

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.

How Core Stabilization Translates to Sport Performance

Properly challenging the core musculature through resistance and stability training techniques for adaptations related to sport performance is currently a topic of debate. To ascertain what methods could be considered optimal, one must first understand muscle action inherent to the core region of the body. The core does not simply refer to the abdominal musculature as many believe, but is actually a functional group of muscles that act on the spine and pelvis. The core of the human body constitutes all of the lumbopelvic musculature and is utilized to maintain proper body alignment and protect the spine. A few of the major muscle groups and functional connective tissues that are emphasized when enhancing core function include: the rectus abdominis, internal and external obliques, erector spinae which serve prime movement and phasic energy transfer and the diaphragm, thoracolumbar fascia, multifidus, transverse abdominis and pelvic floor which stabilize both static and dynamic action. These groups are further coupled with muscle actions of the hip including both flexors and extensors. When stability, range of motion, and/or balance in one (or any number) of these muscle groups becomes compromised, an individual may have reduced ability to efficiently transfer force through the trunk to the upper or lower extremities. Essentially, force capacity may be lost during movements utilizing the entire kinetic chain. Due to the need for ground reaction force transfer, energy loss along the kinetic chain presents a predominant challenge in optimizing the efficiency of the

often complex movements demanded in competitive sports. For this reason core stabilization has been indicated as an important aspect of athletic conditioning.

There are a few differing training methods presented in modern literature that propose to challenge core stability, endurance, and strength; and consequently enhance sport performance. The primary methods are; utilizing isometric stabilization exercises, training on unstable surfaces, and utilizing resisted exercises that significantly engage the core musculature through complex, multi-joint movements with added dynamics such as asymmetrical loading or single limb instability/balance requirements.

The majority of the initial methods for functional core training made its appearance out of the rehabilitation sector. Isometric stabilization exercises such as planks and bridges were employed by health professionals such as physical therapists to enhance dynamic function for athletes and the general population alike. It has been repeatedly demonstrated in recent literature that isometric stabilization exercises and like rehab-based methods used to improve core stabilization are beneficial for reducing lower back pain and carrying out activities of daily living (ADLs) with greater ease. The basic issue with these types of exercises translating into improvements in sport performance is the movements don't match. Stabilizing the pelvic and performing tasks of daily living are very controlled with instability meeting the basic requisites for locomotion. On the other

hand those seen in competitive events are almost always multi-joint and complex in nature; performed at much faster velocities and require greater endurance and stability over broader ranges of motion. Based on these facts isometric holds have limited transfer into improvements of human performance.

Another large portion of core stability based training has been focused on utilizing various pieces of equipment to add greater instability to common movements such as a squat or shoulder press. Implements such as stability balls, stability disks, Bosu balls, trampolines, foam rollers, and balance boards are commonly utilized to add a balance or proprioceptive component to familiar exercises and their applicable variations. Utilization of stability balls and other similar modalities may provide additional benefits such as with the stability ball abdominal crunch where greater range of motion may be attained when compared to crunches from the floor. This being said, seated bilateral dumbbell press on the ball yields minimal core activation compared to sitting on a bench. Whereas in other seated or isolated exercises using the stability ball such as chest press on the ball demonstrate additional core activation. When closed kinetic chain exercises are examined where a modality of instability is used under the feet or hands, the ability to produce force is significantly reduced and much of the instability compensations may simply occur in the ankles or wrists. This again may not have optimal translation for enhancements in sport performance if it is the only method used. Ground-based sports generally do not

present the same type of proprioceptive demand or force requirements from unstable surfaces. Being able to stand on a Bosu and perform bicep curls, does not necessarily indicate an individual will maintain adequate core stability or power to effectively perform a single leg jump with rotation and simultaneous overhead arm extension to successfully attain possession of the ball for a rebound during a competitive basketball game.

Recent literature supports these statements based on comparisons between (body resisted) isolated and isometric movements and loaded closed chain movements. Stability activities such as the side plank or superman exercises fail to exert the same core activation as compound lifts such as the deadlift and back squat exercises. The compound lifts actually allow greater activation of the core musculature than isolated (semi)statics. The activation of the core musculature is further challenged when the lifts combined ground reaction force with asymmetrical loading as seen in the suitcase (single arm) deadlift and sandbag squats (single shoulder loaded). Likewise it appears greater trunk activity is encouraged from side loading and rotational exercises rooted in the ground such as the diagonal low to high cable chop.

It appears that the majority of modern research points toward core strength and stability having an effect on sport performance, but the methods used to enhance it should attempt to replicate the movement patterns and force production demands seen in the actual sport. This can be done in whole or in part and should have

consistency to movement planes and velocities. Although static stability training can improve techniques used for more dynamic training actions, it is the challenges to dynamic stability that seem to transfer optimally to sports performance. Complex movements utilizing the entire kinetic chain, such as a medicine ball reverse lunge with rotation into unilateral hip flexion with an overhead press, allow for the activation of core musculature while challenging similar proprioceptive and force transfer demands encountered on a traditional field or court. This general concept was recently reinforced in a number of research studies published in the *Journal of Strength and Conditioning Research*. In one study, researchers found that greater levels of core muscle strength correlated to faster running times in a 5000-

m run. In another study, compound lifts using multiple muscle groups enhanced core stability to a greater degree than isolated isometric movements thought to focus solely on core musculature. Introductory core stability training can initially focus on isometric planks and bridges to develop baseline endurance, but it seems that subsequent training techniques should have a dynamic component to it for optimal applicability within the sports realm. The general concept to consider is that the body functions as a single unit during sport rather than segments. Even if the weakest links in the unit are being addressed; optimal adaptations will occur with replication of synchronized and dynamic body segment activation, once baseline isometric endurance is achieved.

How Core Stabilization Translates to Sport Performance

CEU Quiz

1. The core refers to _____.
 - a. The abdominals
 - b. A functional group of muscles that act on the spine and pelvis
 - c. The muscles of the lower back
 - d. A functional group of muscles acting on the upper body

2. Which of the following are muscles in the core?
 - a. Rectus abdominus and transverse abdominus
 - b. Internal and external obliques
 - c. Erector spinae, multifidus, and thoracolumbar fascia
 - d. All of the above are correct

3. When the range of motion, stability, and/or balance of any of the muscles of the core is compromised which of the following is likely to occur?
 - a. A reduction in the ability to efficiently transfer force through the trunk to the upper/lower extremities
 - b. An increased force production capability in the upper body
 - c. A reduction in perceived exertion from all lower body activities
 - d. An increase in efficient energy transfer from the lower to upper body extremities

4. Which of the following is NOT one of the traditional training methods that challenge core stability, endurance, and strength?
 - a. Isometric stabilization
 - b. Training on unstable surfaces
 - c. Utilizing machine based, single joint movements
 - d. Utilizing resisted exercises that significantly engage the core muscles through complex, multi-joint movements

5. Isometric stabilization exercises such as planks and bridges appear to be most beneficial at _____
 - a. Improving upper body explosiveness
 - b. Reducing low back pain and improved ADLs
 - c. Decreasing flexibility of the hip joint
 - d. Increasing the range of motion of the shoulder

 6. Isometric holds appear to have limited transfer to improvements in human performance during sport because _____
 - a. The sports movements are often performed at a faster velocity
 - b. The sports movements are not complex enough and do not require stability
 - c. The sports movements require greater endurance and stability over a broader range of motions
 - d. Both A and C are correct

 7. Stability balls, Bosu balls, and foam rollers are commonly used to _____.
 - a. Increase balance and proprioceptive components to familiar exercises
 - b. Decrease the balance and stability requirement
 - c. Dampen the proprioceptive input necessary to successfully complete the exercise
 - d. Increase the power and explosiveness of the movement

 8. When traditionally closed kinetic chain exercises are performed in an unstable environment, much of the stability force compensations of the body occur _____.
 - a. In the prime movers
 - b. In the ankles or wrists
 - c. In the upper body
 - d. In the lower body

 9. Research supports the fact that activation of the core musculature is greater when _____.
 - a. Lifts are performed in stable machines
 - b. Exercises are performed at a high velocity
 - c. Lifts combine ground reaction force with assymetrical loading
 - d. Exercises are performed with body weight
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10. Optimal adaptations of core stability strength and endurance related to performance will occur _____.
- a. With replication of synchronized and dynamic segment activation
 - b. With individual body segment isometric holds
 - c. Heavy resistance training
 - d. Concurrent aerobic and anaerobic conditioning

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	



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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