NON-ARTHRITIC HIP PAIN

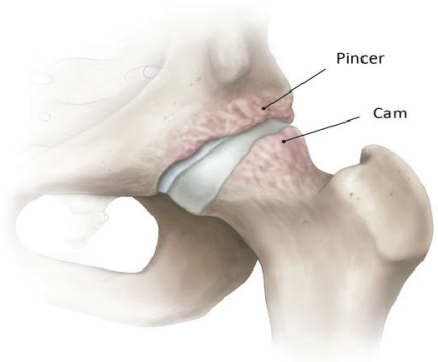
The hip joint is created by the junction between the femur (thigh bone) and the pelvis. The round femoral head articulates with the lower part of the pelvis, called the acetabulum (socket). The hip joint has a complex muscle anatomy which allows it to undergo significant stress in everyday activities, but also more importantly in extremes of motion. Stability of the hip joint is increased by the labrum (a cartilaginous ring around the socket), responsible for the suction seal effect in this ball and socket joint.

Research has greatly progressed over the past decades and surgeons now better understand nonarthritic hip pain. While there can be multiple causes for hip pain in the absence of arthritis, one reason could be abnormal contact between the femur and the acetabulum, also called femoroacetabular impingement {FAI). FAI is usually characterized by pain in specific positions and/or extremes of movements.

For the management of FAI, research strongly supports attempting a thorough hip-focused rehabilitation protocol. A substantial proportion of patients find this very helpful in preventing surgical management. Even if surgery is undertaken, rehabilitation prior to it can better equip the patient with postoperative rehabilitation. It is therefore essential to attempt a conservative management with a well-trained rehabilitation specialist, before considering any surgical management.

Furthermore, the scientific data has also allowed us to highlight that a high percentage of radiologic abnormalities are found in asymptomatic patients, which emphasis the importance of a thorough assessment and a comprehensive trial of conservative management strategies. Hip related pain can be associated with a wide variety of muscle and/or kinematic abnormalities that can originate anywhere from the lower back to the knee. Recent literature supports that a supervised rehabilitation plan with a focus on lower extremity and core strengthening leads to better outcomes and return to sport rates.

Femoroacetabular Impingement



CONSERVATIVE HIP REHABILITATION PROTOCOL

	Phase 1: MANAGE *Swelling + joint motion*	Phase 2: RESTORE *Functional movement, balance, fitness*
	Day 1- 3 weeks	3 weeks – 2 months
Phase Objectives + Pre-Test Goals	CONSERVATIVE TRIAL **1) Educate** • pathophysiology of injury, biomechanics (e.g. positions of impingement), goals of conservative trial period, rehabilitation objectives and plan **2) Decrease hip pain (VAS) and improve pain-free ROM** **3) Address local hip strength and control** • reduce neuromuscular inhibition • local hip muscle activation • build up hip strength and stability **4) Address core and pelvic control** • lumbopelvic dissociation patterns **5) Evaluate and train base movement patterns** • (squat, hinge, lunge, step up, SL squat) **6) Pool Exercise Program** **7) Maintain cardiovascular fitness** • Bike/ walk program	CONSERVATIVE TRIAL **1) Educate** • Objectives of Phase 2 including goals for functional progressions and plan **2) Decrease hip pain (VAS) and maintain improved pain-free ROM, while increase functional activities and training** **3) Load and train base movement patterns** • (squat, hinge, lunge, step up, SL squat) **4) Introduce linear running mechanics** **5) Prepare for power-based training** • (jump+ landing mechanics) **6) Retrain multiplanar movements** • (side-step, pivot, ladder drills) **7) Pool exercise program** **8) Build cardiovascular fitness** • Bike/ walk program
Precautions	Keep pain< 3/10 during functional activities Monitor for progressive loss of internal rotation or total ROM	Keep pain< 3/10 during functional activities Monitor for progressive loss of internal rotation or total ROM
Clinical Tests + Milestones	**1) Hip ROM** Flexion Extension External Rotation Internal Rotation Bent knee fall out **2) Screening tests** • FABER/ FADIR **3) Hip Strength (HHD)** • Limb symmetry index (LSI) Goal >7S% with hip abduction, adduction, IR, ER • If a dynamometer is unavailable use Manual Muscle Testing (Oxford scale) **4) Copenhagen 5 second adductor squeeze test** **5) Gait Assessment** • Optimal walking mechanics sustained for 10 minutes	**1) Hip ROM** Flexion Extension External Rotation Internal Rotation Bent knee fall out **2) Screening tests** • FABER/ FADIR **3) Hip Strength (HHD)** • Limb symmetry index (LSI) Goal >90% with hip abduction, adduction, IR, ER • If dynamometer unavailable use Manual Muscle Testing (Oxford scale) **4) Copenhagen 5 second adductor squeeze test**

	Phase 1: MANAGE *Hip Strength and Stability*	Phase 2: RESTORE *Functional Capacity*
	Day 1- 6 weeks	6 weeks – 12 weeks
Functional Tests + Milestones	**1) Hip and Trunk Capacity** • Single leg bridge, 20x • Dead bug Lowers, l0x • Side plank, 30 sec hold • Front plank, 60 sec *assess position, control, capacity **2) Functional Capacity** • Double leg body weight squat to 90° knee flexion Symmetrica I X 20 **3) Neuromuscular control** • Single leg balance: 30 sec eyes open, 10 sec eyes closed • Single leg squat to 70° "good control" without kinetic collapse	**1) Hip and Trunk Capacity** • Single leg bridge, 30x • Dead bug lowers, 20x • Side plank hip abduction, 60 sec • Front Plank, 90 sec *assess position, control, capacity **2) Functional Capacity** • Single leg step up (Tempo 1:0:1) X 30 • Single leg squat: 70 degrees knee flexion, X 20 (Tempo 2:0:2) • Max bilateral squat: 3RM to 90° knee flexion. > than 70% BW **3) Neuromuscular control** • Single leg drop landing with good mechanics • Y Balance Test Anterior Reach differential <4 cm **4) Hop Tests** • Single leg hop for distance, 85% LSI • Lateral bounding for 90 sec
Outcome measures	IHOT12 HOS Orebro	IHOT12 HOS Orebro

This document was produced by:

- Dr. Parth Lodhia MD
- Dr. Mark McConkey MD
- Dr. Jordan Leith MD
- Dr. Erik Therrien MD, MSc
- Damien Moroney, BSc. PT, CSCS
- Ryan Murray, MPT, BHK, Sport Dip, CSCS
- Declan Norris, BSc. PT, MSc Sports Physio, RISPT

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