PROXIMAL HAMSTRING AVULSION REPAIR
CLINICAL PRACTICE GUIDELINE

Progression is time and criterion-based, dependent on soft tissue healing, patient demographics and clinician evaluation. Contact Ohio State Sports Medicine at 614-293-2385 if questions arise.

Rehabilitation Precautions

- Non-weight bearing without bracing for 2 weeks. Toe-touch weight bearing Weeks 2-4
- No terminal/end-range hamstring stretching for 6 weeks
- Avoid long-sitting position for 6 weeks
- No isolated isotonic hamstring strengthening for 8 weeks

**Phase I: Weeks 0-2**
- Home exercises only
- Maintain non-weight bearing status
- Compression, cryotherapy, ankle pumps

**Goals to Progress to Next Phase**
1. Control pain and inflammation
2. Wound healing

**Phase II: Weeks 2-4**
- Begin physical therapy
- Toe-touch weight bearing using crutches or walker
- Initiate gentle hip, knee and ankle PROM within patient tolerance → avoid lengthened hamstring positions
- Initiate quad sets, straight leg raises in abduction only
- Initiate gentle soft-tissue mobilization at proximal insertion/incision site, if wound is fully closed

**Goals to Progress to Next Phase**
1. Full hip, knee, and ankle PROM in protected positions, avoiding lengthened hamstrings
2. Good quad control in non-weight bearing position
3. Continue pain and inflammation control
### Phase III: Weeks 4-6
- Begin weight bearing progression, per patient tolerance
- Aquatic activities (if available): forward and retro ambulation, gentle AROM (avoid terminal stretching), gentle partial weight bearing squats (small range)
- Initiate gentle PROM straight leg hamstring stretching per patient tolerance
- Continue soft tissue mobilization
- Initiate single leg stance and static proprioceptive activities
- Initiate sub-maximal hamstring isometrics. Avoid lengthened hamstring positions initially.
- Begin at 30°, 45°, 60°, 90° knee flexion, patient supine.
- Initiate closed-chain terminal knee extensions (resisted quad sets)
- Straight leg raises in flexion (0° to 30° maximum ROM), abduction, adduction, per patient tolerance
- Initiate core strengthening program: pelvic tilts, transverse abdominus activation

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<th>Goals to Progress to Next Phase</th>
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<tr>
<td>1. Normalization of gait at 6 weeks</td>
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<td>2. Achieve 45° SLR PROM</td>
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<td>3. SLR without quad lag</td>
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### Phase IV: Weeks 6-8
- Initiate terminal/end-range hamstring stretching, per patient tolerance
- Progress full lower extremity stretching program per patient tolerance
- Initiate gentle isotonic resistive hamstring exercises
  - *Bilateral only*, progress eccentric to concentric
  - *Begin with mid-range strengthening initially. Avoid lengthened hamstring position initially.*
- Progress core strengthening/dynamic lumbar stabilization program
- Progress proprioceptive activities: Include single leg stance on various surfaces, single leg stance with perturbations (“steamboats”)

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<tr>
<td>1. Full range of motion at each lower extremity joint</td>
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<td>2. SLR 0°-70° PROM</td>
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<td>3. Improved closed chain proprioception/stability without symptom increase</td>
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### Phase V: Weeks 8-12
- Full hamstring and quad strengthening program, per patient tolerance
- Progress bilateral to unilateral, eccentric to concentric for hamstring strengthening
- Advanced core strength and stabilization program
- Include single knee balance activities on BOSU
- Bridging, Swiss ball bridging
- Advanced dynamic proprioceptive activities
- Initiate partial weight bearing plyometrics on shuttle or Total Gym
- Resisted ambulation, all directions, with cable-column or resistance bands — *use caution with resisted forward ambulation* due to increased hamstring activation

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<tr>
<td>1. SLR range of motion within normal limits</td>
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<td>2. 5/5 straight plane strength in MMT positions</td>
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<td>3. Tolerate PWB plyometrics on shuttle without symptom increase</td>
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Week 12

- Progress to FWB hop-downs, light, per patient tolerance
- Begin with 1 to 2 inch height box/step. Progress slowly to higher step. Progress from bilateral to unilateral.
- Lunges: Forward and retro
- Slide Board

Goal

1. Perform hop-downs with appropriate mechanics, no evidence of dynamic instability, and without symptom increase in order to progress difficulty and/or intensity.

Phase VI: Weeks 12-16

- Continue progression of full-weight bearing plyometric activities
  - Double leg side/side and diagonals
  - Single leg multi-directional
- Continue core stabilization program
  - Swiss ball lower extremity curl-ups
- Initiate walk-jog progression
- Criteria to begin jogging:
  1. Perform hop-downs with appropriate mechanics, no evidence of dynamic instability, and without symptom exacerbation.
  2. Perform 10 single-leg hops on involved side, with good mechanics, without symptom increase, and symmetrical with uninvolved side.

Goals to Progress to Next Phase

1. Jog on treadmill and even surfaces with symmetrical mechanics and no symptoms.

Phase VII: Weeks 16-20

- Continue multi-directional/advanced plyometric program
- Hops to/from BOSU, multi-directional
- Initiate sport-specific drills, per patient tolerance
  - Patient must tolerate all above activities without symptom increase prior to initiating sport-specific activities.
    - Include in sport-specific progression: running, cutting/diagonals, carriocas: progress
    - 50% to 75% to full-speed
    - Resisted forward running

Weeks 16-28 Criteria to Return to Sports

- Functional testing: Must demonstrate >85% performance of involved side when compared with uninvolved.
  - Include single-leg hop for distance test, 3-single-leg hop for distance
- Isokinetic testing:
  - Must demonstrate >85% strength of involved side versus uninvolved side at 60°/sec, 180°/sec, and 300°/sec testing.
  - Demonstrate hamstring to quadriceps strength ratio of 55-65% bilaterally
- No symptom increase with sport-specific progression or testing as described above.
References


O Mohamed *et al*: Relationship between wire EMG activity, muscle length, and torque of the hamstrings. *Clinical Biomechanics* (2002); 17: 569-579
