PAO Rehabilitation for Hippreservation.org

Periacetabular Osteotomy (PAO) Rehab

A Periacetabular Osteotomy (PAO) is a complex surgical procedure designed to correct the abnormal anatomy of the pelvis and hip in patients with hip dysplasia. Hip dysplasia refers to a shallow socket (acetabulum), which can lead to labral tears, joint instability, and increased wear and tear on the hip joint, often resulting in pain and long-term damage.

The PAO procedure aims to reposition the acetabulum to provide better coverage for the femoral head, stabilizing the hip joint and alleviating symptoms caused by hip dysplasia. Recovery from a PAO is a step-by-step process that progresses through various phases of healing. This rehabilitation protocol provides guidelines to follow, but it's important to remember that recovery is highly individualized.

General Guidelines

- **Progression through the rehabilitation protocol will vary from patient to patient. It is crucial to follow your body's cues, as recovery is not linear. Some patients may progress faster or slower than the guidelines based on surgical outcomes, pain tolerance, and individual healing rates.**
- **Swelling, stiffness, and discomfort are common, but sharp pain is an indicator to stop or modify activities. Always listen to your body and consult your physical therapist if you experience increased pain or are unsure how to proceed with exercises.**
- **As you progress, it is important to continually focus on muscle activation, especially in the posterior and lateral hip muscles, to prevent compensatory movement patterns that could delay recovery.**

Basic Post-Operative Information

Following the PAO procedure, most patients will be hospitalized for 3-4 days to manage pain and ensure safety with crutch ambulation, hygiene, and bed mobility before discharge.

Weight-Bearing Precautions:

- **If a microfracture was performed during any arthroscopy prior to the PAO, weight-bearing will be limited for up to six weeks to allow cartilage healing.**
- **In cases without significant cartilage damage, patients may begin full or partial weight-bearing soon after surgery, progressing as tolerated.**

Movement Precautions for the First 6 Weeks:

1. **No hip flexion beyond 90 degrees: Avoid bending forward to put on shoes, socks, or other similar activities.**
2. **No external hip rotation: Avoid movements where your knee rotates outward.**
3. **No hip extension beyond neutral: Avoid hip flexor stretches, long strides while walking, or pushing your leg behind you.**
4. **No sleeping on your stomach: This should be avoided for the first 4 weeks.**

Patients should schedule their initial post-operative visit with their surgeon within 10-21 days of surgery, at which point they will receive updates on weight-bearing status and movement precautions.

Stage 1: Initial Mobility and Muscle Activation (Weeks 4-6)

Goals for Stage 1:

- **Gradually introduce weight-bearing activities while using crutches (as allowed by your surgeon).**
- **Begin isometric exercises and basic range-of-motion (ROM) exercises.**
- **Increase tolerance for daily activities, household walking, and crutch use.**

- **Reduce swelling and pain, and improve sensation in the hip area.**

Exercises for Stage 1:

Mobility/Range of Motion (ROM):

1. **Reverse Butterflies: Lie on your back with knees bent. Rotate knees inward together, then slowly return to neutral.**
2. **Pelvic Tilts: Lie on your back with knees bent and feet flat. Gently flatten your lower back against the surface, then arch it slightly without causing discomfort.**
3. **Ankle Pumps and Circles: Perform while lying down or sitting to improve circulation and reduce swelling.**
4. **Passive ROM (with assistance): A caregiver or family member can assist with gently moving your hip into flexion (less than 90 degrees), abduction (outward movement), and circumduction within pain-free limits.**

Muscle Activation/Isometrics:

1. **Quad Sets: While lying down with the surgical leg straight, tighten the front thigh muscle and press the back of your knee down.**
2. **Short Arc Extensions: Lying on your back, place a small towel under your knee, and extend your leg while tightening your quadriceps.**
3. **Hamstring/Glute Isometrics: Gently squeeze your glutes and hamstrings without moving your legs.**
4. **Hook-Lying Hip Abduction (Isometrics): In a hook-lying position (knees bent, feet flat), engage your outer hip muscles to push your knees outward into resistance (a band or support).**

Core Activation:

1. **Transverse Abdominis Isometrics: Lie on your back with knees bent. Engage your deep core muscles by gently drawing your navel toward your spine while maintaining a natural curve in your lower back.**

2. **Samurai Exercise: While lying on your back with a small ball between your arms and knees, press your arms into the ball, engaging your core muscles. Progress to moving one arm at a time overhead while maintaining core stability.**

Stage 2: Range of Motion and Muscle Activation (Weeks 6-8+)

Key Focus: Activating the posterior and lateral hip muscles while protecting the hip joint from overuse of the front muscles (hip flexors). Gradually increase your ROM and weight-bearing capacity.

Goals for Stage 2:

- **Strengthen hip muscles, particularly the glutes.**
- **Increase ROM and functional movement while minimizing pain in the groin and hip flexor area.**
- **Progress weight-bearing without developing a limp.**
- **Begin stationary cycling without resistance (up to 5 minutes, 2x/day, increasing by 1-2 minutes daily as tolerated).**

Exercises for Stage 2:

Range of Motion (ROM):

1. **Supine Hip Flexion with Feet on Ball: Lying on your back, place feet on a ball and gently pull knees toward your chest, staying within post-op precautions.**
2. **Prone Terminal Knee Extension: Lie on your belly and lift the knee of the surgical leg off the surface, keeping your core engaged.**
3. **Prone Active Hip Internal Rotation: With the surgical leg bent to 90 degrees, rotate the lower leg inward.**

Muscle Activation:

1. **Standing Hip Abduction: Stand and kick outward with the surgical leg while maintaining a neutral trunk.**
2. **Bridges: Begin with both feet flat on the ground. Squeeze your glutes to lift your hips while maintaining alignment.**
3. **Modified Clamshells: In a side-lying position, engage the outer glute and lift your top knee slightly while keeping feet together.**

Core Stability: Continue exercises from Stage 1, progressing the Samurai exercise to include arm movements.

Stage 3: Muscle Activation and Weight Bearing Transition (Weeks 8-10+)

Key Focus: Continue to build muscle strength, especially in the posterior and lateral hip regions, while slowly increasing weight-bearing capacity and ROM.

Goals for Stage 3:

- **Achieve full weight-bearing without limping.**
- **Continue strengthening glutes and core stability to support daily activities.**
- **Progress with ROM and functional mobility while managing any residual pain.**

Exercises for Stage 3:

Range of Motion (ROM):

1. **Prone Hip Internal/External Rotation: With knees bent, rotate lower legs inward and outward while keeping the pelvis stable.**
2. **Butterflies: Gently rotate knees outward in a butterfly position, focusing on hip external rotation.**

Muscle Activation:

1. **Prone Isometric Hip ER ("Prone Frogs"): Lying on your stomach, knees bent outward, press feet together while engaging glutes.**
2. **All 4s Rocking Back: Engage your glutes as you sit back toward your heels in an all-fours position, maintaining stability.**

Weight-Bearing Progression:

1. **Tall Kneel to ½ Kneel Transition: Progress from tall kneeling (both knees on the ground) to half-kneeling, emphasizing glute engagement and pelvic stability.**
2. **Single-Leg Stance: Begin balancing on the surgical leg, engaging glute muscles to maintain stability.**

Stage 4: Strengthening and Conditioning (Weeks 10-14+)

Goals for Stage 4:

- **Begin functional weight-bearing exercises and continue building strength in the posterior hip muscles.**
- **Work toward symmetry between the surgical and non-surgical legs.**
- **Gradually introduce conditioning activities like cycling, elliptical, or swimming as tolerated.**

Exercises for Stage 4:

1. **Lateral Weight Shifts and Squats: Progress to deeper squats and lateral weight shifts, ensuring proper muscle engagement.**
2. **Single-Leg Balance: Progress balance exercises by challenging the stance leg with upper or lower body movements.**

Stage 5: Advanced Strength and Proprioception (Weeks 12-24+)

Goals for Stage 5:

- **Continue single-leg strengthening and proprioceptive exercises.**
- **Achieve symmetry in squatting, lunging, and functional movements.**
- **Begin preparing for higher-level activities like light jogging or hiking (with physician and therapist approval).**

Maintenance Phase (6-10+ months)

At this stage, patients are working toward returning to more demanding activities like running or sports, depending on their goals. Maintenance of hip strength and flexibility is crucial for long-term success. Continue exercises focusing on the lateral/posterior hip muscles, core stability, and full hip ROM. Progress gradually to more dynamic movements, and always prioritize form and control to avoid compensatory patterns that could lead to re-injury.

Key Points for PAO Recovery:

- **Recovery timelines can vary greatly depending on surgical outcomes, individual response, and adherence to the rehabilitation program.**
- **Focus on posterior and lateral hip muscle activation to avoid compensatory movement patterns.**
- **Progress at your own pace**