Periacetabular Osteotomy (PAO)

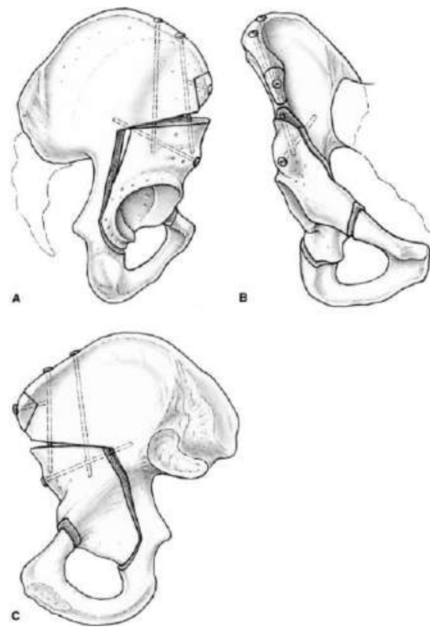
2024

North East Hip Clinic, Nuffield Health, Clayton Road, Newcastle upon Tyne, NE2 1JP https://nehipclinic.com

Information for patients and carers

Peri-Acetabular Osteotomy (PAO)

Trauma and Orthopaedics



Introduction

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

The leaflet explains how the operation is completed detailing the benefits, risks and alternative management pathways. Information is included regarding post-operative care and what to expect, this information is based on research studies and best practice advice. 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 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 an unstable ball-in socket hip joint that is characterised by a shallow socket that does not cover the ball of the thigh bone sufficiently. This anatomical variation produces instability of the hip and increased stress on the

socket rim which can lead to damage and more rapid degeneration of the hip joint cartilage. If left untreated, hip dysplasia will cause pain, decreased function, and eventually result in hip osteoarthritis.

The poorly fitting acetabulum and femoral head starts to degenerate (Arthritis) exposing the underlying bone, resulting in gradual roughening and further 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; surgery is recommended to avoid or reduce progression to a moderate to severe arthritic level.

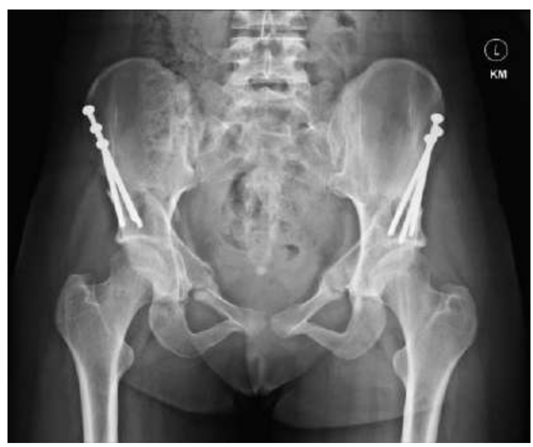
- Patients with hip dysplasia often start experiencing symptoms between their late teens to early 30's with the average being in the early to mid 20's.
- Hip Dysplasia is said to be present in 3-5% of the population.
- Women are more commonly affected than men (up to 80% higher incidence).

- Pain can present insidiously leading to restriction and pain with movement / activity on a daily basis. This ultimately is due to the increased stresses placed upon the shallow hip in daily life.
- Hip dysplasia frequently leads to an increased development of hip arthritis in 25-50% of people by an average age of 50.

What is a peri-acetabular osteotomy (PAO)?

A peri-acetabular osteotomy is an operation designed to improve the alignment of the hip joint by surgically rotating the socket in order for it to cover more of the ball. The surgery helps to preserve and protect the hip joint by allowing more normal contact stresses to be passed through the hip.

During the operation, several bony cuts (osteotomy) are made in the pelvis around the socket of the hip joint to allow the surgeon to move it into a new position. The socket is then fixed back in place with a number of screws providing a stable, yet mobile hip joint.



The osteotomy usually takes 10-12 weeks to heal. During this time taking weight on the operated leg will be restricted, you will be allowed to **partial weight bear only** with an appropriate walking aid. This is where you can rest your foot to the floor for balance, but with only **10-15Kg** of weight put through the operated leg.

Your consultant will review you between 6 to 12 week post surgery and advise you when to progress the level of weight going through your leg.

Benefits of PAO?

Moving the socket into a better position, surgeons are attempting 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.
- Increase a possibility you may return to some sporting activities.

What are the risks of having a PAO?

All operations have risks and your surgeon will talk these through with you before you have your surgery. A combination of general and spinal 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 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% risk overall).

Problems that can happen months or years after your operation:

- **You still have pain in your hip:** Some people will suffer on going soft tissue pain after surgery which can take a few months to settle down. This is associated with post operative pain and occasionally this can be accompanied by clicking in the front of the hip which can relate to a specific muscle tendon issue (iliopsoas). Physiotherapy can help with this.
- **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 arthritic change established before the surgery, and the shape of the hip

socket (acetabulum), you may still develop arthritis in the hip. Although a PAO aims to improve the shape of your hip it still won't be a perfect fit and the stresses going through the joint may still result in arthritic change 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 continue to be reduced and painful. You will continue to be at an increased risk of developing arthritis in one or both of your hips. This is likely to lead to a total hip replacement if your arthritis becomes severe.

Alternative management options

- **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. Decreased weight = Less pressure through the hip.
- **Consult 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?

Following decision to proceed with surgery you will be seen in a pre-assessment clinic where a number of medical checks are needed before the operation will be carried out. These include an ECG (Heart monitor), swabs,

X-rays and blood tests. You may be given pre wash and nasal ointment to be used prior to being admitted.

You will be admitted to hospital on the day of your surgery. The average length of stay for patients undergoing PAO is four to five days. 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.

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 nightwear) for up to five days. (Baggy, loose clothing is preferred or shorts)
- Your toiletries. You will have one small locker, 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. **Don't bring iPads or Laptops with you**.
- 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 groin crease in 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 put a local anaesthetic into the wound which will work alongside the other pain relief you will be given.

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.
- Low blood pressure – Drinking increased levels of water post op will help with this
- Physiotherapy follow up on the ward to get you up moving and introduce you to exercises.

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 continue to experience considerable pain beyond this time call 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. These 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 injection (into the abdomen area) 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 occurs you will be prescribed these medicines. 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 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.
- **Ensure this discussed at pre-op and on the day of admittance.**

Side-effects of your medication

- The following lists some of the 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 medication 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 nine months before you feel back to normal. It is common to feel overawed and/or emotional after a big operation. If you having issues with ongoing low mood post surgery please discuss this with your family doctor (GP).
- You should be seen for an outpatient appointment with you consultant at about six to twelve 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 only partial weight bear (PWB) putting minimal weight **(10-15Kg)** through your operated leg until after your consultant review.

- If your leg becomes painful and/or swollen, elevate it on a stool with your knee supported and slightly flexed.
- An ice pack made by wrapping a damp towel around a packet of frozen peas. Placing it on your hip for 10-15 minutes can be beneficial for pain management. Never place ice directly onto your skin as it can burn or on an area where you have decreased sensation.

  You can repeat this 3-4 times daily but if pain or swelling persists, contact your GP.
- Initially until told otherwise do not lift your leg up straight without support – The Physiotherapy team will advise you how best to move your leg, often using a bandage to help move your leg to get in and out of the bed or chair.

Physiotherapy – Initial post op phase.

The physiotherapist will show you,

- Breathing exercises and coughing to prevent any chest problems
- Circulatory exercises to help with blood flow
- Exercises to move your leg and strengthen muscles on your operated leg and 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 going home. The Physiotherapist will show you how to do this and it is contained in the crutch leaflet.

Always ensure you pick up your feet and step around when turning; this will avoid twisting (and hurting) your hip.

Crutch use – Walking

- Stand up straight with your elbow crutches by your side.
- Place your elbow crutches, one at a time, approximately a foot in front of you.
- Step you affected leg forwards onto an imaginary line between the two crutches.
- Step your other leg to join it. Continue this sequence, keeping your gaze directly ahead.

Stairs

- **Walking upstairs:** Stand at the bottom of the stairs. Hold on to a rail and use elbow crutches as needed.

When going up the stairs, follow this sequence:
- Place your good leg on the step first
- Next, bring your other leg to the same step
- Finally, bring your crutch up to join your feet on the step.

Repeat this sequence for each step until you reach the top.

- **Walking down stairs:** Hold on to a rail and use elbow crutches as needed.

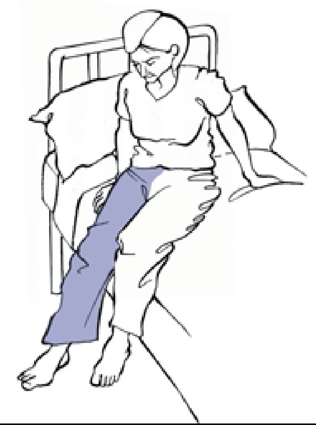
When going down the stairs, follow this sequence:
- Place your crutches on the step you are going to move down to - Next, put your weakest leg down on the same step
- Finally, bring your other leg to the same step

Repeat this sequence for each step until you reach the bottom.

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. Help will be required in the beginning but don't be disheartened as you will be able to move independently over time.

First, move your operated leg towards the edge of the bed closely followed by your non operated leg. Use the mattress for support.



Secondly, bring your legs over the side of the bed together and sit up. You may need a strap to support the operated leg initially.

Sitting down

At first, it is best to sit in a **high firm chair**. If your leg is swollen, place it on a foot 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 making sure you push up with your hands on the arms of the chair to support you.

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, contact your local age concern or Red Cross organisation to see if you can hire a wheelchair.

Stairs

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

Exercises

Exercises are very important to optimise recovery from your operation. Strong muscles are required to support your new hip and help the healing process.

You will be able to start exercises 1-3 on your return to the ward after your operation. The ward Physiotherapist will teach exercises 4-8 from day one onwards. You should continue doing these exercises as tolerable until your Physiotherapist reviews them at your outpatient appointment or your 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. **Repeat 5 times** **Do 3 sessions/day**
	5/ Sideways hip slides Use a board and the leg lifter strap around your foot, slide the leg outwards as comfortable, hold 3 seconds and move it back in again. Gradually use the lifter less. **Repeat 5 times** **Do 3 sessions/day**
	6/ Knee straightening Lying on the bed, rolled towels under knee, lift and straighten out the knee pulling the foot up towards you. Hold for 3 seconds return back to the starting position. **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 2 seconds then place foot back on floor. **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**

You will receive a referral on discharge to your local hospital for Physiotherapy. There you will be assessed and your exercises progressed. Advice will also be given with regards hydrotherapy exercises you can complete. Always

consult your doctor or physiotherapist before starting any activity or exercise outside your prescribed rehabilitation programme.

Engaging in the rehabilitation programme will help increase your recovery from surgery.

Occupational Therapy

The role of the Occupational Therapist on the ward will be to show you how to safely perform activities like sitting, toilet use, bathing and dressing. They will discuss what specific needs you may require after your surgery and help organise any equipment you may need.

Before coming for your surgery please take and bring with your measurements from the floor to the sitting surface of the bed, chair/sofa and toilet to aid the OT to help you.

Bed

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

  Bed Height ___________cm

Chair

- Ideally use a firm chair with arms both sides or borrow a suitable height chair from friend or family if required.

Chair Height ___________cm

Toilet

- Your OT will assess how you are managing to get on and off the toilet. You may require a toilet raise seat if your toilet is low, the OT will arrange delivery and fitting.

Toilet Height _________cm

Activities of Daily Living

There are a number of normal daily activities you will need to reconsider in preparation for your return home. It is recommended that you ensure you have everything you would generally need close at hand in the location you will

be spending your time post surgery. A fully charged phone, medication, a snack / bottle of water and a grabber are suggested items to have close by.

Bathing / Dressing

Washing and dressing should not present you with too many problems but you will need assistance for the first couple of weeks.

You will not be able to sit in the bottom of the bath or get in/out of the shower in the conventional way immediately post surgery.

Recommendations include:

- Use a walk in shower or have a strip wash.
- Discuss a bath seat with Occupational therapy staff
- Get assistance with trousers and socks or speak to OT about a sock aid.

Kitchen

- Standing longer periods and carrying items will be difficult following your surgery; you will need to consider having assistance with cooking.
- It is worth pre planning the layout of your kitchenware so that commonly used items are accessible without having to bend down or reach excessively. Eating your meals in the kitchen so you don't have to carry your meal may help also.
- It may be useful to stock up on pre prepared meals in the freezer as you may not feel like cooking initially on your return home.

Housework & Shopping

It is advisable to arrange assistance for tasks such as vacuuming, cleaning, shopping (you may be able to have this delivered) and laundry for the weeks after surgery as you will not be able to complete these due to your restrictions with walking.

Driving

You will **not** be able to drive after your operation until your consultant clears you to do so. This period varies between 6 and 12 weeks for most patients, you will therefore need to organise alternative travel arrangements.

You may travel in a car as a front seat passenger using a plastic bag to assist you in and out of the car seat. Remove this once in the car and replace for getting out. Due to weakness strapping your legs together whilst travelling in the early weeks with a belt will help to keep your legs in a comfortable position.
We would also advise that you check with your insurance company prior to resuming driving.

Going 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.

- At a later date you will receive an appointment for your consultant review usually 6-12 weeks after your operation. You will either have or will get shortly an appointment for Physiotherapy.
- Ensure you have enough medication to last the first couple of weeks after leaving hospital. If you wish to save money on your long term prescriptions go to the website below to purchase a 3-month prepayment certificate.

https://www.nhs.uk/using-the-nhs/help-with-health-costs/save-money-with-a-prescription-prepayment-certificate-ppc/

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. Don’t be afraid to ask the ward staff any questions you have we will be happy to help where we can.

Where can I get more information?

Northumbria Healthcare NHS Foundation Trust

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

Ward 10, Wansbeck General Hospital: 01670 529107

- **NHS Direct** Telephone: 111

- **Northumbria orthopaedic helpline** Mon-Friday 9 - 4pm
  Telephone: Wansbeck: 01670 529431 North Tyneside or Hexham: 0191 2934220

Home aids / support at home

One call (Northumberland) 01670 536400

Carepoint (North Tyneside) 0191 643 7429

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