NORTH EAST HIP CLINIC
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Northumbria Healthcare NHS
NHS Foundation Trust

Information for patients and carers

Peri-Acetabular Osteotomy (PAO)

Trauma and Orthopaedics

North East Hip Clinic, Nuffield Health, Clayton Road, Newcastle upon Tyne, NE2 1JP

Introduction

This booklet will help you understand what is involved in a peri-acetabular osteotomy (PAO).

It explains how the operation is done 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 where the socket (acetabulum) of the hip joint is 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.

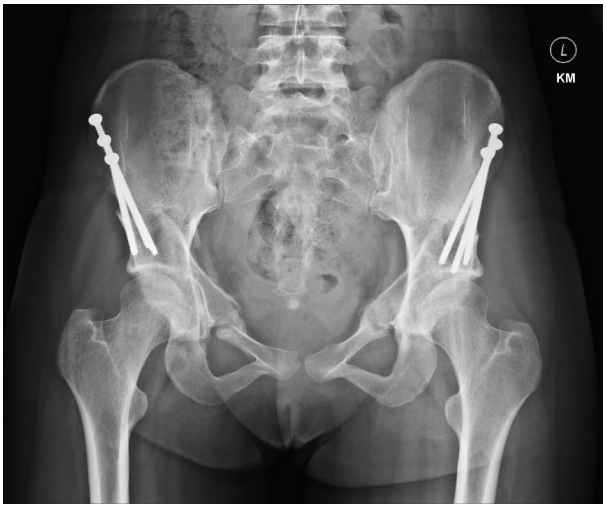
Patients with hip dysplasia often start experiencing symptoms in their early 20's or 30's. This is due to the increased stresses a shallow hip has to withstand, leading to damage to the edge of the socket and pain on movement. The surfaces of a healthy hip joint are covered with a smooth cartilage lining (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 surgery 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 cover more 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 (the osetotomy) 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 osteotomy usually takes 6-8 weeks to heal. During this time taking

weight on the operated leg will be restricted. You will be allowed to partial weight bear only (PWB), with an appropriate walking aid. This is where you can rest your foot to the floor for balance, but no real weight is put through the operated leg -about 10-15Kg. Your consultant will review you at 6 weeks and you will be advised on how to progress your weight bearing by your consultant or physiotherapist.



Benefits of PAO?

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

- Reduce pain
- Help you move more easily
- Reduce the likelihood of developing 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.

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 further surgery. 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. 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 history of DVT, please let your surgeon know.
- **Getting a blood clot in your lungs:** The risk will be reduced by wearing elastic stockings after your operation and early mobilisation.
- **Damage to the nerves in your leg:** nerves in your leg can be damaged 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 months 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 heal:** the area has a very good blood supply which should help with bone healing, but in the rare case of non-union (not healing), 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 day surgery.

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 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 and other walking aids.

What happens before the operation?

Your doctor and anaesthetist will explain the operation to you and the role they play in your recovery. If you have any allergies you must tell your doctor before your operation.
You will be seen in a pre-assessment clinic where a number of medical checks, such as X-rays and blood tests that are needed before the operation will be carried out. You will be admitted to hospital on the morning of your surgery. The average length of stay for patients undergoing PAO is five to seven days.

What should I bring into hospital with me?

- This leaflet.
- Supportive slip-on shoes with good backs.
- Daily changes of clothing, including day clothes (not just pyjamas) for up to five days.
- 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
- Your medication. Please bring medication in the box it was dispensed in as this helps the nurses to identify what they are giving you.

What happens during the operation?

- The procedure will take approximately 2 hours. The procedure is done through a relatively small incision (8-11cm) at the front of your hip. The wound will be closed with dissolving stitches and waterproof tissue glue. (No dressings are required).
- Your blood pressure, temperature, heart rate and breathing will be closely monitored to make sure you are safe during surgery. During the operation you will lose some blood, and there is a chance you may require a blood transfusion.
- At the end of the operation the surgeon will place a fine plastic tube (catheter) into the wound which will be attached to a small infusion pump. This will deliver local anaesthetic directly to the wound and work alongside the other pain relief you will be given. The infusion runs for 48 hours and when complete the catheter will be removed by the ward nurses.

What can I expect after the operation?

- There may be some numbness at the front of the hip/ thigh and it may be difficult to move your hip to start with.
- You may have a tube (catheter) inserted into your bladder to help you urinate, as initially your mobility will be restricted and it may be difficult to get to the toilet.

Pain relief

- You will feel pain after the operation. 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, mobilise and ultimately go home. There are several options to help control your pain.
- One option which you may have is a PCA (Patient controlled analgesia) machine. You may have a drip in your arm to give you fluids and a second one attached to this machine which typically

contains morphine to give you pain relief on demand 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. You may have an oxygen mask on and you will need to keep it on whilst you have your PCA. If you had a spinal anaesthetic, you may not be able to feel or move your legs for a few hours after your operation.

- There are also other painkillers (analgesics) available which you may be prescribed and you discuss any questions you may have about your medication with the nursing and medical staff.
- **Paracetamol** -all patients will be given Paracetamol regularly and you need to take two tablets four times a day. If you already take any other medicines containing Paracetamol (e.g. Co-Codamol) at home, please let the pharmacist, nurse or doctor know, but these should not be taken at the same time.
- **Opiate pain relief e.g. Codeine or Tramadol** . You can take these along with your Paracetamol. The usual dose is one or two tablets (or capsules) up to four times a day If you require them to take home you should expect to take them for up to a week. If you are still having considerable pain beyond this time you should ring the orthopaedic helpline and also speak to your GP.
- **Non steroidal Anti-inflammatory drugs (NSAIDs)**
- **Ibuprofen** This is a pain killer which reduces inflammation. The dose is one 200mg or 400mg tablet three times a day, or **Naproxen.** The dose is one 250mg or 500mg tablet twice a day. Both types of NSAIDs should be taken with or after food. If you are already taking other NSAIDs you will not be given Ibuprofen or Naproxen.

Which medicines will I be given to reduce the risk of complications?

- **Low Molecular Weight Heparin (Tinzaparin).** This medicine is given by subcutaneous injection (under the skin on your stomach) which reduces the risk of blood clots following surgery. It is usually required whilst you are in hospital and potentially for up to four weeks after your operation. See patient information leaflet in the Tinzaparin box for more information.
- **Anti-sickness medicines -Cyclizine & Ondansetron.** Some patients can feel sick after surgery. If this happens you will have these medicines prescribed. Patients do not usually need these medicines when they go home.

- **Laxatives -Senna & Docusate.** Some patients may become constipated after surgery. This can be a side affect of the opiate pain medication. The normal dose for Senna is two tablets at night and for Docusate, two capsules, twice a day.
- 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 so please tell the nursing staff if you feel itchy.

What if I cannot take some of the medicines?

- If you are allergic to any of the medicines, you should discuss this with the pharmacist, doctor or nurse and where possible an alternative medicine will be prescribed.

Side-effects of your medication.

- All medicines can have side effects. There will be an information leaflet in each box of medicines that you are given to explain these fully. The following chart lists some of the more common side effects caused be the medications referred to in this leaflet.

Medicine	**Common side-effects**
Paracetamol	Side-effects are rare. Some patients may develop a rash.
Codeine and Tramadol	Nausea (feeling sick) and vomiting (being sick), constipation, dry mouth, mood changes, dizziness, confusion, rashes.
Ibuprofen and Naproxen	Stomach pain which may lead to bleeding and ulceration, nausea, rashes, headache.
Tinzaparin	Bruising. See patient information leaflet for more information.
Cyclizine	Dry mouth, muscle spasm.
Ondansetron	Headache, constipation, flushing, irritation at injection site.

Senna	Skin rash, stomach cramps.
Sodium docusate	Skin rash, stomach cramps.

What can I expect after the operation?

- During the first few days you will have an x-ray to check your remodelled pelvis.
- 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 with you consultant at about six weeks after the operation to check how you are progressing.

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 minimal weight 10-15Kg (PWB) through your operated leg for the first 6 weeks.
- If your leg becomes painful and/or swollen, elevate it 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 move your leg to get in and out of the bed and chair, often using a bandage to help move your leg.

Physiotherapy

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

- Breathing exercises and coughing to prevent any chest problems
- Circulatory exercises to help the blood flow
- Exercises to strengthen muscles on your operated leg

- Bending and straightening exercises to regain movement in your hip.
- You may be given an ice pack to use on your hip and we may use a machine that gently bends your hip to help you regain movement.

Walking

Initially, you will use a frame to walk PWB 10-15Kg , but you should be able to walk with elbow crutches before you go home. The physiotherapist will show you how to do this. (Please refer to the crutch leaflet for walking sequence).

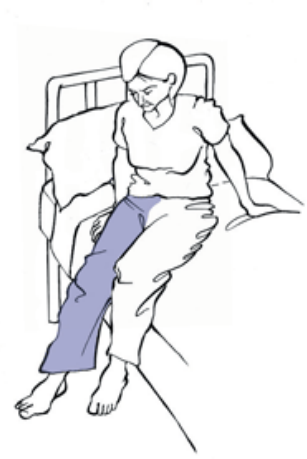
Always pick up your feet when turning around, as this will avoid twisting (and hurting) your hip.

Getting in and out of bed

The physiotherapist or nurses will help you to get out of bed and sit in a chair. This is usually the day after the operation. 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.

Secondly, bring both legs over the edge of the bed and sit up.



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, 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 make sure you push up hard with your hands on the arms of the chair.

Wheelchair

Due to the fact that you will be PWB 10-15Kg for the first six weeks, you may wish to consider a wheelchair if you are planning to mobilise long distances outdoors. If you feel you need a wheelchair, please discuss this with one of the therapy team after your operation.

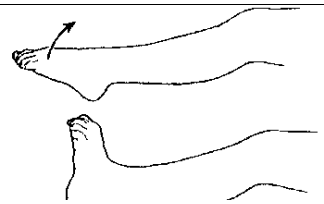
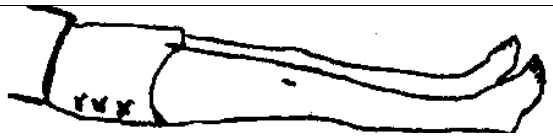
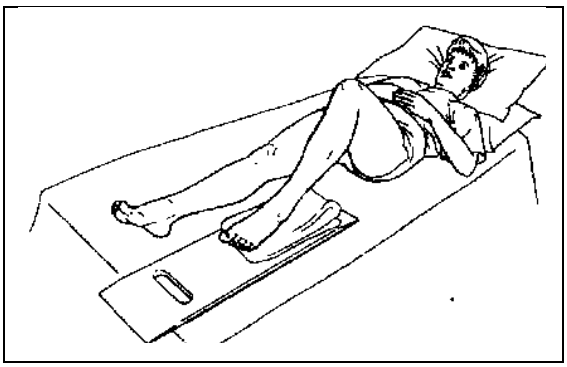
Stairs

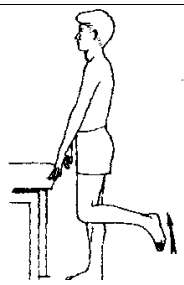
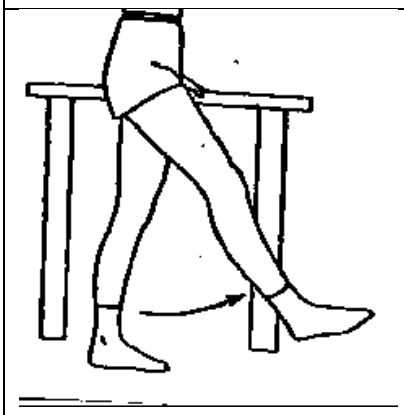
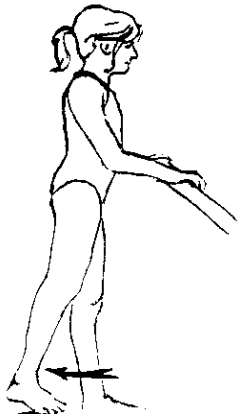
Before you go home, your physiotherapist will teach you how to safely climb the stairs. (Please refer to the crutch leaflet for stairs sequence).

Exercises

Exercises are very important: you need strong muscles to support your new hip and help the healing process. Exercises 1-3 you will be able to start on your return to the ward after your operation. Your physiotherapist will teach you exercises 4-9 from day one onwards after your operation You should continue doing these exercises until your physiotherapist or consultant tells you to stop.

- Try to do your exercises 3 times a day. Do them after you have had your pain killers as this makes them more comfortable to do.
- 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.

	**1/ Ankle exercises** Each time you exercise start by moving your feet up and down rapidly for **2 minutes every hour**
	**2/ Thigh squeezes** Lie flat on the bed. Turn up your feet and push the back of the knees into the bed. Hold for 3 seconds then relax. **Repeat 5 times** **Do 3 sessions/day**
	**3/ Buttock squeezes** Squeeze cheeks of bottom together and hold for 3 seconds. Do not hold your breath **Repeat 5 times** **Do 3 sessions/day**
	**4/ Hip and knee bends** You can use a board or a tray for this exercise. Keep the heel down on the board and slide the foot towards you. Hold for 3 seconds then slowly straighten. Remember not to bend the hip more than 90 degrees **Repeat 5 times** **Do 3 sessions/day**
	**5/ Knee straightening** Sitting on a chair, lift and straighten out the knee pulling the foot up towards you. Hold for 3 seconds then allow the knee to bend as fully as possible **Repeat 5 times** **Do 3 sessions/day**

	**6/ Hamstring curls** Stand and hold onto the back of a chair. Bend your knee backwards, bring your heel up towards the buttocks. Hold for 3 seconds then slowly place the foot back on the floor **Repeat 5 times** **Do 3 sessions/day**
	**7/ Forward hip movements in standing** Hold onto the back of a chair and slowly bend the hip and knee of the operated leg upwards. Hold for 3 seconds then place foot back on floor. Remember not to bend the hip more than 90◦ Repeat --------times Do ------sessions/day
	**8/ Back wards hip movements in standing** Hold onto the back of a chair and slowly take the leg out backwards keeping the knee straight. Hold for 3 seconds then place the foot back on the floor **Repeat 5 times** **Do 3 sessions/day**

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 on discharge.

Patient Exercise Chart

Whilst you are in hospital, please record your exercises on the chart below. 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
1. Ankle Exercises					
2. Thigh squeeze					
3. Buttock squeezes					
4. Hip/ knee bends					
5 Heel lifts in chair					
6 Hamstring curl					
7. Hip flexion					
8. Standing hip backwards					
9. Take 3 deep breaths every hour					

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 and they 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 your own bed raised. Your Occupational Therapist will advise you on this.

Chair

- Use a firm chair with arms both sides.
- Borrow a suitable height chair from friend or family.

Toilet

- Your OT will assess how you are managing to get on and off the toilet. If you need any equipment they will arrange for its delivery and fitting.

Bathing / 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. 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.

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 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 meal.
- It may be useful to stock up on ready meals in the freezer, 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 laundry.

Driving

You will not be able to drive after your operation until your consultant gives you the "go ahead", therefore you will need to organise alternative travel arrangements. This time of no driving varies between 6 and 12 weeks for most patients.

You may travel in a car as a front seat passenger. One of the therapy team will be able to answer any queries you may have about getting in and out of your car. We would also advise that you check with your insurance company prior to resuming driving.

Going home

- When you come to hospital, your nurse will ask about your plans for going home. The nursing staff will decide if you need hospital transport to go home.
- On the day of your discharge, you may be asked to wait in the discharge lounge before being collected.
- You will be given a spare pair of elastic stockings to take home.
- You will be given a card with the orthopaedic helpline number: ring this number if you have any worries at all about your recovery e.g. pain, wound, constipation, mobility, mood etc.
- You will receive an appointment through the post for your consultant review clinic -usually 6 weeks after your operation.

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. When and where do I see the consultant in out patients?

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

3. How long do I need to keep doing the exercises in the booklet?

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

5. How am I getting home?

6. Do I know what medication I need to take and for how long?

7. Have I got my orthopaedic helpline card?

8. Any other questions?

Where can I get more information?

- **Internet:-** Hip dysplasia support group. https://groups.yahoo.com/neo/groups/hipwomen/info
- **Northumbria Healthcare NHS Foundation Trust**

  Telephone: 0844 811 8111 **www.northumbria.nhs.uk**

  Ward 7, Wansbeck General Hospital: 01670 529107
- **NHS Direct** Telephone: 0845 46 47 **www.nhsdirect.nhs.uk**
- **Northumbria orthopaedic helpline** Mon-Friday 9 -4pmTelephone: Wansbeck 01670 529431 North Tyneside 0191 2934220

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