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Femoroacetabular Impingement Rehabilitation Protocol

*Evidence-informed conservative strengthening program for physiotherapists | Revised
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PRIMARY EMPHASIS	PROGRAM FORMAT	INTENDED USE
Core + lumbopelvic control	4 phases / criteria-based	Clinician-guided rehabilitation

Purpose and clinical approach

This program expands the supplied conservative hip rehabilitation framework into a detailed, progressive exercise pathway for symptomatic femoroacetabular impingement syndrome (FAIS). It prioritizes trunk control, hip abductor capacity, single-leg control, and proprioception while avoiding repeated loading into the individual patient's painful impingement range.

The program is not a rigid calendar. Phase timing is approximate; progression is based on symptom response, movement quality, strength, and task tolerance. A physiotherapist should individualize exercise selection, range, external load, and return-to-running or sport exposure.

Key symptom rule: Pain during exercise should generally remain 0-3/10, without sharp catching or progressive loss of motion. Symptoms should return to the pre-exercise level by the next morning. If not, reduce range, resistance, volume, or task complexity by 20-30%.

Evidence-informed principles

- Use active, supervised and individualized rehabilitation as first-line care; education and activity modification support adherence but should not replace progressive exercise.
- Train the trunk and hip together. Prioritize neutral lumbopelvic control, hip abductors and extensors, and movement retraining during squatting, stepping, hinging and single-leg tasks.
- Do not force hip flexion or internal rotation into a painful pinch. Improve usable, comfortable motion rather than pursuing a universal range target.
- Progress from isolated control to integrated strength, then to reactive balance, power, running and sport-specific loading.
- Use objective outcomes: iHOT-12 or iHOT-33, HAGOS/HOS, pain response, handheld dynamometry when available, step-down quality and Y-Balance/Star Excursion performance.

Baseline assessment and red flags

Record irritability, aggravating positions, ROM, gait, squat/hinge strategy, single-leg balance, step-down quality, and hip abduction/extension/rotation strength. Consider lumbar spine, adductor, tendon and intra-articular differential diagnoses.

Reassess or refer: Escalating night/rest pain, inability to bear weight, systemic illness, significant trauma, neurological symptoms, true mechanical locking, or deterioration despite appropriate load reduction warrants clinical reassessment.

Program structure and loading

Exercise	Technique / intent	Dose	Progression	Modify if symptomatic
Strength frequency	Core and hip sessions	2-3 days/week	Add load before excess repetitions	Avoid daily heavy loading
Balance / motor control	Short, high-quality practice	3-5 days/week	Less hand support, added reach/perturbation	Stop when control deteriorates
Intensity	Technical work: RPE 4-6/10; strength: RPE 6-8/10	2-4 sets	Leave ~2-3 good reps in reserve	Reduce if next-day response is worse
Tempo	Controlled lowering	Usually 2-3 sec eccentric	Then add faster intent/power	Do not chase depth. Could start with isometric
Aerobic fitness	Bike, elliptical, pool or walking	20-40 min, 3-5 days/week	Increase time, then intensity	Choose a hip-tolerant setup

Warm-up option (5-8 minutes): comfortable bike or walk, then 1-2 sets each of pelvic clocks, quadruped rock-back within a non-pinching range, and low-load glute activation. Mobility is symptom-guided; aggressive stretching into flexion/adduction/internal rotation is not required.

Phase 1 - Settle symptoms and establish control

Typical window: weeks 0-3. Goals: understand symptom modification, restore comfortable daily activity, activate trunk/hip musculature, and control pelvis/femur in low-load tasks.

Core and lumbopelvic control

Exercise	Technique / intent	Dose	Progression	Modify if symptomatic
Bird dog	Supine; quiet exhale, ribs over pelvis avoid rotation, gentle abdominal brace without posterior pelvic over-correction	2-3 x 6-12 each side	Slow temp or hold extension	Partial range or arms/legs only.
Dead-bug heel slide/tap	Move one heel; prevent lumbar rotation or rib flare	2-3 x 6-10/side	Longer lever, then opposite arm reach	Shorten lever
Knee-supported side plank	Shoulder-pelvis-knee line; lift from underside trunk/glute	3 x 15-30 sec/side	Long-lever side plank	Reduce hold or use wall side plank
Pallog isometric hold	Tall stance; resist band rotation, ribs stacked	3 x 15-25 sec/side	Press-outs or split stance	Lighter band / wider stance/kneeling start

Hip abductor and extensor strength

Exercise	Technique / intent	Dose	Progression	Modify if symptomatic
Side-lying hip abduction	Slight hip extension; pelvis stacked; lead with heel	2-3 x 8-15	Band at knees/ankles; longer pause	Smaller range; wall-supported standing abduction
Wall press isometric	Affected-side stance; opposite knee presses wall; pelvis level	3 x 20-30 sec	Mini single-leg squat hold	Use fingertip support

Exercise	Technique / intent	Dose	Progression	Modify if symptomatic
Bridge	Ribs down; drive through feet without lumbar extension	3 x 8-15	Band abduction; marching bridge; elevated feet	Decrease hip lift
Standing band abduction	Tall pelvis; move leg without trunk lean	2-3 x 10-15/side	Cable load / longer lever	Isometric push into wall
Fire hydrants	On all fours engage core then lift leg out to side with knee at 90. Pause at top then return to starting position.	2-3 x 8-10/side	Extend hold. Extend leg into full extension before return to kneeling	Reduce ROM. Do clamshell lying on side.

Proprioception and movement control

Exercise	Technique / intent	Dose	Progression	Modify if symptomatic
Supported single-leg stance	Tripod foot; pelvis level; knee tracks over mid-foot	3 x 20-30 sec	No support, head turns, eyes closed	More hand support
Clock taps	Stand on involved leg; tap free foot forward/side/back	2 x 5 each direction	Increase reach or remove support	Reduce reach
Hip hinge to wall	Push hips back with neutral trunk; shin near vertical	3 x 8-12	Add light kettlebell/dumbbell	Shorten range

Phase 1 progression criteria

- Daily walking and chosen exercises remain $\leq 3/10$ and settle by the next morning.
- Single-leg stance 30 seconds with level pelvis and no marked trunk lean.
- Bridge and side-plank variations completed with consistent trunk/pelvic control.
- Bodyweight squat or hinge to an individually comfortable depth without a painful pinch.

Phase 2 - Build foundational strength and balance

Typical window: weeks 3-6. Goals: increase abductor/extensor capacity, integrate anti-rotation core work, and develop controlled single-leg loading.

Core progression

Exercise	Technique / intent	Dose	Progression	Modify if symptomatic
Dead bug with contralateral reach	Maintain stacked ribs/pelvis while opposite arm and leg move	3 x 6-10/side	Band pulldown dead bug	Return to heel taps
Bird dog	Reach long; resist pelvic rotation and lumbar extension	3 x 6-10/side, 3-sec hold	Band resistance / bear hover	Move one limb only
Front plank	Neutral trunk; steady breathing	3 x 20-45 sec	Long-lever or shoulder taps	Elevated plank
Suitcase carry	Walk tall with one-sided load; no lateral trunk shift	3 x 20-40 m/side	Increase load/distance	Short carry or lighter load

Hip abductor and integrated lower-limb strength

Exercise	Technique / intent	Dose	Progression	Modify if symptomatic
Lateral band walk	Athletic stance; pelvis level; quiet feet	2-3 x 8-12 steps each way	Band lower on legs / more tension	Higher stance or lighter band
Step-up	Whole foot on step; drive pelvis forward; controlled lowering	3 x 8-12/side	Higher step or external load	Lower step / rail support
Split squat	Vertical pelvis; front knee follows second toe; comfortable depth	3 x 6-10/side	Add dumbbells	Shorten range / supported stance
Single-leg bridge	Level pelvis; hip extension from glute	3 x 6-12/side	Foot elevated / external load	Kickstand bridge

Proprioception progression

Exercise	Technique / intent	Dose	Progression	Modify if symptomatic
Single-leg stance + reach	Reach in 3 directions while maintaining tripod foot/pelvis	2-3 x 4-6 cycles	Foam surface or external target	Toe-touch assist
Step-and-hold	Step forward or lateral; stabilize 2-3 sec	2-3 x 6/side/direction	Larger step / light perturbation	Smaller step
Supported single-leg Romanian deadlift (RDL)	Hinge around stance hip; pelvis remains square	3 x 6-10/side	Remove support; add load	Kickstand RDL

Phase 2 progression criteria

- 10 controlled step-ups and split squats per side at a useful, non-pinching depth.
- Single-leg RDL and multidirectional reach without repeated pelvic rotation or knee collapse.
- Hip abduction strength improving toward $\geq 80\%$ limb symmetry when HHD testing is appropriate.
- Exercise load can increase without a clinically meaningful next-day flare.

Phase 3 - Strength, endurance and dynamic single-leg control

Typical window: weeks 6-10. Goals: develop moderate-to-heavy strength, frontal/transverse plane control, and controlled deceleration.

Advanced core integration

Exercise	Technique / intent	Dose	Progression	Modify if symptomatic
Side plank + hip abduction	Long-lever plank; lift top leg without pelvic roll	3 x 6-10 or 20-40 sec	Band resistance	Knee-supported version
Bear hover shoulder tap	Knees hover; alternate taps without trunk rotation	3 x 6-10/side	Slower tempo / wider reach	High plank at bench
Cable/band chop and lift (can use bands)	Rotate through thorax/hips as appropriate; control pelvis	3 x 8-12/side	Heavier load / split stance	Pallof press
Farmer + suitcase carry mix	Maintain gait and pelvic control under load	3-4 x 30-50 m	Heavier or offset load	Shorter distance

Hip abductor and kinetic-chain strength

Exercise	Technique / intent	Dose	Progression	Modify if symptomatic
Lateral step-down	Slow 3-sec lower; pelvis level; knee tracks forward	3-4 x 6-10/side	Increase step/load	Reduce step height
Loaded single-leg RDL	Hip hinge; square pelvis; strong foot contact	3-4 x 6-10/side	Increase external load	Kickstand RDL
Hip thrust	Full-foot pressure; finish with glutes, not lumbar extension	3-4 x 6-12	Increase load / single-leg	Bridge
Lateral lunge	Sit into hip in comfortable range; push floor away	3 x 6-10/side	Add load / deeper tolerated range	Short lateral step
Standing cable abduction (can use bands)	Stable stance leg; controlled return	3 x 8-15/side	Increase load or lever	Band / wall isometric

Dynamic proprioception and deceleration

Exercise	Technique / intent	Dose	Progression	Modify if symptomatic
Y-Balance / star reach practice	Reach without losing foot tripod or pelvic control	2-3 x 3-5 each direction	Increase reach toward symmetry	Use toe support
Single-leg squat to target	Sit to box; knee/pelvis aligned; controlled tempo	3 x 6-10	Lower target / add load	Higher box / TRX support
Lateral bound and stick	Small bound; absorb quietly and hold 2-3 sec	3 x 4-6/side	Increase distance / reactive cue	Lateral step-and-hold
Drop-to-stick	Low step; land balanced with hip-knee flexion	3 x 4-6	Single-leg or multidirectional	Snap-down without step

Phase 3 progression criteria

- Hip abduction/extension/rotation strength generally $\geq 90\%$ limb symmetry when comparison is valid; interpret dominant-sport asymmetry clinically.
- 20 controlled single-leg squats or step-downs to the selected target without pain escalation or repeated loss of alignment.
- Y-Balance anterior reach side-to-side difference < 4 cm and acceptable composite/control pattern.
- Low-level hop/landing drills are pain-free during and do not flare the next day.

Phase 4 - Return to running, power and sport

Typical window: weeks 10-12+ and individualized. Begin only when everyday function and Phase 3 loading are well tolerated. Running and sport exposure should be gradual and based on the demands of the athlete.

Power and reactive-control options

Exercise	Technique / intent	Dose	Progression	Modify if symptomatic
Squat jump / countermovement jump	Comfortable depth; symmetrical take-off and quiet landing	3-4 x 3-5	Increase intent, not fatigue	Fast calf raise or snap-down
Lateral bound repeated	Control pelvis and trunk; stable direction changes	3 x 5-8/side	Continuous bounds / reactive cue	Bound-and-stick
Single-leg hop and stick	Short forward hop; hold landing 2 sec	3 x 4-6/side	Multiple hops / directions	Step-and-hold

Exercise	Technique / intent	Dose	Progression	Modify if symptomatic
Acceleration / deceleration drill	Build speed gradually; stop with controlled steps	4-8 efforts	Faster, shorter stopping zone	Walk-jog changes

Sample walk-jog progression

Exercise	Technique / intent	Dose	Progression	Modify if symptomatic
Session 1	1 min jog / 2 min walk	8 rounds	Easy pace	Repeat if symptoms rise
Session 2	2 min jog / 1 min walk	8 rounds	Easy pace	Return to Session 1
Session 3	4 min jog / 1 min walk	6 rounds	Easy-moderate	Reduce interval length
Session 4	10 min jog / 1 min walk	3 rounds	Conversational	Repeat before progressing
Session 5	Continuous run	20-30 min	Then add 5-10 min/session	Separate volume and speed increases

Allow at least 48 hours between early run exposures. Progress only if gait remains normal, pain stays $\leq 3/10$, and symptoms return to baseline by the next morning. Add hills, speed, cutting and contact demands one variable at a time.

Return-to-sport considerations

- Full training-quality strength session tolerated without symptom escalation.
- Sport-specific cutting, pivoting, acceleration and deceleration performed with confidence and control.
- Hop battery and dynamic balance results are acceptable for the individual; do not rely on limb symmetry alone.
- Patient-reported function is improving and the patient reports readiness for graded participation.
- A clinician confirms that residual symptoms, morphology and sport demands have been considered.

Example weekly schedule (Phases 2-3)

Exercise	Technique / intent	Dose	Progression	Modify if symptomatic
Monday	Strength A	Core anti-extension; step-up; split squat; band walk; balance reach	45-60 min	Moderate-heavy
Tuesday	Aerobic + control	Bike/walk; mobility; short proprioception practice	25-40 min	Easy
Wednesday	Strength B	Anti-rotation; RDL; hip thrust; abduction; step-and-hold	45-60 min	Moderate-heavy
Thursday	Recovery	Comfortable aerobic or rest	20-30 min	Easy
Friday	Strength C	Side plank; step-down; lateral lunge; carry; Y-Balance	45-60 min	Moderate
Weekend	Activity exposure	Graded recreational or sport-specific task	Individual	Symptom-guided

Clinician monitoring sheet

Exercise	Technique / intent	Dose	Progression	Modify if symptomatic
Pain response	During / after / next morning	0-10 + symptom description	Each visit or weekly	Modify if recovery >24 h
Hip ROM	Flexion, IR, ER, extension	Comfortable range + symptom location	Every 2-4 weeks	Avoid forced painful range
Hip strength	Abduction, extension, IR/ER	HHD normalized to body mass if available	Every 3-4 weeks	Track absolute change + LSI
Movement quality	Squat, hinge, step-down, SL squat	Pelvis, trunk, knee and depth	Every 2-4 weeks	Video may improve reliability
Dynamic balance	Y-Balance / Star Excursion	Direction values + asymmetry	Phase 2 onward	Standardize limb length/setup
Patient report	iHOT-12/33, HAGOS or HOS	Same tool over time	Baseline, 6-8 wk, discharge	Interpret with clinical change

Exercise-selection cautions

- Deep squats, deep split squats and prolonged sitting may need temporary range or exposure modification; they are not automatically prohibited.
- Avoid repeatedly provoking the patient's familiar anterior hip pinch merely to "gain mobility." Substitute a shallower range, more hip hinge, wider stance, or different task.
- Hip flexor loading can be included if clinically indicated and tolerated, but high-volume straight-leg raises or aggressive flexor work may aggravate some irritable hips.
- Do not let band resistance distort technique. A lighter band with good pelvic control is preferable to heavy resistance with trunk lean or femoral collapse.
- Because morphology does not correlate perfectly with symptoms, treat function and irritability rather than attempting to "correct" bone shape through exercise.

Evidence summary

The strongest evidence supports a supervised, individualized, active rehabilitation program rather than a single "best" exercise. Consensus and current-concepts literature consistently emphasizes education, activity modification, core/lumbopelvic control, hip strength, movement retraining and graded return to activity. Exercise-specific dosing and exact milestone thresholds are less certain; therefore, the detailed exercises and criteria in this document operationalize those principles using contemporary rehabilitation and strength-training practice.

References

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Clinical note: This is a general rehabilitation framework, not a substitute for diagnosis or individualized medical and physiotherapy assessment. Exercise selection should account for age, irritability, comorbidities, instability/dysplasia, prior surgery, training history and goals.