

# Quiz Policies

## **Eligibility**

The NCSF online quizzes are open to any currently certified fitness professional, 18 years or older.

## **Deadlines**

Course completion deadlines correspond with the NCSF Certified Professionals certification expiration date. Students can obtain their expiration dates by reviewing either their certification diploma or certification ID card.

## **Cancellation/Refund**

All NCSF continued education course studies are non-refundable.

## **General Quiz Rules**

- You may not have your quiz back after sending it in.
- Individuals can only take a specific quiz once for continued education units.
- Impersonation of another candidate will result in disqualification from the program without refund.

## **Disqualification**

If disqualified for any of the above-mentioned reasons you may appeal the decision in writing within two weeks of the disqualification date.

## **Reporting Policy**

You will receive your scores within 4 weeks following the quiz. If you do not receive the results after 4 weeks please contact the NCSF Certifying Agency.

## **Re-testing Procedure**

Students who do not successfully pass an online quiz have the option of re-taking. The fees associated with this procedure total \$15 (U.S) per request. There are no limits as to the number of times a student may re-test.

## **Special Needs**

If special needs are required to take the quiz please contact the NCSF so that appropriate measures can be taken for your consideration.

# Quiz Rules

## **What Do I Mail Back to the NCSF?**

Students are required to submit the quiz answer form.

## **What do I Need to Score on the Quiz?**

In order to gain the .5 NCSF continued education units students need to score 80% (8 out of 10) or greater on the CEU quiz.

## **Where Do I Mail My Quiz Answer Form?**

You will mail your completed answer form to:

**NCSF**

**Attn: Dept. of Continuing Education**

**5915 Ponce de Leon Blvd., Suite 60**

**Coral Gables, FL 33146**

## **How Many CEUs Will I Gain?**

Professionals who successfully complete the any continuing education quiz will gain .5 NCSF CEUs per quiz.

## **How Much does each quiz cost?**

Each quiz costs the student \$15.00.

## **What Will I Receive When The Course Is Completed?**

Students who successfully pass any of the NCSF online quizzes will receive their exam scores, and a confirmation letter.

## **How Many Times Can I Take The Quizzes For CEUs?**

Individuals can take each NCSF quiz once for continuing education credits.

## Why Train Your Calf Muscles

The muscles of the calf are often considered “genetic” muscles among fitness enthusiasts, suggesting that one is born with sizable and well developed calves or not. Do to the symmetry and balance with other leg musculature the calves are commonly trained mainly for aesthetic purposes. But the muscles of the lower limb play a more important role than simple accents to basketball shorts or high heels. During standing posture, the soleus muscles act to control sway in the anteroposterior (AP) direction aided by contractions of the gastrocnemius. Since the soleus does not cross the knee (meaning it is not involved in knee flexion) it serves as an anchor to the foot, fibula, and tibia. In contrast, the gastrocnemius crosses the knee and contributes to locomotion via both plantar flexion and knee flexion.

When the task is quiet standing, both soleus muscles share a common function to maintain alignment of the skeleton. The central nervous system (CNS) monitors the position of the body's center of mass (COM) and makes adjustments to accommodate the center of pressure (COP) in the foot to maintain an upright stance. The center of pressure represents bone loading and is relevant for the efficiency of the base of support. The body has a tendency toward anterior lean and therefore the posterior, lower limb must accommodate this loading for extended periods of time, albeit when standing or during locomotion such as that experienced on a long walk. When the body speeds up for running activities, strong plantar flexion of the gastrocnemius syncs with hip extension to raise the center of mass as well as aid in knee flexion to propel

the body forward. These differences suggest that the musculature have fairly unique responsibilities above simple heel elevation.

The control of quiet symmetrical stance is a task that requires bilateral activation of the ankle plantar flexors as both soleus and gastrocnemius muscle activity has been shown to be correlated to changes in the COP. The soleus plays a predominant role in adjusting the COP to match changes in the COM in quiet stance, whereas the gastrocnemius demonstrates less activity than the soleus during standing posture in humans. The soleus is designed to serve a dominant role over the gastrocnemius in standing posture as ~80% of the muscle tissue is comprised of type I muscle fibers where as the gastrocnemius is closer to 55% in humans and better structured for multispeed locomotion.

In a neutral standing position, the motor control mechanisms that preside over anteroposterior sway (forward/backward) and mediolateral sway (side to side) are independent, suggesting that different muscles account for sway in different planes. The ankle flexors are responsible for the sagittal component of sway, whereas the hip abductors/adductors control frontal plane sway. Interestingly, researchers have demonstrated that normal, healthy subjects can stand in a stable manner when receptors in the ankle muscles are the only source of information about postural sway, clearly demonstrating their importance in this role. It is well known that visual, vestibular and tactile data affects sway, explaining difficulty in standing stationary when intoxicated or with one's eyes closed. This

also explains added challenges performing reverse exercises like lunges without the assistance of visual (spatial) awareness. It is likely the sway triggers proprioceptive activity via the anterior tibialis and gastrocnemius to modulate agonist activity to correct AP displacement.

This information is important to the personal trainer for a couple of reasons:

1. Identifying exercise strategies for hypertrophy, power, and strength suggest the gastrocnemius to be of primary focus and trained specific to intent
2. To optimize stability in dynamic exercise all the muscles of the lower limb should be properly balanced in training and coordinated with hip abductors/adductors for sagittal and frontal movement control
3. When working with those at elevated fall risk the postural and locomotive muscles should be challenged for adequate strength and proprioceptive responsiveness
4. Bilateral and unilateral balance training may aid in center of pressure management for sports and the prevention of injury

These four aspects of calf activity suggest that selecting exercises for outcome specific programming address the relative factors affecting the client. For instance, if hypertrophy is the goal for the calf muscles, it makes more sense to emphasize heavily loaded standing calf raises rather than performing seated calf raises which emphasize the soleus. The slow twitch sheath-like (postural) muscles of the soleus do not respond to hypertrophy as well as the

muscles used for locomotion (gastrocnemius). This is not to suggest a comprehensive program exclude performing some flexed knee, plantar flexion under load, but rather overloading the seated calf raise exercise in exchange for standing calf raise makes little sense.

When more functional or athletic goals replace vanity driven training the movements should become more coordinated than isolated. For example, a reverse lunge to knee raise exercise concentrically ending with plantar flexion further challenges the kinetic chain beyond stable calf raises. Likewise, split stance overhead stability with plantar flexion trains the postural stabilizers in preparation for more challenging and dynamic actions. To further raise the proprioceptive activity in the calves, exercises can be performed on dynadiscs, Bapse boards, and balance pads. Squats, lunges, and athletic stance activities on balance devices, ballistic exercises using triple extension (power cleans) and even plyometrics can be implemented to improve the function of the ankle and calf musculature.

For older adults who have compromised aspects of balance and coordination, a variety of central and peripheral activities are needed to reduce risk of falling. For individuals over 65 years of age this risk is a very relevant component to training and only increases with age. Research data underscore this point. The prevention of falls in the elderly trial (PROFET) 12-month follow-up; the total reported number of falls occurring in the year was 183 in the intervention group compared with 510 in the group that received no training. The risk of falling was significantly reduced in the

intervention group as was the risk of recurrent falls. Although muscle atrophy, gravitational shifts, loss of vestibular efficiency and reduced vision all contribute to this risk, improving the function of the ankle joint by increasing strength, center of pressure management, and better sway control certainly contribute to reduced fall risks. Strengthening the muscles of the trunk, hip and ankle using modified and traditional exercises are an important part of this effort.

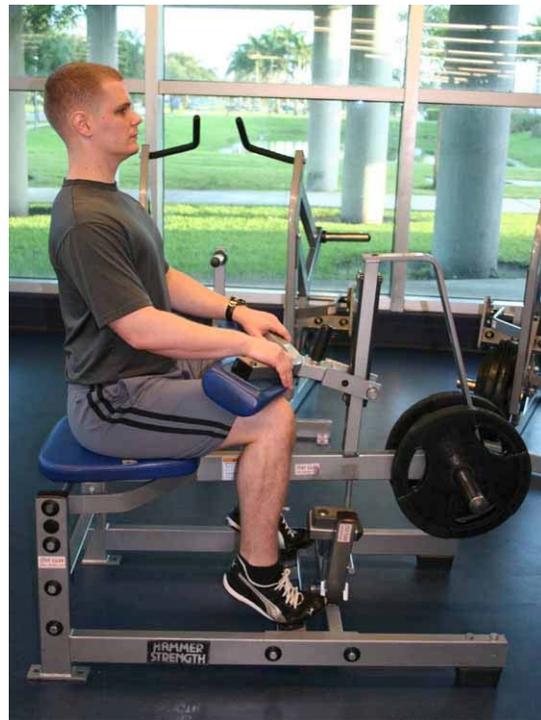
Understanding the role of the muscles helps personal trainers develop better programs to

improve the health, fitness and performance of clients. Selecting the right exercise and training technique will allow for more rapid goal attainment and a reduced risk of injury. Although the calves are designed for posture and low speed locomotion they are sizable enough to produce significant force; and the gastrocnemius is comprised of enough fast twitch fibers to support growth and power improvements when properly trained. The key is recognizing the differences between the calf muscles and matching the stress to the desired outcome.

### Seated Calf Raise



Starting Position



Ending Position

**Standing Calf Raise**



Starting Position



Ending Position

**Split Stance Overhead Calf Raise**



Starting Position



Ending Position

**Reverse Lunge to Knee Raise (with Plantar Flexion)**



Starting Position



Ending Position

## Why Train Your Calf Muscles CEU Quiz

1. During standing posture the \_\_\_\_\_ controls sway in the anteroposterior direction.
  - a. Gastrocnemius
  - b. Soleus
  - c. Tibialis anterior
  - d. Rectus femoris
2. Which of the following muscles of the “calf” crosses the knee joint and therefore assists with knee flexion in addition to plantar flexion?
  - a. Gastrocnemius
  - b. Soleus
  - c. Tibialis anterior
  - d. Sartorius
3. Strong plantar flexion from the \_\_\_\_\_ syncs with hip extension to raise the center of mass and propel the body forward during running activities.
  - a. Gastrocnemius
  - b. Soleus
  - c. Plantar fasciitis
  - d. Biceps femoris
4. Approximately \_\_\_\_\_ of the soleus is comprised of Type I muscle fibers while approximately \_\_\_\_\_ of the gastrocnemius is comprised of Type I muscle fibers.
  - a. 50%; 50%
  - b. 75%; 25%
  - c. 80%; 55%
  - d. 25%; 80%
5. True or False. The motor control mechanisms that are responsible for anteroposterior and mediolateral sway are independent.
  - a. True
  - b. False

6. The ankle flexors are responsible for managing sway in the \_\_\_\_\_ plane.
  - a. Transverse
  - b. Frontal
  - c. Horizontal
  - d. Sagittal
  
7. If hypertrophy of the calf is the goal of a client, a competent personal trainer will program exercises that emphasize \_\_\_\_\_.
  - a. High repetitions with light weight
  - b. Seated calf raises to train the Type I muscle fibers of the soleus
  - c. Heavily loaded standing calf raises to train the Type II fibers of the gastrocnemius
  - d. Slow speed body weight movements
  
8. Which of the following training devices can assist a personal trainer when trying to increase the proprioception of the calf muscles?
  - a. Dynadiscs
  - b. Balance pads
  - c. Bapse boards
  - d. All of the above can be used appropriately
  
9. In the older adult population, training that focuses on sway control can \_\_\_\_\_.
  - a. Reduce the risk of falls
  - b. Drastically alter body composition
  - c. Contribute to decreased stability
  - d. All of the above
  
10. The gastrocnemius and soleus are primarily designed for \_\_\_\_\_ but can also be trained for \_\_\_\_\_.
  - a. High power output; function
  - b. Posture; power
  - c. Flexibility; posture
  - d. Hypertrophy; function

# Quiz Answer Form

FIRST NAME \_\_\_\_\_ LAST NAME \_\_\_\_\_ M.I. \_\_\_\_\_

TITLE \_\_\_\_\_

ADDRESS \_\_\_\_\_ APT. \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

COUNTRY \_\_\_\_\_ POSTAL CODE \_\_\_\_\_

CERTIFICATION NO. \_\_\_\_\_ CERTIFICATION EXP. \_\_\_\_/\_\_\_\_/\_\_\_\_

MEMBERSHIP NO. \_\_\_\_\_ MEMBERSHIP EXP. \_\_\_\_/\_\_\_\_/\_\_\_\_

Quiz Name	Member Price	Total
	\$15	



Discover



Visa



Mastercard



Amex



Check/Money Order

Account No. \_\_\_\_\_

Exp. Date \_\_\_\_\_

Security Code \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

## Quiz Answers

- |          |           |
|----------|-----------|
| 1. _____ | 6. _____  |
| 2. _____ | 7. _____  |
| 3. _____ | 8. _____  |
| 4. _____ | 9. _____  |
| 5. _____ | 10. _____ |

Fill in each blank with the correct choice on the answer sheet. To receive 0.5 CEUs, you must answer 8 of the 10 questions correctly.

Please mail this Quiz answer form along with the proper enclosed payment to:

NCSF  
5915 Ponce de Leon Blvd., Suite 60  
Coral Gables, FL 33146

Questions? 800-772-NCSF