

Physiotherapy information after pectus surgery

A patient's guide

What is a pectus abnormality?

Pectus abnormalities are thought to be caused by poorly co-ordinated and possibly excessive growth of the ribs, usually around where they connect to the breast bone. With growth, this can either push the breast bone inwards, causing pectus excavatum, or outwards, causing pectus carinatum.

Pectus excavatum may be minimal, with only a slight depression of the chest or it may be quite severe, causing compression of the heart and lungs and affecting their function.

Pectus carinatum is rarer and its effects are more cosmetic.

Living with a pectus abnormality can affect confidence and create body insecurities.

There are a variety of treatments, with surgical techniques being one option to change the appearance of a pectus abnormality. Pectus correction surgery is performed by a specialist thoracic surgeon.

Pre-op advice

Posture - good vs bad

Pectus abnormality is often linked with poor posture, which can cause certain muscles to tighten or shorten and others to lengthen and weaken.

A common posture linked with pectus abnormalities is the 'rounding' of the shoulders. To optimise the surgery, it is very important to ensure good posture.

Many patients with pectus excavatum and pectus carinatum may have had poor posture for some time. Therefore muscles that have become weak may need time and exercise in order to ensure they become strong enough to hold good posture.

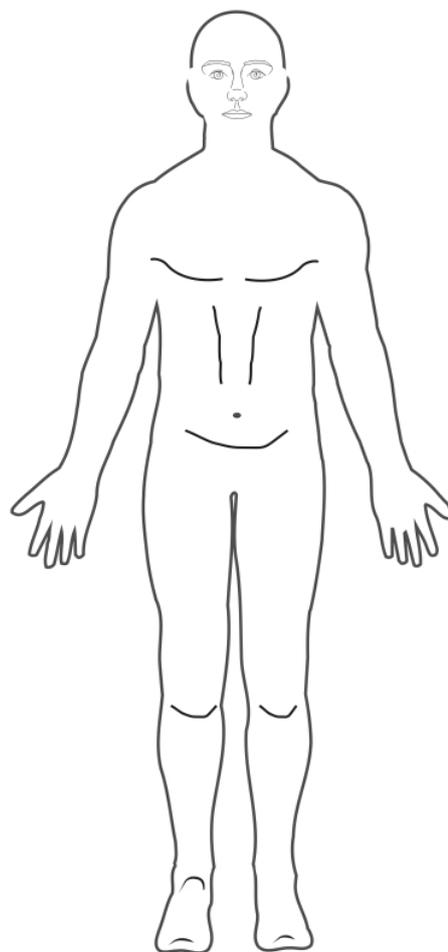
Your physiotherapist will demonstrate a number of exercises to complete from the first day after your surgery, which you will need to continue independently for up to six months.

Pre-operative posture self-test

It is a good idea to become aware of your posture before your surgery as knowing the points in your posture which need to change will help you to correct them after your operation. The following pages include a self-test postural assessment that can be used by yourself to highlight areas you feel need working on.

The wall test

Stand with the back of your head touching the wall and your heels six inches (15 centimetres) from the wall. With your buttocks touching the wall, check the distance with your hand between your lower back and the wall, and your neck and the wall. If you can get within an inch or two (2.5 to 5 centimetres) at the lower back and two inches (5 centimetres) at the neck, you are close to having excellent posture. If not, your posture may need professional attention to restore the normal curves of your spine.



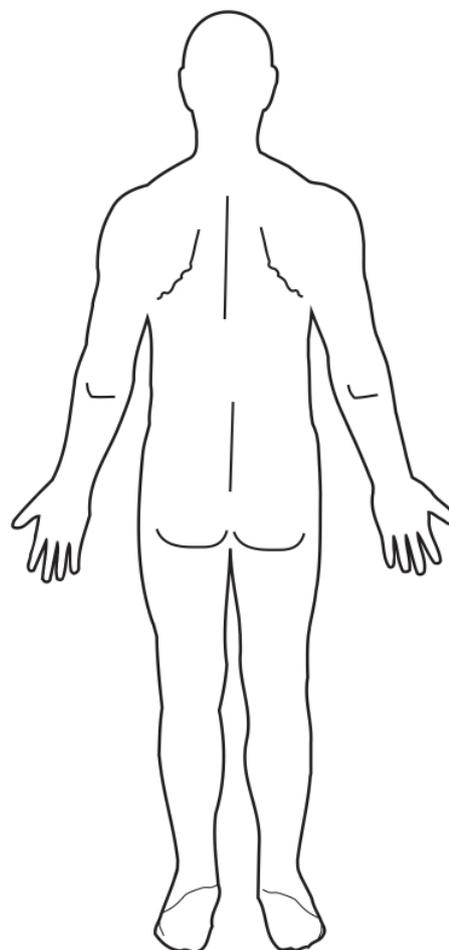
The mirror test

Front view. Stand facing a full length mirror and check to see if:

1. Your shoulders are level.
2. Your head is straight.
3. The spaces between your arms and sides seem equal.
4. Your hips are level and your kneecaps face straight ahead.
5. Your ankles are straight.

Side view. This is much easier to do with the help of another person, or maybe by taking a photo. Check for the following:

1. Head is upright, not slumping forward or backwards.
2. Chin is parallel to the floor, not tilting up or down.
3. Shoulders are in line with ears, not drooping forward or pulled back too far.
4. Stomach is flat.
5. Knees are straight.
6. Lower back has a slightly forward curve (not too flat or curved too much forward, creating a hollow back).



Immediate post-operative recovery

On the first day after your operation we advise you to either lie down (with one small pillow for support), sit upright, or stand.

To sit up you will have to bend at the hips, with your arms folded across your chest whilst keeping your back straight. The physiotherapist and/or nursing staff on the ward will assist you.

No log rolling, side lying, slouching, waist bending or twisting is allowed.

Your recovery will be optimised if you sit out in the chair and walk as early as you are advised to. Usually this will be in the morning after your operation, but can be in the evening of the same day as the operation.

Immediately after your operation it is important to complete deep breathing exercises. It is possible after your operation for you to develop a productive cough and it is very important that any phlegm that is on your chest is cleared to prevent a chest infection.

Deep breathing exercises are as follows:

1. Sit upright, supported in your chair or bed, with your shoulders relaxed.
2. Take a slow deep breath in through your nose.
3. Hold your breath for a few seconds.
4. Gently 'sniff' in a little more air to top up the breath. Do this a couple of times until you can take in no more air. Breathe out through your mouth and relax.
5. Breathe normally five or six times.
6. Once breathing is under control, try a supported huff or cough.

Complete four or five deep breaths per session.

Coughing

Good effective coughing is extremely important to clear any secretions present. When you cough after your operation we will ask you to support your wounds with either your hands, a pillow or rolled towel.

You should practise your deep breathing exercises to help the expansion of your lungs. Your physiotherapist will advise you how often you need to perform these exercises.

Precautions

Due to the bar or metal plate that has been inserted during your operation, there are a few precautions **you must adhere to**, to ensure it stays in place. These are as follows:

- Avoid sleeping on your side or stomach for six weeks. However you can sleep and rest in bed at any angle when lying on your back so long as you are not slouched in posture.
- It is your responsibility to look after your wound. Avoid lifting, pushing and pulling objects over five kilograms. For example not lifting a full kettle of water for 12 weeks.
- No twisting at the waist for three months.
- After three months most people are able to resume more strenuous activities, like running, swimming or gym work.
- No contact or extreme sport (e.g. karate, gymnastics, rugby) for at least six months. Discuss this with your surgeon on your follow up visit as they can take into account the specific details of your surgery.

On the next page is a table with activities and the length of time they should be avoided:

Activity:	Length of time to avoid for:
Lying on side or stomach	Six weeks
Side twisting	Three months
Pushing up with arms or heavy items over five kilograms	Three months
Gentle exercise (e.g. jogging, cycling, swimming)	Can be started gently after three months
More vigorous exercise/activity (e.g. athletics, mountain biking, gym, yoga, pilates, aerobics)	Three to six months
Contact sport/competitive sport (e.g. football, rugby, tennis, cricket)	Can be started from six months

Activity advice after plate carinatum repair:

You are allowed to perform any exercise from three months unless specifically instructed not to by your surgeon or physiotherapist.

Immediate post-op exercises

The following exercises will be shown to you by your physiotherapist after your operation.

Sit down on an upright, firm chair:

- Gently roll your shoulder in a circle backwards. Repeat five times with each shoulder.
- Pull your shoulders back and down by squeezing your shoulder blades together. Hold for five seconds, then repeat five times.
- Stretch one arm as far above your head as you can, try to push gently up towards the ceiling and then lower it again. Repeat with the other arm, then repeat until you have done this five times with each arm.

Your physiotherapist will go through these exercises with you to ensure you have the correct technique. You will then be able to complete these independently.

After your surgery it is important to build up your exercise levels gradually. One of the best ways to increase your fitness levels and exercise tolerance is by walking. You can start this as soon as you get home.

When you begin, take two short walks a day, starting with the distance that you have been covering with your physiotherapist within the hospital.

Gradually increase the distance and pace of your walking. You should walk at a pace that makes you slightly out of breath. Do the 'walk and talk' test - can you hold a conversation and walk?

Most patients are back to their usual exercise level after six to eight weeks.

Strengthening exercises from three months onwards

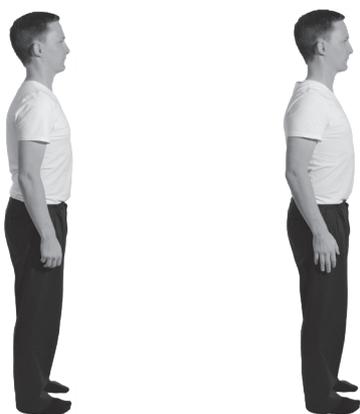
In order to correct your posture, it is essential to strengthen the muscles that have become weak. The following strengthening exercises target specific muscles that most commonly become weak with poor posture. These exercises need to be repeated twice daily in order to gain strength.

Initially, repeat the exercises five to six times each and gradually increase the number when you feel you are able to. When completing these exercises it is essential that the correct technique is used to ensure that full benefits are gained. These exercises will be shown to you at a musculoskeletal outpatient appointment.



Serratus press

Lie on a hard surface on your back. Stretch both arms straight out in front of you whilst holding a fist-sized ball. Lift the ball higher in the air using your shoulders without bending your arms.



Scapular squeezes

Stand with your arms down by your sides in front of a mirror - ensure that your shoulders are relaxed. Squeeze or pull your shoulders back so that your shoulder blades are pushed together. After you have held this position for five seconds, relax and bring your shoulders back to a neutral position.



Wall angels

Stand with your back against the wall. Hold your arms out horizontally along the wall, with your elbows bent and hands towards the ceiling. From this starting position, glide your hands up towards the ceiling until your arms are straight above you. Keep your arms against the wall at all times. Slowly reverse this movement until you are back to the starting position.



Shoulder rolls

Stand in front of a mirror with your arms by your side. Gently roll your shoulders backwards. Keeping the movements as controlled as possible will help to ensure all muscles are working.

Stretching exercises from three months onwards

Poor posture can also result in tightened muscles. In addition to strengthening the weaker muscles, it is important to lengthen the ones that have become tight. The stretches need to be completed twice a day, five to six times each. Hold each stretch from between 30 to 45 seconds each to ensure the most is gained from the stretches.



Latissimus dorsi stretch

Stand upright with your arms above your head. Reach up as high as possible. Hold for between 10 and 30 seconds.



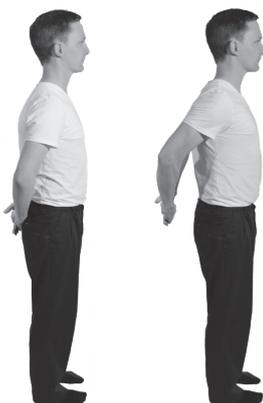
Lower back towel stretch

Place a rolled up towel behind your back whilst you are sitting in a chair. Gently relax back onto the towel feeling a stretch across the lower back.



Upper trapezius

Standing upright, tilt your head over to one side. Using your arm on the same side that your head is tilted, gently pull your head over a little more until you feel a light stretch.



Pectorals

Standing upright with your arms relaxed by your side, gently pull your arms behind you until you can feel the stretch across the front of your chest. Hold for five seconds and relax.

Your record

Use the following tables or a digital alternative to record the exercises and stretches that you complete and the number of repetitions.

	Date								
Stretch									
1									
2									
3									
4									

	Date								
Stretch									
1									
2									
3									
4									

Kinesiology taping instructions

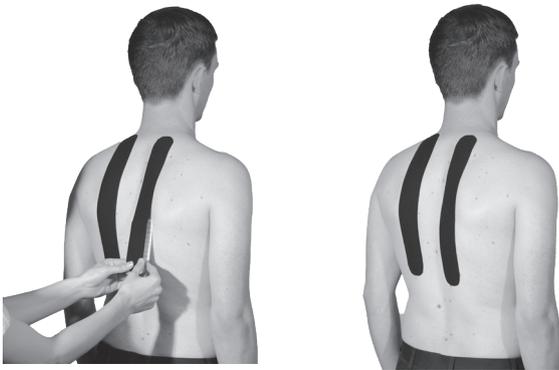
It is very easy to forget about posture throughout the day. Taping can be a way to remind you to keep good posture. A physiotherapist will go through this technique with you and your family or friends so you can carry on using it at home.



Step-by-step guide

Step 1

Stand upright with head held high. Relax the shoulders and ensure shoulders are pulled back.



Step 2

Place a strip of tape starting from one side of the base of the neck, straight down the back, pulling gently downwards when applying the tape. Ensure the tape is applied smoothly with no wrinkles.



Step 3

Place another strip of tape on the other side of the neck in the same way.



Step 4

Repeat the process, but this time apply from the front of the shoulder, across and down the back to meet with the previously applied tape (to form a V shape.) Repeat on the other shoulder.

If you experience any redness or skin irritation around the tape applied, please remove the tape immediately and seek medical advice. Please do not try to use tape other than kinesiology tape for this technique.

The good posture guide

The following information provides you with advice on correct posture. Many people are unaware of their posture during daily activities.



A good sitting posture

- Sit fully back in a chair so lower back is supported.
- Keep head neutral.
- Keep shoulders slightly down and back so they are relaxed and not hunched.
- Ensure feet are flat on floor so legs are supported.



A good standing posture

- Have equal weight through both feet, and keep feet a hip distance apart.
- Keep head central.
- Keep shoulders slightly down and back so they are relaxed and not hunched.
- Allow arms to hang down naturally.
- Pull in your abdomen gently.



A good walking posture

- Ensure you are looking forward, not at the ground.
- Keep shoulders slightly down and back so they are relaxed and not hunched.
- Allow your arms to swing naturally with a slight bend to your elbow.
- Pull in your abdomen gently.



A good sleeping posture

Sleep on your side or back. Do not sleep on your front as this will aggravate a 'sway back' posture and force you to turn your head to one side which is not good for your neck posture. Your pillow should be at the correct height, so your head is in line with your spine.

Advanced postural exercises

These exercises are aimed at improving your posture and should only be carried out if you are instructed to do so by your physiotherapist. Each exercise should be carried out six to eight times and completed three times a day.



Wall circles

- Stand facing a wall about an arm's length away. Keeping your back straight, place a ball between your hand and the wall.
- Lean your body weight onto the ball slightly. (You can either hold this position for a minute or you can move the ball in small circles).



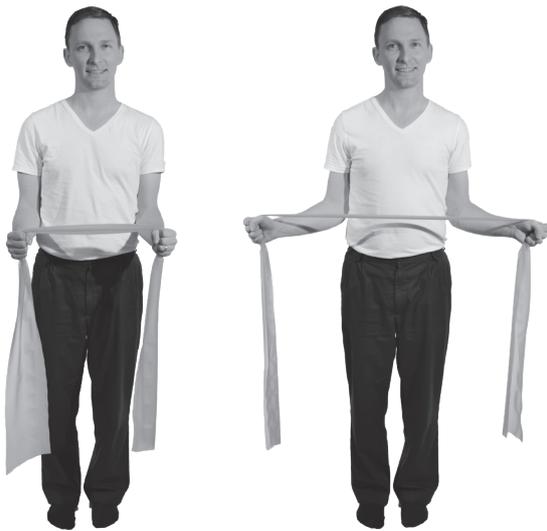
TheraBand™ scapular squeezes

- Standing upright, hold your arms out in front of you at shoulder height. Grasp the ends of the band in front of you ensuring that there is little slack in the TheraBand™.
- In small movements, move your arms outwards stretching the band. Ensure your arms are kept straight and at the same height. Slowly return to starting position.



Seated TheraBand™ abductions

- Sit on a chair with a straight back.
- Place the band under both feet and grasp an end of the band in each hand.
- Keeping your arms straight out to the side, pull up on the band until your arms reach shoulder height. Hold for five seconds and return slowly to starting position.



External rotation with a TheraBand™

- Either sitting with your back straight or standing upright, bend your elbows keeping them by your side.
- Grasp each end of the band in each hand ensuring there is no slack.
- Stretch the band outwards but keeping your elbows by your side.
- Slowly return to starting position.



Standing TheraBand™ row

- Begin with one leg slightly in front of the other. Stand on the end of the TheraBand™ with the front foot. Bend forward at the hips, keeping your back straight.
- Grasp the end of the band with the arm opposite to the leg, whilst standing on the band. Your arm should be straight.
- Pull the band upwards by bending your elbow, bringing your hand to your waist.
- Slowly return to starting position.

Discharge

On discharge from Royal Papworth Hospital you will be referred to a musculoskeletal outpatient clinic at your local hospital. Here a member of the physiotherapy team will help to optimise the results of the surgery by adjusting your posture and addressing any musculoskeletal issues.

You will be asked for your preferred contact details. Please ensure these details are correct to enable your local hospital to contact you so that an appointment can be made.

Appointments are usually made for about three months after your surgery, so that more advanced exercises and stretches can be prescribed.

Do not worry if your appointment is more than three months after your surgery, but please call the physiotherapy department on **01223 368215** if you have any queries.

Royal Papworth Hospital NHS Foundation Trust

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