

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.

What is the Best Option for Relieving DOMS

Variations in training volume and methodology as well as individual characteristics can impact a client's ability to fully recover from training sessions. Muscular adaptations to exercise vary depending on the individual's gender, biological and training age and the nature of exercise engaged. A common occurrence following a bout of unaccustomed physical activity is the delayed sensation of skeletal muscle discomfort or pain, known as delayed onset muscle soreness (DOMS). The discomfort associated with DOMS is often characterized by muscle stiffness and tenderness. It is generally accepted that DOMS follows an inverted U-shape curve over time, in which the intensity of discomfort increases during the first 24 hours following the cessation of exercise, peaks between 24 to 72 hours, then subsides and eventually disappears by 5-7 days post-exercise. Eccentric exercises are primarily cited for evoking DOMS as the nature of the contraction as well as the potential for greater loading promotes more muscle damage than concentric or isometric contractions.

There are many factors known to increase the risk for DOMS:

- Primary factors
 - The fitness level of the participant (previously-sedentary or novice clients experience the most significant symptoms)
 - The performance of eccentric exercises using small muscles groups
 - The use of faster movement velocities under load (ballistics and plyometric activities)
 - Reinitiating an intense training regimen following a period of notable detraining
- Secondary factors
 - The incorporation of new exercises
 - Dramatic changes in training volume
 - The performance of exercises through an increased range of motion (ROM)

There are various physiological mechanisms *proposed* to be associated with the initiation of DOMS such as lactic acid accumulation, muscle spasms, excessive microtrauma, connective tissue damage, significant inflammation, and electrolyte/enzyme efflux out of previously-working cells. A single theory does not currently seem feasible to explain DOMS, thus integration theories that include a number of events at the structural and functional level are well accepted. Many scientists agree that DOMS is the result of significant disruption to sarcomeres (repeating units within muscle fibers that allow for contractions to occur) with accompanying metabolic/mechanical damage and cellular inflammation. Essentially, theory suggests DOMS is caused by damage induced to skeletal muscle via tangible sarcomere, membrane and cytoskeletal disruption. DOMS is the body's way of communicating significant muscle cell damage which needs to be repaired and complemented by appropriate recovery. The alterations seen at the structural level induce changes at the functional level; explaining the notable reduction in performance (e.g., lower force output, higher RPE values) when a client presents with DOMS.

Several methods have been proposed to counteract soreness after unaccustomed exercise, including those with limited or no effect on restoring muscle functionality. The adjacent figure provides a side-by-side comparison among recovery methods investigated in research, and the specific outcomes at the perceptible level (soreness). Obviously, a number of these modalities and methods will not be available for implementation in a fitness facility, or should not be implemented by a trainer without medical guidance (as indicated), but the information does give some insight into best practices to effectively deal with DOMS. Unfortunately, there is no protocol or combination considered to be the "gold standard", particularly since comparison among methods is difficult. It is also important to understand that the placebo effect for some of these methods may be greater than the actual

Recovery Method Outcomes for DOMS

- **Massage**
 - Effectiveness seems to depend on the individual
- **Exercise**
 - Apparently effective for reducing symptoms
- **Nutriceutics** (consuming specific nutrients)
 - Effectiveness seems to depend on the individual
- **Compression**
 - Apparently effective for reducing symptoms
- **Acupuncture/Electrical current**
 - Apparently ineffective for reducing symptoms
- **Whole body vibration**
 - Apparently effective for reducing symptoms
- **Nonsteroidal anti-inflammatory drugs (NSAIDs)**
 - Apparently effective for reducing symptoms but requires medical guidance
- **Cryotherapy** (cold water)
 - Effectiveness seems to depend on the individual

physical performance change demonstrated under laboratory conditions. In real life experiences, symptoms may be lessened due to a combination of the positive effects of the recovery method and the placebo effect.

A quick examination of the above figure reveals that exercise, compression techniques, whole body vibration and NSAIDs seem to be most reliable for effective relief according to research. Whole body vibration equipment will not be available for 99% of trainers, and NSAID use should not be recommended by the trainer without medical guidance. This leaves active exercise and compression techniques as the best viable options at the trainer's arsenal; pointing to the use of foam rolling/massage or active warm-up techniques to help reduce symptoms that are limiting a client's performance or adherence to a program.

A recent study published in the *Journal of Strength and Conditioning Research* in which researchers examined the usefulness of different practical methods for relieving muscle soreness reinforced this recommendation. Twenty healthy females (mean age of 32) performed controlled eccentric contractions for the upper trapezius to induce DOMS. Soreness presented 48 hours later, and the participants either (1) received a 10 minute massage for the upper trapezius or (2) performed 10 minutes of active exercise involving light shoulder shrugs with increasing resistance using Thera-bands (10 sets of 10 repetitions total). Compared to the controls, both of these treatments reduced the intensity of their perceived soreness as well as pain sensitivity. For both treatments the benefits peaked 20 minutes after treatment. The data seems to indicate that personal trainers could use either an active warm-up period or massage to reduce DOMS in an acute fashion before an intense training session, but one needs to keep in mind that the reduction in pain is only temporary.

In summary, personal trainers have a few viable options to help clients with a lower sensitivity to pain deal with the symptoms of DOMS. An active warm-up that fully activates the sore musculature seems to go a long way, as does compression/massaging techniques. Note that compression and massage can be provided through various means including manual manipulation, foam rolling, or the use of tennis balls or trigger point sticks. Ideally, with the presence of notable DOMS, the trainer will seek to implement both to provide adequate progressive preparation and deal with any underlying issues such as significant connective tissue restriction.

What is the Best Option for Relieving DOMS

1. According to the research presented in the article, the symptoms associated with DOMS tend to peak within which of the following time frames following unaccustomed exercise?
 - A. 6-8 hours post-exercise
 - B. 12-16 hours post-exercise
 - C. 24-72 hours post-exercise
 - D. 5-7 days post-exercise
2. Which of the following is **not** considered a primary risk factor for experiencing DOMS?
 - A. Performing intense exercise when previously sedentary
 - B. Performing slow, controlled concentric contractions
 - C. Performing heavy ballistic exercises
 - D. Performing eccentric activities using small muscle groups
3. True or False? Performing an exercise through a greater range of motion (ROM) than normal can increase the risk for DOMS.
 - A. True
 - B. False
4. True or False? The primary cause of DOMS at the cellular level appears to be residual lactic acid activity due to lack of an appropriate cool down to flush metabolites out of the previously-working tissues.
 - A. True
 - B. False
5. Which of the following methods for dealing with DOMS is apparently effective for reducing symptoms?
 - A. Acupuncture
 - B. Nutraceuticals
 - C. Cryotherapy
 - D. Exercise
6. Which of the following methods for dealing with DOMS is apparently effective for reducing symptoms but requires medical guidance?
 - A. Whole body vibration
 - B. Compression techniques
 - C. NSAIDs
 - D. Massage

7. Which of the following is considered the “gold standard” for dealing with the symptoms associated with DOMS?

- A. Whole body vibration
- B. Cryotherapy
- C. Compression techniques
- D. None of the above

8. Based on the provided research, which of the following combinations of recovery methods seem to be the most practical options for personal trainers?

- A. Cryotherapy and massage
- B. NSAIDs and acupuncture
- C. Exercise and compression techniques
- D. Whole body vibration and nutriceutics

9. Which of the following has been shown to be completely ineffective for dealing with DOMS?

- A. Exercise
- B. Acupuncture
- C. Massage
- D. Cryotherapy

10. Which of the following detriments to performance are associated with DOMS?

- A. Reduced force output
- B. Muscle tenderness
- C. Higher RPE values during work
- D. All of the above

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



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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