University College London Hospitals NHS
NHS Foundation Trust

Information for patients and carers

Peri-Acetabular Osteotomy (PAO)

Trauma and Orthopaedics

When you come into hospital for your operation, please bring this booklet with you.

Planned operation date: _____

Planned date of discharge from hospital*: _____

* subject to you being well enough to go home

Patient signature ……Therapist signature……..

UCL HOSPITALS

Introduction

We have written this booklet to help you understand what is involved in a peri-acetabular osteotomy (PAO).

It explains how we do the operation and gives details of the benefits, risks and alternatives. It also includes details of what happens after your operation. This information is based on research studies and may differ between surgeons and hospitals. Members of the orthopaedic team will explain any differences to you and will try to answer any questions you have.

The hip joint and hip dysplasia

The hip joint is at the top of your leg. It is a type of a joint called a 'ball-and-socket' joint. The ball is the top of the thigh bone (the femur), which fits into the hip socket (the acetabulum). Hip dysplasia is a condition which is characterised by the socket (acetabulum) of the hip joint being more shallow with an upward slope which provides a poor fit for the top of the thigh bone (femoral head). This condition may occur in babies whose hips are dislocated at birth or who have unstable hip joints, or those in whom the hip does not quite develop normally. Women are more commonly affected than men (ratio 8:2) and hip dysplasia frequently causes arthritis of the hip in older patients.

Patients with hip dysplasia often start experiencing symptoms in their early 20's or 30's. This is due to the increased stresses a shallow hip has to withstand, leading to damage to the edge of the socket and pain on movement. The surfaces of a healthy hip joint are covered with a smooth cartilage lining (the gliding surface of the joint). A poorly fitting acetabulum and femoral head start wearing away the cartilage and expose the underlying bone, resulting in gradual roughening and distortion of the joint. Unfortunately, once symptoms start to occur, it is usually a sign that the hip joint can no longer compensate for its abnormal shape and restorative action is recommended to avoid or reduce arthritic changes.

What is a peri-acetabular osteotomy (PAO)?

A peri-acetabular osteotomy is an operation designed to improve the biomechanics of the hip joint by surgically rotating the socket (the acetabulum) in order for it to provide improved coverage of the ball (the head of the femur bone). It helps to preserve and protect the hip joint by creating more normal contact stresses passing through the hip.

During the operation, several bony cuts are made around the socket of the hip to allow moving it into a new position and then fixed in place with a number of screws, providing a stable, yet mobile hip joint. The bone usually takes 6-8 weeks to heal. During this time patients will mobilise toe touch weight-bearing with two crutches, this means you can only put weight through your toes, but not the heel of your foot. Provided your Consultant is happy with your progress after 6 weeks and everything looks good on the x-ray or CT scan, you may then increase the weight you put through your operated leg to approximately 50%. After a further two weeks, you may be able to put full weight through both legs equally and use only one crutch to correct your gait and further strengthen the muscles around the hip joint. Your physiotherapist will advise you accordingly and answer any questions you may have.

Benefits of PAO?

By moving the acetabulum into a better position, surgeons try to:

- Stop your hip hurting
- Help you move more easily
- Reduce the likelihood of developing of arthritis, although this is dependent on how much arthritic damage has occurred prior to surgery.

What are the risks of having a PAO?

All operations have risks and your surgeon should talk these through with you before you have your peri-acetabular osteotomy. General anaesthetics are used in most operations, these are usually very safe but there can be side effects. For example, you are likely to have a slightly sore throat and may feel sick or dizzy afterwards. There are also some very rare, but serious complications which can be explained to you at your anaesthetic preassessment. Information booklets will be given to you about the anaesthetic at this visit.

If you have any allergies you must tell your doctor before your operation, as this makes an allergic reaction more likely. Drugs and equipment are available to deal with any such complications,. Your blood pressure, temperature, heart rate and breathing will be closely monitored to make sure you are safe.

The procedure will take approximately 2 hours. During the operation you will loose some blood, but it is rare to require a blood transfusion. The procedure is done through a relatively small incision (8-11cm) and the results are generally predictable with good outcomes.

Problems that can happen during or soon after the operation

- **Wound infection:** there is a small risk of infection in the skin tissue around the wound and the remodelled pelvis itself. The infection rate is around 1 per cent for this surgery although it slightly increases if you have a high body mass index (BMI) or are a smoker. If you get a wound infection, it can be treated with antibiotics but sometimes requires surgery. If an infection becomes serious, it may require one or two big operations to get rid of it. Long-term use of antibiotics may also be necessary.
- **Getting a blood clot in your leg:** if you get a blood clot / deep vein thrombosis (DVT), you will need drugs to thin your blood. In most people the

clots cause no trouble. Getting out of bed the day after the operation helps reduce this risk. (1 per cent risk). If you have had a previous DVT or family Hx of DVT, please be sure to let your surgeon know.

- **Getting a blood clot in your lungs:** this is more serious, but the risk will be reduced by wearing elastic stockings after your operation. These are provided for you and keep the blood flowing in your legs.
- **Damage to the nerves in your leg:** nerves in your leg can be hurt during the operation. This can make your foot floppy and weak. Most people recover, but you may need an operation to find the cause of the damage. You may also experience small areas of numbness in your skin over the upper aspect of your thigh, this area should gradually get smaller over time. (2 per cent risk overall)

Problems that can happen months or years after your operation:

- **You still have pain in your hip:** there will be some on going soft tissue pain after surgery that will take weeks to settle down. Clicking in the hip is common and often relates to a specific tendon (psoas tendon) which also takes time to resolve.
- **Failure of the osteotomy to unite:** the area has a very good blood supply which should help with bone healing, but in the rare case of non-union, a further operation may be necessary to encourage bone healing.
- **Arthritis:** Depending on the extent of the damage sustained before the surgery, and the shape of the hip socket (acetabulum), you may develop arthritis in your hip joint. Although a PAO aims to correct the shape of your hip to improve the biomechanics of your hip joint, it still won't be a perfect fit and the stresses going through the joint may result in arthritic damage at a later stage.

- **Removal of metalwork (the screws):** The screws are often removed around one year after the initial surgery, if the bones have healed well. Your Consultant will advise you at your follow-up appointment if this is suitable in your case. Removing the screws is a minor procedure which will usually be carried out as a day surgery which means you may be able to go home that day and not stay overnight in hospital.

What are the alternatives to surgery?

If you choose not to have this operation, your hip movements may be reduced and pain whilst walking may increase. You may develop arthritis in one or both of your hips and may need a total hip replacement if your arthritis becomes severe. There are a several things you can do to help manage your arthritis without drugs:

- **Stay active:** taking a bit of regular exercise will help to reduce your pain. Try some gentle swimming, walking or cycling, if you can.
- **Lose any excess weight:** carrying extra weight puts a strain on your hips and is likely to make your pain worse. If you are overweight, losing weight should help.
- **See a physiotherapist:** physiotherapists can teach you exercises to strengthen your hip and keep it mobile.

Physical aids: there are many devices to help you move around more easily and confidently, including elbow crutches, other walking aids and shock-absorbing shoes.

What happens before the operation?

Your doctor and anaesthetist will explain the operation to you and the role they play in your recovery.

A number of medical checks, such as X-rays and blood tests are needed before the operation. These are normally arranged in a pre-admission clinic. You will also be seen by a member of the therapy team who will prepare you for your discharge home after the operation.

What can I expect after the operation?

The wound over the front of your hip will be closed with dissolving stitches and waterproof tissue glue. (No dressings are required). You may have a drip in your arm to give you fluids and a second one attached to the PCA (morphine) to give you pain relief on demand. If you had an epidural (spinal) anaesthetic, you may not be able to feel or move your legs for a few hours after your operation.

You will feel pain and stiffness after the operation. There are several options to help control your pain:

- You may have a machine with a button to press to control your own pain relief. This is called a PCA machine and gives you a small amount of morphine, via your drip, whenever you press the button. A limit is set to stop you taking too much, so press the button as often as you need to. Taking more painkillers than you need may make it harder for you to get out of bed as you may feel light headed or dizzy.
- If you have an epidural anaesthetic, your legs may be numb when you wake up, they may also feel heavy and very weak. Epidurals generally last for a few hours but they are sometimes continued for 24-48 hours after the operation.

- Some people feel itchy in the first 24 hours after the operation, this is often due to the morphine pain killers and responds to antihistamine tablets or injections
- There is a wide range of painkillers (analgesics), which are available from the hospital pharmacy. Morphine-based analgesics, referred to as “opioids” are usually used. Sometimes people experience some side effects which include vomiting and constipation. If you experience any of these please inform a nurse. Laxatives can be prescribed to prevent constipation, and tablets or an injection can be given to stop patients from feeling sick.
- Tell the nurses if you are in pain, as too much pain can make it take longer for you to get up out of bed and to get better. The nurses will provide you with the right painkillers and can contact the doctors if there are any problems.

During the first few days, you will have an X-ray to check your new remodelled pelvis. As your mobility will be restricted and it may be difficult to get to the toilet, a small plastic tube (catheter) may be inserted to help when you need to urinate (pee).

You will recover quickly and be should be able to go home within five to seven days. Whilst in hospital, you will be treated by a physiotherapist, who will teach you exercises to carry out and how to walk and climb stairs.

An occupational therapist may be needed to teach you about how to manage your normal day to day activities. They will help you with personal hygiene and dressing yourself when you get home, following precautions to protect your hip.

Your old hip pain and stiffness may go away very quickly, but it does take time to get over having major surgery. It may be three to six months before you feel back to normal. It is common to feel emotional and tearful after a big operation. If you have a low mood for a long time after your surgery, please discuss this with your family doctor (GP). You should be seen for an outpatient appointment about six weeks after the operation to check how things are going.

What should I bring with me?

- This leaflet and your exercise sheets
- Supportive **slip-on** shoes with good heels
- Daily changes of clothing, including day clothes (not just pyjamas)
- Your toiletries. You will have one small locker, so don't bring too much with you.
- Valuables should be left at home; any valuables you do bring should be handed in to your nurse for safe keeping
- Any equipment you need, such as a long-handled shoehorn, long-handled reacher, sock aid or mobility aids. Make sure they are clearly marked with your name on.

How can I protect my hip?

To prevent damage to the hip joint, we advise that you follow a few simple rules for the first six weeks:

- Try not to stand for long – ensure you are only putting weight through your toes on your operated leg for the first 4 weeks – may be modified according to surgeon's instructions
- If your leg becomes painful and/or swollen, elevate your leg on a stool. You can make an ice pack by wrapping a damp towel around a packet of frozen peas and place it on your hip for about 15 minutes. Never place ice directly onto your skin as it can burn. You can repeat this 3-4 times daily. If pain or swelling persists, contact your GP.
- Do not hold your leg up straight – The therapy team will advise you how best to get in and out of the bed and chair.

Physiotherapy

The physiotherapist will show you some exercises to practice in bed and in a chair. These are:

- Breathing exercises and coughing to prevent any chest problems
- Leg exercises to help the blood flow
- Exercises to strengthen muscles on your operated leg
- Bending and straightening exercises to regain movement in your hip.
- In addition, you may be given an ice pack to use on your hip to reduce pain and swelling. We may use a machine that gently bends your hip to help you regain movement.

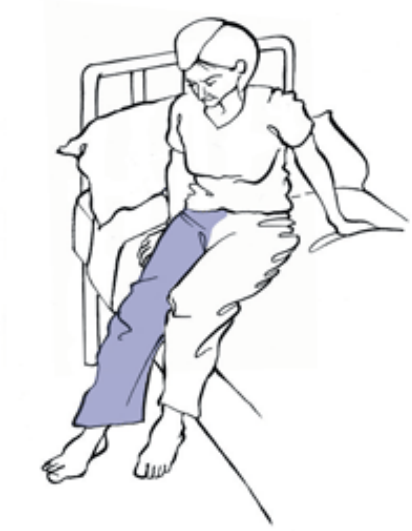
Exercises are very important: you need strong muscles to support your new hip and help the healing process. You should continue these after you go home.

Getting in and out of bed

When you are ready, we will help you to get out of bed and sit in a chair. You will need help to begin with, but will be able to move independently over time.

First, move your operated leg towards the edge of the bed, using the mattress for support.

Second, bring both legs over the of the bed and sit up. Use your arms to push on



Sitting down

At first, it is best to sit in a high firm chair. If your leg is swollen, place it on a stool. When sitting down, put both sticks/crutches to one side, feel for the arms of the chair with both hands, slide the operated leg forward and sit down slowly.

Standing is the reverse of sitting down. Take your body weight through the leg that was not operated on and making sure you push up hard with your hands on the arms of the chair.

Walking

Initially, you will use a frame to walk, but you should be able to walk with elbow crutches before you go home. For the first four weeks, you will only be allowed to toe-touch weight bear but this may be modified according to the surgeon's instructions. This means placing a tiny amount of weight through your toes and not the entire foot. A Physiotherapist will show you how to do this. The sequence of walking is always:

- First, walking aid
- Second, operated leg ("bad leg")
- Third, un-operated leg ("good leg")

Always pick up your feet when turning around, as this will avoid twisting (and hurting) your hip.

Wheelchair

Due to the fact that you will be toe-touch weight-bearing for the first six weeks, you may wish to consider hiring a wheelchair if you are planning to mobilise long

distances outdoors. Your Occupational Therapist can advise you on wheelchair hire.

Stairs

Before you go home, your physiotherapist will teach you how to use stairs. The sequence is:

- Going upstairs: Leg that was not operated on ("good leg")
  Operated leg ("bad leg")
  Crutches
- Going downstairs: Crutches
  Operated leg ("bad leg")
  Leg that was not operated on ("good leg")

You can hold both walking aids in one hand and the banister with your free hand.

Footwear

After the operation, wear a pair of slippers or shoes with good heel support**.** You will find walking a lot easier wearing these types of shoes.

Occupational Therapy

The role of the Occupational Therapist will be to assist you in learning how to safely perform your daily activities like bathing and dressing.

- When you are invited to attend the Pre-Admission Clinic (PAC) you will be sent a questionnaire to complete which asks for details of your home circumstances and furniture heights. We ask that you complete this form and bring it with you to PAC as it forms the basis for the OT's assessment.

- We will discuss what specific needs you may have after your operation. This is to see what equipment you may need, and provide advice about how to make life easier and safe after your surgery.

Bed

- If this is too low, you could use an alternative bed or have it raised.

Chair

- Use a firm chair with arms both sides.
- If your chair is low, place an extra cushion or firm piece of foam on it to raise the height of the seat.
- Borrow a suitable height chair from friend or family.

Toilet

- If needed, the OT will provide a raised seat to place on your toilet to ensure it is the correct height for you.

Bath

- You will not be able to sit in the bottom of the bath or get in/out the conventional way initially following your operation.
- Use a walk in shower.
- Have a strip wash.

If your bath is suitable the OT can provide a board that sits across the bath allowing you to sit over the bath.

Activities of Daily Living

There are a number of normal daily activities you will need to reconsider in preparation for your return home after the operation. Below we discuss some that

you are likely to have some difficulty completing immediately after your operation but should be able to resume after the first couple of months.

Kitchen

- Immediately after your operation it is likely that you will be using walking aids. You will therefore have difficulty carrying items, so you will need to consider having assistance with cooking.
- It is worth planning the layout of your kitchenware so that commonly used items are accessible without having to bend down, and eating your meals in the kitchen so you don't have to carry your dinner.
- It may be useful to stock up on ready meals in the freeze, as you may not feel like cooking initially on your return home. Also consider using a microwave if you have one. Bending down to your oven will be difficult if it is too low.

Housework & Shopping

You may find it difficult to complete heavy cleaning tasks on your return home, due to your need for walking aids. It is advisable to arrange assistance for tasks such as vacuuming, cleaning, shopping (you may be able to have this delivered) and heavy laundry. If doing laundry, it is easier to load/unload onto top of machine and to hang clothes indoors.

Driving

You cannot drive for a period of time after your operation, typically 6 – 8 weeks, therefore you will need to organise alternative travel arrangements. You may travel in a car as a front seat passenger. An Occupational Therapist will advise you how to do this. You should have the go-ahead from your consultant before driving again. We would also advise that you check with your insurance company prior to

resuming driving. If you have an automatic car and it is your left hip that was operated on then you can resume driving much sooner.

Personal Care

You may find your hip is stiff and weak after your operation, however getting yourself washed and dressed should not present too many problems. The OT will review this after your operation.

Going home

When you come to hospital, your nurse will ask about your plan for going home. The ward sister will decide if you need hospital transport. Hospital transport can only be provided if your medical condition prevents you from being able to use public transport or a taxi, or if you are over 80 years old.

On the day of your discharge, you may be asked to wait in the discharge lounge before being collected. This means the next patient waiting for surgery can use the bed.

How can I help myself get better?

Regular exercise is good for you and your operated hip. Ask your physiotherapist for advice about exercise before you leave hospital. Always consult your doctor or physiotherapist before starting any new exercise program. You will receive a referral for your local hospital to see a physiotherapist and you may be able to receive hydrotherapy (exercises in a heated pool with a therapist), where available.

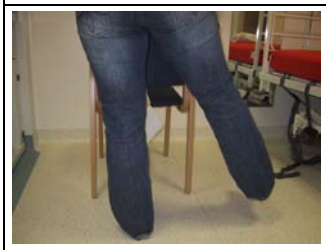
Overleaf are some of the exercises you will be carrying out immediately after the operation. Please to learn them before your operation, so you can do them afterwards**.** Try to follow your exercises 3 times a day. Start with 5 repetitions of each exercise, increasing to 10 repetitions by the time you go home. Always exercise within your comfort and pain limits.

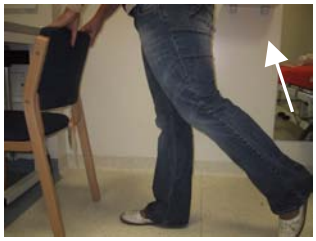
Bed exercises

	**Ankle Pumps** Slowly move your foot up and down. You can start this straight after surgery.
	**Knee / hip bending** Keeping your foot on the bed, slide it towards you to bend your knee. You can use a bandage or theraband to help you do this.
	**Static quads** Push your knee down into the bed, tightening the muscle at the front of your thigh.
	**Hip abduction** Keeping your leg on the bed, slide your leg out to the side as far as possible, then back to the middle.

	**Inner range quads** Place a rolled up towel under your knee. Keeping your knee on the towel, lift your foot off the bed.
In bed, in the chair or standing	**Static glutes** Squeeze your bottom muscles. Hold for 5 seconds and slowly relax.

Chair and standing exercises

	**Knee extension** Sitting on a chair, lift your lower leg to straighten knee.
	**Active Hip abduction** Raise your operated leg out to the side and back in. Keep your toes pointing forward.
	**Hip extension** Take your operated leg out behind you, keeping your knee straight.

	**Hamstring curls** Holding onto a chair for support, slowly bend your knee, bringing your foot towards your bottom. Slowly straighten your knee.

Patient Name:…….....Hospital Number……D.O.B……..

Patient Exercise Chart

Whilst you are in hospital, please record your exercises on the chart below. This will help you to monitor your own progress.

Please feel free to ask the therapist for help with any of the exercises that you struggle with.

Exercise	Day 1	Day 2	Day 3	Day 4	Day 5
Ankle Pumps					
Knee/ Hip bend					
Static Quads					
Hip Abduction					
Inner Range Quads					

Static Glutes					
Knee Extension (Chair)					
Active Hip Abduction (Standing)					
Hip Extension(Standing)					
Hamstrings					

Things to ask before you leave hospital

Before you leave hospital, it is important that you make sure you are completely happy with what happens next. You may find it helpful to ask the following questions, and write down the answers in the space provided.

_____

1. Do I need referral for more Physiotherapy? Where am I being referred to?

_____

2. For how long do I need to keep doing the exercises in the booklet?

_____

3. Has the Occupational therapist ordered me any specialist equipment? If so, has it been delivered?

_____

4. Any other questions?

Contact details

Please contact us between the hours of 8.00 and 16.00 if you have any concerns or questions before or after your operation.

Senior I Orthopaedic Physiotherapist
Telephone: 0845 155 5000 (Switchboard)
Extension: 73619 Bleep: 2110
Fax: 020 7691 5835

Senior 1 Musculoskeletal Occupational Therapist
Telephone: 0845 155 5000 (Switchboard)
Extension: 73618 Bleep: 1217
Fax: 020 7691 5835

If you need to contact someone urgently out of hours, please contact your GP, NHS Direct (on: 0845 46 47) or your local Accident & Emergency Department.

Ward contact details

T10 (10th Floor, Tower)
University College Hospital, 235 Euston Road, London, NW1 2BU
Telephone: 0845 155 5000 (Switchboard)
Extension: 70700 (ward reception)

Ward visiting hours (T10)

10am to 1pm, 3pm to 8.30pm.

Where can I get more information?

Internet:

Yahoo Hip Dysplasia Support Group for Women - Hipwomen

NHS Direct

Telephone: 0845 46 47 Website: www.nhsdirect.nhs.uk
Interactive television: (Sky Active™)

UCL Hospitals NHS Trust cannot accept responsibility for information provided by external organisations.

Space for your notes and questions

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If you require an audio or translated version of this document please contact us on 0845 155 5000 bleep 2110. We will try our best to meet your needs.

Date of publication: June 2009 Date last reviewed: 17 June 2009
Review due: June 2010 Leaflet code: UCLH/SUR/TO/PAO

UCL HOSPITALS

UCL Hospitals is an NHS Foundation Trust incorporating the Eastman Dental Hospital, Elizabeth Garrett Anderson & Obstetric Hospital, The Heart Hospital, Hospital for Tropical Diseases, The Middlesex Hospital, National Hospital for Neurology & Neurosurgery, The Royal London Homoeopathic Hospital and University College Hospital.