



THE HIP ARTHROSCOPY REHABILITATION GUIDE

FOR PATIENTS, SURGEONS AND THERAPISTS

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PRE-OPERATIVE EXERCISES



PRE-HABILITATION

- Despite the research base for pre-habilitation in hip arthroscopy surgery being sparse, it has been recommended to prepare the patient for surgery, maximise function and identify patients who may not be compliant in the recovery process ^{20, 21, 22, 93} .
- Clinical Practice Guidelines written for the American Physical Therapy Association (2014) recommend a period of at least 8-12 weeks of non-surgical management prior to surgical intervention which may include physical therapy, medication and ultrasound/fluoroscopic guided therapeutic injections ²³ .
- Bortoli et al ²⁴ reported her findings at ISHA 2012. In their sample of 69 subjects (29 control), the intervention group of 40 subjects who carried out pre-operative exercises improved significantly in the Modified Harris Hip Score ($p=0.04$) at 8 weeks post-surgery, She concluded that pre-operative therapy can improve hip pain and function during the early stages of recovery.
- In a systematic review of physical impairments in FAIS it was concluded that the findings demonstrated deficits in hip muscle strength and reduced dynamic balance on one leg ²⁵ .
- Therefore, can we utilize the time before surgery to address these possible issues?

THE HIP ARTHROSCOPY PRE-HABILITATION 'HAPI' STUDY

As part of my MSc research, I carried out a Randomised Controlled Trial to investigate if doing pre-operative exercises would help post-operative outcome from hip arthroscopy surgery for FAIS (September 2013. National Research Ethics Service IRAS ID 129236. International Trials Registry ISRCTN 13779749.

The reason I did this was because I had noticed in my many years of working with this patient group, individuals who were coming to see us before surgery seemed to cope better with the post-operative rehab exercises, have realistic expectations about recovery and outcome; and have a generally smoother experience. My study sample size was small as I had a limited time to finish my Masters Degree, but it showed positive trends towards doing pre-habilitation exercises. Our patients also commented that the pre-op planning and discussion about surgery and the recovery process was very valuable, both mentally and physically. If you want to read my study, The 'HAPI' Study, it is listed on the reference page, type it into Google and up it will pop! ³

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The HAPI 'Hip Arthroscopy Pre-habilitation Intervention' study: does pre-habilitation affect outcomes in patients undergoing hip arthroscopy for femoro-acetabular impingement?

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THE 'HAPI' STUDY PRE-OPERATIVE EXERCISES

- The HAPI program was designed in 2012 to address the specific muscle weakness in the hip flexors, extensors, external rotators, adductors and abductors which have been identified in FAIS acetabular labral tear subjects ^{26, 27, 28}. As the study was a controlled research trial, all the patients had to do the same plan so I could compare the effects of a set intervention.
- We also looked at the research in a wider sense to include calf strengthening, as Lewis et al ²⁹ presented findings to suggest increased ankle push-off could help decrease forces through the hip. We noted that anecdotally many papers commonly reported hip flexor tightness; therefore gentle mobility work was incorporated ^{30,31}. Another very common feature we noticed in clinical practice was a weak, poorly controlled single leg squat, so we thought it a good idea to try and improve that functional movement. This movement was found to be a pre-operative indicator of post-operative function in total hip replacement patients in a study published in 2011 ³². Since then there has been evidence published in 2016 stating 1 to 2 years after hip arthroscopy, deficits in single-leg squat performance exist that have the potential to increase hip joint impingement and perpetuate postoperative symptoms ³³.

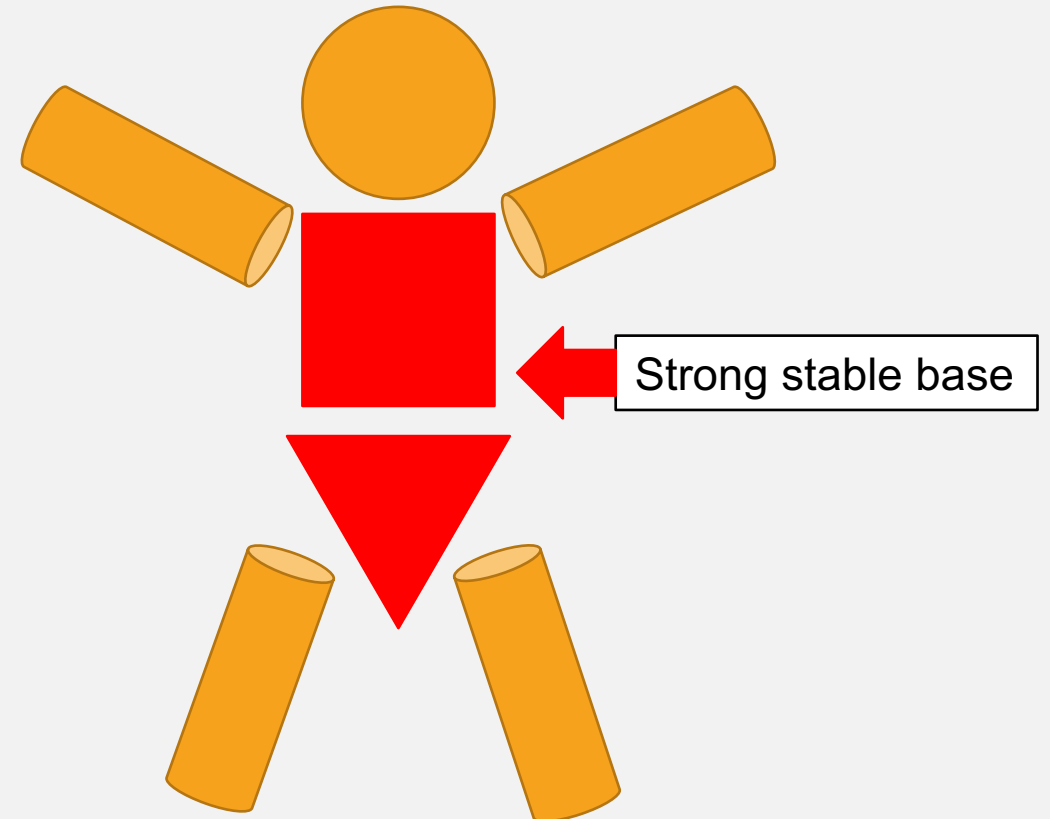
PRE-OPERATIVE EXERCISES RECIPE OR TAILORED?

- One thing to note about the following pre-op exercises is that I have designed are basics so a **wide variety** of patients can use them. In my HAPI research study, all the patients had to do the same plan so I could compare the effects of a set intervention.
- At our Physiocure Practice we get a vast range of different hip patients. Some patients attend pre-op on crutches, occasionally in a wheelchair, some are in a very painful depleted state, and then the other extreme are the elite athletes, and some whose pain only occurs during certain activities, pain may be constant or intermittent, they may have joint hypermobility, Ehlers Danlos or other health conditions.. so these differences need to be considered when publishing a general advice program.
- The best way I personally find is for an individual to be assessed an a program designed especially for them. Many of our patients see Tom Higo who is a Rehabilitation Specialist trainer and works at our rehab gym – **Fitcure**. We liaise with Tom and he can create a bespoke program for our patients which they can access on his 'App' along with additional health, fitness and training advice.



PRE-OPERATIVE EXERCISES CONSIDER - A STRONG STABLE BASE

- The trunk and core muscle strength are very important to hip health. They contribute to your pelvic posture, think about how the pelvic tilts forwards as abdominal muscles lengthen at the front of the trunk in pregnancy and how this pelvic tilt then affects the position of your hips. The spine must be able to bear load and provide a stable base for limb movement, so strength around this central section of the body is vital ⁹⁹.



PRE-OPERATIVE EXERCISES CONSIDER -HOW THE HIP MOVES

- The hip, being a ball and socket joint moves in a multi-axial way, hence a variety of muscles need to be addressed that control this multi-directional movement.
- So, in addition to thinking about how the base (trunk/core/mid section and pelvis) the hip works from is strong and stable, we need to think about the strength of the muscles surrounding the hip.
- Hence, exercises/activities that only involve one plane of movement, will only strengthen those particular ones involved eg. cycling, rowing, running..., so an exercise program that assesses and addresses not just the hip but the rest of the body and its involvement, may be required.



PRE-OPERATIVE EXERCISES THE BASICS

- The following exercises give basic suggestions for the –
 - Hip Flexors (forwards)
 - Hip Extensors (backwards)
 - Hip Abductors (out to the side)
 - Hip Adductors (bringing the leg inwards)
 - Hip External rotators (rotating the hip outwards)
 - Hip Internal rotators (rotating the hip inwards)
- Single leg stance work which helps train those hip muscles (gluteus medius) which prevent the opposite pelvis from dropping down.
- Diaphragm, breathing and core



1. Breathing and core awareness –

The diaphragm and breathing play an important role in core control and normal movement ^{57,58}. Learning how to breathe well will help your core muscles to engage naturally and you will become more aware of them and how to gently engage them through breathing and **not** by ‘bracing’, ‘sucking your tummy in’ or ‘breath holding’.

Lie on your back with your knees bent at approximately 45 degrees. Place a small pillow or folded towel under your head if needed. Chin gently tucked in, neck lengthened. Next, tilt your pelvis to find neutral. Do this by tucking your tailbone under, flattening your back onto the floor and then the opposite way so your back is arched off the floor and finding the middle, neutral ground between these movements. Raise your arms in front of you as if holding onto a large ball so your scapulae (shoulder blades) are wide apart with your rib cage and spine in contact with the floor.

Breathe in gently and fully through your nose filling your lungs with air, feel the lower ribs expand sideways and the air fill up the back of your lungs. Don't let your shoulders raise or your spine/ribs lift off the floor.

Pause for 3 seconds. Then breathe out through your mouth, slowly and fully.

Pause for 3 seconds and then repeat. Try this for 1-3 minutes a day.



PRE-OPERATIVE EXERCISES

Hip extension and core

2. Double leg bridges –

Lie on your back with your knees and hips bent, feet on the floor. Your knees should be hip distance apart, pelvis level, and lumbar spine in a neutral position. Next, thinking about your breathing, gently engage your tummy muscles and gently switch on the gluteus maximus muscle (the main fleshy bit lying over the back of your hip), tuck your tailbone under and bit by bit slowly lift up each segment of your spine so your body is in the position shown

in the photo. Too hard? Try positioning your heels closer to your bottom, or don't lift your bottom as high. Hold for 5 seconds, then slowly lower, starting with the upper back and segment by segment, lowering until your tailbone is back on the floor. Your gluteal muscles and tummy muscles should be gently engaged throughout. Do not arch/extend the spine during this exercise.

Repetitions – 10 times, hold for 5 seconds, once a day.

Top tip – try knees wider than hips if your hips/knees have a tendency to roll-in

Hard option - make it more challenging by doing one legged

Aim – to improve hip extension strength ³⁶.



PRE-OPERATIVE EXERCISES

Hip Adduction

3. Hip adduction –

Lie on your side, supporting yourself with pillows/yoga blocks. Make sure you are lying in straight line with your back straight and thinking about your breathing, gently engage your tummy muscles. Point the foot of the underneath leg, 'lengthen through the leg' and float the leg upwards so it is lifted off the floor.

Modifications may need to be made if it is uncomfortable for you to lie on your hip. For example, performing the action laid on your back with a soft ball between your knees that you can gently squeeze

Repetitions – 10 each leg, hold for 5 seconds, once a day.

Aim – to improve hip adduction strength ³⁵.



PRE-OPERATIVE EXERCISES

Hip Abduction

4. Hip Abduction in lying -

Lie on your side with your head supported and body positioned (pillow can be used between knees). Make sure your shoulders are relaxed and body is in a straight line. Next, thinking about your breathing, gently engage your tummy muscles and then gently switch on the upper outer gluteal muscle taking care not to brace back the knee or tense the rest of the leg. Keep the knee 'soft' imagine the rest of the leg is weightless. Keeping the bottom muscle squeezed, slowly float the leg up to hip height.

Hold for 5 seconds and then slowly lower. The bottom muscle needs to be 'switched on' throughout the whole movement from start to finish.

Can't lie on your side? Try leg sliding sideways, whilst laid on your back.

Repetitions – 10 each leg, hold for 5 seconds, once a day.

Aim – to improve hip abduction strength ²⁶.



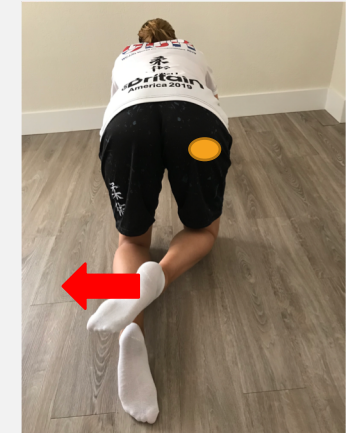
PRE-OPERATIVE EXERCISES

Hip Rotation

5. Deep hip rotators – these exercises are best done in a staged progression ⁶³. The first step is to work on static activation, palpating the muscle by locating the ischial tuberosity (boney prominence often called ‘sit bone’ of your bottom then move your fingers out 2cm, then up 2cm. Produce a gentle contraction of this quadratus femoris muscle and practice switching it on and off.

- Do 1 minute of contract 3 seconds, and relax 2 seconds, 6 x a day
- When a) becomes easier, try the next step – windscreen wiper, switching the muscle on and keeping it switched on as you rotate the lower leg inwards and outwards, keeping your pelvis still. Aim to do 5 movements then rest 3 seconds and repeat. 1 minute each side.
- Only when you have mastered b) and it is non pain provoking, add in the same exercise with resistance bands.

Aim – to improve hip rotator strength ²⁷.



PRE-OPERATIVE EXERCISES

Hip Flexion and core

6. Hip flexion –

Stand near an appropriate support or with your back flat against the wall. The back and pelvis need to stay straight in this exercise and not tucked under. Adopt a good standing posture and thinking about your breathing, gently engage your tummy muscles. Palpate the upper outer gluteal muscle of the leg you are about to balance through. Check you can feel this muscle 'switch on' as you balance on that leg. Now 'float' the other leg up as if you were stepping on a box. Keep your back straight and imagine the leg is as light as a feather. Don't let your pelvis hitch up.

Repetitions – 10 each leg, hold for 5 seconds, once a day.

Some people may manage 90 degrees hip flexion, some 30 degrees. It is important to exercise in a pain-free range.

Want a different option? Then adopt the same principles with posture and muscle control and try laid on your back - see photo below.

Aim – to improve hip flexion strength and lumbar/hip flexion dissociation ³⁴.



PRE-OPERATIVE EXERCISES

Lengthening

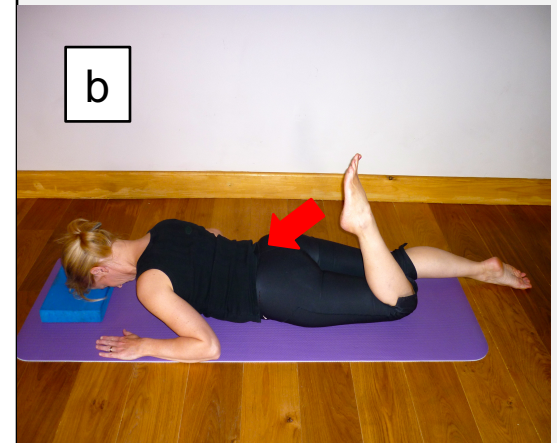
7. Hip flexor stretch –

a) Adopt the kneeling position as shown in the photo. Thinking about your breathing, gently engage your tummy muscles and with the lumbar spine in neutral, slowly lunge the front knee forwards so that you feel a gentle stretch in the rear thigh. Try and keep the hip, knee and shoulder aligned so you are stretching the muscle rather than forcing the hip joint forwards (anterior femoral glide) against the acetabular labrum and capsule.

b) Lie on your front with a folded towel under your forehead. Thinking about your breathing, gently engage your tummy muscles keeping your lumbar spine and pelvis in neutral. Now bend your knee, pushing your knee away from your hip bone, lengthening down the thigh. Do not strain the knee joint by over-bending it. In this position, gently squeeze your bottom on that side but without forcing the hip forwards or losing a neutral spine.

Repetitions – 20 second hold, 10 times each leg, once a day.

Aim – to maintain/improve hip flexor/quadriceps length ³⁷.



PRE-OPERATIVE EXERCISES

Hip Abduction

8. Hip abduction in standing –

Stand, facing an appropriate support that you can lightly hold onto if needed, feet hip distance apart. Adopt a good posture so that your ear, shoulder, hip, knee and ankle fall in a straight line. Thinking about your breathing, gently engage your tummy muscles.

Palpate the upper outer gluteal muscle of the leg you are about to balance through. Check you can feel this muscle 'switch on' as you balance on that leg. Now squeeze the upper outer gluteal muscle of the opposite leg as you take this leg out to the side. Keep this muscle 'switched on' and controlling the whole movement from start to finish. The top picture shows a 'sliding' method, the bottom picture shows with a slight lift – if you decide to lift your leg, make sure your pelvis doesn't hitch up, keep your waist lengthened and only move from the joint of the hip.

Repetitions – 10 each leg, hold for 5 seconds, once a day.

Aim – to improve hip abduction strength ²⁷.



PRE-OPERATIVE EXERCISES

Calf and balance

9. Calf raises –

Stand, facing an appropriate support that you can lightly hold onto if needed. Adopt a good posture so that your ear, shoulder, hip, knee and ankle fall in a straight line.

Thinking about your breathing, gently engage your tummy muscles and be mindful of your pelvis that it isn't rotating or tilting. Push through the balls of your feet so you lift your heels off the floor, feeling the effort in your calf muscles. Keep your ankles stable and pointing forwards throughout the movement. Next, slowly lower your heels to the floor.

If you are able to, try to perform this exercise on one leg

Repetitions – 10 each leg slowly, once a day.

Aim – to improve ankle push-off strength ²⁹.



PRE-OPERATIVE EXERCISES

Pelvic and lower limb control

10. Single leg standing mini squats –

Stand, facing an appropriate support that you can lightly hold onto if needed, feet hip distance apart. Adopt a good posture so that your ear, shoulder, hip, knee and ankle fall in a straight line and thinking about your breathing, gently engage your tummy muscles. Palpate the upper outer gluteal (buttock) muscle of the leg you are about to balance through. Check you can feel this muscle 'switch on' as you stand on that leg taking the opposite foot off the floor. Slowly bend the knee of the stance leg ensuring the knee and ankle are pointing forwards and the pelvis is level. Only bend the knee as far as the end of the toes. The gluteal muscle and tummy muscle should be gently engaged throughout the whole movement. Imagine your trunk as a cylinder where the ring of the rib cage and also that of the pelvis are aligned in that cylinder and not tilting or rotating.

Repetitions – 10 each leg slowly, once a day.

Easier version - double leg mini squats. Harder - balance on a wobble board.

Aim – to improve quadriceps and gluteus medius strength^{32,33}.

