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Femoral/Tibial Stress Fracture Protocol:

Progression from one step to the next is based solely on pain symptoms. You should never feel pain unless it is that of muscle soreness/stiffness. ***Do not take any pain relievers while attempting to complete this program***, as they may prevent you from safely moving from stage to stage by masking your pain. After 4 weeks of no pain/ and non-weight bearing activity (except walking), you may begin this program. You may move through the weeks, one day at a time as long as there are no pain symptoms. If any pain is felt during this program, stop immediately and contact your therapist or physician. **DO NOT progress further than one workout per day.**

During your warm-up (5 minutes on a stationary bike) and cool-down, perform the stretching program included with this packet. All stretches, weights, therapeutic exercises and single leg exercises should be performed bilaterally.

When beginning the leg extensions, leg curls, the 4-way hip machine and squats, choose smaller weight amounts. Lifting too much weight too quickly may hinder your recovery. The weights should not be too heavy for you to perform the lift safely and properly. If you have no access to a 4-way hip machine, you can substitute ankle weights to perform hip abduction, adduction, flexion, and extension movements, or use the resistive band exercises.

Please consult your enclosed pictures and your physical therapist to ensure that you are performing the exercises correctly.

Resistive Band Exercises #1(RBE#1): *Resisted hip ER stand/kneel w/elastic 3x8, Resist hip adduction with single leg stance w/elastic 3x8, Resisted hip abduction/ knee flexion w/ elastic (side lunges) 3x8, Resisted hip ext stand w/elastic 3x8, Resisted hip flex stand w/elastic 3x8.*

Resistive Band Exercises #2 (RBE#2): *Resisted knee side to side step w/elastic 3x8, Resisted hip abd uni supine w/elastic 3x8, Resisted hip adduction with single leg stance w/elastic proximal 3x8, Resisted hip abduction bilateral supine legs straight w/elastic 3x8, Resisted hip IR w/elastic 3x8.*

Resitive Band Exercises #3 (RBE#3): *Resisted hip ER w/elastic 3x8, Resisted knee crossover w/elastic 3x8, Resisted hip abduction w/elastic (seated) 3x8, Resisted hip IR stand w/elastic 3x8.*

Biodex® Strengthening: *(con/con 90 speed x5, 180 speed x10 and 240 speed x15).*

Aquatic Therapy
The swimming portion of this program consists of either swimming with a buoy between the legs, running in a deep well pool, flutter kick swimming (as long as you are having no pain), or a

combination of all three of these exercises. If swimming, DO NOT kick off the walls with the injured leg during turns.

Treadmill running: *The unweighted treadmill at PT is required to begin running when using this program.*

STAGE I

Week 1 –TO BE COMPLETED AT THERAPY

Days

1. Treadmill run: 7.5 min @ 45% unweighted, Bodyweight squats 3x10.
2. Biodex® strengthening, Swimming program/elliptical machine @ 30 minutes, RBE#1.
3. Treadmill running: 7.5 min @ 40% un-weighted, Bodyweight squats 3x10.
4. Biodex® strengthening, Swimming program/elliptical machine @ 30 minutes, RBE#2
5. Treadmill running: 7.5 min @ 35% un-weighted, Bodyweight squats 3x10.
6. Swimming program/elliptical machine @ 30 minutes, RBE#3.
7. OFF

Week 1-TO BE COMPLETED AT HOME

Days

1. Walk 1 mile at a quick pace. Bike/Swim/Elliptical 20-30 minutes. Bodyweight squats 3x10, RBE#1
2. Walk 1 mile at a quick pace, RBE#2
3. Walk 300 yards, jog 100 yards, walk 300 yards, jog 100 yards, walk 300 yards, jog 100 yards, walk 300 yards, jog 100 yards, walk 100 yards. Bike/ Swim/ Elliptical 20-30 minutes. Bodyweight squats 3x10.
4. OFF
5. Walk 200 yards, jog 200 yards, walk 200 yards, jog 200 yards, walk 200 yards, jog 200 yards, walk 400 yards.
6. Walk 400 yards, jog 400 yards, walk 400 yards, jog 400 yards, walk 100 yards. Bike/ Swim/ Elliptical 20-30 minutes, RBE#3.
7. Walk 400 yards, jog 800 yards, walk 400 yards, Bodyweight squats 3x10.

Week 2- TO BE COMPLETED AT THERAPY

Days

1. Treadmill running: 15min @ 30% un-weighted, 4-way hip machine 3x5 @ ___lbs (Abduction, Adduction). Bodyweight squats 3x10.
2. Biodex® strengthening, Swimming program/elliptical machine @ 30 minutes, RBE#1.
3. Treadmill running: 15 min @ 25% unweighted. Bodyweight squats 3x15
4. Biodex® strengthening, Swimming program/elliptical machine @ 30 minutes, RBE#2
5. Treadmill running: 15 min @ 20% unweighted, 4-way hip machine 3x5@___lbs, Bodyweight squats 3x15.
6. Swimming program/elliptical machine @ 30 to 40 minutes, RBE #3.
7. OFF

Week 2-TO BE COMPLETED AT HOME

Days

1. Walk 200 yards, jog 1200 yards, walk 400 yards. Bike/Swim/Elliptical 25-35 minutes. Bodyweight squats 3x10. RBE#1
2. Walk 100 yards, jog 1 mile, walk 100 yards. Single leg extensions 3x8 ___lbs, 4-way hip machine 3x8 ___lbs (Abduction, Adduction), Single leg hamstring curls 3x8 ___lbs.
3. Jog 300 yards, run 100 yards, jog 300 yards, run 100 yards, jog 300 yards, run 100 yards, jog 300 yards, run 100 yards, jog 100 yards. Bike/Swim/Elliptical 25-35 minutes. Bodyweight squats 3x15, RBE #3.
4. OFF
5. Jog 200 yards, run 200 yards, jog 200 yards, run 200 yards, jog 200 yards, run 200 yards, jog 400 yards. Single leg extensions 3x8 ___lbs, 4-way hip machine 3x8 __lbs, Single leg hamstring curls 3x8 __lbs.
6. Jog 400 yards, run 400 yards, jog 400 yards, run 400 yards, jog 100 yards. Bike/Swim/Elliptical 25-35 minutes. Bodyweight squats 3x15.
7. Jog 400 yards, run 800 yards, jog 400 yards. RBE#2

STAGE II

Week 3-TO BE COMPLETED AT THERAPY

Days

1. Treadmill running: 15min @ 15% unweighted, 4-way hip machine 3x5 @ ___lbs (Abduction, Adduction, Flexion, Extension), Bodyweight squats 3x15.
2. Biodex® Strengthening, RBE#3.
3. Treadmill running: 15min @ 10% unweighted, Bodyweight squats 3x20.
4. Biodex® Strengthening, RBE#1.
5. Treadmill running: 15min @ 0% Unweighted, 4 way hip machine 3x5 @ ___lbs, Bodyweight squats 3x20.
6. OFF
7. Run on treadmill at 0% for 15 minutes, RBE#2.

Week 3-TO BE COMPLETES AT HOME

Days

1. Jog 600 yards, run1200 yards, walk 400 yards. Bike/Swim/Elliptical 30-40 minutes. Bodyweight squats 3x15. RBE#2.
2. Jog 400 yards, run 1 mile, jog 200 yards. Single leg extensions 3x8 __lbs, 4 way hip machine (adduction, abduction, flexion, extension) 3x8 __lbs, Single leg hamstring curls 3x8 __lbs.
3. Jog 400 yards, run 1 mile, jog 200 yards, walk 400 yards, Bodyweight squats 3x20. RBE#1.
4. Run 50 yards at 50% speed x2, then at 75% speed x2, and finally at 100 % speed x2, 1 minute rest between change in speeds. Run 100 yards x2 with 1 minute rest. Bike/Swim/Elliptical 30-40 minutes.
5. OFF
6. Run 100 yards x4 with a 45 second rest between 100 yard increments, jog 400 yards, walk 100 yards. Bodyweight squats 3x20. RBE#3.
7. Run 40 yards x10 with 2 minutes rest, jog 400 yards, walk 100 yards. Bike/Swim/Elliptical 30-40 minutes. Single leg extensions 3x8 __lbs, 4-way hip machine 3x8 __lbs, Single leg hamstring curls 3x8 __lbs.

Stage III

Week 4

The distances listed in the workouts during week four, have been designed for use on a football field or a grass field. A football field is 100 yards long and is marked in 10 yard increments from goal line to goal line.

****Running during this week and following weeks should be performed on grass, trails, asphalt, treadmill, or track. Avoid running on concrete of any kind (i.e., sidewalks). No stadium stair running. Try to avoid working on the track every day of the week.****

Days

1. Jog 300 yards, run 100 yards, jog 300 yards, run 100 yards, jog 300 yards, run 100 yards, jog 300 yards, run 100 yards, jog 300 yards. Jog for 10 minutes.
2. Jog 400 yards, run 400 yards, jog 400 yards, run 400 yards (x 2), Swimming/elliptical/bike @ 20 to 30min, Single leg extensions 3x10 ___lbs, 4-way hip machine 3x10 @ ___lbs, Single leg hamstring curls 3x10 @ ___lbs. Squats 3x10 (with dumbbells).
3. 10 minute jog. Jog 50 yards at 50 % speed x2, then at 75% speed x2, and finally at 100% speed x2, taking as much time as needed to rest between intervals.
4. Run 100 yards x 6 with 45 seconds rest between each 100 yards. Bike for 20 minutes (5 minute warm up, then do sprint intervals - 30 seconds fast, 30 seconds normal pace for a total of 10 minutes, then 5 minute cool down), Squats 3x10 (with dumbbells).
5. 10 minute jog. 40 yards x 18 (20 seconds rest after each 40 yards).
6. Run 50 yards x 20 (20 seconds rest after each 50 yards), Bike/elliptical 30 minutes. Single leg extensions 3x10 ___lbs, 4-way hip machine 3x10 ___lbs, Single leg hamstring curls 3x10 ___lbs.
7. OFF.

Stage IV

Week 5 workout or Agility workout

The agility workout should be substituted for the week 5 workout for those athletes participating in a sport that requires speed and agility work rather than distance work, including jumping and cutting. If you want a combination of agilities and distance work, you may substitute a couple of the agilities workouts for a couple of workouts during week 5. Single leg extensions, Squats with dumbbells, the 4-way hip machine work and single leg hamstring curls and speed work should be added to the agility workout.

Days

1. Trail/Grass running: Up to 2 miles.
2. Speed work: Run 75 yards x 15 (30 second rest after each 75 yards), Single leg extensions 3x10 ___lbs, 4-way hip machine 3x10 __ lbs, Single leg hamstring curls 3x10 ___lbs. Squats 3x10 (with dumbbells).
3. Trail/Grass running: Up to 2.5 miles.
4. Speed work: Jog 20 yards, sprint 20 yards, jog 20 yard sprint 20 yards x15 with 30 seconds rest, Single leg extensions 3x10 ____ lbs, 4-way hip machine 3x10 ___lbs, Single leg hamstring curls 3x10 ___lbs. Squats 3x10 (with dumbbells).
5. Trail/Grass running: Up to 3 miles.
6. Off
7. Trail/Grass running: Up to 3 miles.

__**Agility workout**__

Complete warm up of 1 mile and then initiate agility exercise. Complete one cycle of each exercise at 50% of speed and then progress to one cycle at 75% and finally one cycle at 100%. If disabling pain occurs stop and proceed as directed in the introduction. Certain people may find they can complete the agility activities within one session. Distance and sprint running are then completed

Figure of 8 running: run figure of 8 pattern with two10 foot diameter circles and then with two 5 feet diameter circles. Complete 3 repetitions.

Carioca: run sideways crossing legs in front of and then behind the lead leg for 20 yards, rest 5 seconds, and return in other direction. Repeat 4 times.

Backward running: run 20 yards, rest 5 second. Repeat 4 times

Box running: select an area and mark out a 5 yard squat box for the run. Initiate run by running the box 5 times clockwise and then 5 counterclockwise.

Vertical jumping: jump with 50% effort and mark spot on wall. Repeat jumping to mark 10 times. Change mark to 75% effort and jump 10 times. Change mark to 100% effort and jump 10 times

Days

1. Carioca 15 yards x3 ♦ side shuffle 10 yards x3 ♦ backpedal 10 yards x3 ♦ line jumps-double leg, forward/backward 20 seconds x4 ♦ side/side 20 seconds x4 ♦ 5-10 yard straight sprints w/ no quick stop x5 ♦ cone chute 15-20 yards x5.
2. Carioca 15 yards x3 ♦side shuffle 10 yards x3 ♦ backpedal ladder drill x6 ♦ S-cone drill 25 yards x6.
3. Carioca triangle drill x6 ♦ backpedal/sprint drill x4 ♦ S-cone drill, 25 yards x6.
4. OFF
5. Shuffle v 8 drill x 6 ♦ box jumps (2 feet in height) x3 ♦ line jumps, single leg forward/backward 20 seconds x3 ♦ side/side 20 seconds x 3
6. 45 degree square drill w/shuffle x6 (both sides) ♦ plant and cut drill 30 yards x 5 ♦ 5-10-15 yard ladders x4.
7. Plant and cut drill 30 yards x 7 ♦ zig-zag backpedal x4 ♦ four corner shuffle drill x 5.

Stage V

Practice sessions are not initiated until functional rehabilitation is successfully completed this is at the discretion of the physician and therapist to discuss return to sport specific activity. All practice sessions are initiated with warm up that includes: 1) light running and stretching, 2) gradual increase in speed of full speed running, 3) completion of agility activities with gradual increase in intensity, and 4) gradual increase in speed and intensity of movements specific to sport. After practice, complete a cooldown of running and stretching.