Thoracic surgery

Patient information and diary

Patient's name: ....

Consultant's name: ....

Admission date: ....

Planned discharge date: ....

Type of operation: ....

Date of operation: ....

Please bring this booklet with you on admission

Introduction

We want you to get better as soon as possible after your operation. To achieve this, we have developed an ‘Enhanced Recovery Programme’ for thoracic surgery with the aim to:

- Get you as fit as possible for your operation
- Reduce the stress of surgery on your body
- Get you up and about soon after your operation

This booklet gives you information about the things you can do to make sure that you get better as soon as possible after your operation. There is a diary at the end of this booklet for you to monitor your progress and we would encourage you to do this.

An online education programme which can be accessed via our website is available to support the explanation in this booklet:

https://royalpapworth.nhs.uk/our-services/respiratory-services/oncology/patient-information

Remember, if after using these materials you still have questions, please get in touch or ask when you are in the clinic or on the ward. You will find our contact information on page 24 of this booklet.

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Before coming into hospital

1. Be prepared
Start to make plans for going into hospital and coming home after your surgery.

- **Think about how you will travel to the hospital.** It might involve an early start so try to get some rest the day before.
- **Think about what you will take into hospital.** Make sure you have a pair of well fitting, flat, comfortable slippers or shoes. If you normally use a walking aid or have glasses, dentures or hearing aids, then make sure you bring these with you.
- **Think about how you will get home from hospital.** You will be given the date that we expect you to be discharged. Make sure your friends and family know when this will be.
- **Check that you have enough support in place for when you get home**, as you might need extra help. If you live alone, you may want a family member or friend to stay with you for a short period.
- **Before going into hospital, think about stocking up your freezer** so you don't have to worry about shopping immediately after you are discharged.
- If you are finding it difficult to manage at home prior to your operation, or you cannot get up out of a chair easily without using your arms, please mention this to the doctor or nurse in clinic. You will be given an 'All About Me' booklet to fill in and bring with you. This includes measuring heights of furniture around your home. You may also be referred to the occupational therapist team at pre-admission clinic to avoid delaying your discharge home.
- If you are the carer for someone else, think about how this person will be looked after while you recover from your operation.
- Please bring an up-to-date prescription and all your medication, in their boxes if possible.

2. Live well
Stopping smoking is good for your health at any time but is particularly important prior to your operation as smoking increases the risk of complications, such as a serious chest infection.

If you need some help:

- Your GP practice or local pharmacy may have a registered Stop Smoking Advisor who can help you. Ask for further information at your GP practice.
- Contact your local NHS Stop Smoking Service for free group, or one-to-one help and advice from trained experts. Let them know that you are going to have an operation so they can give you priority.
- Ask your local pharmacist if they have a trained Stop Smoking Advisor you can see for free one-to-one help and support.
- The NHS Smoking Helpline and website are there to give free advice, help and support. Call **0300 123 1044** or for online help and support visit **www.nhs.uk/smokefree**

You must also limit the alcohol you drink. Do not exceed national recommendations which are currently 14 units per week for men and women.

3. Eat well

Good nutrition is always important but it becomes even more vital before and after surgery. A healthy balanced diet will provide your body with all the nutrients it needs to fight infection and repair tissues. Studies have shown that people who are underweight, malnourished or overweight have more complications after surgery.

Prior to surgery your nutritional state will be assessed. If you are identified as malnourished or at risk of malnutrition (this means you are eating and drinking too little or have unintentionally lost weight) you will be provided with some written dietary information to help you to improve your nutrition before surgery. You may also be prescribed supplement drinks and referred to a dietitian for further advice.

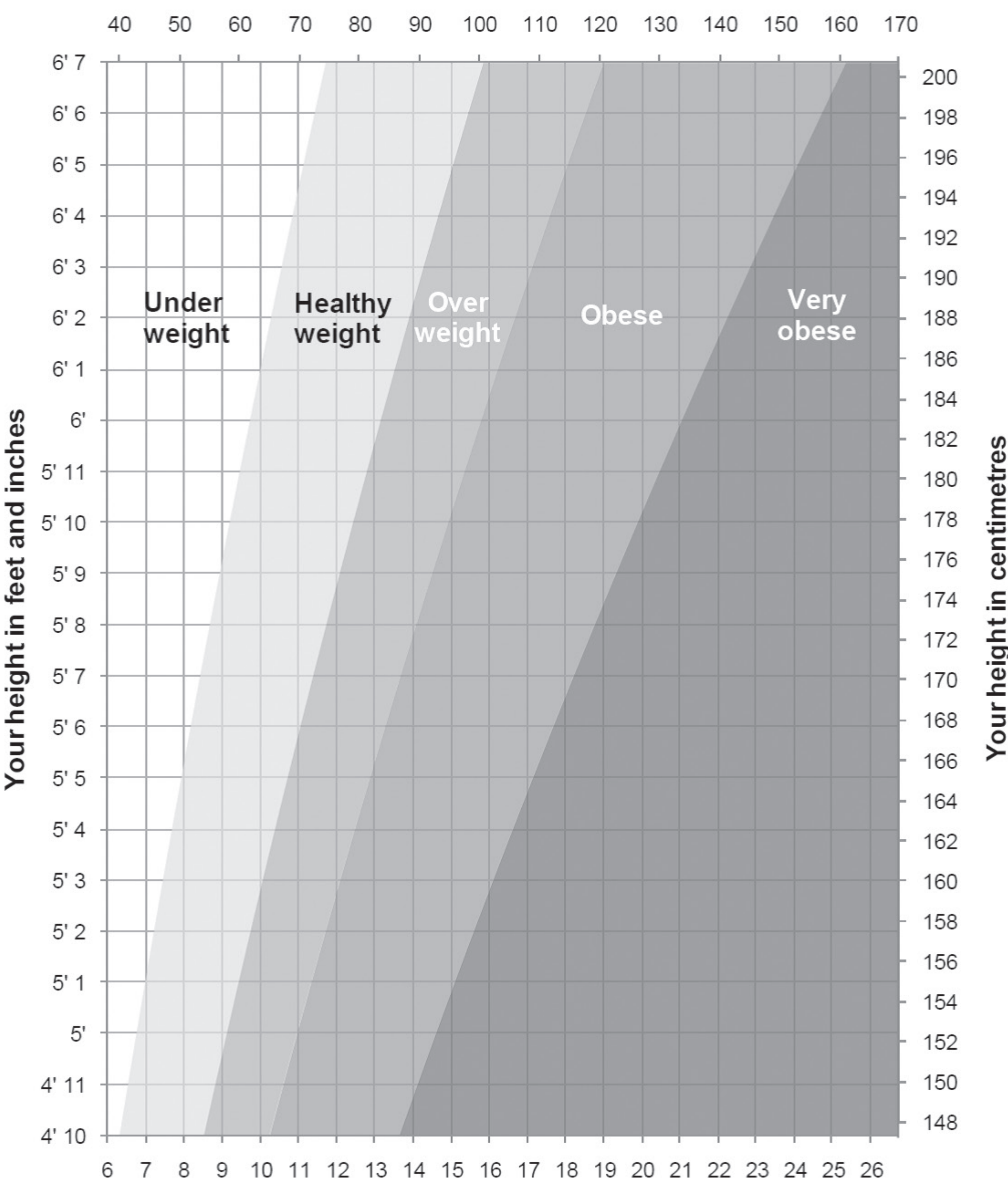
If you are found to be overweight, you should try to take steps to lose weight before surgery as this will reduce your risk of complications (particularly breathing and wound problems). You should do this sensibly by continuing to eat a healthy balanced diet. It is important that you continue to eat regular meals but you could cut down on food and drinks high in fat, sugar and salt and reduce your portion size. If you need to snack between meals, choose healthy snacks such as fruit and low-calorie yoghurts.

For most people a healthy balanced diet includes:

- **Fruit and vegetables** - aim to eat at least five portions per day. Ensure you have a variety and choose from fresh, frozen, tinned, dried or juiced.
- **Starchy foods** at each mealtime, such as rice, bread, pasta and potatoes. Choose wholegrain varieties when you can.
- **Protein-rich foods** such as meat, fish, eggs, beans, lentils or nuts. These should be eaten at least twice a day.
- **Milk and dairy foods each day.** Try lower-fat versions if you need to lose weight.
- **Limit foods high in fat, sugar and salt.**

Good nutritional habits before your surgery will be easier to maintain after your surgery.

Before surgery	After surgery
Nutritionally balanced + a healthy weight	= Quicker recovery and fewer complications


Your weight in kilograms
40
50
60
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80
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120
130
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160
170
Your height in feet and inches
6' 7
6' 6
6' 5
6' 4
6' 3
6' 2
6' 1
6'
5' 11
5' 10
5' 9
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5' 1
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4' 11
4' 10
Under weight
Healthy weight
Over weight
Obese
Very obese
Your height in centimetres
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Your weight in stones

4. Stay active and exercise

It is important to remain physically active while you wait for your operation. The stronger and fitter you are before the operation the sooner you are likely to be able to go home after your operation. Physical activity means day-to-day activities like walking and housework or a structured exercise programme. The exercise you choose will depend on your level of fitness, but it is important for you to find ways of introducing exercise into your daily routine.

The following exercises are a combination of cardiovascular exercise and stretches. You do not need to do all of the exercises every day, but you should choose activities from each section and try to do something at least five days of the week if you are able to and for a total of 30 minutes. You should use the BORG scale of breathlessness to gauge how hard you are working.

Shortness of Breath BORG Dyspnea Scale

Using the BORG scale of breathlessness, you will be aiming for 3-4 whilst you are exercising.

0	No shortness of breath
0.5	Very very slightly (just noticeable) short of breath
1	Very slightly short of breath
2	Slightly short of breath
3	Moderately short of breath
4	Somewhat severely short of breath
5	Severely short of breath
6	
7	Very severely short of breath
8	
9	Very very severely short of breath (almost completely)
10	Completely short of breath

Warm-up

You should always warm-up your muscles and prepare your body for exercise. 5 to 10 minutes should be enough - by marching on the spot, or starting a very gentle walk or cycle.

Marching on the spot

Standing on the spot, march your legs up and down picking your knees up high.

You should march at a pace which works you at a level around a BORG score of 2 as this is just a warm-up to prepare you for exercise. If you find it too easy, you can lift your knees higher or march at a faster pace. You should use your walking aid if you need one.

If your exercise tolerance is poor and marching works you at a BORG score of 3-4 then you can use this as part of your cardiovascular exercise instead of stairs/ exercise bike.

Cardiovascular
Walking, cycling and climbing stairs are all good ways of improving your fitness. You should choose an activity and an intensity that is appropriate for your current level of fitness. Ideally the exercise should raise your heart rate and make you breathless; however you should not be so breathless that you cannot hold a conversation.

Using the BORG scale of breathlessness you will be aiming for 3-4 on the scale. If you feel you are working at a level less than 3, you should consider increasing the amount of time you spend exercising, or increasing your speed.

Try to gradually increase the amount of time you exercise to between 30 and 45 minutes. Then consider increasing your speed or cycling resistance if you are finding it too easy.

Walking
It's important to increase the amount of walking you can do before your operation.

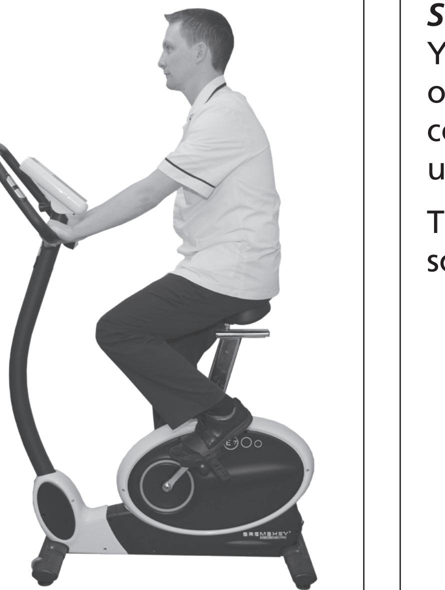
Start at a comfortable pace and see how long you can walk for, keeping yourself working at a Borg score of 3-4.

You should increase the distance you are able to walk before increasing your pace.

Exercise bike
If you have a static exercise bike you can use this as part of your cardiovascular exercise. Start by pedalling at a low speed of 40-50 revolutions per minute (RPM) with low or no resistance and aim to cycle for 10 minutes.

Increase the amount of time you are able to cycle for, before you increase your speed or the resistance.

Remember to keep yourself working at a BORG score of 3-4.



Stairs
You can climb the stairs at home as part of your cardiovascular exercise, either completing a full flight or by doing step-ups on the bottom step.

This activity should work you at a BORG score of 3-4.

Strengthening

The following exercises are designed to strengthen the muscles in your legs and arms so that you find it easier to move around after your surgery. Remember to use the BORG scale - you can then reduce the number of repetitions if it is too hard. If you feel that the exercises are becoming too easy, you can increase the number of repetitions you complete, or you can add resistance such as ankle / wrist weights, or with something as simple as holding a can of beans!

Bicep curls

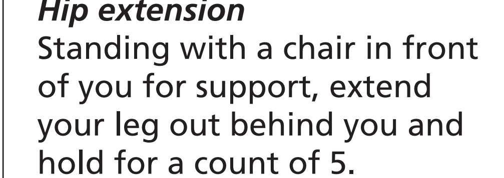
Either sitting or standing, bend and straighten your elbow 10 times.

Before your operation you can increase the resistance by holding a hand weight or something like a can of beans.

After your operation you must not use any resistance to allow your wound to heal. Repeat with other arm.

Knee extension in sitting

Sitting on a chair, straighten your knee, hold it for a count of 10, and then bend it again. Repeat this 10 times on each leg.



Static quads

Sitting or lying on the bed with your legs straight out in front of you, straighten your knee as much as possible pushing the back of your knee into the bed, and hold for a count of 10. Repeat 5 times on each leg.

Hip extension

Standing with a chair in front of you for support, extend your leg out behind you and hold for a count of 5.

Repeat 10 times on each leg

Stretches

The stretches on the next page are to improve your flexibility and posture prior to your surgery. You should feel a stretch but it should not be painful. You will be expected to continue these stretches after your surgery to ensure that your shoulders and back remain flexible whilst your wound heals. Remember that any increase in activity, however small, will be beneficial for you.

Shoulder flexion

Sitting on a chair, raise your arm up above your head in front of you, keeping your arm straight, and slowly lower it again.

Repeat 10 times on each arm.

Trunk rotation in sitting

Sitting in a chair, cross your arms over your chest and turn to look over your left shoulder making sure you turn at the waist.

Hold for a count of 3, then repeat turning to look over your right shoulder.

Repeat this 5 times in each direction.

Trunk lateral flexion in standing

Standing up with your arms down straight by your side, slide your left hand down your left leg, bending to the left as you do so.

Slowly return to an upright position, and then repeat with your right hand sliding down your right leg, bending to the right as you do so.

Repeat 5 times in each direction.

Neck rotation

Sitting in a chair, turn your head to look over your right shoulder and hold it there for a count of 3, then repeat to look over your left shoulder.

Repeat this 5 times in each direction.

Deep Breathing Exercises
You need to practice deep breathing exercises prior to your surgery to get familiar with them. You will be encouraged to do these exercises quite soon after you wake up after your surgery. The exercises will help your lungs recover from the anaesthetic and keep your chest clear of phlegm, reducing the risk of a chest infection.

- With your shoulders relaxed, take a deep breath in through your nose, hold for one to two seconds and then let the breath out through your mouth. When you have completed three or four breaths, you should have a 'huff' (like steaming up a mirror) and then have a cough.

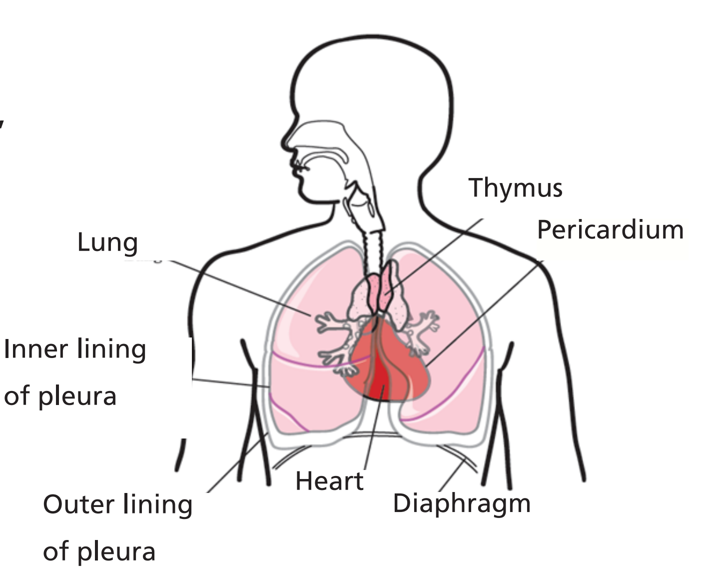
- After your surgery, you may want to support your wound as you do this - your physiotherapist will show you how to make it more comfortable. Although pain relief will be provided, coughing will be uncomfortable especially soon after the operation, but it is important to remove any phlegm from your lungs.

What's inside your chest?

The lungs are not a single block. The right lung is divided into three parts (lobes) and the left in two. You can imagine the lungs as a big sponge full of air, with grooves along it, dividing it.

The space between the lungs is the mediastinum. This space contains the heart, major blood vessels, the food pipe (oesophagus) and wind pipe (trachea).

In the mediastinum there are also a number of glands (lymph nodes) that might become enlarged in the presence of disease. These glands work like filters designed to protect the rest of the body. Sometimes the surgeon takes samples from these glands to guide your treatment.



Exercise record

Please record your activities in the following exercise record - it will help you to monitor your progress. When your physiotherapist sees you after the operation, he/she will use this diary to gauge what your capability was prior to your operation.

Date	Time	Activity	Duration/ repetitions	Borg	Comment
Example	10.00am	Walk	15 mins	3	
Example	3.00pm	Stretches	3 of each	N/A	

Information prior to your surgery

Who's who

Thoracic Surgeon	A medical doctor who performs operations on the lungs, oesophagus, and other organs in the chest
Surgical Registrar	A medical doctor who assists the main surgeon with performing operations on the lungs, oesophagus, and other organs in the chest and ensures that the surgeon's instructions are actioned on the ward
Thoracic Oncology Clinical Nurse Specialist (Key worker)	A nurse with particular expertise in caring for patients undergoing lung cancer treatment
Advanced Nurse Practitioner (ANP)	A highly experienced and educated member of the team who is able to take comprehensive patient history; carry out physical examinations; and assess and evaluate, with patients, the effectiveness of the treatment and care provided and make changes as needed
Anaesthetist	A medical doctor responsible for administering anaesthesia and pain relief, and monitoring vital functions during surgery
Senior House Officer (SHO)	A medical doctor undergoing training in a speciality, in this context - surgery
Physiotherapist	A healthcare professional who works with patients to optimise and support physical activity and respiratory function
Dietitian	A healthcare professional who is an expert on diet and nutrition

Consenting to your surgery

Your surgeon will explain the operation to you including risks, benefits and alternative treatment options. If you want to proceed with the operation, the surgeon will ask you to sign a consent form stating that you agree to have the operation and understand what is involved.

Your Thoracic Oncology Clinical Nurse Specialist:

- Discuss with you the lifestyle changes that you may need to make before your surgery so that you are in the optimal condition (eg stopping smoking/dietary advice/reducing your alcohol intake/increasing your mobility).
- Educate you about your condition, possible complications, the enhanced recovery process and expected outcomes.

Pre-operative assessment:

Pre-op assessment will be undertaken by a clinical nurse specialist or an advanced nurse practitioner. Some or all of this may take place in clinic, virtually (e.g. over the phone) or on the ward.

Pre-op assessment includes:

- A physical examination
- A medical clerking – questions about your past medical history, presenting and current symptoms.
- Full medication history – please ensure you bring all of your medication and if possible an up to date prescription.
- MRSA swabs

- Blood tests
- COVID swabs are required within 72 hours of your surgery, this may necessitate another visit to RPH.

An anaesthetist will:

- Assess your anaesthetic requirements risks.
- Discuss pain control methods with you.

On admission we will discuss with you:

- How to prepare your skin for surgery i.e. about using a special skin wash (Octenisan) on the night before and the morning of surgery.
- When to stop eating and drinking in preparation for your surgery.
- What to expect during your stay in hospital.
- Your plans for your discharge day - how you will get home from hospital and arrangements you need to make at home for the first few weeks.
- Any further routine tests required.

Routine tests

You may undergo some of the following routine tests; these will be arranged either before your admission or on the day of admission.

- **Chest X-ray (CXR):** This will look at the size & shape of your heart and general condition of your lungs.
- **Electrocardiogram (ECG):** This is a test that will measure the electrical activity of your heart.
- **Blood tests:** Blood samples are taken to assess how certain organs are working within your body, e.g. kidneys and liver, and to identify your blood group.
- **MRSA screening:** Methicillin Resistant Staphylococcus Aureus (MRSA) is an antibiotic-resistant form of a common bacterium called staphylococcus aureus, which is found growing harmlessly on the skin and in the nose. Healthy people may not even be aware that they have MRSA. However, if the bacteria get into the body through a surgical wound, they can cause infection and sometimes a serious infection called septicaemia. Taking swabs from your nose, throat and groin does screening for MRSA.
- **A Covid swab** to assess for SARS-CoV2 virus will be taken 72 hours prior to your surgery.
- **Baseline observations:** Your temperature, pulse, blood pressure, oxygen saturations, height and weight are recorded.

Additional tests that may be required
You may need to undergo additional tests such as:

- **Pulmonary function tests:** These measure how efficiently you breathe. i.e. taking in and expelling air and exchanging oxygen and carbon dioxide within the blood.
- **Chest CT scan (Computed Tomography):** This is an X-ray in which cross-sectional images are taken from many different angles within your chest. These images are then processed through a computer to form a detailed picture of the inside of your chest.
- **ECHO (Echocardiogram):** This is a special ultrasound examination of the heart. Ultrasound uses sound waves to create images. It assesses the structure and function of the heart muscle & valves.
- **Cardiopulmonary Exercise Test (CPEX):** This is usually performed on an exercise bike and is used to assess the response of your heart and lungs to exercise.
- **Ventilation/perfusion scan (VQ):** A VQ scan is a test that measures air and blood flow to the different parts ovf your lungs.

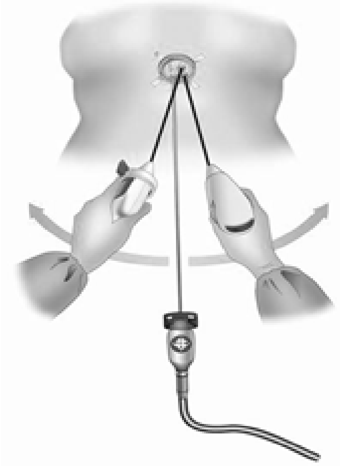
How does the surgeon operate on my lungs?

There are two main ways that a surgeon can access your chest to operate on them.

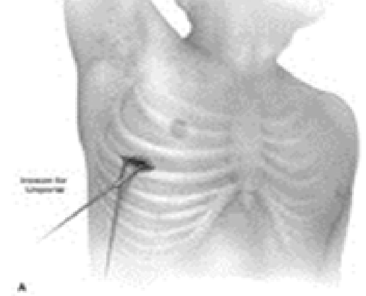
Minimally invasive surgery or Video Assisted Thoracoscopic Surgery (VATS), commonly referred to as 'keyhole surgery'. In this type of surgery, the surgeon inserts a tiny camera and surgical instruments into your chest to examine the lung and perform the procedure. The pictures on the next page show the most common locations of these incisions, though the exact placement and number of incisions might vary according to the type of surgery and the target area.

Subxiphoid VATS Incision

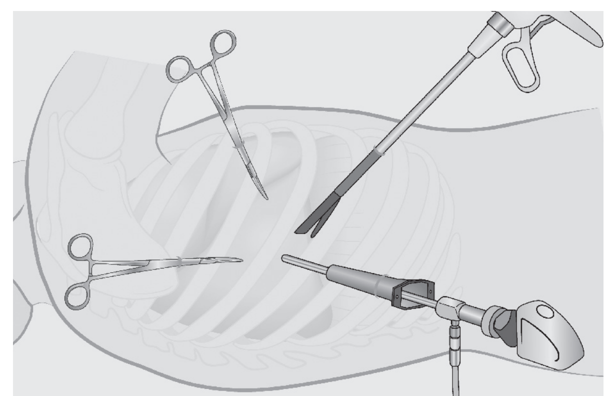
Some procedures can now be done through a 'Subxiphoid VATS' incision. The surgeon inserts a tiny camera and surgical instruments via a single incision at the Subxiphoid area (bottom of your chest bone). The picture below shows how this type of surgery is performed.



Uniportal VATS Incision (one incision)



Multiple port VATS Incision (more than one incision)

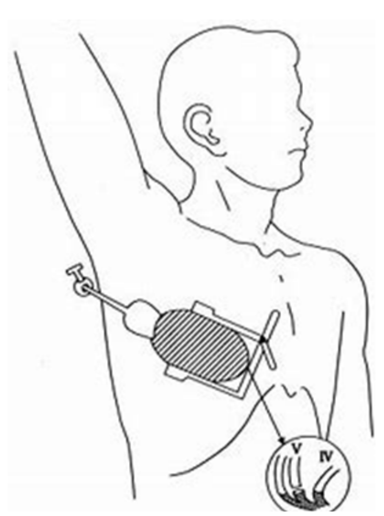


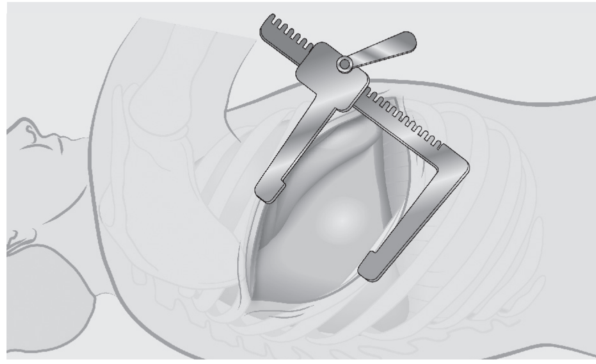
Keyhole surgery may produce a reduced inflammatory response, which means that the surgery is gentler on your body and you are likely to recover sooner and leave the hospital sooner. With good pain control, you will also be able to breathe more easily and you will experience a shorter period of discomfort after surgery as the large muscle in your back (latissimus dorsi) is not cut as much in keyhole surgery.

Wound precautions for VATs procedures are 1 week of avoiding heavy lifting, pulling or pushing through your operated side. Your physiotherapist will guide you on this after your surgery. There are **no** extra precautions for Subxiphoid VATS incisions.

It might be necessary to have this type of access to the inside of your chest as some conditions require a larger view than that offered by the keyhole approach. A thoracotomy may also be necessary if you have had previous procedures that caused the lung to get attached to the chest wall, leaving no space to insert the camera and the instruments required for keyhole surgery.

You will take a combination of oral painkillers and receive a special tube with local anaesthetic in your back to improve pain relief during the first few days.





Thoracotomy
This name is given to the cut that a surgeon makes around the side of your body below your shoulder blade and between your ribs.

Wound precautions for thoracotomy Avoid heavy lifting, pushing or pulling for six to eight weeks. Your physiotherapist will guide you on this after your surgery.

Risks

Recent advances in chest surgery have reduced the rates of complications and death. However, as with any operation and anaesthetic there are still some associated risks. Your surgeon will discuss both general and individual risks associated with your proposed operation.

Below is a list of some of the possible risks:
Common risks and complications (more than 5%)

- Chest infections: Serious chest infections/ pneumonia can delay your discharge. These can be prevented with good pain control, mobilising early, doing your 'deep breathing' exercises and ensuring you have stopped smoking before your operation.
- Prolonged air leak: If you imagine the lung as a big sponge full of air, surgery creates the risk of an air leak from the lung. Most air leaks stop on their own within a few days. Patients with an underlying lung condition e.g. COPD/ILD may require a chest drain for a longer period of time. You might have to go home with a drain and be assisted in your home by a district nurse. Your surgeon will review you at regular intervals.

Less common risks and complications (1-5%)

- **Infections, e.g., wound/urinary tract:** These are quite rare and are usually resolved with a course of antibiotics.
- **Blockage of blood vessels in the leg (Deep Vein Thrombosis -DVT) or blood clot in the lung (Pulmonary Embolism - PE):** These are potentially serious conditions. The hospital has a care package in place to limit the occurrence of DVT. Please follow your nurse's instructions, in particular regarding wearing TED stockings (thrombo-embolic deterrent stockings to prevent clots) and keeping active during your hospital stay. Some patients who are at higher risk of DVT PE's will be discharged on Low-Molecular Weight Heparin (LMWH) or oral anti-coagulants to help thin the blood.
- Ultrasound uses sound waves to create images. It assesses the structure and function of the heart muscle & valves.
- **Cardiopulmonary Exercise Test (CPEX):** This is usually performed on an exercise bike and is used to assess the response of your heart and lungs to exercise.
- **Ventilation/perfusion scan (VQ):** A VQ scan is a test that measures air and blood flow to the different parts of your lungs

- **Worsening of any existing heart problems:** Pre-existing heart conditions do not mean that you cannot have your operation. In fact, we deal with these conditions routinely at our hospital. However, any surgery will put an extra strain on the heart which could, in rare cases, lead to a heart attack. Your doctor will enquire about heart problems and if appropriate refer you to a cardiologist to assess your risk and optimise your heart function prior to surgery

- **Persistent pain:** In 5% or more patients' persistent pain can last for more than a few months. If this happens, we can refer you to a pain specialist. A risk factor for these chronic problems is a history of previous pain problems. Please tell us if you have had previous pain problems

- **Surgical emphysema** (or subcutaneous emphysema) occurs when air is located in the subcutaneous tissues (the layer under

the skin). This usually occurs in the chest, face or neck. In patients with surgical emphysema, the skin makes a distinctive crackling noise when it is palpated because of the trapped air inside. If a case is mild, the patient may be watched but otherwise not actively treated. Eventually the body will reabsorb the air and the air pockets will resolve. Occasionally, the air pockets may need to be ventilated with the insertion of a chest drain or small cuts in the skin to allow the air to escape.

Rare risks and complications

- **Bleeding:** Most episodes of bleeding inside the chest cavity will settle on their own. You will be closely monitored by an experienced team for any deterioration or abnormal drainage. Rarely, you may need to be taken back to the theatre.
- **Death:** The risk of death after surgery is very low in our hospital. Your surgeon will discuss the estimated likelihood of death from surgery in your particular case.
- **Risk of general anaesthetic:** General anaesthesia is a very safe procedure. Skilled anaesthetists who specialise in dealing with heart and lung conditions will look you after. However, minor side effects and complications such as feeling sick, sore throat, hoarse voice or bruised lip are common (one in ten to one in a hundred people).
- Other complications such as teeth damage are uncommon (one in a thousand people), and serious complications such as severe allergic reaction or death related to anaesthesia are very rare (one in a thousand people).
- **Delirium** is another name used to describe acute confusion. It is unusual following thoracic surgery and more commonly affects patients admitted to critical care, older patients and those who have liver problems. If you become critically unwell many parts of the body can be affected including the brain. Delirium is a sign that the brain is not working properly but it is usually temporary and will only last a few days or so.

Delirium can be caused by:

- Infection
- Drugs being given to help treat your illness or condition
- Strong pain killers such as Codeine or Morphine
- Changes in the function of your kidneys, heart of lungs

A patient with delirium can imagine seeing, hearing or feeling many types of things that do not actually exist. This can be very frightening for both patient and their family or friends. If you think your relative has delirium because they are acting differently to normal, please tell a doctor or nurse who will thoroughly assess the situation and offer you further information and support.

- If you would like more written information please ask for leaflet: Delirium and Intensive Care (icusteps.org).

Coming into hospital

You will be asked to come into hospital either the afternoon before your operation or on the morning of your operation. You will be advised of this by the booking team.

You must not eat any food from midnight before surgery and should be allowed clear fluids* until 06:00. The nurse looking after you on the ward will tell you when you need to stop drinking as the theatre co-ordinator will confirm the order of the operating list by 08:30. If you are being admitted on the same day as your surgery, please try to have a glass of water (250ml) before 06:00.

If you suffer from gastro-oesophageal (stomach and gullet) problems such as reflux or hiatus hernia, we may ask you to stop drinking from midnight.

***Clear fluids refers exclusively to clear still water.**

It is important that you follow the instructions for stopping food and drink otherwise we

cannot usually proceed with your operation because of the risk of aspiration (choking due to food particles coming back up your throat and into your lungs).

On the morning of your surgery, the skin on your chest (where the surgical cut will be made) will be shaved and marked. It is best to shave the site close to the time of operation so do NOT shave your chest prior to admission. You will then have a shower using a special skin wash. You will be given a clean theatre gown to put on and if needed, a pair of elastic stockings to wear to assist the blood flow in your legs.

Anaesthesia

When it is time for your operation, you will be transferred into theatres. Several people will be there, including your anaesthetist and the anaesthetic assistant. It is in the theatre where the anaesthetist will anaesthetise you. Your anaesthetist will attach you to machines to watch your heart rate, blood pressure and oxygen in the blood.

To give you an anaesthetic, a thin plastic tube (a 'cannula') is inserted into a vein in the back of your hand or arm. Once you are safely anaesthetised, a ventilator will be used to 'breathe' for you. After all 'drips' are in place and you are well positioned for surgery, the operation starts.

After your surgery

Your operation usually takes approximately one to three hours, following which you will wake up in the recovery area. You will have an oxygen mask, drips and tubes in place but these are temporary and will be removed within approximately 24 hours. You will spend one to three hours in the recovery area. In recovery the nursing staff may get you out of bed into a chair if they feel you are ready and awake enough; if not, the nursing staff on the ward will help you mobilise to the chair or bathroom when needed. When you are fully awake, you will be encouraged to do your deep breathing and coughing exercises. It is important that you do these as they help to prevent a build-up of phlegm (if you are unable to cough due to pain please ask the nursing staff for some more pain relief as this is essential for a quicker recovery).

- **Nausea and vomiting:** You should not experience any nausea but if required we will give you an anti-sickness medicine (anti- emetic) to manage this.
- **Fluid balance:** You will have a cannula (a small plastic tube) placed in a vein either in your arm or your neck through which fluids will be administered.
- **Urinary catheter:** You may have a urinary catheter (fine tube) in your bladder, which allows urine to drain freely.
- **Eating and drinking:** A few hours after your operation you will be able to start drinking. You may even have something to eat if you feel up to it.
- **Chest drain:** Following surgery, you may have one or more chest drains. These are tubes leading from your chest to a bottle, which drain air and fluid from the space where the lung or a part of it has been removed. Most of these are portable and you will be expected to carry them around with you as you exercise.

When we feel that you are ready you will be transferred back to your ward room. Once on the ward your Nurse or Physiotherapist may help you get out of bed and walk around your room or along the ward corridor. If you start moving around earlier you will reduce your risk of developing complications.

Occasionally, some patients may need to be more closely monitored and will be admitted to intensive care if deemed necessary.

Length of stay

The average length of stay post operatively is between one and four. The medical team will discuss with you whether your feel ready to go home. Please express any concerns you have about your discharge and whether you feel ready to go home. Please make necessary arrangements before your surgery as to who will pick you up. Hospital transport is not

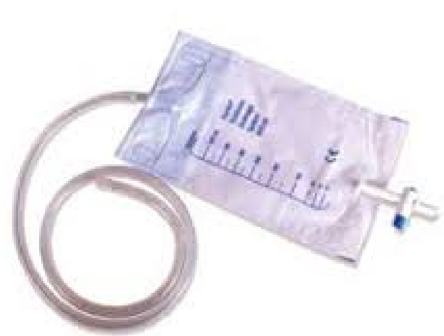
readily available.

Types of Drains

Thopaz Drain:
Ward based drain immediately after your surgery – this type of drainage system has an inbuilt suction unit therefore you can exercise with this attached.

Pneumostat Drain:
This drain is an ambulatory (inpatient and outpatient) drain unit and is worn underneath your clothing. This drainage system is mainly used for air leak management. If you require this type of drain system to go home with you will educated on this prior to discharge.

Portex Bag:
This drain is an ambulatory (inpatient and outpatient) drain unit and is worn underneath your clothing. This drainage system is mainly used for liquid management. If you require this type of drain system to go home with you will educated on this prior to discharge.



The surgeon may suggest that it is safe for you to go home with your drain still in-situ. The ward will arrange for a district nurse to support you in the community with your drain. Please see 'managing a chest drain at home'.

Pain control

Good pain control is a priority after thoracic surgery allowing you to deep breathe, cough and move effectively. A combination of pain management techniques are used to control any pain.

1. Whilst you are asleep during the operation the anaesthetist is able to inject a local anaesthetic drug directly into the nerves around the site of the surgery
2. Patient Controlled Analgesia (PCA) When you wake up you may have a pump with an intravenous painkiller such as morphine. This type of pain relief will be available for you to use on demand when the pain intensity increases.
3. Intravenous and then oral Paracetamol will be given regularly.
4. Stronger oral pain killers such as Codeine or liquid Morphine can also be given as appropriate.

The nursing staff and physiotherapists will regularly assess your pain and make every effort to minimise this using different methods to control it. It is, however, important that you are honest with the nursing staff and tell them how your pain is. You will be asked to describe your pain as:

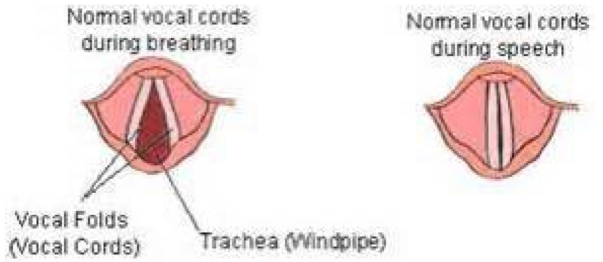
0	**No pain**
1	**Mild pain**
2	**Moderate pain**
3	**Severe pain**

When your pain is well controlled you will be able to breathe deeply and move and cough more effectively which will aid your recovery.

When your pain is well controlled you will be able to breathe deeply and move and cough more effectively which will aid your recovery.

Your voice after your surgery

How does the voice work?
Your vocal folds are located at the top of your trachea (windpipe). Air passes up from the lungs, passes between the vocal folds and makes them vibrate against each other. This creates your voice. Both vocal folds need to be able to move in order to create a 'normal' voice. The vocal folds must touch each other whilst they are vibrating in order to create a 'normal' voice. The vocal folds are also part of the breathing mechanism. They move wide apart when you are breathing in, in order to allow air into the lungs.



Why can my voice be affected by surgery?
Thoracic surgery can affect the nerve that makes the vocal folds move so that one of the vocal folds either does not move or only moves a small amount. This can result in a voice that sounds breathy and/or hoarse, as the vocal folds are not touching each other enough whilst they are vibrating in order to create a strong voice. The effect on voice quality may vary considerably from person to person. In many cases the effect on the nerve is only temporary and the voice will recover quite quickly over several days or a few weeks. Sometimes the problem is more long lasting, in which case a referral to ENT will be made to discuss surgical options to restore the voice.

Who can help me?
If you have changes to your voice after surgery you will be referred to Speech and Language Therapy. Your therapist will listen to your voice and inform you whether it is necessary to begin voice therapy exercises to help the vocal folds move, reduce excess tension and improve voice quality. Your therapist will also inform you of vocal hygiene techniques that you can implement in order to help your voice to function as well as possible. Your therapist will monitor your voice whilst you are at Royal Papworth and if necessary, may ask your GP to refer you to a local speech and language therapy service for on-going support once you are discharged.

If swallowing is a problem a speech and language therapist can assess your swallow and provide advice, exercises and strategies to help you compensate while the weakness recovers.

If you feel there are changes to your voice or swallow after surgery and you are not referred to speech and language therapy automatically or you would like to check that a referral has been made, please speak to your doctor or nurse.

Once you are discharged home, if you feel your voice and/or swallowing problems are continuing, please speak to your GP. Sometimes the problem is more long-lasting, in which case a referral to ENT will be made to discuss surgical options to restore the voice.

What can I do to help my voice and swallow?

- **Try not to whisper.** Speak as normally as you can rather than force your voice to be louder. Attempts to speak loudly usually make the voice sound worse.
- **Make sure you have your listener's attention** and face them while you speak.
- **Avoid noisy surroundings** where possible.
- **Make sure your visitors know that your voice isn't working as well as normal** and that you cannot speak loudly so they make allowances and don't speak over you.

- **If your voice difficulty makes you more breathless, pace yourself** by going a bit slower and give yourself time to adapt your breathing.
- **If you have problems with swallowing make sure you sit upright while eating and don't try to eat and talk!** Ask for a referral to a Speech and Language Therapist.
- **Make sure you eat and drink more slowly** taking smaller, more manageable mouthfuls.
- **Try to avoid foods with a mixture of solids and liquids** (e.g. cereal with milk, or meat with thin gravy) as while you are chewing solids the liquid and may 'go the wrong way' and cause coughing.

Physiotherapy after your surgery

A Physiotherapist will either see you immediately after your operation (if appropriate) or the following day. Depending on the type of lung surgery you are having will be dependent on if you require Physiotherapy input or not. This will all be discussed with you immediately after your surgery or the first day after your surgery.

After lung surgery you need to be as active as possible as this helps your body get strong and fit again and reduce your risk of complications. After your surgery you will be encouraged to be active as soon as possible.

Here is a typical programme for after your operation:

Day 0 (after your surgery)
If suitable and medically stable either a Physiotherapist or a nurse will aim to get you out of bed and start moving around. If you start moving around earlier then you reduce your risk of developing complications associated with surgery. It is also key to start your deep breathing exercises (as described on page 11) and coughing. If you are unable to cough due to pain please ask the nursing staff for some more pain relief as this is essential for a quicker recovery.

Day 1 (after your surgery)
Your breathing will be checked to ensure that you can take a deep breath and cough comfortably. You will be taught how to support your wound to ensure you can cough strongly. If you are unable to cough due to pain, please ask the nursing staff for some more pain relief.

The aim of the first morning is to walk with the Physiotherapist 60-100m (with assistance if required). After this you should feel confident to walk to the toilet and on the ward on your own. You should also get up hourly and walk either around your room or along the ward corridor (dependent on what the Physiotherapist advice is). If you have multiple attachments (drips etc.) then you may be advised to walk **with** a nurse or physio.

The Physiotherapy team will then see you again in the afternoon to progress your walking distance and pace. If you are able to walk by yourself, with minimal shortness of breath they will also assess you on step-ups. Step-ups and stairs can be used as a good form of exercise.

The Physiotherapist may also start you on an exercise bike (dependent on your level of fitness before your surgery). If the Physiotherapists feels you are safe, they may ask you to continue the exercise bike regime on your own in-between Physiotherapy sessions. Keep a note of the distances you manage.

The Physiotherapist will also guide you on your arm exercises (as described on page 7). These exercises should not be painful and are to avoid you developing complications with your shoulder movement because of the surgery.

You will be encouraged to get in to your normal clothes as soon as possible.

Day 2 (after your surgery)
If you still require Physiotherapy input, over the next day or two you will be encouraged to walk more, continue to take deep breaths and cough. The Physiotherapist will progress your walking distance and pace, the time spent on the exercise bike and what additional exercises they recommend for you to improve your fitness.

Our aim is to get you as independent as possible as soon as possible. If the Physiotherapist feels you are back to the level of fitness you were before your surgery they may discharge you from Physiotherapy. However, if you have any concerns about your breathing or walking the Physiotherapist can come and review you again.

For you to be signed off by the Physiotherapist you must:

- Be able to take deep breaths
- Be able to cough strongly
- Be able to carry out your arm exercises by yourself
- Be able to get on / off the toilet, bed & chair by yourself
- Be able to walk by yourself
- Be back to your level of function you were before your surgery (or better)
- Be able to climb a flight of stairs (if able to before your surgery)
- Be able to exercise by yourself (as recommended by your Physiotherapist)

Be positive - remember little steps go a long

Exercise record

Please record your activities in the following exercise record - it will help you to monitor your progress. When your surgeon sees you at their follow-up clinic, they will ask what exercise/ activities you have been doing since leaving hospital.

Date	Time	Activity	Duration/ repetitions	Borg	Comment

Day-to-day activity diary

It might be useful to keep a diary or log so you can track your daily feelings and progress on the road to recovery. Be positive about your recovery - remember little steps go a long way!

Afternoon/evening following surgery

Your checklist to complete:

I have done my deep breathing exercises and supported cough every waking hour ☐ **Yes** ☐ **No**

I have done my arm exercises ☐ **1** ☐ **2** ☐ **3** ☐ **4 times today**

I have changed my position every 2 hours to relieve the pressure on my bottom ☐ **Yes** ☐ **No**

What have I had to eat today?

....

....

....

....

Do I feel nauseated? ☐ **Yes** ☐ **No**

Pain is scored as follows:

0 No pain 1 Mild pain 2 Moderate pain 3 Severe pain

What is my pain score?

When resting ....

When moving ....

Have I achieved my goals today? ☐ **Yes** ☐ **No**

Why have I had difficulty reaching my goals, e.g. too tired, pain etc?

....

....

....

....

Day 1 after surgery

Your checklist to complete:

I have done my deep breathing exercises and supported cough every waking hour ☐ **Yes** ☐ **No**

I have done my arm exercises **1 2 3 4 times today**

I have changed my position every 2 hours to relieve the pressure on my bottom ☐ **Yes** ☐ **No**

I have been sitting out of bed for **.......... hours today**

I have walked at least 60 metres **1 2 3 times today**

OR

I have cycled on the bike for 5 minutes **1 2 3 today**

What have I had to eat today?

....

....

....

....

Pain is scored as follows:

0 No pain 1 Mild pain 2 Moderate pain 3 Severe pain

What is my pain score?

When resting ....

When moving ....

Do I feel nauseated? ☐ **Yes** ☐ **No**

***Have I passed urine*?** ☐ **Yes** ☐ **No**

Have I passed wind? ☐ **Yes** ☐ **No**

***Have I opened my bowels*?** ☐ **Yes** ☐ **No**

Discussed my discharge plans with my nurse? ☐ **Yes** ☐ **No**

Checked my transport arrangements for getting home on discharge? ☐ **Yes** ☐ **No**

Have I achieved my goals today? ☐ **Yes** ☐ **No**

Why have I had difficulty reaching my goals, e.g. too tired, pain etc?

....

....

....

Day 2 after surgery

Your checklist to complete:

I have done my deep breathing exercises and supported cough every waking hour ☐ **Yes** ☐ **No**

I have done my arm exercises **1 2 3 4 times today**

I have changed my position every 2 hours to relieve the pressure on my bottom ☐ **Yes** ☐ **No**

I have been sitting out of bed for **.......... hours today**

I have walked at least 100 metres **1 2 3 times today**

OR

I have cycled on the bike for 10 minutes **1 2 3 today**

What have I had to eat today?

....

....

....

....

Pain is scored as follows:

0 No pain 1 Mild pain 2 Moderate pain 3 Severe pain

What is my pain score?

When resting ....

When moving ....

Do I feel nauseated? ☐ **Yes** ☐ **No**

Have I passed urine? ☐ **Yes** ☐ **No**

Have I passed wind? ☐ **Yes** ☐ **No**

Have I opened my bowels? ☐ **Yes** ☐ **No**

Discussed my discharge plans with my nurse? ☐ **Yes** ☐ **No**

Checked my transport arrangements for getting home on discharge? ☐ **Yes** ☐ **No**

Have I achieved my goals today? ☐ **Yes** ☐ **No**

Why have I had difficulty reaching my goals, e.g. too tired, pain etc?

....

....

Managing a chest drain at home

This section of the Thoracic Surgical Booklet will give you advice and information on how to care for a chest drain in the community. You will be referred to the District Nurse to support you and your family with the care of your drain.

If you, your family, GP or District Nurse have any questions please contact:

Ward 5 South: 01223 638535 / 638515
Ward co-ordinator: 07775550661

There is also information on:

- What you need to do.
- How to empty you valve/bag.
- What to look out for.
- What the District Nurse needs to.
- A page to record the amount and type of drainage daily & for the District Nurse to comment on your wound/drain site.
- Comments or questions.

If you need to visit your GP or A&E while your drain is still in place please bring this booklet with you.

Please bring this booklet with you when you attend your drain review appointment.

Being discharge with a chest drain.

Patients are occasionally discharged home when medically fit following surgery with a chest drain in place. This maybe because there is still air or fluid in the pleural space (the space between the lung and chest wall). Your drain will be fitted with either a Pneumostat valve or a Rocket Ambulatory Bag (flutter bag) in place. These devices have a one way valve which allows both air and fluid to drain out from your chest but not to go back in.

Pneumostat valve and rocket ambulatory bag

How to look after your drain at home:

- You and your family will be shown how to empty you bag or valve and be supplied with equipment to do so, clamps and dressings, syringes and wipes also a spare bag or valve (depending on your consultants' preference or amount of air / fluid being drained)
- Please make sure you check your bag or valve every 2-3 hours and empty the bag/ valve when necessary, making sure you record the drainage on the chart in your booklet.
- It is always advised to empty your bag/ valve before going to bed.

The Nursing staff will show you and your family:

- How to make sure your drain is not kinked or the bag is not folded- if the drain gets kinked air and fluid will not drain into the bag or valve
- How to check that the valve is fluttering- this means an air leak is still present.
- If you are being discharged from hospital with a drain for a persistent air leak the nursing staff will show you how to empty air from your bag.

Advice about caring for your chest drain:

- If your chest drain is attached to a flutter bag, you can wear your drain with the strap provided which can be worn around your waist.
- You may find it more comfortable to tap your drain to your chest.
- Please keep your bag upright this will help prevent your bag leaking and blocking the one way valve.
- Avoid wearing a belt or tight clothing over your drain tube as this could potentially kink your tube and stop air or fluid being drained.

How to empty your Rocket Ambulatory Bag (flutter bag):

- Hold the bag upright and work out the amount of fluid in your bag. Record this on the drainage chart.
- Wash and dry your hands
- Over the toilet open the tap at the bottom of the bag and empty contents in the toilet. Close the tap and clean with dry paper.
- Wash and dry your hands.

How air is expelled air your flutter bag:

- If you were discharged home with an air leak your drain will be attached to a flutter bag. At the top of your flutter bag there will be a blue valve and a red clip. The blue valve will be pulled open and the red clip put into place to prevent the valve closing accidently and air building in the bag.
- If your find that your bag is filling with air, please check that the red clip is still in place and the valve is not blocked. You may need to change the flutter bag. This procedure will be demonstrated to you before you leave hospital. Please contact 5 South if you have any concerns about this and a member of staff will advise you what to do.

How to empty a Pneumostat valve:

- Wash and dry your hands
- Clean the drainage port with a sterile wipe
- Insert a 20ml syringe and aspirate the fluid in the valve
- Record the amount and type of fluid on the drainage chart
- Flush the fluid in the toilet
- Wipe the drainage port
- Wash and dry your hands.

Drainage chart

Date and time	Amount of fluid	Colour	Air leak Y/N

Caring for your wound after discharge

Before you leave hospital, the Nursing Staff will arrange a District Nurse to visit you at home to change your dressing and check your drain.

There are two stitches around your drain, one holding your drain in place and the other one is used to close the drain site when your drain is removed at hospital. It is very important that these stitches are not cut by the District Nurse.

If these stitches break and your drain falls out, cover with a dressing and contact 5 South co coordinator immediately for advice. You may need to your local A&E department, if so please take this booklet with you.

You will be given some spare dressings to take home with you in case your dressing becomes wet and needs changing before the District Nurse visits. (Please see the guide on how to change your dressing).

If you think your drain is not draining properly check that the bag is not folded and that your drainage tube is not kinked or bent.

If you think your drain has been pulled please check to see if the tube has moved that it is still draining as previously.

Contact the ward if you have any concerns; patients are encouraged to call 5 South for advice if they experience any problems.

What you should do if your drain becomes disconnected.

- Re connect the drain to the bag or valve
- Try to cough to push out any air which may have got into your drain tube
- If you are feeling unwell and are very short of breath after re connecting your drain please go to your nearest A&E department or call 999.

If you need to change the bag or valve, use the two clamps to clamp your chest drain tube (the tube which comes from your chest), disconnect the old bag/valve and attach the new device. Remove clamps. You will need to prime the flutter bag with the syringe in the pack prior to replacing the new bag. This will be explained and demonstrated by the nursing staff prior to you being discharged. It is very important not to leave the clamps in place.

General advice

If you develop a temperature and are feeling unwell contact your GP.

If you need to visit A&E please take this booklet with you and all your current medications.

Please ask the medical team to contact the Thoracic Surgical team at Royal Papworth Hospital on bleep 310.

Advice for District Nurse

This patient has recently undergone thoracic surgery at Royal Papworth Hospital.

They are medically fit for discharge but still require to have a chest drain in situ attached to either rocket ambulatory bag (flutter Bag) or pneumostat valve for either an ongoing air leak or drainage. The patient will be returning to 5 South at Royal Papworth Hospital on a weekly basis until the chest drain can be removed.

The patient will need wound assessment and dressing changes every other day.

Please change drains site dressing on: Monday, Tuesday, Wednesday, Thursday, and Friday.

(Ward nurse to circle on day of discharge)

Guidance for changing dressings

Procedure	Rationale
Inspect chest drain tubing and bag/valve to ensure tube is patent	If tubing is blocked this could lead to tension pneumothorax or pleural effusion
If needed empty the bag/valve and record amount and type of drainage	Recoding this information allows the surgical team to make a decision regarding drain removal
Prepare equipment for redressing drain site	A chest drain site is a surgical wound and at risk of infection
Remove old dressing and assess wound	To check for signs of redness and to ensure sutures have not loosened or drain has moved
If there is any redness or discharge please swab the area. Please call 5 South Coordinator on 077550661 or Bleep 310 to speak to the Thoracic Surgical Dr to discuss antibiotic cover	A drain site infection could lead to the patient developing and empyema and requiring further surgical intervention
Clean the drain site with normal saline	To prevent any infection
DO NOT cut the sutures	One suture holds the drain in place and the other suture is tied once to drain has been removed to close the drain site up.
Redress the drain site using an occlusive dressing using the keyhole method	To continue to protect the drain site
Documentation of drain site	Useful to the surgical/nursing team when assessing wound

Observation of wound chart

Date	Dressing changed Drain site appearance Swabbed Y/N	Comments	Sign

After you leave hospital

In case of emergency, dial 999.

For the first two weeks after you go home, or longer if you still have a have a drain in, please contact the ward for advice. They may arrange for you to be seen at Royal Papworth or advise GP or local hospital review.

If it is longer than two weeks and you do not have a drain in, please contact the consultant's office who may arrange for you to be seen at Royal Papworth or advise GP or local hospital review.

Stay active
You should continue with your exercise programme when you get home to aid your recovery and regain fitness. Remember to do the stretching exercises recommended by your physiotherapist to prevent any stiffness in your back or shoulders as a result of your wound.

Most people find that it takes around six to eight weeks after the operation for them to make a full recovery. Generally people who have had part, or all their lung removed, take longer to recover than people having other types of lung surgery. Age is also relevant; an older person may require a longer period of recovery than someone younger.

Avoid any heavy lifting, pushing or pulling e.g. vacuuming or carrying the shopping for 6-8 weeks after a thoracotomy and 1 week after VATS procedures. The Physiotherapist will inform you which of these timescales applies to you.

Eat well
Eat regular, nutritionally balanced meals and drink at least eight cups of fluid every day. If you are eating less than normal, try to include some snacks between your meals until your appetite improves.

Pain control
Your painkillers (analgesics) will be identified before you go home; take them regularly to allow you to cough and breathe deeply without discomfort. When you feel ready to cut them down, try taking one tablet instead of two (i.e. reduce the dose of medication before reducing the frequency). When you feel ready to reduce the painkillers further stop the ones during the day first, continuing to take them when you get up in the morning and before you go to bed, as this helps to ensure a good night's sleep.

Bathing
This can be done as soon as you feel strong enough. You may find it easier to use a shower if available, as sometimes getting in and out of a bath may be difficult. You may find bathing tiring at first, so bathe before bedtime.

Driving
As a result of your surgery, bones and muscles are temporarily damaged. Driving could therefore be difficult. Please avoid driving for four weeks after leaving hospital and then ask your GP or your consultant before starting to drive again. Please remember it is illegal to drive without your seat belt on.

Constipation
Constipation following surgery is quite common. Prevention is better than cure. Try to:

- Increase the amount of fibre in your diet (whole grains, beans, bran, fresh/dried fruit and vegetables).
- Increase the amount of liquid you drink (this means water!).
- Limit high fat foods.
- Keep moving - the more you move your body the more the food moves through your body (you will have been given some laxatives by the hospital to take home).
- Take preventative oral laxatives.
- Seek advice if you have not had a bowel movement for 2-3 days.

You should be discharged home with a simple laxative. Please check this before you leave the hospital.

Thrombo-embolic deterrent stockings (TED) stockings.
Please follow your nurse's instructions about wearing TED stockings and keeping active following discharge. Some patients who are at higher risk of DVT or PE's will be discharged on Low-Molecular Weight Heparin (LMWH) or an oral anti-coagulant tablet to help thin the blood.

Wounds
Dissolvable stitches are now used in the majority of operation wounds. These do not need to be removed following surgery. However, if you have had any drains, you will have one stitch per drain that will need to be removed. This should be arranged with your practice nurse. You may notice your wound is swollen at the lower end; this is normal and the swelling will go down.

Once you go home, if you notice that your wound begins to leak, becomes red or hot and tingly, or if you feel feverish, contact your GP for advice. Should your wound require dressing after you have been discharged, this will be done either at your home by a district nurse or by the practice nurse at your doctor's surgery.

Work
This depends on your job and on your recovery. Returning to work can be discussed with your Physiotherapist. If you feel ready to start work sooner than advised, please ask your GP/ surgeon or specialist nurse.

Holidays/flying
After your chest surgery, our advice is that you avoid flying or taking a holiday, particularly abroad, until after you have had your surgical review with your consultant.

Alcohol
Alcohol in small amounts is not bad for you. Only drink in moderation, especially if you are taking medicines. Ask for an information leaflet on the subject if you require more assistance.

Sexual activity
Resume sexual intercourse once you feel confident to do so. If you remain relaxed and possibly adopt a more passive role, you may return more easily to your normal routine.

Follow-up
Most patients are seen in four to eight weeks following discharge. If you are waiting for histology results your surgeon will contact you by telephone or see your three to four weeks post discharge. If your surgeon wishes to see you beforehand you will be advised of this before you leave the hospital.

If you have not received an appointment from Royal Papworth Hospital (or your referring hospital) please contact us.

Remember we are always here to help you.

Contact details

Clinical Nurse Specialist Team: (for patients with a malignant condition)

Monday to Friday 09.00-17.00 (except bank holidays)

01223 638000 and ask for bleep 064

Ward contacts:

5 South West - 01223 638515

5 South East - 01223 638535

5 North West - 01223 638525

5 North East - 01223 638520

Physiotherapy department: 01223 638215

Ward physiotherapist: 07775553488

Consultant Secretaries:

Monday to Friday 09:00-17:00 (except bank holidays)

Mr Aresu - 01223 639766
Mr Coonar - 01223 639874
Mr Peryt - 01223 639775

Royal Papworth Hospital NHS Foundation Trust
Papworth Road
Cambridge Biomedical Campus
Cambridge
CB2 0AY

Tel: 01223 638000

www.royalpapworth.nhs.uk

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