

# The Sports Medicine Specialists

RSH Physical Therapy  
1601 Main Street # 602  
Richmond, TX 77469  
281.341.2874

Houston Orthopædics & Sports Medicine  
1601 Main Street # 601  
Richmond, TX 77469  
281.565.8800

OakBend Medical Center  
1705 Jackson Street  
Richmond, TX 77469  
281.341.3000



**David Edell, LAT, ATC, CSCS**

Cellular: 713.858.3802 • Fax: 281.341.3012 • E-Mail: dedell@athleticadvisor.com

## Quadriceps Strain & Contusion Rehabilitation

### Phase I

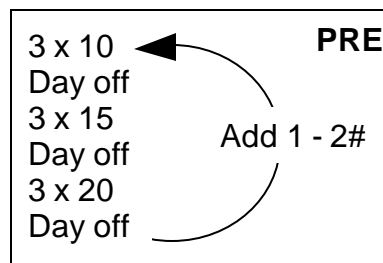
- Ice Massage with hip extended and knee flexed as much as tolerable. Before and after exercises and as often as possible between exercise sessions.
- Mild full-leg compression wrap for initial 48 hours.
- Non-steroidal anti-inflammatory (NSAID) medications as prescribed by physician.
- Mild muscle relaxant medication as prescribed by physician.
- Static Quadriceps Stretching:** Stretch as tolerated 2 - 3 times daily. Hold each stretch for 10 - 30 seconds, repeat 5 - 10 times per session. Perform with hip flexed and hip extended as shown in the graphic.
- Proprioceptive Neuromuscular Facilitation:** Perform 2 - 3 times daily as directed by Athletic Trainer. Perform with hip flexion, neutral hip extension, and with hip hyperextension.
- Stationary Bicycle:** Ride with seat as high as tolerable and light to moderate resistance to maintain quadriceps muscle function.
- Straight Leg Raises (SLR):** Perform with light weight and high repetitions in all 4 planes: Supine, Abduction, Adduction, and Prone.



- Progress to Phase II: When 10 supine SLR's can be completed with little or no discomfort.

### Phase II (2 - 7 days post-injury)

- Continue with Phase I activities unless otherwise instructed.
- Begin ultrasound and or electrical stimulation, as directed by physician, when swelling has been controlled and the chance of further internal bleeding has passed.
- Continue quadriceps strengthening (SLR) exercises utilizing Progressive Resistance Principles (PRE) and add:



D. **Hip Flexion:** Sit on the edge of a firm surface with feet resting on floor. Lift involved knee toward chest. Hold and slowly lower to beginning position. Progress under PRE guidelines.



E. **Seated Knee Extension:** In sitting position, slowly extend lower leg until knee is straight. Hold, contracting thigh muscles as tightly as possible, and slowly lower to starting position.



F. **Partial Squats:** Stand with feet shoulder width apart and toes slightly turned out. Bend knees and slowly squat down, keeping knees from going in front of toes. Squat as low as tolerable, pause at lowest depth and raise to beginning position. Do not allow thighs to go lower than parallel to the floor.



G. **Side Step-Ups:** Stand sideways with involved leg next to 3 - 6" step. Place involved foot on step and slowly lift body weight with involved leg. Slowly lower body back to start position, gently touching heel on ground, then repeat by slowly lifting body with involved leg. Repeat as by increasing repetitions for 3 x 10 to 3 x 15 to 3 x 20, increase step height 2 - 3" begin with 3 x 10 reps, increasing to 3 x 20.



H. Begin interval training on stationary bicycle.

I. Begin light jogging on smooth, straight surface. No sudden starts and stops.

J. Progress to Phase III when Phase II exercises can be performed with little or no discomfort.

### Phase III

A. Continue Phase I and II activities as directed.

B. Begin functional activities as tolerated:

1. High Knee Jogging,
2. Running: start sprint running with coast-through stops,
3. Cariocas,
4. Bounding drills, and
5. Vertical leaps progressing to horizontal jumps.

C. Return to full activities as tolerated when Phase III can be completed with little or no discomfort and:

1. Bilateral quadriceps strength is equal and
2. Quad to Hamstring strength ration is 60 - 80%.