cancer has been diagnosed early and it is only in one part of the lung. While there is a slight increase in the chance of the cancer coming back, the rate of complications is much lower and patients who are less fit can survive this surgery.
What are the types of lung surgery? (continued)

b) **Segmentectomy** - this means removing a slightly larger part of the lung. It is also used when cancer has been diagnosed early and it is only in one part of the lung. While there is a slight increase in the chance of the cancer coming back, the chance of complications is much lower and patients who are less fit can survive this surgery.

c) **Lobectomy** (and **bilibectomy**) – a lobectomy is the most common type of operation for lung cancer. The right lung is made up of three lobes and the left lung is made up of two lobes. A lobectomy means removing a lobe and a bilobectomy means removing two lobes. It is used when cancer is in just one part of the lung.

d) **Pneumonectomy** – this means removing one whole lung. It is used when cancer is in the middle of the lung, and affecting all the lobes in that lung. This surgery may not be suitable if your lungs have been badly damaged by, for example, cigarette smoke. You have to be stronger and fitter to survive this surgery.

Some wedge resection and some lobectomy operations can be done using keyhole surgery. This is known as video-assisted thoracoscopic surgery (VATS). Doing it this way means smaller incisions (cuts) and usually it means easier recovery. This is not suitable for everyone though. You can discuss it with your surgeon. Please note that the rest of this leaflet does not apply to keyhole surgery.

**What happens?**

The surgery is performed under general anaesthetic.

The lung being operated on is collapsed by the anaesthetist to allow the surgeon access to it and to the body compartment where it is located (the pleural cavity).

A cut, about nine inches long (20cm), is made around your back and side, under your arm. Your ribs will be spread apart and it one of them may have to be cut. If the cancer is invading any of your ribs, they will be removed.

The lung or part of the lung being removed is essentially cut away from its links with your heart. This involves cutting and tying off major blood vessels and sealing your windpipe where it reaches the lung or part of it that is being removed.

For most operations, two drains (chest tubes) will be put in place. Drains are not placed after a pneumonectomy though.
What will the side-effects be?

The following side-effects will happen. However, your doctors, nurses and physiotherapists will try to keep them to a minimum.

Pain after your operation
There will be pain around the side and front of your chest, following the distribution of the nerve which runs under the rib (the intercostal nerve). There will also be discomfort from the drains which come out between the ribs and which may also irritate an intercostal nerve.

The anaesthetist will usually offer you an “epidural”. If so, you will be offered information about this, including any possible complications.

If an epidural is not possible, you will probably be offered a patient controlled analgesia system (PCAS). This will mean you are able to give yourself a shot of painkilling medication as you require it. You will be encouraged by the physiotherapists to use enough medication to allow you to move around your bed, breath deeply and cough as required.

You will need less pain killers over the following few days and especially after the drains are removed. You will then be started on painkilling tablets which you will be able to take home with you when you leave hospital.

Difficulty breathing
Your breathing may be more difficult after surgery. You will be given oxygen to help your breathing and the physiotherapists will instruct you on how best to breathe and cough. Deep breathing is important as it helps healing.

Difficulty coughing
It is important that you are able to cough up any secretions (spit) which may collect in the lungs.

All smokers produce a lot of secretions. Your operation will increase this. If the secretions are not coughed up, they clog up your lungs and cause pneumonia (severe chest infection).

You are encouraged to take enough pain medication to allow you to cough properly. The physiotherapist will help you to cough. If you are not able to cough well enough, they will ask your doctors to pass a small tube through the skin at the front of your throat under local anaesthetic. This is called a miritracheostomy or Minitrach. It will allow the physiotherapists and nurses to suck out any secretions that you cannot cough up.

Abnormal heart rhythm (dysrhythmia)
Your heart will be very sensitive after lung surgery. This is partly because the operation is so close to it.

Most people having lung surgery have been smokers and will have some coronary artery disease. This makes abnormal heart rhythms more common. Because abnormal rhythms are so common (half of patients will have one) your heart will be monitored for the first 48 hours. If an abnormal rhythm occurs it usually is corrected by injections of cardiac drugs.
What are the risks?

Lung surgery is **major** surgery, much more extensive that hernia, gall bladder or bowel surgery. With major surgery, complications are very common. *It is important to be aware that people die of these operations.*

On average, three out of every 100 people having a lobectomy for lung cancer die of the procedure\(^1\). This rate is higher if you have had a previous heart attack or angina, or have chronic airways disease or asthma. Eight out of every 100 people having a pneumonectomy die of the procedure\(^1\).

Damage from smoking means that the risk of pneumonia, heart attacks and strokes after lung surgery will be higher. All efforts have been made however to ensure you are fit for the surgery. You will consider accepting a certain risk because surgery offers you the best chance of curing your cancer.

**Surgical complications**

Any procedure performed by a surgeon has risks of injury, complication or death. Possible complications are:

- **Bleeding** – there will be some bleeding after the surgery. This is normal whenever the lung has been cut. A basal chest drain will be inserted to drain excess blood. As large blood vessels coming out of the heart are tied and cut during the operation, it is possible for there to be major bleeding. While this is usually controlled you may need a blood transfusion. *It is possible to die from major bleeding.*

- **Air leak** - where the lung has been stapled, sewn, cut or where adhesions have been divided there is the potential for leakage of some air from the lung. An apical drain will be placed to drain air and keep the lung expanded.

- **Prolonged air leak** - if the lung is slow to heal (common if you are on steroid medication) or if the lung is slow to fully re-inflate, the air leak may persist for a number of weeks. Where this is the case a portable drain (flutter bag) will be applied and you will be allowed home with district nurse supervision and weekly medical review. Sometimes this is referred to as a broncho-pleural fistula. You may require further surgery to deal with this, but it is very rare.

- **Empyema** – this is an infection in the cavity which holds the lung. In some ways it is like a large boil (abscess) and therefore has to be drained. Usually this can be done directly through the skin but sometimes further surgery is required.

- **Long-term discomfort**: While you will likely still need painkilling medication 4-6 weeks after your operation, you may feel vague discomfort in your chest even a number of years later. Incisions can also be painful and nerves that run under each of your ribs may have been irritated.

**Anaesthetic complications**

Anaesthetic complications can happen – information about anaesthetic will be offered to you.
What happens before the operation?

You should go to the reception desk, after which you will be shown where to wait until you are collected by a member of staff.

The toilets and public phone are clearly signposted, should you need to use them at any time.

The surgeon will explain the operation to you, and will ask you to sign a consent form. If you have any worries or questions at this stage, do not be afraid to ask.

Will I be awake during the operation?

All lung surgery is done under general anaesthetic. This means you will be asleep throughout your operation. You will be given separate information about your anaesthetic.

How long will it take?

It will take around three hours.

Do I need to avoid eating and drinking before surgery?

You will be advised about this when you are being given information about anaesthetic.

What about my medicines?

If you are taking any drug which thins the blood, this may increase the risk of bleeding. An alternative may need to be prescribed up to two weeks before the procedure and you may need to be admitted earlier than planned. Please advise your surgeon (or contact his secretary) if you are taking any of the following drugs:

- Warfarin
- Aspirin
- Plavix (Clopidogrel)
- Any drug for treating arthritis. These include: Voltarol (diclofenac) Indocid (indomethacin) Brufen (ibuprofen) Ketoralac Mobic (meloxicam) Celebrex (celecoxib) Vioxx (rofecoxib) Advil Neurofen Feldene.
After your operation (‘postoperative care’)

You will be nursed in a high nursing intensity ward for the first 2-3 days. This is done in Ward 4a in the Royal Victoria Hospital. You will be given pain killing medication and your blood pressure, heart rhythm, oxygen levels, urine output and pulse will all be monitored. Physiotherapists will work with you to breathe deeply and cough up any spit which settles on your chest.

You will be encouraged to sit out of bed the day after the surgery and gradually move around more each day. Your breathing will be better out of bed.

Chest drains are usually removed after 3 to 4 days.

Most patients are discharged from hospital about a week after their surgery. This will depend on your progress and any complications.

There is information available from your Clinical Nurse Specialist about the ways in which you can continue to access support and advice about your health following your treatment for lung cancer.

How will you know if the operation has removed all of the cancer?

A pathologist will need to look at your removed lung tissue to work out what the type of cancer is, how far it has spread in the lung and whether it has spread to any of the lymph glands in the lung. This might not all have been finished by the time you leave hospital. If this is the case, you will be given an outpatient appointment to discuss the results.

The pathologist’s report could suggest that you may also benefit from chemotherapy or radiotherapy. If so, you will be referred to a cancer expert (oncologist).

Further information

If you have any questions, please ring your Clinical Nurse Specialist on ………………………………………………………………………………………………………………………………………………………………..

Before you leave

Make sure you know if, and when, you need to come back to the hospital.

It is important that you make a list of all medicines you are taking and bring it with you to all your follow-up appointments. If you have any questions at all, please ask your hospital doctor or nurse. It may help to write down questions as you think of them so that you have them ready. It may also help to bring someone with you when you attend your outpatients appointments.
Contact numbers:

- Royal Victoria Hospital Thoracic Surgical Ward 4a: 028 90632016
- Royal Victoria Hospital Thoracic Secretaries: 028 9063 3730 / 2027
- Belfast City Hospital Surgical Ward 5 South: 028 90263649
- Belfast City Hospital Thoracic Secretaries: 028 90263749

About this Information

This guide is provided for general information only and is not a substitute for professional medical advice. Every effort is taken to ensure that this information is accurate and consistent with current knowledge and practice at the time of publication.

We are constantly striving to improve the quality of our information. If you have a suggestion about how it can be improved, please contact us via our website: www.cancerni.net.

This leaflet is adapted, with permission, from information produced by Mr Kieran McManus, Consultant Thoracic Surgeon, Belfast Health and Social Care Trust.

1 These rates are from Belfast Health & Social Care Trust audit data (www.belfasttrust.hscni.net).

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