



York and Scarborough  
Teaching Hospitals  
NHS Foundation Trust

# Complex Abdominal Wall Hernia

Includes Stoppa Mesh repair and  
Component Separation techniques

Information for patients, relatives and carers

## Department of Surgery

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The following is a guide on what to expect before, during and after your abdominal wall hernia repair operation. This leaflet covers the most common questions patients have about their recovery. Your doctor can answer any questions you might have which are not covered in this leaflet.

This leaflet is **not** about groin hernias or other simple hernias even though they form 70% of hernias of the abdominal wall. There are separate leaflets for them.

# What is the Abdominal Wall?

## Abdominal Wall

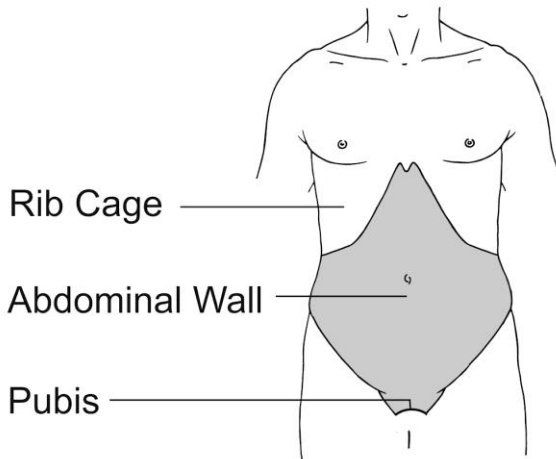


Figure 1: Abdominal wall

The abdominal wall forms the front cover of the abdomen as shown in figure 1.

The abdominal wall is made up of

1. Skin
2. Layers of fat
3. Layers of muscles

## Layers of the abdominal Wall

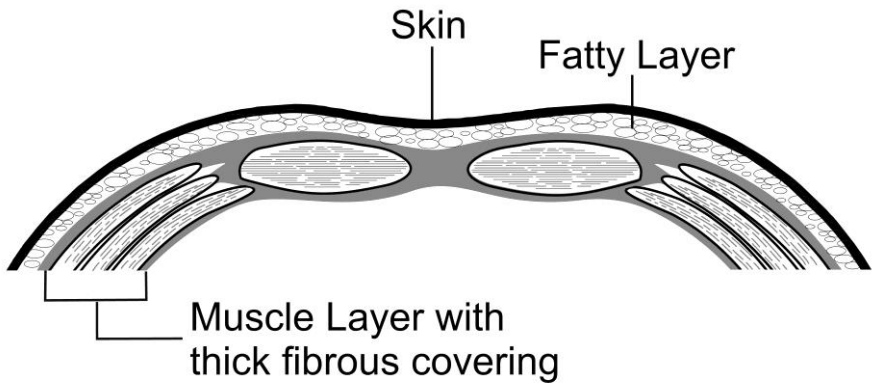


Figure 2: Layers of the abdominal wall

The muscles of the abdominal wall and their coverings have complex relationships to each other as shown in Figures 2 and 3.

## Muscles of the Abdominal Wall

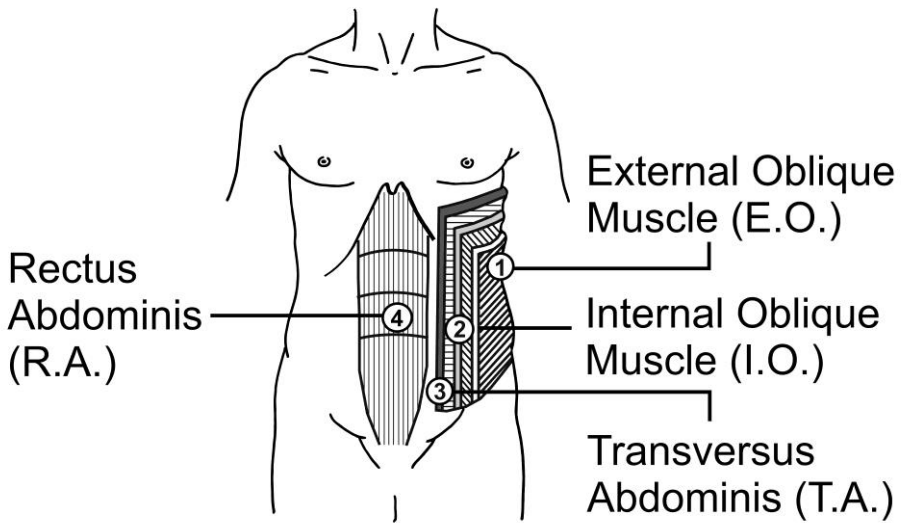


Figure 3: Muscles of the abdominal wall

In the middle of the tummy there is a bulky muscle called the rectus abdominis (RA), sometimes called the 'six pack'. This muscle is about 10cms wide. On each side of the abdomen there are three muscles. The three muscles on the sides and their relationships to each other are shown in figure 3. These three muscles cross over each other and give the sides of the abdominal wall strength.

## **What is the function of the abdominal wall?**

This group of muscles have their own blood supply and nerves. Together they create a strong structure which supports the internal organs. They also help in providing abdominal pressure when needed e.g. in breathing out, emptying bowels and bladder.

## **What is an Abdominal Wall Hernia?**

A hernia of the abdominal wall is a bulging of the abdominal contents through an area of weakness in the wall. An abdominal wall hernia can be small and simple or large and complex. Many hernias do not cause symptoms, but some may cause pain. If you have symptoms like pain and you would like your hernia repaired then we can consider this. However, you must be fit enough for surgery.



# What are simple Abdominal Wall Hernias?

Simple abdominal wall hernias include groin hernia (inguinal and femoral hernia), umbilical hernia, epigastric hernia, spigelian hernia, and incisional (ventral) hernias.

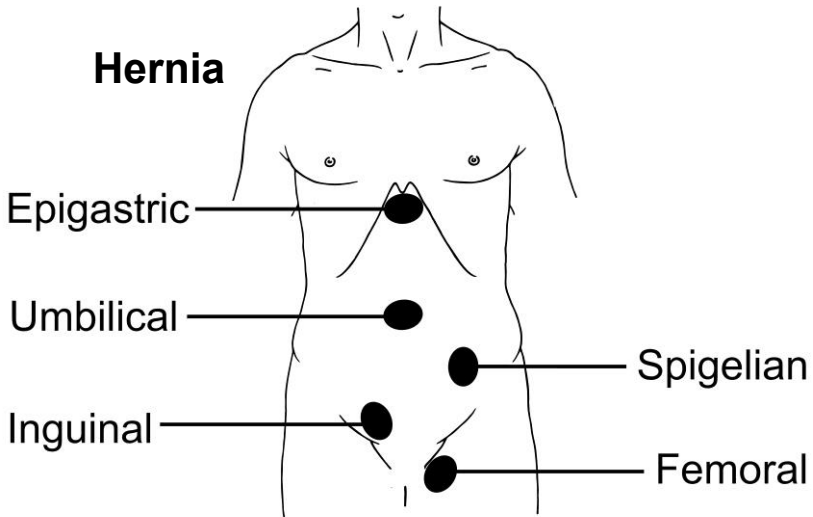


Figure 4: Types of simple abdominal wall hernia

- Umbilical hernias: bulging through the belly button (umbilicus).
- Epigastric hernias: bulging through the midline.
- Spigelian hernias: bulging through weakness in the lateral muscle of the abdominal wall, usually below the level of the umbilicus.
- Groin hernias: include inguinal hernias and femoral hernias. Inguinal hernias occur above the groin crease. Femoral hernias generally occur below the groin crease.

# **What is Complex Abdominal Wall Hernia?**

These are usually large (greater than 10cms in size). Depending on the size and nature of the hernia and the strength of your abdominal wall you may need complex surgery which is described on the next few pages.

These hernias often occur through the incision of a previous abdominal operation. This is then known as an **incisional hernia**.

## **What causes Incisional Hernia?**

Most incisional hernias are caused by an impairment in the healing process after an operation. The wound may break down due to wound infection, a blood clot called haematoma or a collection of fluid called a seroma. In addition, healing may also be impaired if there is a prolonged and sustained increase in the pressure inside the abdomen as occurs if the patient is having incessant coughing, urinary obstruction as in prostate enlargement or constipation.

Poor wound healing has been linked to smoking, diabetes, obesity, long term steroids and malnutrition.

We will talk to you about changing some of these if they apply to you.

# Repair of Complex Incisional Hernia

There are different ways in which we can repair your hernia. Your surgeon will consider many factors when planning the repair:

- Whether to use a sheet of strong material (mesh) and what material to use,
- Which layer of the abdominal wall to place the mesh in e.g. in open surgery this is called Stoppa repair,
- Whether the layers or components of the abdominal wall should be released in order to reduce the tension of the closure (e.g. component separation techniques).

The goals of the operation are to

- enhance the function of your abdominal wall
- prevent future complications like strangulation of the bowel
- improve the shape of your abdomen

The final result may not be as your abdomen was before you had any surgery but should be an improvement.

## a) Stoppa repair

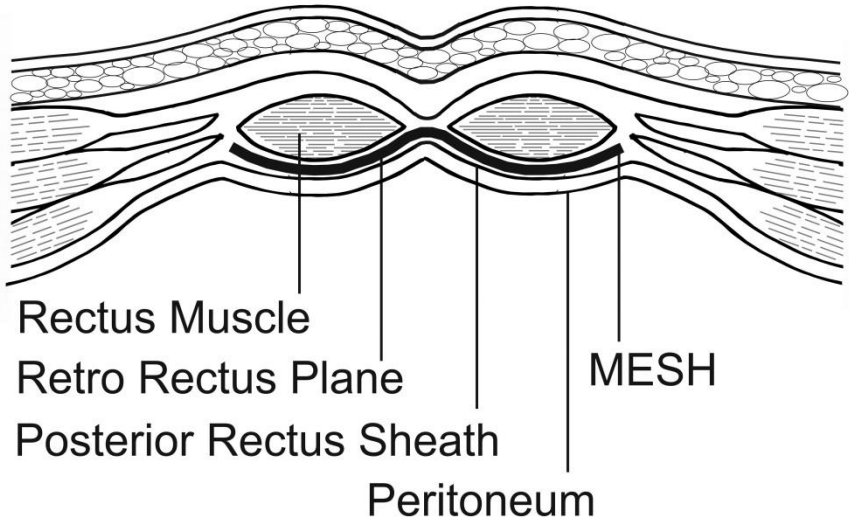


Figure 5: STOPPA repair

If you have this kind of operation the surgeon will put the mesh either behind your rectus muscle or above the peritoneum.

In this operation the surgeon stitches (sutures) the layers of posterior rectus sheath together and puts a mesh in front of them (see figure 5). After this the surgeon closes the anterior rectus sheath over the top. You may have drains placed in your abdominal wall to collect any fluid that gathers after surgery. Your doctor will decide when to remove the drains. The other layers of the abdominal wall are then closed and the wound is dressed.

## b) Anterior Component Separation technique

- |                                  |                           |
|----------------------------------|---------------------------|
| ① External Oblique Muscle (E.O.) | ④ Rectus Abdominis (R.A.) |
| ② Internal Oblique Muscle (I.O.) | ⑤ Hernia                  |
| ③ Transversus Abdominis (T.A.)   |                           |

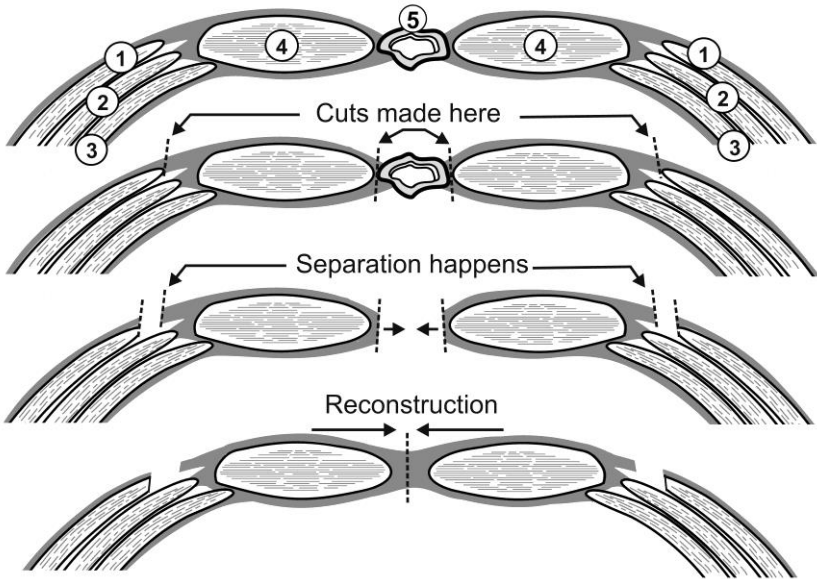


Figure 6: Component separation

Component separation is a surgical technique that releases one or more of the muscles on the side of the abdominal wall. This separates them from the rectus abdominis (RA) muscle and allows this muscle to slide towards the middle of the abdomen. The abdomen can then be closed without any tension, which reduces the risk of the hernia occurring again.

However, this technique causes an extensive raw area internally that leads to seepage of fluid. This means that you have to have drains inserted into the abdominal wall. Your doctor will decide when the drains can be removed. Sometimes your doctor will send you home with drains in your body and make arrangements to see you in clinic to remove them.

### **c) Small Incision Lateral Anterior Component Separation (SILACS) technique**

In this type of operation, the surgeon releases the outer (external oblique) muscle through a small horizontal incision on both sides of the abdominal wall. This technique is less invasive than the other method of component separation and therefore you avoid creating a large raw area. However, you get less movement of the abdominal wall, which means less reduction of the tension in the abdomen. This may mean there is a higher risk of getting another hernia.

## d) Transverse Abdominis Release (TAR)

In this procedure we go behind the rectus muscle and develop the plane behind the rectus muscle but in front of the posterior rectus sheath. This is same plane as in Stoppa repair (see figure 7).

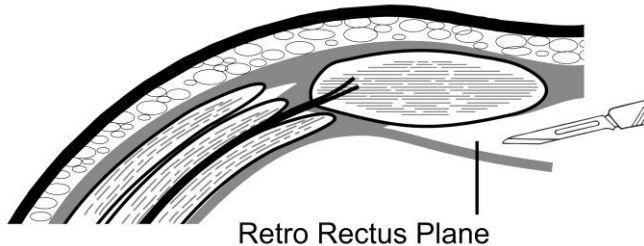


Figure 7: Retro Rectus Plane

Then when we reach the Transversus abdominis muscle we curve the cut to release that muscle and then go on to develop a plane in front of the peritoneum (see figure 8). It is a more extensive surgery but may provide greater ability of the abdominal edges to come together.

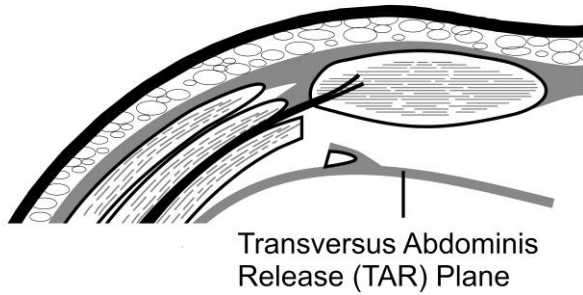
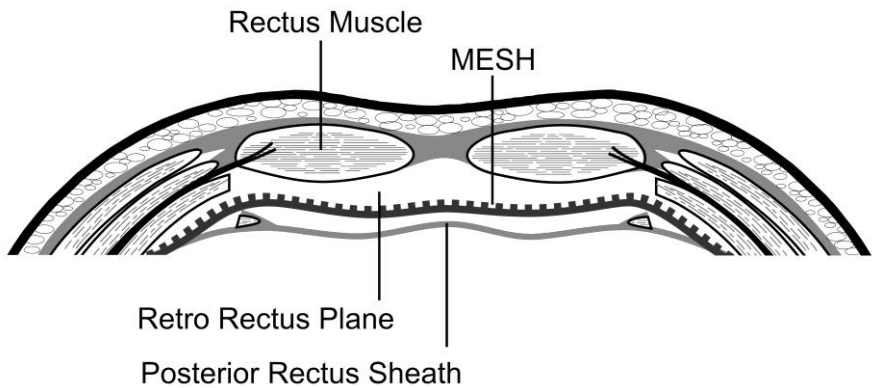


Figure 8: Transversus Abdominis Release (TAR) Plane

Figure 9: Describing TAR





# What types of mesh are used?

Broadly speaking there are three kinds of mesh

1. Synthetic mesh  
This is non-absorbable making it permanent. It is very strong
2. Semi synthetic mesh  
This takes about a year to get absorbed by the body. It provides strength to the abdominal wall while the repair heals
3. Biologic  
This is made from human or animal tissue. It is resistant to infection but if infection does set in it will get destroyed completely.

Your surgeon will discuss the best mesh for you based on:

- the kind of hernia you have
- which layer of the abdomen the mesh needs to be placed in
- your risk of having problems with your surgical wound and
- your views about the types of mesh being placed inside you

## **What are the benefits of this surgery?**

The main benefits of having such complex surgery are:

- reducing the risk of strangulation of bowel within the hernia at a later date
- returning the function of the abdominal wall to the best possible state

## **Am I fit for surgery?**

An anaesthetist will see you and assess your fitness for surgery. You may have exercise testing to check your heart and lungs. When we know how fit you are the anaesthetist will decide the most appropriate place to nurse you after your operation. That may include the Nurse Enhanced Unit, High Dependency Unit or Intensive Care Unit.

You will also come to a pre-assessment clinic. Here you will have further checks such as blood tests.

## Will I be in any pain?

You are having extensive surgery and it will be painful. We control the pain by using a combination of pain killers, anti-inflammatory drugs and morphine. Before your operation your surgeon and anaesthetist will discuss how we will manage your pain.

One form of pain relief that the anaesthetist may discuss with you is an epidural. In an epidural, the anaesthetist puts a fine tube (cannula) into your back. An anaesthetic is given through this tube which numbs the abdomen and relieves pain. It is usually very effective.

## What complications could there be?

There are two types of complications associated with the surgery, those which are **specific** to the operation techniques and then those which are **general** to any major operation of this nature.

The **specific** complications to consider are:

### a) Bleeding

Operating on a hernia can cause bleeding. Most bleeding is controlled during surgery. Infrequently, less than one in a 100 patients will be taken back to theatre to control the bleeding.

## **b) Wound infection and breakdown**

This is of great importance. We know that it is more likely to happen in people who smoke, are obese, have diabetes or who have had previous wound infections.

It is extremely important to try to stop smoking. If you smoke, we will refer you back to your GP for help with this.

If you are obese you should try to lose some weight. Your surgeon may set a target weight loss that you have to achieve before we can safely do the operation. We will refer you to a dietician for help.

If you have diabetes you should see your GP so we can make sure your blood sugar level is well controlled in the period before your surgery.

If you have had a previous wound infection we will screen your skin to look for any existing infection. If you have an infection we will treat it before you have your operation.

### **c) Wound seromas**

A seroma is a collection of serous (clear or yellow) fluid underneath the surgical wound. It usually goes away on its own in about six weeks. However, if it is tense or causing pain or showing signs of becoming infected we may need to remove it using a needle. Sometimes we may not be able to drain it successfully using a needle. In this case you may need an operation.

We leave a small tube called a drain to help collect the serous fluid and your doctor will decide when it is to be removed. Sometimes we discharge patients from the ward with the drain still in them. We review you in a few days to check how much of fluid is coming out of the drain. When the doctor is reassured with the reducing amount of fluid the drain is removed.

### **d) Wound bruising**

There can be different degrees of bruising in the abdomen. The bruising usually takes 6 to 12 weeks to settle down completely

### **e) Skin and abdominal wall necrosis**

Sometimes there can be a loss of skin and superficial part of abdominal wall due to destruction that occurs as a reaction to wound breakdown. This will need dressing and, if required, an operation. Your surgeon will decide the appropriate course of action for you.

## **f) Bowel injury during surgery**

We take great care to avoid injuring the bowel but given the extensive nature of the surgery this is a real but small risk. If it happens we will repair the bowel during the operation. However, if we are unaware of it during the operation we may need to take you back to theatre for a second operation. This may include taking some of your bowel out. We may also need to create a stoma. A stoma is where a piece of bowel is brought onto the tummy through a small opening. Waste material from the body is passed through this stoma into a bag.

## **g) Bowel ileus**

This is when the bowel does not work properly in the period after surgery. We encourage the return of normal bowel activity by giving you drinks soon after the operation. Despite this your bowel may go into ileus. To treat that we may need to pass a tube down your nose into your stomach so we can drain the fluid collecting in your stomach. This allows your bowel to rest and recover its function. Once everything returns to normal the tube will be removed.

## **h) Intra-Abdominal Hypertension (increased pressure in the abdomen)**

This is a sudden sharp increase in pressure inside the abdomen. It may be caused by returning the contents of a large hernia back into your abdomen. The increase in pressure may affect your kidneys and reduce the amount of urine you make. At this stage it is called Intra-Abdominal Compartment syndrome. After surgery we will monitor you for this and start treatment if needed. This may include emergency surgery to reduce the pressure (decompress) the abdomen.

## **i) Mesh infection**

The mesh can become infected but this is rare. You may have to undergo an operation to remove the infected mesh.

## **j) Recurrence**

With each operation on your abdominal wall the strength of your wall weakens further. This is unavoidable and therefore there is a risk of you having a further abdominal hernia developing.

You can help to prevent this by maintaining a healthy weight, not smoking, and managing any factors that will increase your abdominal pressure e.g. chronic constipation.

## **k) Scarring**

The operation will leave permanent scars on your abdomen. These scars typically take 12 – 18 months to fade, becoming smoother and less noticeable over time. Occasionally thicker scars known as ‘hypertrophic’ or ‘keloid scars’ can form: these take much longer to settle and can cause pain, tenderness and itchiness.

## **l) Abdominal appearance**

The operation may leave some loose or excess soft tissue or skin. There may also be some irregularities of shape and differences in how the two halves of the abdomen look.

**Sometimes we will have to remove the belly button (umbilicus) as part of the operation. If you feel strongly about this please discuss with your surgeon.**



The **general** complications are:

### **a) DVT (blood clots in legs)**

To reduce the chance of getting a DVT after surgery, move your feet at your ankles up and down and bend your knees up and down. Do this about ten times an hour when you are awake. We give you special support stockings as well as injections to thin your blood. Both measures help reduce DVT occurrences. Rarely a blood clot in legs can break off and go to the lungs. When it happens, the condition is called **Pulmonary Embolism** and we need to treat you for this. Very rarely it can be fatal. Hence, we take all measures needed to reduce the chance of getting a blood clot in your legs.

### **b) Lung infections**

To reduce the chance of a lung infection after the surgery, take deep breaths and then blow out air as if attempting to blow out candles on a cake. Do these ten times an hour when you are awake. It would be helpful to practice them in the week before your operation so it becomes second nature to do them.

There is a small risk of death after any major surgery like this. It is generally less than one in a hundred but remains a possibility and depends on the combination of pre-existing health conditions (comorbidities) and significant complications. We do everything to manage and improve the comorbidities and reduce complications

Before your surgery, we will ask you to sign a consent form (reference FYCON169-1 repair of complex abdominal wall hernia) confirming that you fully understand your operation, anaesthetic, risks and benefits, are aware of the alternatives, and agree to have the operation. The form will be kept in your patient notes and you will be offered a copy for your own records.

## **What will recovery be like after I leave hospital?**

It takes about two to three months to be able to mobilise comfortably and get back into your normal routine of taking walks and being active. During this period, we may suggest you wear a corset to support the abdominal wall. It is important during this time that you do not lift anything heavier than 2-3kg or a full kettle.

## **How will my wound be managed after I go home?**

You will need daily dressings of your wound. We will contact your GP practice to let them know you are being discharged. The nurse at your GP practice will contact you to arrange your wound dressings.

## **When can I have a bath or shower again?**

If your wound has healed well you will be able to take a shower a week after your operation. If you have skin staples then once your nurse has removed them you can have a bath. The staples are removed after about ten days.

## **When can I return to driving?**

You can return to driving when you are comfortable and pain free. One way of testing if you are ready to drive is to check if you are able to do an emergency stop. You do this by getting into a stationary car and slamming your foot on the brake. If this does not cause any pain you should be able to do an emergency stop. We find it usually takes patients about eight weeks to start driving again. However, this does vary from person to person.

You will also need to discuss this issue with your insurance company to see if they have specific requirements.

## **When can I return to work?**

When you are able to return to work depends on the nature of the work you do e.g. whether it is a physical job and whether it involves moderate or heavy lifting. Please discuss this with your surgeon. Your ability to return to work may also be affected by your mood. Following such major surgery, it is usual to feel low in energy and mood. This improves with time.

## **When will I be able to return to normal activity?**

After you have gone home it is helpful to do gentle exercises. You can build up your programme of doing gentle stretches and bending. Walk every day and plan to walk a little further distance each day. Initially walk on flat surfaces as they are more comfortable than uneven surfaces. Gradually build up to tackling curbs, cobblestone paths, rough ground or inclines. These surfaces cause abrupt small changes in direction and you can feel the discomfort in healing abdominal muscles. You should avoid lifting anything heavier than 2-3kg or a full kettle. In general, if lifting an object causes pain do not do it.

After two months or so you can resume moderate exercise like walking uphill or bicycling. However, continue to avoid sudden jerky movements while doing housework e.g. hovering.

We would advise you to avoid exercises like weight lifting or sit-ups as they put undue pressure on the abdominal wall, which though repaired, is still weak and prone to recurrent hernia developing.

In general, the abdominal wall strength starts approaching original levels of strength after two years.

## **Will I regain sensation in my abdomen?**

In the initial few months you will notice a considerable area of numbness of the abdominal wall. This will slowly improve and with time may recover completely. However, it is not unusual to be left with some numbness.

## **What kind of diet should I follow after my surgery?**

After you have gone home you should drink 8 to 10 glasses of water a day. You should also have a high fibre diet so you do not strain while having a bowel movement.

## **Will I develop a further hernia?**

With each operation on your abdominal wall the strength of your wall weakens further. This is unavoidable and therefore there is a risk of you having a further abdominal hernia developing. You can help to prevent this by maintaining a healthy weight, not smoking, and managing any factors that will increase your abdominal pressure e.g. chronic constipation.

## **Can you remind me of the benefits of this surgery?**

The main benefits of having such complex surgery are:

- reducing the risk of strangulation of bowel within the hernia
- returning the function of the abdominal wall to the best possible state

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