AMERICAN HIP INSTITUTE
& ORTHOPEDIC SPECIALISTS

999 E. Touhy Ave. Suite 450
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Rehabilitation Protocol after Periacetabular Osteotomy (PAO Surgery)

Benjamin D. Kuhns, M.D., M.S.

The intent of this protocol is to provide guidelines for your patient's therapy progression following PAO with combined hip arthroscopy. It is not intended to serve as a recipe for treatment. We request that the PT/PTA/ATC use appropriate clinical decision-making skills when progressing a patient forward.

The following is an outline of the post-operative rehabilitation program for periacetabular osteotomy procedures utilized by **Dr. Benjamin D. Kuhns.** This protocol is to be utilized as a guideline to assist communication between the surgeon, rehabilitation team, and patient during the recovery process. **Individual patient differences regarding progression and/or tolerance of specific activities can and will vary.**

Please call **(833) 872-4477** to obtain the operative report from our office prior to the first post-op visit. Please contact our office if there are any questions about the protocol or your patient's progression.

Please keep in mind common problems that may arise following hip surgery: hip flexor tendonitis, adductor tendonitis, sciatica/piriformis syndrome, ilial upslips and rotations, LB pain from QL hypertonicity and segmental vertebral rotational lesions. **These are especially common following the PAO procedure.** If you encounter any of these problems, please evaluate, assess, and treat as you feel appropriate, maintaining American Hip Institute's precautions and guidelines at all times. For symptoms that persist without improvement 2 weeks following symptom onset please contact AHI office to schedule a postoperative visit.

Gradual progression is essential to avoid flare-ups. If a flare-up occurs, back off with therapeutic exercises until it subsides. Please reference the protocol for timelines and use the following precautions during your treatments. Thank you for progressing all patients appropriately. Successful treatment requires a team approach, and the PT/PTA/ATC is a critical part of the team! Please contact AHI at any time with your input on how to improve the therapy protocol.

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Please send therapy progress notes and renewal therapy prescription requests with the patient or by fax to (630) 323-5625. Notes by fax must be sent 3 days prior to the patient's visit to internally process this request. We appreciate your cooperation in this matter.

Please remember that discharge and return to play/activity should be ability and not time based

General Guidelines (Please read protocol thoroughly)

- Weight bearing precautions:
  - 0-4 weeks: 20lbs foot flat partial weight bearing with bilateral crutches/walker
  - 5-6 weeks: initiate progression of weight bearing gradually at week 5 with the goal to be WBAT with 2 crutches at 6 weeks
    - If there is increased pain or flare up, keep 20lb weight bearing restriction until 6 week postoperative visit with MD
  - 6-10 weeks: Gradually progress to full unaided WBAT
- Pain:
  - While hip pain is common during the acute healing phase, any exercise/technique causing sharp pain must be avoided.
- Hip Bracing
  - 2 weeks with labral repair (most common)
  - 6 week brace with labral reconstruction
- Physical Therapy POC "Pearls"
  - Avoid **Active** hip flexion for the first 4 weeks.
  - Manual therapy treatments throughout the POC is a priority due to excessive compensatory activation patterns prior to surgery as well as the change in muscle length-tension ratio due to surgical techniques
    - Manual techniques can be chosen per PT's discretion.
  - Be cautious about progressing activities too quickly to avoid tissue irritations
    - The protocol indicates when certain activities are allowed
    - but the patient's symptom responses should dictate when they are ready to do so.
  - If and when symptoms increase, it is important for the therapist to recognize this and slow down the progression until symptoms have resolved
    - This may include a return to crutches for select patients
    - ***For symptoms that fail to improve over several weeks please contact the provider team***
  - Hypermobile patients are common in this population
    - Will often progress slower than non-hypermobile patients
    - Focus on strengthening when protocol allows
    - ***Avoid joint mobilization for these patients***

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- Home exercise program
  - Critical and should be monitored throughout recovery
- Modalities
  - CPM/Romtech 0-45 degrees, progressing to 0-90 degrees if tolerated
  - Cryotherapy
    - Icing 30 minutes on 30 minutes off continuously for 2 weeks
    - Gameready if available
  - Hot packs
    - Avoid surgical sites until at least 6 weeks post surgery; incisions must be fully healed
  - Blood flow restriction training
    - Must be >= 6 weeks post operative and incisions must be fully healed before starting treatment
- Discharge/release to full activity and sport will ultimately be up to the surgeon with valuable input from the rehabilitation team and patient reported outcomes
  - Goals for Return to Sport/Activity:
    - 1. Pain-free full AROM
    - 2. Healed osteotomy sites
    - 3. Strength ~ 85% of contralateral side
    - 4. Met all PT milestones to date
    - 5. Pass both frontal, lateral and pivoting assessments with good control
    -

Early Rehabilitation (Phase I) (Post-op day 0-End of Week 4):

Goals:

- Control swelling and pain
- Protect surgical fixation and repair
- Gradually restore voluntary muscle contraction
- Initiate ambulation with crutches/walker with restrictions
- Continue restoration of ***passive*** range of motion
- Patient understanding of restrictions and rehabilitation expectations

Precautions

- 20 lb. flat-foot weight-bearing
  - Avoid twisting/rotation in loaded position
- brace x 2 weeks post-op for labral repair
  - unless noted otherwise (6 weeks for labral reconstruction/microfracture)

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  - Brace worn at all times, including sleeping, except when in PT or while using the CPM/bike
- Do not push through pain or pinching, gentle stretching will gain more ROM
- Gentle PROM only, no passive stretching
- No Active range of motion
- No hip extension beyond neutral
- **Avoid capsular mobilizations**
- **Avoid any isolated contraction of iliopsoas**

Post op Day 0- End of Week 2

Range of Motion (ROM)

At Home ROM treatments

- CPM is to be used 4 hours a day, 7 days a week, for 8 weeks following surgery
  - 0-45 degrees of flexion progressing to 90 degrees as tolerated
- Alternatively, an upright or recumbent stationary bike may be used for 2 hours a day, 7 days a week, for 8 weeks following surgery, zero resistance only
  - Bike seat should be placed so that the hip does not exceed 90^{0} flexion.
    - Tips: upright bike – place seat high and sit upright; recumbent bike – recline seat (if able) and keep more slouched posture.
- Do NOT use CPM/bike for 2-4 hours consecutively, instead break it up throughout the day.

Physical Therapy ROM Guidelines

- No active range of motion
- Hip Flexion (PROM) 0-90°
  - Do not push through resistance or increased pain
- Passive hip circles at 45°-60° of hip flexion by PT or caregiver (not by patient)
- Hip abduction: gentle passive abduction 25-30° as tolerated
- Gentle log roll to tolerance with bolster under knee, limit 20˚ ER

Initial Exercises/Interventions

Passive

- STM (scar; ant, lat, med and post aspects of hip; lumbar paraspinals; quad/hamstring)

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Active

- Quadricep isometrics
- Gluteal isometrics
- Adductor Isometrics
- Ankle Pumps

Week 3- 4

• Instruct patient on scar management and mobilization after sutures removed

Range of Motion

- Continue with **NO AROM** of the hip joint
- Continue PROM as indicated above. Continue to progress ROM within pain-free zone
- Begin prone exercises initiating progression of hip extension "AKA belly time"
- Avoid hip extension past neutral

Active Interventions

- Continue exercises listed above
- Initiate prone lying with prone external rotation-internal rotation 20 degrees (or to patient tolerance) with knee flexed 45-60 degrees
- Prone active knee flexion to 90˚ (affected extremity)
- Supine bent knee fall out with assistance back to neutral starting point
- Hamstring mobilization

Transitional Rehab (Phase II): Physical Therapy Weeks 5-6

Weight bearing:

• Progress gradually to WBAT w/crutches starting at week 5, if no pain. If there is an increase in pain continue to remain 20lb FFWB through 6 weeks until follow up with Dr. Kuhns

• Transition for step-to gait to step-through gait as weight bearing normalizes with bilateral crutches

Range of motion:

- Continue range of motion as listed weeks 3-4
- Gradually progress hip extension as tolerated

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- Gentle hip joint mobilization (Grade I-II)
- No active range of motion until week 6
- Initiate AAROM to AROM progression
    - Start with gravity eliminated and progress to against gravity per patient tolerance

Exercises:

- Continue exercises as listed weeks 3-4
- Active **Assisted** heel slides (using strap assist), limit TFL/Sartorious activation
- Add supine marching week 6 if progressing well with AAROM exercises
- Hamstring isometrics- pain free

Intermediate Rehabilitation Phase III (Weeks 7-9)

Goals:

- Continue pain management
- Progress weight bearing to full weight bearing, normalize gait
- Full restoration of passive range of motion in all planes
- Initiate weight bearing motor control/proprioception exercises
- Hip strength 3+/5
- Initiate and progress strengthening exercises
- Emphasize gluteus medius strengthening in weight bearing

Weight bearing:

- Normalization of ambulation with assistive device
    - 6-week postoperative visit with MD will allow for clearance for return to unassisted full weight bearing. **If weight bearing delayed continue assisted device use until MD clearance**
- No limp present to progress to no assist devices, otherwise use 1 crutch or cane

Precautions

- No forced (aggressive) stretching of any muscles
- No joint/capsular mobilizations – to avoid stress on repaired tissue
- Avoid inflammation of hip flexor, adductor, abductor, or piriformis

Range of motion:

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- Continue hip joint mobilization as indicated
    - (minimal if hypermobility present-Beighton >6)
- PROM at end range with overpressure
- Continue AAROM/AROM progression to as tolerated

Exercise:

- Continue progression of exercises weeks 1-6
- Initiate gentle resisted AROM as tolerated
- Initiate dynamic weight shifting exercises
- Initiate closed chain strengthening in accordance with weight bearing status
- Progress core stabilization exercises
    - **Core strength critical for appropriate rehabilitation**
    - Bilateral bridging
    - Quadruped lumbar / core stabilization progression
        - Pelvic tilts to arm lifts to hip extension to opposite arm/leg raise)
- Add standing hip flexion w/resistance bands, if tolerated
- Crab / monster walk
- Increase intensity of quadriceps and hamstring strengthening
- Balance progression: single leg balance to compliant/uneven surface
- Elliptical / stair stepper
- Step and squat progression
- Slide board: hip abduction / adduction, extension, IR/ER.
    - No forced abduction.
    - Stop short of any painful barriers
- Straight leg raise beginning week 8 if no pain

Modalities:

- *Important to address common tendon pain areas – psoas, rectus, TFL, abductors, adductors, hamstring
    - Heat to begin session
    - Stim, laser as needed
    - Manual modalities, graston, dry needling if needed

Physical Therapy: Advanced Rehabilitation: Weeks 10-12

Criteria for progression to phase 4

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- Full hip ROM and normal gait pattern
- Hip flexor strength 4-/5
- Hip abduction adduction, extension, IR/ER strength 4/5

Goals

- Focus on restoration of muscular strength and endurance
- Focus on restoration of patient's cardiovascular endurance

Precautions

- No contact activities
- No forced (aggressive) stretching
- No grade III-IV joint mobilizations – to avoid stress on repaired tissue
- No treadmill walking for fitness/cardiovascular training until Phase 5
- Can use alter G earlier starting at week 10 if available

Weight bearing:

- Week 10: ambulating normally without assistive device, no limp
- Progress walking endurance

Range of Motion:

- Achieve and maintain full passive and active range of motion

Exercises:

- Continue closed chain exercise progression
- Advance bridging program
- Advance core stabilization
- Clamshells
- Continue with progression of exercises from appendix
- Anterior/side plank progression
- Lunges, all directions
- Single leg squat
- Seated hip internal and external rotation with theraband resistance
- Total Gym/Leg press avoiding full depth
- Single leg balance and proprioception
- Side-stepping w/Tband
- Squats w/T-band

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Late Rehabilitation Phase IV: Weeks 12-16

Goals:

- No muscular or joint pain
- Return to full ADL function
- Restore full strength, endurance, and neuromuscular control
- Return to desired level of activity/sport

Range of Motion:

- Maintenance of full passive and active range of motion
- Initiate straight line interval jogging (may begin earlier if Alter-G available, and no pain, good strength and full ROM
- Joint mobilization grades I-IV
    - Usually not required for hypermobile patients

Exercises

- Progress to continuous jogging if radiographs clear and progressing well in PT
    - No twisting or cutting
- • Progress resistance with exercises listed above through full range and depth
- • Initiate:
    - Eccentric loading
    - Multi-directional lunges
    - Band walks, various tempo
    - Progress dynamic balance
    - Lateral Stepdown
    - Front Step down
    - Back squats
    - Slide board exercises
    - Deadlifts
    - Begin single-leg work

Sport Specific Training Phase V (Week 16+)

Criteria for progression to Sport Specific Training:

- Hip flexor, Hip add, abd, ext, IR/ ER strength of 4+/5
- Cardiovascular endurance equal to pre-injury level
- Demonstrates proper squat form and pelvic stability with initial agility drills.

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- Stable single-leg squat.
- Return to sport activities as tolerated without pain, consistent with MD orders.

Goals

- Focus on restoration of muscular strength and endurance
- Focus on restoration of patient's cardiovascular endurance

Precautions

- No contact activities until 6 months minimum and cleared by MD
- No forced (aggressive) stretching
- No joint mobilizations – to avoid stress on repaired tissue

Exercises

- Progress to cutting/pivoting once able to control eccentric deceleration with straight line running
- Continue aggressive strengthening
    - Side planks
    - Resisted aBduction
    - Squats w/Tband
    - Initiate plyometrics forward and lateral
    - Initiate Sport specific drills
    - Enhance cardiorespiratory fitness
- Gradual return to sport
    - Z cuts, W cuts, carioca
    - Agility drills

Physical Therapy 6 months +

- Functional Testing to Consider:
    - Side plank for 60 seconds
    - Single Leg Balance for 30 seconds (eyes open/eyes closed)
    - Unilateral leg press test at half body weight for 30 seconds
    - Broad jump for distance
    - Unilateral step-down test
    - Single leg hop for distance
    - Triple hop for distance
    - 6 meter hop for time

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  - Crossover hop for distance
  - Star Excursion Balance Testing
- Functional testing analysis to be performed at AHI at 6-7 month postoperative time point