

Open Proximal Hamstring Repair Rehabilitation Protocol

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Diagnosis: Proximal Hamstring Rupture

Brace: Locked in 45-50° of knee flexion for 6 weeks.

Phase I: Weeks 0-6 (Home)

- **Weight Bearing:** Toe touch weight bearing with crutches/walker x 6-8 weeks
- **Brace:** hinged knee brace locked at 40-50 degrees of flexion at all times until week 6
 - Week 0-2: locked at 50 degrees
 - Week 2-4: locked at 45 degrees
 - Week 4-6: locked at 40 degrees
- Formal PT deferred until **6 weeks post-op**
- DVT prevention – ankle pumps, leg elevation, Aspirin 2x daily (every 12 hours)
- Precautions
 - **AVOID** hip flexion coupled with knee extension (hamstring stretch)
 - **AVOID** unsafe surfaces and environments
- Suggested Therapeutic Exercises
 - Quad sets
 - Ankle pumps
 - Abdominal isometrics
 - Passive knee ROM without hip flexion during knee extension
 - Scar mobilizations
 - **Cardiovascular Exercise:** Upper body circuit training or upper body ergometer (UBE)
 - **Post-operative weeks 3-4:** Begin pool walking drills (if incision healed, without hip flexion coupled with knee extension), hip abduction, hip extension, and balance exercises
 - **Progression Criteria:** 6 weeks post-operative

Phase II: Weeks 6-12 (Start Formal Physical Therapy)

- **Rehabilitation Goals**
 - **Post-operative weeks 4-8:** Unlock hinged knee brace to 30 degrees flexion for several days, then 0 degrees flexion/extension. Progress to partial weightbearing (PWB) 25% then 50% then weight bearing as tolerated with weaning from crutches
 - Normalize gait
 - Good control and no pain with functional movements, including step up/down, squat, partial lunge (do not exceed 60° of knee flexion)
- **Precautions**
 - **AVOID** dynamic stretching
 - **AVOID** loading the hip at deep flexion angles
 - **NO** impact or running

- **Suggested Therapeutic Exercises**

- Non-impact balance and proprioceptive drills – beginning with double leg with gradual progression to single leg
- Stationary bike
- Gait training
- **Begin hamstring strengthening** – start by avoidance of lengthened hamstring position (hip flexion combined with knee extension) via working hip extension and knee flexion moments separately
 - Begin with isometric and concentric strengthening with hamstring sets, heel slides, double leg bridge, standing leg extensions, and physioball curls
- Hip and core strengthening
- **Cardiovascular Exercise:** Upper body circuit training or UBE
- **Progression Criteria**
 - Normal gait on all surfaces
 - Ability to carry out functional movements without unloading the affected leg or pain while demonstrating good control
 - Single leg balance >15 seconds
 - Normal (5/5) hamstring strength in prone with the knee in a position of at least 90° knee flexion

Phase III: Weeks 12-16

- **Rehabilitation Goals**

- Good control and no pain with sport and work specific movements, including impact

- **Precautions**

- No pain during strength training
- Post-activity soreness should resolve within 24 hours

- **Suggested Therapeutic Exercise**

- **Continue/advance hamstring strengthening** – progress toward strengthening in lengthened hamstring positions
 - Begin to incorporate eccentric strengthening with single leg forward leans, single leg bridge lowering, prone foot catches, and assisted Nordic curls
- Hip and core strengthening
- **Impact control** exercises: 2 feet to 2 feet → 1 foot to the other → 1 foot to same foot
- **Movement control** exercises: low velocity / single plane activities → higher velocity, multi-plane activities
- Initiate running drills (**NO sprinting until Phase IV**)
- **Cardiovascular Exercise:** Biking, elliptical machine, Stairmaster, swimming, and deep water running
- **Progression Criteria**
 - Dynamic neuromuscular control with multi-plane activities at low/medium velocity without pain or swelling
 - **< 25%** deficit for side to side hamstring comparison on Biodex testing at 60° and 240° per second

Phase V: Weeks 16-24

- **Rehabilitation Goals**
 - Good control and no pain with sport and work specific movements, including impact
- **Precautions**
 - No pain during the strength training
 - Post-activity soreness should resolve within 24 hours
- **Suggested Therapeutic Exercise**
 - **Continue/advance hamstring strengthening** – progress toward higher velocity strengthening and reaction in lengthened positions, including:
 - Eccentric strengthening with single leg forward leans with medicine ball, single leg dead lifts with dumbbells, single leg bridge curls on physioball, resisted running foot catches, and Nordic curls
 - Running / sprinting mechanics and drills
 - Hip and core strengthening
 - **Impact control exercises:** 2 feet to 2 feet → 1 foot to the other → 1 foot to same foot
 - **Movement control exercises:** low velocity / single plane activities → higher velocity, multi-plane activities
 - Sport/work specific balance and proprioceptive drills
 - Stretching for patient specific muscle imbalances
 - **Cardiovascular Exercise:** Replicate sport or work specific energy demands
 - **Return to Sport/Work Criteria**
 - Dynamic neuromuscular control with multi-plane activities at high velocity without pain or swelling
 - **< 10%** deficit for side to side hamstring comparison on Biodex testing at 60° and 240° per second
 - **< 10%** deficit on functional testing profile

| Exercise | Week | | | | | | | | | | | | | | |
|---|------|---|---|---|---|---|---|---|---|----|----|----|----|----|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | 16 | 20 | 24 | |
| Initial Exercises: | | | | | | | | | | | | | | | |
| Scar mobilization | █ | | | | | | | | | | | | | | |
| Quad Series | █ | | | | | | | | | | | | | | |
| Abdominal isometrics | █ | | | | | | | | | | | | | | |
| Passive knee ROM (no hip flex w/ knee ext.) | █ | | | | | | | | | | | | | | |
| Ankle Pumps | █ | | | | | | | | | | | | | | |
| Crutch weaning | NWB | | | | | █ | | | | | | | | | |
| PROM hip extension, abduction | | | | | █ | | | | | | | | | | |
| Non-impact Balance/Proprioceptive drills | | | | | | | █ | | | | | | | | |
| Hip and Core strengthening | | | | | | | █ | | | | | | | | |
| Weight-bearing Strength Exercises: | | | | | | | | | | | | | | | |
| Standing leg extensions | | | | | | | █ | | | | | | | | |
| Double Leg Bridges | | | | | | | █ | | | | | | | | |
| Physioball curls | | | | | | | █ | | | | | | | | |
| Single leg forward leans | | | | | | | | | | | █ | | | | |
| Single Leg Dead Lift | | | | | | | | | | | | █ | | | |
| Nordic curls | | | | | | | | | | | | | █ | | |
| Sports Test Exercises | | | | | | | | | | | | | | █ | |
| Cardiovascular Exercises: | | | | | | | | | | | | | | | |
| Bike with both legs-no resistance | | | | | | | █ | | | | | | | | |
| Bike with both legs-resistance | | | | | | | | █ | | | | | | | |
| Upper body circuit training | █ | | | | | | | | | | | | | | |
| Aqua walking (pending incision healing) | | | | | | | █ | | | | | | | | |
| Treadmill-walking 7% incline | | | | | | | | █ | | | | | | | |
| Swimming and deep water running | | | | | | | | | | | █ | | | | |
| Elliptical Trainer | | | | | | | | | | | | █ | | | |
| Rowing | | | | | | | | | | | | | █ | | |
| Stair stepper | | | | | | | | | | | | | | █ | |
| Agility Exercises: | | | | | | | | | | | | | | | |
| Running Progression | | | | | | | | | | | | | █ | | |
| Initial-Single Plane | | | | | | | | | | | | | | █ | |
| Advance-Multi Directional | | | | | | | | | | | | | | | █ |
| Functional Sports Test | | | | | | | | | | | | | | | █ |
| High Level Activities: | | | | | | | | | | | | | | | |
| Golf Progression | | | | | | | | | | | | | | | █ |
| Outdoor biking, hiking, running | | | | | | | | | | | | | | | █ |
| Return to Full Sport at 6 months post-op | | | | | | | | | | | | | | | █ |

Adapted from post-operative protocol from Dr. Jorge Chahla created by Howard Head Physical Therapy, Jill Monson, PT, OCS and Jon Schoenecker, PT, OCS, CSCS