UK PHYSIOTHERAPY HIP NETWORK

REHABILITATION PRIOR TO HIP ARTHROSCOPY FOR FEMORO-ACETABULAR IMPINGEMENT SYNDROME (PREHABILITATION)

Topic covered by this guidance

This guidance covers the pre-operative physiotherapy management of adults (over age 16) with Femoro- Acetabular Impingement (FAI) syndrome awaiting hip arthroscopy.

Prehabilitation aims to prepare patients for surgery and to facilitate their post-operative recovery.

The target audience for this guidance is physiotherapists working within the National Health Service (NHS).

Goals

To support NHS physiotherapists in providing:

- Appropriate advice and physiotherapy treatment for patients prior to planned arthroscopic FAI surgery (Prehab).
- Timely referral to to secondary care or other specialist services.
- Suggestions on a range of options for service delivery for FAI syndrome patients.

How can I manage a person with FAI syndrome prior to hip arthroscopy?

Consider the following in the patients pre-operative management

Review

- It is recommended that all patients with FAI syndrome should have completed a course of conservative treatment, including physiotherapy prior to being listed for hip arthroscopy. If this is not the case, a comprehensive physiotherapy package may be required whilst the patient is on the waiting list prior to surgery[1].
- The length of waiting lists may mean a patient has not had recent contact with a clinician and may benefit from an opportunity to discuss changes in their hip and general health, previous advice and exercise.
- A physical assessment to check for changes in the hip and general health can identify co-existing deficits or pathologies which can be ameliorated pre or post-operatively for example lumbo-pelvic issues.
- The need for psychological and medical optimisation may be identified and additional support sought for these.
- If red flags are identified, refer for urgent orthopaedic review. Red flags include rapid deterioration in symptoms, recent trauma, unplanned significant weight loss, difficulty weight bearing, and infection. Orthopaedic review should also be requested if signs and symptoms suggest that the initial diagnosis of FAI syndrome has changed.

Advice and information:

- Clarify the expectations of surgery, post-operative recovery and rehabilitation specific to the planned operation, post-operative restrictions, weight bearing status, driving, sitting etc.
- Establish expectations on the active role required by the patient in their post-operative rehabilitation.
- Promote understanding of the anatomy, function and control of the hip and lumbo pelvic complex.
- Advise on walking aids, analgesia and functional restrictions required for post-operative joint protection.

Pre-operative exercises

- As waiting lists are likely to be significant in the NHS, the patient may be deconditioned and require general exercise advice in addition to specific exercise.
- Specific hip exercises targeting areas of dysfunction are recommended. In addition to improving deficits pre-operatively, familiarity with the exercises can facilitate engagement in rehabilitation post-operatively[1,2].
- A home exercise programme carried out once daily for 8 weeks pre-operatively following one session of instruction by a physiotherapist was shown to improve pre-operative outcome measures. These are reproduced in appendix 1 with the kind permission of the author[2].
- A tailored programme of exercise is recommended over a generic programme[2].
- There are no specific recommendations on progression of exercises through the pre-operative period although modification and progression of the programme can be made following individual assessment by a Physiotherapist.

Outcomes

Use of a validated measure is recommended to establish a baseline on which to base goal progression, measure final outcome, and signpost the need for orthopaedic review or referral to other services.

A variety of hip specific, musculoskeletal specific and general activity outcome measures are incorporated with objective physical measures in the literature and clinical practice. Hip specific outcome measures include the International Hip Outcome Score (iHOT 12 and iHOT 33), the Hip disability and Osteoarthritis Outcome Score (HOOS), the Copenhagen Hip and Groin Outcome Score (HAGOS) and the Non-Arthritic Hip Score (NAHS). Musculoskeletal outcome measures include the Lower Extremity Functional Scale (LEFS), Single Assessment Numeric Evaluation (SANE), the Global Rating Of Change (GROC), Musculo-Skeletal Health Questionnaire (MSK-HQ) and Patient-acceptable Symptom State (PASS). Generic measures of health included the widely used EQ-5D-5L.

A consensus paper in 2020 which included physiotherapists amongst the review panel, recommended HAGOS and iHOT as the most appropriate patient reported outcome measures in FAI syndrome. In addition, the iHOT 12 is used to measure surgical outcomes on the UK Non-Arthroplasty Hip Register[3].

Service delivery suggestions

Although a face to face appointment allows a full review with the patient after a period on the waiting list, service restrictions may preclude this. Telephone or video consultation can also be considered on a one to one or group basis. Information including exercises can be delivered via leaflet, on line or through social media.

Outside the physio department, it may also be possible to deliver information in other departments attended pre-operatively eg in Orthopaedic clinic or preparation for surgery units.

A survey of UK Physiotherapy Hip Network members in 2023 found none that offered a formal prehabilitation programme. Waiting lists, scarcity of resources and prior completion of a physiotherapy programme as a pre-requisite prior to surgical referral were cited as reasons for not offerring prehabilitation routinely. Most offered patient information leaflets and an option of one to one treatment if required preoperatively.

Basis for recommendation

There is a lack of well designed trials on pre-habilitation prior to hip arthroscopy for FAIS. Following a literature search to identify levels 1-3 evidence, a panel of 5 clinicians reviewed a single level 1 pilot study which provided the basis for the exercise recommendations in this guidance[1]. The purpose of this randomized prospective controlled pilot study by Grant et al was to determine whether a home exercise programme performed for 8 weeks pre-operatively affected post-operative outcomes in patients having hip arthroscopy for FAI syndrome. The intervention group conducted daily specific hip exercises following a single session with a physiotherapist. The control group did not do exercises. Post-operative advice and rehabilitation were the same for all participants.

Muscle power improved in the intervention group during the preoperative study period whereas it declined in the control group. 12 weeks post-operatively there was a statistically significant improvement in hip flexion, quads power and EQ- 5D-5L health scale in the intervention group compared to the control group.

The study recruited NHS patients and as the exercises were carried out independently at home with only one initial physio session, and therefore low cost implications, the practical application of the research is generalisable to the NHS.

There were limitations in the study including a small sample (16 participants) due to time constraints within the pilot study and baseline differences between the two groups. Detailed supplementary material is available through the published paper.

More generally, there is inconclusive evidence on the benefits of pre-habilitation prior to orthopaedic surgery generally. A meta-analysis in 2023 concluded that a minimum duration of 4-6 weeks supervised or unsupervised pre-habilitation for patients undergoing all orthopaedic procedures was associated in moderate pre-operative improvements in hip abductor strength, 6 minute walk test and health related quality of life[4]. However the evidence for an effect on post-operative outcomes is low and inconsistent.

References

1. Takla A, O'Donnell J, Voight M, Byrd T, Dienst M, Martin RR, Philippon MJ, Enseki K, Andrade T, Safran M, Christoforetti JJ, Martin H, Grant L, Campbell A, Ryan M, Tyler T, McGovern RP, Bizzini M, Kohlrieser D. The 2019 International Society of Hip Preservation (ISHA) physiotherapy agreement on assessment and treatment of femoroacetabular impingement syndrome (FAIS): an international consensus statement. *J Hip Preserv Surg*. 2021 Mar 19;7(4):631-642. doi: 10.1093/jhps/hnaa043. Erratum in: *J Hip Preserv Surg*. 2021 May 31;7(4):643. PMID: 34377507; PMCID: PMC8349584.
2. Grant LF, Cooper DJ, Conroy JL. The HAPI 'Hip Arthroscopy Pre-habilitation Intervention' study: does pre-habilitation affect outcomes in patients undergoing hip arthroscopy for femoro-

acetabular impingement? *J Hip Preserv Surg*. 2017 Jan 9;4(1):85-92. doi: 10.1093/jhps/hnw046. PMID: 28630726; PMCID: PMC5467429.

3. Impellizzeri FM, Jones DM, Griffin D, Harris-Hayes M, Thorborg K, Crossley KM, Reiman MP, Scholes MJ, Ageberg E, Agricola R, Bizzini M, Bloom N, Casartelli NC, Diamond LE, Dijkstra HP, Di Stasi S, Drew M, Friedman DJ, Freke M, Gojanovic B, Heerey JJ, Hölmich P, Hunt MA, Ishøi L, Kassarjian A, King M, Lawrenson PR, Leunig M, Lewis CL, Warholm KM, Mayes S, Moksnes H, Mosler AB, Risberg MA, Semciw A, Serner A, van Klij P, Wörner T, Kemp J. Patient-reported outcome measures for hip-related pain: a review of the available evidence and a consensus statement from the International Hip-related Pain Research Network, Zurich 2018. *Br J Sports Med*. 2020 Jul;54(14):848-857. doi: 10.1136/bjsports-2019-101456. Epub 2020 Feb 17. PMID: 32066573.
4. Punnoose A, Weiss O, Khanduja V, et al. Effectiveness of prehabilitation for patients undergoing orthopaedic surgery: protocol for a systematic review and meta-analysis. *BMJ Open* 2019;9:e031119. doi:10.1136/ bmjopen-2019-031119

Additional information

Guenther JR, Cochrane CK, Crossley KM, Gilbart MK, Hunt MA. A Pre-Operative Exercise Intervention Can Be Safely Delivered to People with Femoroacetabular Impingement and Improve Clinical and Biomechanical Outcomes. *Physiother Can*. 2017;69(3):204-211. doi:10.3138/ptc.2016-34

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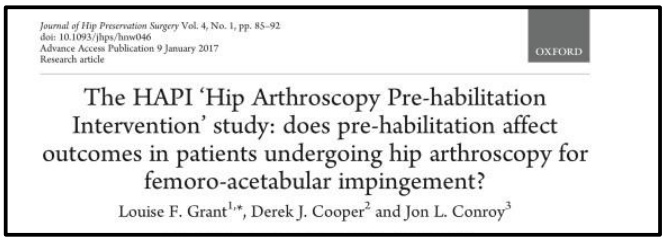
APPENDIX 1



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OXFORD

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

Louise F. Grant[1,*], Derek J. Cooper[2] and Jon L. Conroy[3]

THE HIP ARTHROSCOPY PRE -HABILITATION 'HAPI' STUDY

EXERCISE PROTOCOL

Notes to readers of this online document –

This plan was designed to be taught by a Chartered Physiotherapist (who is additionally trained in pilates), with each exercise being supervised and practiced in a one -to-one setting before commencing with the plan.

The Physiotherapist needs to ensure that the patient understands terminologies used in this guide and has the correct technique for ie. tummy muscles engaged.

The guide was designed for research study subjects who were awaiting femoro -acetabular impingement/labral repair surgery and who were of varying functional abilities and pain levels.

In clinical practice, we often find an individualised approach is more appropriate. However, when designing an intervention for a study where all subjects perform the same regime to enable measurement of quantitative data, exercises need to be able to suit all participants.

Louise Grant - September 2013
National Research Ethics Service IRAS ID 129236
International Trials Registry ISRCTN 13779749

Disclaimer –

- Users of this guide must take full responsibility for their safety and know their limits and not take risks beyond their level of experience, aptitude, training and fitness. Use of this guide is at each person's individual own risk.
- This guide is designed to be taught to a patient by a Chartered Physiotherapist following assessment of the patient's health, fitness and suitability for each exercise. The Chartered Physiotherapist must use their professional judgement and ensure safe instruction and appropriateness of each exercise.
- Users should understand that participating in any exercise or exercise program that there is the possibility of physical harm or injury. If you engage in any exercise program or follow any advice on written advice sheets, you agree that you do so at your own risk, are voluntarily participating in these activities, assume all risk of injury to yourself, and understand the author of this guide accepts no responsibility from any and all claims or causes of action, known or unknown in relation to this guide.
- You must consult your physician prior to starting this or any other program or if you have any medical condition or injury that can possibly worsen with physical activity.
- This program is designed for healthy individuals 16 years and older only.
- Always do a warm -up prior to any exercise.
- If you are taking any medications, you must talk to your physician or Chartered Physiotherapist before starting any exercise program.
- If you experience any light headedness, dizziness, or shortness of breath while exercising, stop the movement and consult a physician immediately.
- If you have any questions or queries it is your responsibility to contact your GP or Chartered Physio.

1. 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.
Gently pull in your tummy muscles. 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. The top photo shows double calf raises. The bottom photo shows the progression to single leg calf raises. Choose the option which is most appropriate for you.

Repetitions – 10 each leg slowly, once a day.

Aim – to improve ankle push -off strength.

Reference – Lewis CL, Ferris DP. Walking with increased ankle push off decreases hip muscle moments. *J of Biomech* 2008; 41(10): 2082 - 2089.

2. 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. Gently pull in 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.

Repetitions – 10 each leg slowly, once a day.

Aim – to improve quadriceps and gluteus medius strength.

Reference – Holstege MS, Lindeboom R, Lucas C. Preoperative quadriceps strength as a predictor for short -term functional outcome after total hip replacement. Arch Phys Med Rehabil 2011; 92:236 -241.

3. 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. Gently pull in 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.

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

Aim – to improve hip abduction strength.

Reference – Casartelli NC, Maffiuletti NA, Item -Glatthorn JF et al. Hip muscle weakness in patients with symptomatic femoroacetabular impingement. Osteo & Cart 2011; 19: 816 -821.

4. Single hip flexion in standing –

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 flex/bend/slouch/tuck under. Adopt a good standing posture and gently pull in 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. Some people may manage 90 degrees hip flexion, some 30 degrees. It is important to exercise in a pain -free range.

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

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

Reference – Tsai Y-S, McCrory JL, Sell TC et al. Hip strength, flexibility and standing posture in athletes with an acetabular labral tear. J of Orthop & Sp Phys Ther 2004; 34(1): A55 -A56.

5. Hip adduction in side lying –

Lie on your side, supporting yourself with pillows/yoga blocks (see photo).
Make sure you are lying in straight line with your back straight and your tummy pulled in gently. 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 it it is uncomfortable for you to lie on your hip. For example, performing the action in standing.

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

Aim – to improve hip adduction strength.

Reference – Casartelli NC, Maffiuletti NA, Item -Glatthorn JF et al. Hip muscle weakness in patients with symptomatic femoroacetabular impingement. Osteo & Cart 2011; 19: 816 -821.

6. Hip abduction in side lying -

Lie on your side with your head supported and body positioned as in photo 1 (pillow can be used between knees).Make sure your shoulders are relaxed and body is in a straight line. Gently pull in your tummy muscles and then gently squeeze 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 (photo 2).
Hold for 5 seconds and then slowly lower. The bottom muscle needs to be 'switched on' throughout the whole movement from start to finish.

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

Aim – to improve hip abduction strength.

Reference – Tsai Y-S, McCrory JL, Sell TC et al. Hip strength, flexibility and standing posture in athletes with an acetabular labral tear. *J of Orthop & Sp Phys Ther* 2004; 34(1): A55 -A56.

7. 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 buttock muscle 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 show 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.

Aim – to improve hip extension strength.

Reference – Valenzuela F, Gandler K, Dupler T & Adickes M. A retrospective study to determine the effectiveness of non operative treatment of hip labral tears. Orth Phys Ther Pract 2010; 22(3): 147 - 152.

8. Hip rotation in crook lying –

Lie on your back, knees and hips bent, feet on floor, ankles together. The front of your pelvis, the bit between your navel and pubic bone should be level, imagine a spirit level across it in multiple directions. Next, put one hand under the back of your hip (deep hip rotator muscles) and one at the front (hip flexor muscle) to be able to get palpable feedback on what muscle you are activating.
Gently pull in your tummy muscles, then gently 'fire -up' the deep hip rotator round the back of your hip (imagine inflating a balloon round the back of your hip), the hip flexor at the front of the hip should not dominate it should be as relaxed as possible. Keeping your pelvis level, tummy and deep hip rotator engaged, ROTATE your leg outwards as shown in the photo. The deep hip rotator muscle should control your leg throughout the WHOLE movement. Palpate to check it does not switch off, particularly on the return.

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

Aim – to improve hip rotator strength.

Reference – Casartelli NC, Maffiuletti NA, Item -Glatthorn JF et al. Hip muscle weakness in patients with symptomatic femoroacetabular impingement. Osteo & Cart 2011; 19: 816 -821.

9. Hip flexor/quadriceps stretch –

Lie on your front with a folded towel under your forehead to ensure a good spinal posture. Gently pull in your tummy muscles keeping your lumbar spine and pelvis in neutral, do not tuck bottom under. Gently 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, now gently squeeze your bottom on that side but WITHOUT FORCING THE HIP FORWARDS OR TUCKING BOTTOM UNDER. The hip/spine/pelvis should stay in a neutral (centralised) aligned position.

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

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

Reference – Wahoff M & Ryan M. Rehabilitation after hip femoroacetabular impingement arthroscopy. Clin Sp Med 2011;30: 463 -482.

10. Kneeling hip flexor stretch –

Adopt the position as shown in the photo. Keeping your tummy muscles engaged and 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.

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

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

Reference – Wahoff M & Ryan M. Rehabilitation after hip femoroacetabular impingement arthroscopy. Clin Sp Med 2011;30: 463 -482.