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Review article

The 2019 International Society of Hip Preservation (ISHA) physiotherapy agreement on assessment and treatment of femoroacetabular impingement syndrome (FAIS): an international consensus statement

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ABSTRACT

The 2019 International Society of Hip Preservation (ISHA) physiotherapy agreement on femoroacetabular impingement syndrome (FAIS) was intended to build an international physiotherapy consensus on the assessment, non-surgical physiotherapy treatment, pre-/post-operative management, and return to sport decisions for those patients with FAIS. The panel consisted of 11 physiotherapists and 8 orthopaedic surgeons. There is limited evidence regarding the use of physiotherapy in the overall management of those with FAIS. Therefore, a group of

ISHA member physiotherapists, who treat large numbers of FAIS patients and have extensive experience in this area, constructed a consensus statement to guide physiotherapy-related decisions in the overall management of those with FAIS. The consensus was conducted using a modified Delphi technique. Six major topics were the focus of the consensus statement: (i) hip assessment, (ii) non-surgical physiotherapy management, (iii) pre-habilitation prior to hip arthroscopy, (iv) post-operative physiotherapy rehabilitation, (v) stages of post-operative rehabilitation and (vi) return to sports criteria/guidelines after surgery.

INTRODUCTION

The research in the area of femoroacetabular impingement syndrome (FAIS) assessment and surgical treatment has increased considerably over the past decade [1–3]. There have been major advances supporting surgical management with the recent publications of the FASHIoN and FAIT trails [4, 5]. However, high-quality studies investigating physiotherapy management of FAIS, both pre- and post-surgery, are limited [6–8]. The purpose of this project was to construct an international physiotherapy consensus statement to guide physiotherapy-related decisions according to current knowledge and experience regarding the following: (i) hip assessment, (ii) non-surgical physiotherapy management, (iii) pre-habilitation prior to hip arthroscopy, (iv) post-operative physiotherapy rehabilitation, (v) stages of post-operative rehabilitation and (vi) return to sports (RTSs) criteria/guidelines for those with FAIS after surgery.

MATERIALS AND METHODS

Study participants

Participants for the panel were selected from the International Society for Hip Preservation (ISHA) membership to represent experts in the field of hip preservation. Specifically, physiotherapy ISHA members with expertise in conservative and post-operative management of individuals with FAIS were asked to participate. In addition, surgeons with expertise in treating individuals with FAIS using hip arthroscopy were also selected. The panel consisted of 11 physiotherapists and 8 orthopaedic surgeons who represented four countries and had an average of (range: 19–35) years experience. A summary of the attributes of the panel are presented in Table I

Study design

This study used a modified Delphi technique as the research method to structure group opinion. The modified Delphi technique allowed for focused discussion and judgement to be made on questions related to the assessment and treatment of FAIS.

The first step of the study was to determine questions the panel felt were important to answer. The panel submitted their questions to the study primary author/co-ordinator (A.T.) who compiled the responses. This potential list of questions was then e-mailed to the panel for review. Each panel member had the opportunity to comment and rate each question on the list. The study coordinator complied this feedback to create a final list of questions that was e-mailed to the group for review. This final list of questions received 100% agreement as 'relevant questions' that should be answered in a consensus statement related to the comprehensive assessment and treatment of those with FAIS.

The second step involved producing concise answers to the questions. Each panel member had the opportunity to contribute answers to the questions. These answers were then submitted to the study coordinator who compiled the answers. A summary of the answers to each question was distributed to the panel for comment. The study coordinator compiled these comments to produce as second round of answers. The second round of answers was then distributed to the group for final comment and review. These final comments were again submitted to the study coordinator who adjusted the answers accordingly. These answers were submitted to the primary author who edited them with the goal of being appropriate for publication. This final list of questions with answers in publication form was submitted to the panel for final review and edit. All edits were submitted back to the primary author who made appropriate changes and circulated to the panel until 100% agreement on all the answers were achieved by all panel members.

RESULTS

The panel determined the following questions were to be answered:

i. How should physiotherapists evaluate a patient that presenting with hip pain?
ii. What specific tests should a physiotherapists include in their examination?
iii. What physiotherapy interventions are recommended for those with FAIS?

Table I Specialist panel attributes

Name	*Specialty (ortho, sports, trauma)*	*Specialty (ortho, sports, trauma)*	*No. of hip-specific consultation per week*	*Hip surgical procedures per year*	*Academic post (Y/N)*	*Actively involved in research (Y/N)*	*ISHA member (Y/N)*
Tony Andrade	20	Orthopaedic Sports Medicine, Trauma	40	~400 including scopes, osteotomy and arthroplasty	N	Yes	Yes
Thomas Byrd	32	Orthopaedic Sports Medicine	20	400	Yes	Yes	Yes
John Christoforetti	19	Orthopaedic Sports Medicine	40	250	Yes	Yes	Yes
Michael Dienst	20	Hip surgery	40	400	Yes	Yes	Yes
Marc Philippon	25	Hip surgery	29	335	Yes	Yes	Yes
Hal Martin	35	Orthopaedic Surgery	20	240	Yes	yes	Yes
Marc Safran	26	Orthopaedic Sports Medicine	12 new, 50 new and follow up (per week)	225	Yes	Yes	Yes
John O'Donnell	28	Orthopaedic Sports Medicine	60	600 (Hip scopes)	Yes	Yes	Yes

Physiotherapists	*Specialty (ortho, sports, trauma)*	*Specialty (ortho, sports, trauma)*	*No. of hip-specific consultation per week*	*Post-operative physiotherapy rehab per year*	*Academic post (Y/N)*	*Actively involved in research (Y/N)*	*ISHA member (Y/N)*
Mark Ryan	11	Sports and ortho	20		No	Yes	No
Louise Grant	28	Sports and ortho	50	200 (Scopes, PAO, THR)	No	yes	yes
David Kohlrieser	12	Sports and ortho	35	150	No	Yes	No
Keelan Enseki	19	Sports and ortho	10		Yes	Yes	Yes
Tim Tyler	30	Sports and ortho	11	56	No	Yes	Yes
Ashley Campbell	9	Sports and ortho	30		Yes	Yes	Yes
RobRoy Martin	29	Sports and ortho	—		Yes	Yes	Yes
Ryan McGovern	10	Sports and ortho	20		Yes	Yes	No
Mario Bizzini	32	Sports and ortho	6		Yes	Yes	No
Mike Voight	37	Sports and ortho	10		Yes	Yes	Yes
Amir Takla	23	Sports and ortho	40	300	Yes	Yes	Yes

iv. What are the indications to refer a patient for medical/surgical consult or determine conservative care will no longer benefit the patient?
v. What is the role of pre-operative physiotherapy in hip arthroscopy?
vi. What are the stages or timelines and procedure-specific concerns for post-operative rehabilitation?
vii. What do we do and how do we progress post-operative physiotherapy?
viii. What are expected returns to sport rates/outcomes?

The answers to the questions are provided in the proceeding discussion.

DISCUSSION

How should physiotherapists evaluate a patient presenting with hip pain?

Ideally, patients should present to physiotherapy following the onset of hip, groin and pelvic pain for assessment. However, this will be dependent on country's/regions medical system, requirements and restrictions.

A comprehensive examination should follow a logical sequence that considers non-musculoskeletal, lumbosacral spine, intra- and extra-articular sources of hip pain.

The first step in evaluating the hip is to determine whether the symptoms arise from musculoskeletal or non-musculoskeletal origins. A detailed review of medical history and patient interview should determine the nature of symptoms, carefully considering factors that might indicate non-musculoskeletal causes of hip pain that would require referral to an appropriate medical professional [9–11].

Once it is determined that the patient would be appropriate for physiotherapy, the evaluation algorithm outlined in Fig. 1 can be used to categorize patients with musculoskeletal-related hip pain. This includes differentiating hip from lumbosacral pathology. Screening for lumbar spine involvement begins with observing active lumbar range of motion (ROM) into flexion, extension, right/left side bending looking for reproduction of symptoms and limitation of movement. Spring testing (posterior to anterior joint mobilization) of the lumbar vertebrae may be performed to isolate the level of spinal involvement and reproduce pain. Clinical tests to provoke sacroiliac joint pain should also be included [10].

After the lumbosacral spine is evaluated, the clinician should determine if there is an intra- and/or extra-articular source of symptoms. The flexion–abduction–external rotation (FABER), flexion–adduction–internal rotation (FADIR), internal ROM with over-pressure (IROP), Flexion to 90 degree with external rotation and scour tests can be used to determine the presence of *intra-articular* pathology. If FABER, FADIR, IROP and scour tests do not reproduce the patient's symptoms, then the pathology is likely caused by *extra-articular* structures. If intra-articular sources of hip pathology are identified the patient can be categorized into one or more of the following categories: *FAIS, hypermobility and/or hypomobility* [9, 10].

For those with extra-articular sources of hip pain, provocation of symptoms with palpation, passive lengthening/stretching and resisted movements of the involved tissues can determine the source of pathology. This can include potential nerve entrapment [11].

What specific tests should a physiotherapist include in their examination?

Tests should be performed to categorize a patient into one or more of the following categories: *lumbosacral spine, intra- and/or extra-articular pathology*. If an intra-articular pathology is identified, patients can be further classified into FAIS, hypermobility and/or hypomobility. The examination should also identify ROM, flexibility, strength, biomechanical and neuromuscular control impairments that could contribute to the patient's condition [9–11].

Groin and posterior hip pain can be confusing at times. Gomez-Hoyos *et al.* [11] have published a review on posterior hip pain to guide clinicians. The etiology of the groin pain can be intra- or extra-articular in nature. Overlapping conditions may also exist in these patients. Weir *et al.* [12] defined a classification system with four major subheadings of extra-articular groin pain in athletes. These defined clinical entities included: Adductor-, iliopsoas-, inguinal- and pubic-related groin pain.

A comprehensive examination organized by position should be performed. Specific tests to potentially rule in or out specific pathologies can be selected based on patient history and a logical differential diagnosis. Refer to Appendix A for full list of tests. Liaising with a medical practitioner, as necessary, will further help clarify the clinical picture by facilitating relevant imaging to assess the bony morphology as recommended by the Warwick Agreement [4].

What physiotherapy interventions are recommended for those with hip pain?

A classification-based treatment plan can be developed according the evaluation algorithm in conjunction with identified impairments. Interventions should be directed at a prioritized problem list that looks to address deficits in

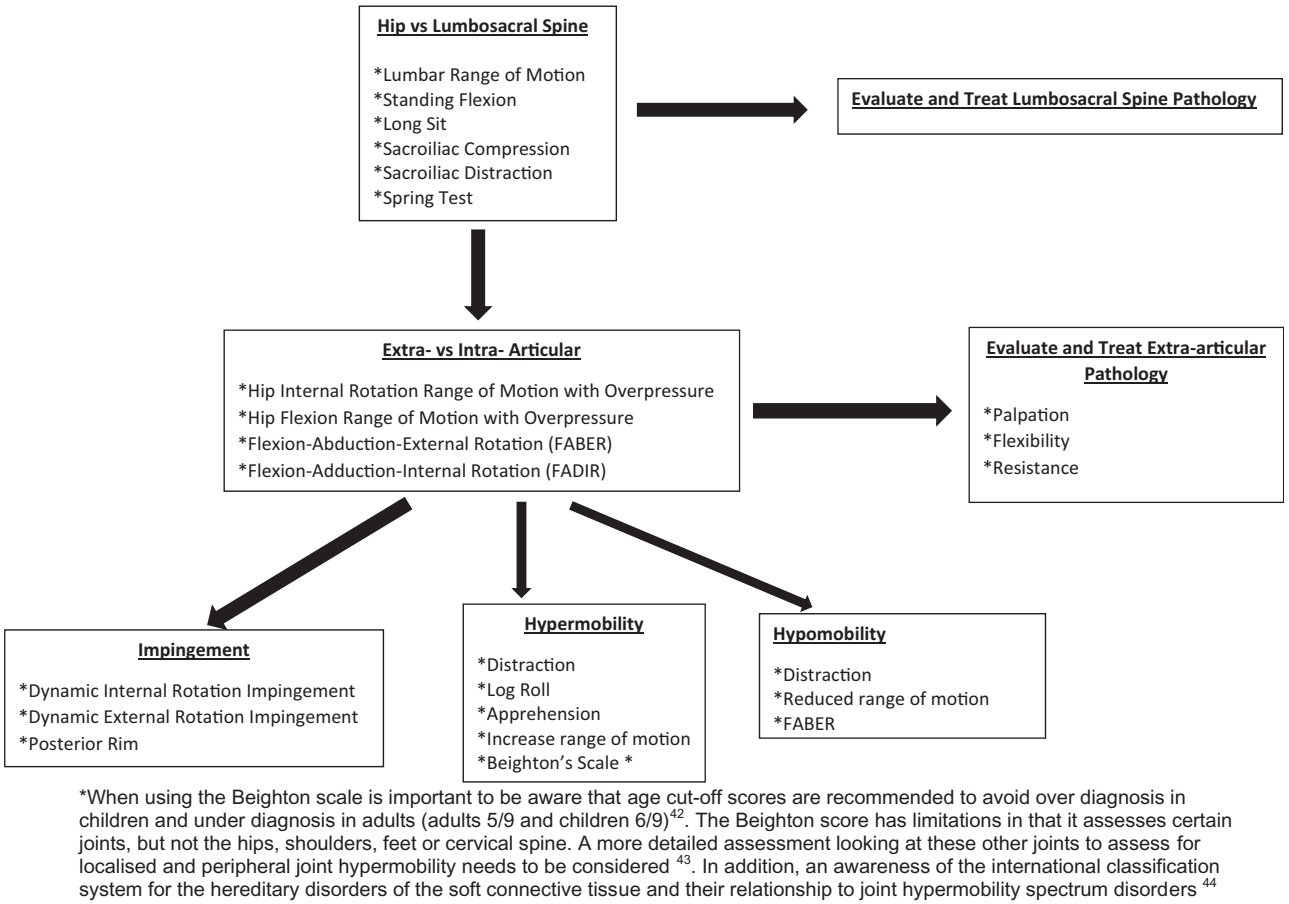

Fig. 1. *When using the Beighton scale is important to be aware that age cut-off scores are recommended to avoid over diagnosis in children and under diagnosis in adults (adults 5/9 and children 6/9) [42]. The Beighton score has limitations in that it assesses certain joints, but not the hips, shoulders, feet or cervical spine. A more detailed assessment looking at these other joints to assess for localized and peripheral joint hypermobility needs to be considered [43]. In addition, an awareness of the international classification system for the hereditary disorders of the soft connective tissue and their relationship to joint hypermobility spectrum disorders [44].

strength, ROM, flexibility and neuromuscular control, while considering biomechanical abnormalities [8, 13].

Lumbopelvic considerations

A clinical practice guideline for physiotherapy can be used to direct treatment for those with lumbopelvic conditions [14]. Those with hip and/or lumbopelvic pain often respond to a mobilization treatment group [15]. Individuals who respond to mobilization may also be given general lumbopelvic ROM and stabilization exercises. The hip–spine connection, particularly for those with a loss of hip extension, should be addressed in those with hip and/or lumbopelvic pain [16].

Femoroacetabular impingement syndrome

For those with FAIS, joint mobilizations, pain-free ROM and strengthening exercises may be implemented to help restore normal arthrokinematics of the hip joint. Specifically, posterior and inferior hip mobilizations may be indicated for patients presenting with painful and/or restricted motions of flexion and internal rotation of the hip joint. Strengthening activities for the muscles of the hip and lumbosacral spine may improve weakness and muscle imbalance. Exercises directed at improving neuromuscular control may help compensate for the boney deformities [13]. Therapeutic interventions need to be implemented with consideration for movements that provoke symptoms and should be executed in a pain-free manner that does not create additional joint irritation [8].

Hypomobility

The Orthopaedic Section of the American Physical Therapy Association has developed evidence-based treatment guidelines for the management of hip pain and

hypomobility [17]. The general treatment approach for patients with hypomobility of the hip joint is a careful balance of therapeutic interventions to improve ROM and strength, while providing reasonable modification of activities that decrease loading of the joint.

Hypermobility

Neuromuscular function of the proximal hip musculature in the form of strength, postural awareness, trunk stability and kinesthetic awareness are critical factors in both the assessment and treatment of patients in the hypermobility category. Treatment interventions should emphasize closed-chain strengthening, stabilization and proprioceptive exercises in non-apprehensive movement patterns. Closed-chain exercises can be used to stimulate mechanoreceptors and encourage a co-contraction of the hip stabilizers. Balance and perturbation training for the hip and the lumbopelvic region can be done to encourage coordinated muscular activity that enhance dynamic stability of the hip. Overall, exercises should be directed at improving neuromuscular control to help compensate for lack of stability in the hip and lumbopelvic region [8].

Extra-articular

For those with extra-articular sources of hip pain, interventions should be directed at improving strength, ROM and neuromuscular control. Manual therapy, such as soft-tissue mobilization, may also be used to augment exercises.

What are the indications to refer a patient for medical/surgical consult or determine conservative care will no longer benefit the patient?

A patient should be referred for medical consult if the patient presents with a history, signs and/or symptoms inconsistent with a musculoskeletal disorder. A patient should also be referred for medical/surgical consult if the patient is not improving after 6 weeks of physiotherapy (up to and including six physiotherapy consults). Physiotherapists need to be aware that prolonged rehabilitation may be detrimental to the patient's outcome, especially in those who continue to perform aggravating activities during their pre-op rehabilitation phase. Although universal agreement regarding the ideal length of time for pre-operative physiotherapy does not exist, the patient's symptomatic acuity and potential joint integrity should be considered. Recently, Kunze *et al.* [18] noted that waiting longer than 3–6 months after becoming symptomatic, resulted in inferior clinical outcomes following hip arthroscopy for patients with FAIS. These results may be utilized to determine a reasonable time frame for pre-operative rehabilitation.

Rehabilitation can address impairments in functional movement patterns, however, the presence of bony deformities may continue to cause further deterioration to the joint. This may be especially true in those who perform activities that require deep flexion and internal rotation. Therefore, the clinician needs to acknowledge their limitations and when referral to an orthopaedic specialist is warranted.

What is the role of pre-operative physiotherapy in hip arthroscopy

Pre-habilitation is formal physiotherapy designed to prepare patients for surgery while maximizing their function. Although clinical experience supports pre-habilitation, research evidence is sparse. A short period of pre-operative rehab may also help identify and provide more extensive education to patients who may not be adherent in the recovery process [19, 20]. Education emphasizing appropriate post-operative expectations as well as the importance of the patient taking an active role in the rehabilitation process is essential for an optimum recovery [20]. Understanding the anatomy of the hip and how the muscles contribute to hip stability during every-day activities, including walking, is important. Education in joint protection strategies may help in pain reduction during the immediate post-operative period. A plan can also be developed to help the patient prepare both mentally and physically for surgery [21]. A pre-operative assessment of ROM, strength, general function, pain level and quality of life can be compared to post-operative assessments as well as the benefits of surgical invention and ultimately improve patient care [22]. Grant *et al.* [23] found positive results in post-operative recovery for those who exercised before hip arthroscopy for FAIS.

The use of pre-operative physiotherapy assessment, advice, outcome measurements, education, exercises to maximize function, interventions to reduce pain and to address additional co-pathologies can be helpful to maximize post-surgical outcomes. Pre-operative physiotherapy may need to be tailored and individualized given the wide variety of pathologies, differences in physical ability, and diversity in hip joint architecture. Therefore, a single protocol may not only be challenging to implement but also inappropriate.

What are the stages or timelines and procedure-specific concerns for post-operative rehabilitation?

Post-operative rehabilitation involves multiple phases that are both time and criteria based. A focus on criteria-based progression through the phases may improve the consistency of rehabilitation and potentially aid in providing patients a safe, efficient return to their desired activities,

including sports. Establishing the predictive utility of clinical measures and functional tests should be a continued emphasis in the development of future post-operative rehabilitation protocols. Typically, the phases progress from immediate post-operative care to return-to-sport criteria. Commonly there are 4 and 5 phases, with total timeframes ranging from 12 to 28 weeks, depending on type and/or number of specific procedures [20, 24–26]. Consensus for time frames related to each phase of rehabilitation are presented in Table II. It should be noted each phase will have specific concerns the physiotherapist will need to be aware of related to weight-bearing, ROM and strength that will be based on the arthroscopic procedure(s) preformed. Though numerous protocols have been described in the literature, there is no universal agreement regarding the post-operative management of patients undergoing such procedures [27]. Recently, a number of review articles have objectively examined the evidence of post-operative protocols described in the literature [7, 28]. In a systematic review, Grzybowski *et al.* [7] found labral debridement and femoral/acetabular osteochondroplasty were the most common surgical procedures in published post-operative protocols. The authors found the current literature of hip arthroscopy rehabilitation lacks high-quality evidence to support a specific protocol. In addition, they found heterogeneity in study and patient characteristics make it difficult to produce agreed upon evidence-based guidelines [7]. These findings were consistent with those

Table II Guidelines for post-operative rehabilitation

Stage	*Estimated time*[a] *(length in weeks)*	*Rehabilitation goals*	*Progression criteria*
Immediate post-operative	2–4	• Pain control • Appropriate gait within weight-bearing status (assistive device if needed)	• 90 degrees of asymptomatic flexion • 10 degrees hip extension • Tolerate all prescribed exercises
Early impairment	2–4	• Symmetrical gait pattern • ROM sufficient for ADLs • Re-establish neuromuscular control for ADLs	• Tolerance of progressive exercise programme • Establish full weight-bearing status • Symmetrical gait pattern • ROM >80% of opposite hip in all planes of motion
Late impairment	2–6	• ROM symmetrical to non-surgical side • Return to low and moderate level ADLs • Return to non-labour occupation activities	• ROM symmetrical to opposite hip • Strength >75% of opposite hip in all planes of motion • Maintain single-leg stance × 30 s • Continuous ambulation >10 min or 1 mile
Functional restoration	2–8	• Return to all ADLs • Low to moderate fitness activities as aligned with patient goals	• Strength >75% of opposite hip in all planes of motion • HOS S >85% for ADL subscale

[a]Time frames are estimated and do not supersede progression criteria.

Table III Post-operative weight-bearing restrictions following hip arthroscopy

Procedure	*Weight-bearing*[a]	*Range-of-motion*[a]	*Strength*[a]
Labral resection	PWB to WBAT, up to 2 weeks	As tolerated by patient	Progression dictated by weight-bearing and ROM status
Labral repair	PWB to WBAT, 2–4 weeks, dependent on location and extent of repair	• *Anterior*: limit external rotation and extension up to 4 weeks • *Posterior*: limit flexion and/or internal rotation up to 4 weeks	Progression dictated by weight-bearing and ROM status
Osteoplasty	PWB to WBAT, up to 6 weeks	As tolerated	Progression dictated by weight-bearing and ROM status
Microfracture	PWB to WBAT, up to 8 weeks	Varies with procedure location	Progression dictated by weight-bearing and ROM status
Capsular modification	Variable with related procedure(s)	• *Anterior*: limit external rotation and extension up to 4 weeks • *Posterior*: limit flexion and/or internal rotation up to 4 weeks	Progression dictated by weight-bearing and ROM status
Tendon lengthening/ release	PWB to WBAT, up to 2 weeks	As tolerated	• *Iliopsoas*: defer supine leg raise for at least 4 weeks • *Iliotibial band*: defer side leg raise 3 and 4 weeks

[a]Surgeries consisting of multiple procedures should utilize most conservative aspect of any given category.
PWB, partial weight bearing; WBAT, weight bearing as tolerated.

reported in an earlier review by Cheatham *et al.* [28]. The consensus for procedure-specific concerns and related time frames are presented in Table III.

The degree and duration of weight-bearing restriction should be based on the tissues affected and amount of biological healing involved with specific surgical procedure performed. Generally, bilateral axillary crutches are the most recommended assistive device after hip arthroscopy. During the initial phase of recovery, recommendations vary between foot flat, toe touch and complete non-weight-bearing patterns. A foot flat pattern is recommended as the use of non-weight bearing or toe touch patterns produce increased compressive forces across the hip joint and can lead to irritation of the anterior soft tissues [29]. Patients should be encouraged to continue the use assistive device until they can demonstrate a normalized gait pattern even if these exceed weight-bearing precaution timelines. Discontinuing assistive device use and allowing patients to ambulate with an abnormal gait pattern may increase intra- or extra-articular irritation and complicate or delay their recovery [24, 30].

What do we do and how do we progress post-operative physiotherapy?

There is no universally accepted protocol for post-operative physiotherapy rehabilitation, with the exception of a general progression of activity. This includes a return to normal activities of daily living (ADL) with pain-free ROM while protecting healing tissue as a first priority. This progresses to a resumption of loading with functional neuromuscular training and endurance activities. The final progression is a RTS with a prevention strategy that will

Table IV Post-operative Physical Therapy recommendations

Pre-operatively (2 weeks prior to surgical procedure) 1 and 2 visits	
Education	— Provide an opportunity to ask questions regarding post-operative rehabilitation
Exercise	— Provide an opportunity to review pre-operative exercises (i.e. core, deep hip rotators and gluteal strengthening) as well as exercises that will be performed immediately post-op
Phase One (1–14 days post-operatively) 1 and 2 visits	
Precautions*:*	
1. Avoid hip flexion beyond 90° during ADL (i.e. putting on shoes and socks) to minimize irritation of the anterior capsule 2. Avoid sitting low chairs or positions of increased flexion 3. Avoid prolonged standing, pivoting or twisting (i.e. car transfer), negotiating public transportation and return to work	
Analgesia	— Adequate pain control is necessary to allow for early rehabilitation — Paracetamol and non-steroidal anti-inflammatory medication for pain control in the early weeks
Muscle activation exercises	— Encourage activation of deep hip rotators (DHR) to reduce Trendelenburg gait pattern
ROM	— Progressed based on healing properties of the involved tissues, including bone, labrum, capsuloligamentous structures and cartilage
Gait	— Facilitation of normal gait pattern is critical for appropriate loading of the hip joint and to avoid compensatory patterns that may increase load through healing tissue
Hydrotherapy	— With adequate wound healing (around 10–14 days post-operatively), consider use of aqua therapy for early ambulation and normalizing gait
Soft tissue mobilization (STM)	– Focused on the psoas, rectus femoris, tensor fascia latae, adductors and glutei to improve muscle activation and flexibility – Monitor lumbar spine mobility to facilitate appropriate joint loading
Phase Two (3–6 weeks post-operatively) 1–2×/week	
Precautions:	
1. Avoid repetitive hip joint flexion beyond 90°, especially in the setting of a labral repair 2. Avoid aggressive compressive forms of loading, such as running on hard surfaces, squats, lunges, skipping and mini-trampoline a. Consider modification of these exercises during the healing period	
Therapeutic exercise	— Initiate cycling with a high seat to avoid hip flexion beyond 90° — Progression of DHR stability programme — Prone, four-point kneeling with resistance band (Figs 3–5a and b, 6a and b) Initiate activation and strengthening of gluteal musculature — To facilitate local hip stability, begin in weight bearing with use of a belt (Fig.9) starting with a quadriceps femoris contraction followed by an isometric contraction of the hip abductors

(continued)

Table IV (continued)

Proprioceptive training	– Initiate proprioception exercises encouraging gluteal activation
Hydrotherapy	– Initiate deep water running, limiting gravity, to progress towards over ground running
STM	– Continue to address soft tissue limitations and spinal mobility
Phase Three (7–12 weeks post-operatively) 1–2×/week	
Precautions:	
1. Progressive joint loading and RTS-specific exercise	
Education	– Importance of regular exercise throughout sport-specific phase to maintain gluteal strengthening and cardiovascular endurance – Emphasis on maintenance of strength for injury prevention
Therapeutic exercise	– Global strengthening – Unilateral loading with emphasis on quadriceps control and improving global muscular support (Fig. 10) – Core stability programme to promote coordinated limb movement
Proprioceptive training	– To promote hip stability and skill execution, progression of DHR strengthening with co-contraction of gluteus medius and minimus in varying degrees of hip flexion (Fig. 10) – Consider utilization of real time ultrasound for feedback in standing, single leg and associated movements
Sport-specific training	Initiate running, jumping and figure eight drills with a heavy emphasis on DHR endurance

Adapted from Bennell *et al.* [30].

protect and support the hip. A randomized control trial found those with structured post-operative physiotherapy had better short-term outcomes than controls [31]. This published protocol was used to develop the consensus post-operative physiotherapy rehabilitation guideline presented in Table IV. This guideline is designed to initially achieve local segmental stability, followed by gradual global muscular strengthening and progression to endurance loading.

What are expected returns to sport rates/outcomes

Systematic reviews have found RTS rates and related outcomes after arthroscopic hip surgery are generally good [32–36]. However, there are limited high-quality studies to support RTS after surgery for FAIS as most publications present case series with level 3b–4 evidence [36]. Systematic reviews and meta-analyses found almost 90% of athletes RTS, with 85% returning to their pre-injury competition level on average 7 months after surgery for FAIS [36]. The systematic review by Casartelli *et al.* [35] found professional athletes RTS at a higher rate compared to recreational and collegiate athletes. However, short- and mid-term follow-up found sport participation tended to decrease for professional athletes. The level of competition, time of evaluation after hip surgery and presence of articular cartilage lesions at the time of surgery may influence RTS [35]. Jack *et al.* [37] using matched asymptomatic players as controls, found athletes in the National Hockey League had a decrease in performance after surgery, while athletes in the National Football League, Major League Baseball and National Basketball Association had no differences. It should be noted, only 14% of studies reported on athletic pre- and post-surgery athletic performance, and no studies reported on the specific criteria used to define to RTS [36]. When specifically asking about RTS level of participation and performance compared to pre-injury level of participation and performance, outcomes may not to be as good. A recent cross-sectional study of 189 athletes in the Danish Hip Arthroscopy Registry reported only 57% of athletes RTS at their pre-injury full participation level, with only 17% reporting optimal performance [38]. It should be noted this study had a 65% follow-up rate and only 23 elite athletes, which may have influenced the outcomes [39].

Determining RTS as an outcome is problematic because the concept is influenced by many factors and not universally defined. There is also a lack of consensus on how to assess outcomes as they relate to evidence-based RTS criteria in athletes after FAIS surgery. Both athlete-based [i.e. questionnaires, as iHot, HAGOS, (Hip Outcome Score) HOS] and performance-based (i.e. strength measurements with HHD, sport-specific tests) outcomes seem to be relevant. Some detailed RTS protocols have been published in case reports, as an example in professional ice hockey [39] and American football [40]. Overall, however there is a need for prospective studies with high levels of evidence that describe and evaluate the rehabilitation and RTS protocols performed by athletes after hip surgery for FAIS. Future research should focus on a standardized approach to defining, measuring and reporting RTS outcomes [41].

A 2016 consensus statement from the First World Congress in Sports Physical Therapy was developed to better standardize RTS rates decision making and reporting [41]. This consensus statement defined RTS as a 'continuum' and emphasized a graded, criterion-based progression that would be applicable for any sport. This continuum includes a progression that included 'return to participation', 'RTS' and 'return to performance'. In addition, it should be considered that RTS success may have different meanings depending on who is defining RTS, whether it be the athlete, coach, athletic trainer, physiotherapist or surgeon [41]. Defining RTS will also be context dependent and influenced by the type and demands of the particular sport as well as competition and performance level (i.e. youth, high school, college, amateur and professional). Other key aspects in defining RTS include a biopsychosocial model, shared decision making, risk assessment and risk tolerance. This type of framework may be helpful to better standardize RTS decisions in clinical practice and reporting for research purposes [41].

Limitations of paper

This consensus has been formulated by specialist physiotherapists from around the world. Many are clinicians with associated academic research positions at tertiary institutions. They are all involved with high volume orthopaedic surgeons with specialist clinics focusing on hip preservation interventions. Many areas require high level scientific research to provide evidence to support what clinicians are currently practicing. Like many areas of physiotherapy, the clinical treatment is years ahead of the scientific research. This document summarizes the latest methods of rehabilitation utilized by some of the largest hip preservation centres around the world.

SUMMARY

This consensus statement provides an outline for assessment for patients presenting with hip and groin pain, more specifically patients presenting with FAIS symptoms. Patients should progress through stages of rehabilitation, and weight-bearing status is dependent on the surgical restrictions prescribed. Post-operative rehabilitation initially focuses on local segmental stability followed by global muscular retraining. RTS depends on several factors including strength, agility and neuromuscular execution of sports specific drills and tasks.

CONFLICT OF INTEREST STATEMENT

None declared.

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