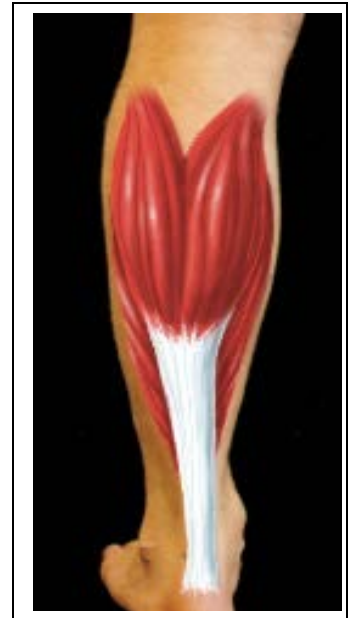


Calf Strain

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ANATOMY

The calf muscles consist of the **Gastrocnemius**, which is the big muscle at the back of the lower leg, and the **Soleus** muscle, which is a smaller muscle lower down in the leg and under the Gastrocnemius. Either of these two muscles can be strained (torn).



INJURY

A calf strain is caused by a tearing of part of the gastrocnemius or soleus muscle from the top of the Achilles tendon. A sudden sharp pain at the back of the leg when running, sprinting or lunging is how the injury presents and occurs. Usually there is tenderness on the calf muscle; especially on the inner side. You may think you've just been hit in the leg. Often, there is an audible "pop," and you may turn around to see what has just hit you. There is a sudden pain at the back of the leg, you may have difficulty in contracting the muscle or standing on tiptoe, and there may be pain, swelling or bruising in the calf muscle. This injury is common in running sports that require quick acceleration of changes in direction. Calf strain is also referred to as "Tennis Leg," because it is so common among tennis players. It usually occurs in people between the ages of 30 – 45.

Severity of Muscle Strains. Muscle strains are graded as mild, moderate and severe. The more severe the strain, the longer the time to recover.

First Degree (Mild). This injury is the most common and usually the most minor. This injury is a 'pulled muscle' with a structural disruption of less than 5 percent. With a first-degree injury, you can expect to be back to sports within 1 to 3 weeks.

Second Degree (Moderate). This injury consists of a more significant, but still incomplete muscle tear. This a partial muscle tear and requires 3 to 6 weeks of rest and recovery before you can return to full activity.

Third Degree (Severe). This injury results in complete tearing of the muscle–tendon unit. A third-degree muscle strain can take many weeks or months to fully heal.

TREATMENT

Rest from the activity that caused the muscle strain allows for healing to occur. Immediately following the muscle strain, ice should be applied over the painful area for 20 min. Periodic icing (2-3 times per day) will help to control swelling and reduce pain. Heat should not be applied to the area during the first 7-10 days since this may increase swelling and bleeding within the muscle. A compressive walking boot can permit pain free walking, and expedite healing. An elastic wrap or compressive stocking may be applied to the area to assist with swelling control. If

the compressive device causes increased discomfort or "pins and needles" in any part of your leg, it is probably too tight. Lying down periodically with your leg elevated allows gravity to assist with your effort to control the swelling.

Though some experts believe early stretching to be valuable, caution should be taken to avoid aggressive stretching (stretching beyond the point of mild discomfort) which may disrupt healing. **NO** stretching or resistive exercise should be done during the first 3 weeks.

As a general rule of thumb, any activity that elicits pain at or near the injured site may be causing further injury and will only hamper your recovery effort.

A gradual conditioning program, specific to your sport, will prepare the calf muscles for the high demands placed upon them during athletics. Don't forget to incorporate a proper warm-up and stretching session into your conditioning program and athletic competition.

Rehabilitation Program

Exercises outlined in the rehabilitation program are described and illustrated in the back of the handout. The 'time line' that is illustrated in the following rehabilitation program is typical after grade 2 and 3 injuries. After a grade 1 injury, rehabilitation can usually begin at phase three.

Phase one - The first week after injury

- Rest from painful activities
- Ice 20 minutes, three times a day
- Compression wrap or neoprene sleeve

Phase two – the second and third week after injury

Ice once a day, 20 minutes, after exercises

Start active ROM exercises, 1-2 times a day, 10 to 20 repetitions

- Ankle ROM exercises: move the foot up and down 20 times and make circles with the foot, left and right, 20 times, three times a day.
- Stationary bicycle, 10 minutes, no resistance, if pain free
- **NO stretching**

Phase three – the 4th, 5th and 6th week after injury

- Theraband Strengthening exercises, pain free
- Stationary cycle, add 1 minute per session up to 30 to 40 minutes
- Slow treadmill walking, pain free, start 5 minutes and add one minute per session to 20 minutes or start "Return to Walk\Run Program" (see below).
- Gentle pain-free stretching, two times a day (see stretching illustrations and instructions in the back of the handout).

Phase four – 7 to 12 weeks after injury

- Follow 'Toe Raising Progression' strengthening supplement
- Stationary cycle
- Continue gentle calf stretching
- Start 'Return to Full Speed Running Program'

Phase five – from 12 weeks onward

- Continue above program
- Start return to sports training

Return to Walk/ Run Program after Calf strain

General Instructions

1. Walking/jogging should be done no more than every other day.
2. The program should be performed step by step. Do not advance your program until you can successfully complete the initial step. Let pain and swelling be your guide. If the activity creates pain, swelling, or causes you to limp, go back to the previous step.
3. Before starting the program and after completion of the program allow 15 minutes to perform warm-up and gentle stretching exercises.
4. Cool down by gently stretching all muscle groups
5. Ice for 20 minutes after cool down stretching.

Phase 1:

- Day #1 Walk 1/4 mile -- easy pace (1/2 speed)
Day #2 Walk 1/4 mile -- (3/4 speed)
Day #3 Walk 1/4 mile -- full speed - briskly

Phase 2:

- Day #1 Walk 1/2 mile -- easy pace (1/2 speed)
Day #2 Walk 1/2 mile (3/4 speed)
Day #3 Walk 1/2 mile -- full speed - briskly

Phase 3:

- Day #1 Walk 3/4 mile-- (3/4 speed)
Day #2 Walk 3/4 mile -- (full speed — briskly)
Day #3 Walk 1 mile -- (comfortable pace — 3/4—full speed)

Phase 4:

- Day #1 Jog 1/4 mile, Walk 3/4 mile, comfortable pace
Day #2 Jog 1/2 mile, Walk 1/2 mile, comfortable pace
Day #3 Jog 3/4 mile, Walk 1/4 mile, comfortable pace

Phase 5:

- Day #1 Jog 3/4 mile, Walk 1/4 mile, comfortable pace
Day #2 Jog 1 mile
Day #3 Jog 1 mile

You can continue to increase distance by 1/4 mile per session until you reach your desired distance. When you have reached your training distance without causing any pain or swelling, and have a normal running form, you can gradually start to increase your running speed or progress to the “Return to sprint program”.

Toe Raising Progression after Calf strain

Phase 1

- Frequency: Daily
Times per Day: 3
Repetitions: 20
Technique: Up and down on both legs together
Duration: 2 weeks

Phase 2

Frequency: 5 days a week, 2 days on, one day off

Times per Day: 1-2

Repetitions and Technique: Up and down on both legs together, 10 times
Up on both legs and down on the affected leg, 10 times
Up and down on both legs together, 10 times

Duration: 2 weeks

Phase 3

Frequency: 5 days a week, 2 days on, one day off

Times per Day: 1-2

Repetitions and Technique: Up and down on both legs together, 10 times
Up on both legs and down on the affected leg, 10 times, 2 sets
Up and down on both legs together, 10 times

Duration: 2 weeks

Phase 4

Frequency: 5 days a week, 2 days on, one day off

Times per Day: 1

Repetitions and Technique: Up and down on both legs together, 10 times
Up on both legs and down on the affected leg, 10 times
Up and down the affected leg only, 10 times
Up and down on both legs together, 10 times

Duration: 2 weeks

Phase 5

Frequency: 4 days a week, 2 days on, 2 days off

Times per Day: 1

Repetitions and Technique: Up and down on both legs together, 10 times
Up on both legs and down on the affected leg, 10 times
Up and down the affected leg only, 10 times, 2 sets
Up and down on both legs together, 10 times

Duration: 2 weeks

Phase 6

Frequency: 3-4 days a week, 1 day on, one day off

Times per Day: 1

Repetitions and Technique: Up and down on both legs together, 10 times
Up on both legs and down on the affected leg, 10 times
Up and down the affected leg only, 10 times, 3 sets
Up and down on both legs together, 10 times

Duration: 1 month

Phase 7

Gradual Return to sports activity

Running program for Return to Sports after Calf Strain

Goals:

1. Safely recondition the injured area for the demands of sports activity.
2. Provide a logical sequence of progressive drills for pre-sports conditioning
3. Provide objective criteria for safe return to sports.

Sports Specific Training

<u>Phases of Training</u>	Straight-ahead running phase Direction change running phase Unrestricted direction change
<u>Prerequisites</u>	Full Range of Motion Symmetrical muscle flexibility Pain free all stretching and strengthening exercises

Warm-up and Stretch and Ice

Make sure that you warm-up well and stretch lightly before workouts, and stretch well again after workouts. Generally, you should do some walking, cycling or jogging so that you break a sweat before starting the running program. You should **then** stretch **before** beginning the running drills. Ice your knee for 20 minutes following workouts after stretching again as you are cooling down.

The criteria to progress

Do not progress to the next step in the progression until the present step is pain free, without swelling.

Frequency:

2 or 3 times per week. Repeat previous steps can be skipped if the running causes no problems.

Phase 1 *Straight Ahead Running*

- STEP 1 Run ½ speed 100 yards, 10 repetitions
- 2 Repeat previous step
 - 3 Run ¾ speed 100 yards, 10 repetitions
 - 4 Repeat previous step
 - 5 Run ½ speed, 100 yards, 3 repetitions
Run ¾ speed, 100 yards, 3 repetitions
Run full-speed, 50 yards, 4 repetitions
 - 6 Continue workout from Step 5, adding one 50 yard run each workout until you can do (10) 50 yard full speed runs.

Phase 2 *Basic Direction Change Running*

- STEP 7 Continue 100 yard run ½ speed, 2 repetitions; ¾ speed, 2 repetitions; full speed, 2 repetitions
Start zig-zag run, round corners, 50 yards, 5 repetitions
- 8 Repeat previous step
 - 9 Repeat previous step, add backward run 25 to gradual stop, then forward run 25 yards to gradual stop, 5 repetitions
 - 10 Repeat previous step
 - 11 Repeat previous step, add circle run, 20 foot or greater diameter circle, 3 repetitions to left and 3 reps to right.
 - 12 Repeat previous step
 - 13 Repeat previous step, add figure of eight run, 20 foot or greater length, 5 repetition
 - 14 Carioca, 50 yards, 5 repetitions left, 5 repetitions right

Phase 3 Unrestricted Direction Change Running

Current workout:

100yd ½ speed, ¾ speed and full speed each distance 2 repetitions
zig-zag run 5 repetitions
forward backward run 5 repetitions
circle run 6 repetitions
figure 8 runs 5 repetitions
carioca 5 repetitions each way

15 Continue Current Workout above and Add:

- 16 **Shuttle run**, 50 yards, direction change every 10 yards, 5 repetitions, alternate hands touching.
- 17 Repeat previous step
- 18 Repeat previous step and add **Box drill**, 20 yards square, 6 repetitions, alternate starting side.
- 19 Repeat previous step
- 20 Repeat previous step
- 21 Repeat previous step and add **agility run**, 5 repetitions, alternate starting side.
- 22 Repeat previous step
- 23 Repeat previous step
- 24 Repeat previous step

Final workout:

100yd ½ speed, ¾ speed and full speed each distance 2 repetitions
zig-zag run 5 repetitions
forward backward run 5 repetitions
circle run 6 repetitions
figure 8 runs 5 repetitions
carioca 5 repetitions each way
Shuttle run, 50 yards, direction change every 10 yards, 5 repetitions, alternate hands touching.
Box drill, 20 yards square, 6 repetitions, alternate starting side.
Agility run, 5 repetitions, alternate starting side

Phase 4 Return to Sports Practice. During phase 3

Do 1 to 2 repetitions of each drill of final workout to warm-up before practice.

Phase 5 Return to Sports Competition. At the end of phase 3