

# Medical and Rehabilitation Definitions

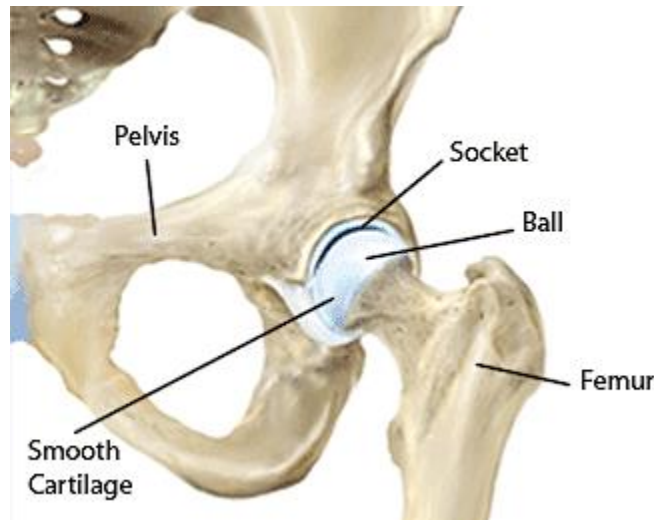


image from smithnephew.com

**Acetabulum:** hip socket

**Anterior:** towards the front of the body

**Closed Chain:** movement in which the end segment of the exercised limb is fixed to the ground. Ex. Standing exercises, leg press

**Concentric:** contraction of a muscle as it is shortening. Ex. “upward phase” of a biceps curl

**Eccentric:** contraction of a muscle as it is lengthening. Ex. “lowering phase” of a biceps curl

**FAI:** femoral acetabular impingement

**Femur:** upper leg bone

**Gait:** walking pattern

**Inflammation:** the body’s natural response to protect from infection and surgical trauma. Can cause swelling, heat, and pain.

**Isometric:** contraction of a muscle without movement

**Joint Mobs:** Joint mobilization is a type of passive movement of a skeletal joint. It is usually aimed at a 'target' synovial joint with the aim of decreasing joint stiffness or decreasing pain.

**Labrum:** a fibrocartilaginous rim extending off the acetabulum to deepen the socket and provide a suctioning effect

**Lateral:** further away from the body's midline

**Medial:** towards the body's midline

**Muscle Imbalances:** differences in strength or tightness in muscles on either side of the joint

**Muscle Inhibition:** "shutting down" of a muscle usually due to pain or inflammation

**Posterior:** towards the back of the body

**PROM:** "passive range of motion" patient does nothing, movement performed by someone else

**Prone:** lying on your stomach

**ROM:** range of motion

**RPM:** revolutions per minute

**Supine:** lying on your back

**Transverse Abdominis (TA):** deepest of the major abdominal muscles which stabilize the spine and pelvis.

# Rehabilitation Program Phase I

## Range Of Motion Phase I

### STATIONARY BIKE

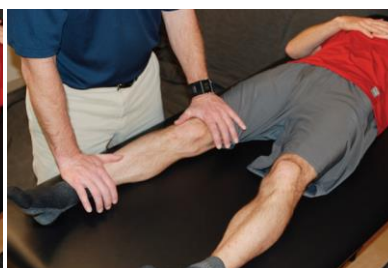
- Set bike seat so that knee extends to approximately 5 degrees at bottom of stroke
- NO resistance is used on bike phase 1
- Max time 20 minutes, 2 times per day



### PASSIVE RANGE OF MOTION:

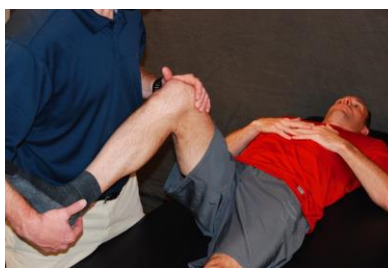
#### LOG ROLLS

Therapist gently rolls affected leg from neutral into internal rotation for 2-3 minutes



### INTERNAL ROTATION •

- Lying on your back, bend knee to 90 degrees and hip to approx. 70 degrees
- Slowly rotate foot outwardly to create Internal rotation at the hip
- Don't push into a pinching sensation
- Repeat 20 times

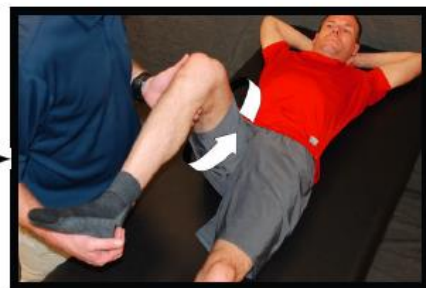
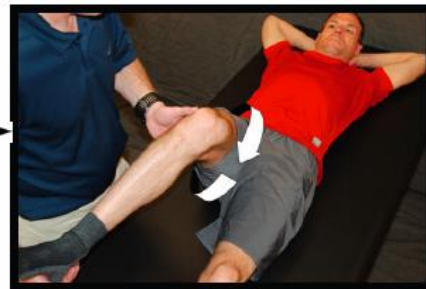
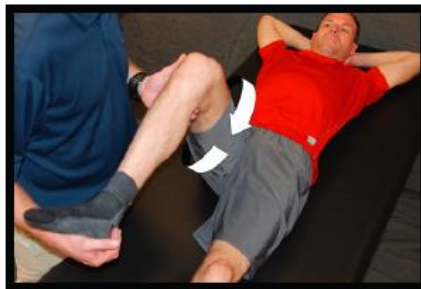


### CIRCUMDUCTION AT 70 DEGREES

Lying on your back with hip in 70 degrees of flexion, have partner/therapist move the knee in a **clockwise** circular pendulum motion for 5 minutes

- Lying on your back with hip in 70 degrees of flexion, have partner/therapist move the knee in a **counterclockwise** circular pendulum motion for 5 minutes

**\*\*Do NOT push into pinch or painful position\*\***

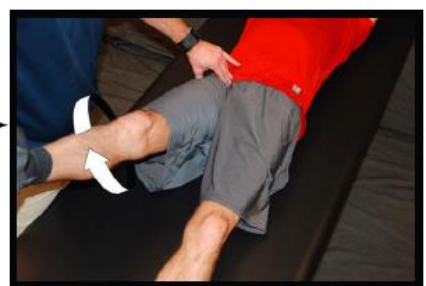
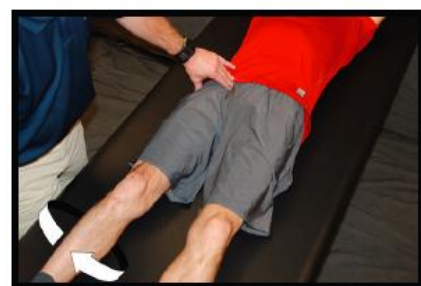


### CIRCUMDUCTION AT NEUTRAL

- Lying on your back with hip and knee straight, have partner/therapist move leg in a **clockwise** circular pendulum motion for 5 minutes

- Lying on your back with hip and knee straight, have partner/therapist move leg in a **counterclockwise** circular pendulum motion for 5 minutes

**\*\*Do NOT pull leg into distraction\*\***



## SOFT TISSUE MOBILIZATION

- Lymphatic or light soft tissue (such as effleurage • techniques) are utilized to flush fluid/swelling from the hip
- Petrissage, myofascial, or deeper strumming techniques are utilized to mobilize deeper tissues after the initial swelling and inflammation has subsided
- Address the TFL, ITB, glutes, adductors, and the low back



## Strengthening Phase I

### ISOMETRICS:

#### TRANSVERSE ABDOMINUS

- Place your first 2 fingers just inside your pelvic bone
- Take a deep breath in and out, relaxing all your abdominal muscles
- At the end of your exhale, draw in your belly button toward your spine/kegel exercise
- You should feel tension under your fingers without bulging and there should be no movement of the spine or pelvis
- Hold the contraction through 10 normal breaths (Repeat hourly while awake)



#### GLUTE SQUEEZES

- Gently contract glute muscles
- Hold for 5 seconds and repeat 10 times
- Repeat hourly while awake



#### QUAD SETS

- Gently contract thigh muscles until knee is straight,
- Hold for 5 seconds and repeat 10 times
- Repeat hourly while awake



## Stretching Phase I

### STRETCHING:

#### HIP FLEXOR

- Lie on your back
- Lift opposite knee to chest

(Hold for 30 seconds, 3 reps, 2 times per day)



### QUADRICEPS

- Lying on your stomach
- Bring ankle toward buttocks

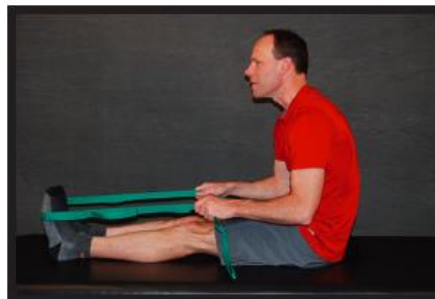
(Hold for 30 seconds, 3 reps, 2 times per day)



### HAMSTRINGS

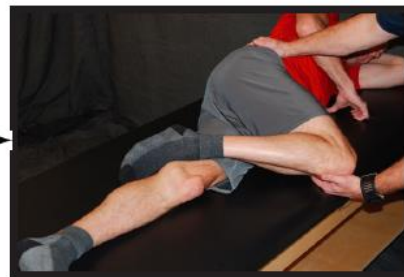
- In a long sitting position with your feet straight out in front of you, reach toward your feet

(Hold for 30 seconds, 3 reps, 2 times per day)



### PIRIFORMIS

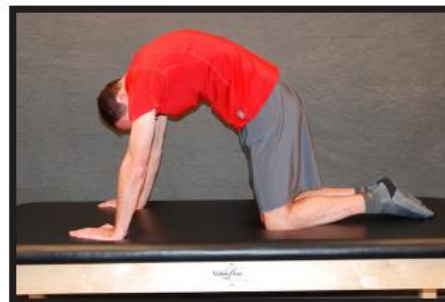
- You may start with pillow to support leg
- Lying on uninvolved side (bottom leg straight, pelvis stacked) bend involved hip into 50-70 degrees of flexion and hook top foot on uninvolved knee
- Stabilizing pelvis, lower involved knee towards the table
- Stretch should be felt in buttock
- Avoid pinch in groin (Hold for 30 seconds, 3 reps, 2 times per day)



### ACTIVE RANGE OF MOTION:

#### CAT AND CAMEL

- Kneeling on your hands and knees, begin with your back in neutral position
- Rotate hips backward while arching your back upward
- Reverse directions and rotate hips forward while extending your back (20 reps, 2 times per day)



## SUPINE ABDUCTION/ADDUCTION

- Lie on your back with surgical leg on slideboard/plexiglass type of surface (sock on foot)
- Keep leg straight while sliding foot out, then return to neutral
- Additional help may be provided by therapist (20 reps, 2 times per day)



## ACTIVE REVERSE BUTTERFLIES

- Lie on your back, feet shoulder width apart, flat on the floor
- Bring inside of knees towards each other leaving feet in place
- Squeeze knees together and hold 5 seconds
- Allow knees to drop out to the side and hold 5 seconds
- Bring back to start position (20 reps, 2 times per day)



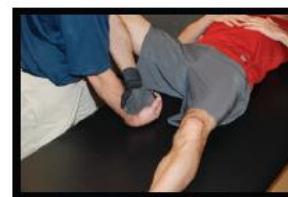
## STANDING ABDUCTION WITH INTERNAL ROTATION

- Standing on nonsurgical leg while keeping surgical leg straight, rotate slightly into internal rotation (point toes inward)
  - Lift your leg out to the side
  - Hold for 2-3 seconds, then return to starting position
  - Do Not lean away from the moving leg
- (3 sets of 10 reps, 2 times per day)



## FABER SLIDES

- Begin once external rotation restrictions are lifted
  - Lie on your back and engage TA to ensure pelvic stability
  - With control, slide heel up table along opposite leg while allowing knee to fall outward
  - Therapist to provide assistance initially
- (20 reps, 2 times per day)



## DOUBLE LEG BRIDGES

- Lie on your back with arms at your sides and hips and knees bent
- Squeeze Glutes and Raise buttocks while keeping core stable
- Slowly return to start position and repeat  
(3 sets of 10 reps, 2 times per day)



## STOOL ROTATIONS

- Stand and place the knee of your surgical leg on a stool
- on a stool
- The level of the stool should allow you to rest your leg on the top of the stool while being straight up and down without dropping or hiking your hips
- Rotate the leg that is resting on the stool both directions without moving your trunk  
(3 sets of 10 reps, 2 times per day)



# Rehabilitation Program Phase II

## WEIGHT SHIFTING EXERCISES

### LATERAL AND FORWARD/BACKWARD

- Beginning with weight primarily distributed on non-surgical leg
- Progressively shift weight to surgical leg
- Statically hold for 30-60 second intervals
- Avoid hiking, dropping, and/or rotating hip



### SINGLE LEG STANCE

- Stand on one leg using support as appropriate
- Statically hold for 30-60 second intervals
- Avoid hiking, dropping, and/or rotating hip
- Do NOT progress to standing on unstable surfaces (i.e. dyna disk, bosu ball, or foam roll) until you can maintain correct form for 60 seconds



### FORWARD SHIFT TO ROMANIAN DEAD LIFT (RDL) -

- Standing on one leg bend forward and reach for the ground
- Keep hips in neutral, do not let hips rotate
- Return to start position and repeat



### STRETCHING: Continue all Phase I stretches

#### HIP FLEXOR

- Let your knee of the surgical leg bend over the end of the table
- Lift opposite knee to chest

#### OR:

- In a half kneeling position with the involved knee on the floor, tighten glutes and shift your weight forward while keeping trunk upright

(Hold for 30 sec, 3 reps, 3-4 times per day)



### QUADRICEPS

- In a standing position, bring ankle toward buttock

(Hold for 30 seconds, 3 reps, 1 time per day)



### HAMSTRINGS

- In a standing position with your knees straight, reach toward the floor

(Hold for 30 seconds, 3 reps, 1 time per day)



### ILIOTIBIAL (IT) BAND

- In a standing position, cross your nonsurgical leg in front of the surgical leg
- Keep your pelvis level and straight while you shift your body weight over your surgical leg
- Most of your weight should be on your surgical leg

(Hold 2-3 minutes, 1 time per day)



**ACTIVE RANGE OF MOTION/ EARLY STRENGTHENING:**  
**Continue all Phase I Exercises plus:**

**DOUBLE LEG BRIDGES**

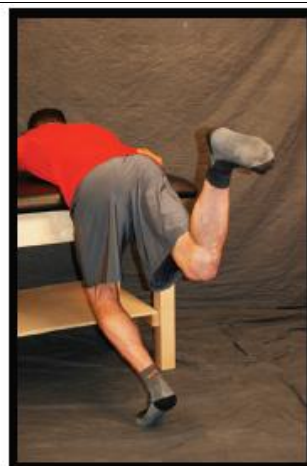
- With theraband around your knees lie on your back with arms at your sides and hips and knees bent
- Squeeze glutes and raise buttocks while keeping core stable
- Slowly return to start position and repeat (3 sets of 10 reps, 2 times per day)



**PRONE HIP EXTENSION OFF EDGE OF BED**

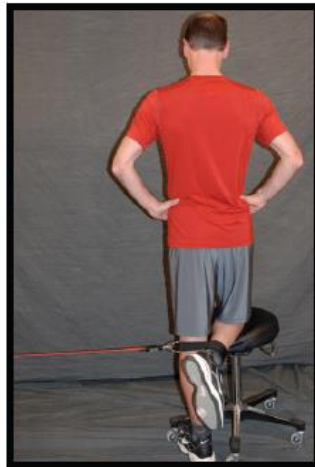
- Lie flat on stomach
- Tighten TA, squeeze glute, and with knee straight, lift leg to neutral position
- Start with knee bent and progress toward straight leg technique

(3 sets of 10 reps, 1 time per day)



## RESISTED STOOL ROTATIONS

- Stand and place the knee of your surgical leg on a stool with sport cord around ankle and attached to wall opposite direction of motion
  - The level of the stool should allow the leg to rest on the top of the stool while being straight up and down without dropping or hiking your hips
  - Rotate the leg that is resting on the stool without moving your trunk (turning the stool outward, back to neutral, then inward)
- (3 sets of 10 reps, 2 times per day)



## DOUBLE KNEE BENDS

- Stand with feet shoulder width apart
- Bend knees to 30 degrees, keeping knees behind toes
- Return to starting position with knees slightly bent

(2 sets, 20 reps, 2-3 times per day)



### DOUBLE KNEE BEND TO CALF RAISE

- Use same technique as knee bends
- Return to the starting position with the addition of a heel raise

(2 sets, 20 reps, 2-3 times per day)



### REVERSE LUNGE/STATIC HOLD

- Stand in a lunge position with the involved leg forward
- Allow the toe of the unaffected leg to touch and assist balance
- Bend the involved knee to 45 degrees and hold that position

(2-3 sets, 10 reps, 10+ second holds, 3 times per week)



# **Rehabilitation Protocol**

## **Phase III and IV**

### **All Patients**

## **Phase III: Advanced Exercises** “multi-directional & plyometric”

### **A. Side to side lateral agility with cord**

*2 sets to fatigue, 3 times/week*

Attach the sport cord from the side with the surgical leg facing the cord. Step sideways to create tension on the cord. The athlete will hop laterally with cord resistance from their surgical leg, land momentarily on their non-surgical leg, only to return onto their surgical leg with the cord pulling them back to the starting position for a total test time of 80 seconds. Each repetition of 1 second includes exploding laterally off the surgical side, landing momentarily on the opposite leg, and then returning to the starting position with emphasis on absorbing by bending at the hip and knee with 30 degrees of knee excursion. Excursion is defined as the amount of absorption from knee flexion at landing to max knee flexion.

### **B. Diagonal side to side with cord**

*2 sets to fatigue, 3 times/week*

Attach the sport cord from the side with the surgical leg facing the cord. Step sideways to create tension on the cord. The athlete will hop diagonally forward at a 45° angle with cord resistance from their surgical leg, land momentarily on their non-surgical leg, only to return onto their surgical leg with the cord pulling them back to the starting position. The following repetition the athlete will hop diagonally backward at a 45° angle. The goal is 80 seconds total. Each repetition of 1 second includes exploding diagonally forward or backward at 45° angles off the surgical side, landing momentarily on the opposite leg, and then returning to the starting position with emphasis on absorbing by bending at the hip and knee with 30 degrees of knee excursion. Excursion is defined as the amount of absorption from knee flexion at landing to max knee flexion.

### **C. Forward Box Lunges with cord**

*2 sets to fatigue, 3 times/week*

The athlete will perform alternating forward lunges onto a box with cord resistance at a cadence of 2 seconds per lunge for a goal of 2.5 minutes. The movement is a forward lunge with maximum hip extension without compensation at the pelvis or spine throughout the 2.5 minutes.

### **D. Plyometrics – water to dry land progression**

*10 sets, 1-2 minutes, 3-5 times/week*

Begin with water: In chest deep water, perform forward bounding. Focus on absorption when landing. Progress to dry land plyos.

## E. Sport specific Progressions - NEVER USE TREADMILL

**RUNNING:** Expect to have mild limping/discomfort/awkwardness – this should go away gradually. Common sense dictates that if limp worsens or there is pain, running should stop. Progress to the next phase each week.

### ***No treadmill. Use softer surface / grass to start***

|                                            | Walk Run Ratio      | Sets/Total Time | Frequency      |
|--------------------------------------------|---------------------|-----------------|----------------|
| R 1                                        | 4 minutes/ 1 minute | 4 sets = 20 min | 4-5 times/week |
| R 2                                        | 3 minutes/2 minute  | 4 sets = 20 min | 4-5 times/week |
| R 3                                        | 2 minutes/3 minute  | 4 sets = 20 min | 4-5 times/week |
| R 4                                        | 1 minutes/4 minute  | 4 sets = 20 min | 4-5 times/week |
| R 5                                        | 5 minute Jog        | 2 sets = 10 min | 4-5 times/week |
| From 10 min jogging, increase as tolerated |                     |                 |                |

**SKATING:** \*\*Goalie – hold back pads an extra week  
Progress to the next phase each week

|    | SKATING PROGRESSION                                    | Time      | Frequency             |
|----|--------------------------------------------------------|-----------|-----------------------|
| S1 | Skate no pads forward and back with crossover          | 20-30 min | 4-5 times/week        |
| S2 | Skate Use of Pads with change of direction, stop/start | 20-30 min | 4-5 times/week        |
| S3 | Sport Specific Drills                                  |           | 2-4 times/week        |
| S4 | Sports Test (to be cleared)                            |           | Week 10 + of protocol |
| S5 | Full Contact – Practice w Team                         |           | After passing test    |

**BALLET/DANCE:** May incorporate D1-D5 as part of Phase II exercises. Frequency 4-5 times / week.

|               | DANCE PROGRESSION                                             |                                                                  |
|---------------|---------------------------------------------------------------|------------------------------------------------------------------|
| D1-<br>Week 2 | 4-Way ankle strength w TheraBand                              |                                                                  |
| D2-<br>Week 4 | Bar Work: stabilization on surgical leg AND Progress Turn Out | <i>Single Leg Balance = Tendu<br/>Turned Out Bridges on Ball</i> |

|              |                                                   |                                                                                                             |
|--------------|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| D3<br>Week 5 | Multi plane muscle stretching                     | <i>Including Pike &amp; V Stretching<br/>→ progress to splits over a 4<br/>week period. Approx 8 weeks.</i> |
| D4<br>Week 5 | Double Knee Bends = Plie                          |                                                                                                             |
| D5<br>Week 6 | Multi plane muscle single leg<br>activities/moves | <i>(eg) ER Leg Lift (when pain<br/>free short lever hip flexion)</i>                                        |
| D6           | Sport Test                                        |                                                                                                             |
| D7           | Jumps                                             | <i>D5 After passing sport test</i>                                                                          |

**GOLF:** Begin after 3 wks of walking. Don't carry bag. Do not pull cart

|    | GOLF PROGRESSION                | Volume   | Frequency |
|----|---------------------------------|----------|-----------|
| G1 | Put, Chip, ½ swing only         | 1 bucket | 1-2 weeks |
| G2 | 8-9 Irons, ¾ swing only         | 1 bucket | 2 weeks   |
| G3 | All Irons, Use cart, full swing | 9 holes  | 2 weeks   |
| G4 | Full play, walking 18 holes     | 18 holes |           |

#### **E. Initial agility drills – Straight Plane Agility**

**Chop-Downs/Back Pedaling**-jog forward, stutter step to a stop, absorb and push off smoothly into a back pedal.

**Side Shuffles**-Start with feet shoulder width apart, maintain an athletic stance and shuffle to the right, then back to the left.

## **Phase IV: High Level Activities-**

### **Functional Sport Test**

Passing the Sport Test = you are cleared per MD discretion!!!

Once the patient passes the Functional Sports Test, HHSM leaves the responsibility up to the patient and coach to continue to progress training for sport. This includes proper conditioning and sport specific agility.

#### **A. Multi-Plane Agility**

- 1. Z Cuts**
- 2. W Cuts**
- 3. Cariocas**
- 4. Ghiardelli's**

Start by crossing the right leg over the left, then swing the left leg out from behind the right absorbing and touching the ground with your left hand in one fluid motion. Repeat to the right side.

#### **B. Sport Specific Training**