

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.



Understanding the

Kinetic Chain

for Goal Attainment

The body has numerous defined actions and movements. Providing resistance to those actions or movements represents an exercise. However, effective exercise selection should entail more than simply identifying a movement and loading it. Rather, the decision for a particular exercise should be based on individual client need, which in many cases is multi-factorial. Does the joint need more stability? Should the prime mover experience higher loads? Do the hip and trunk play a role, and if so, is it for acceleration, deceleration or stabilization? Is range of motion an issue? Does the individual have the musculoskeletal or neuromuscular aptitude to perform the activity? All of these questions should embody the thought process of a certified personal trainer, which then leads to a prudent exercise decision in the workout design.

A common programming error occurs when the emphasis is placed on training muscles, rather than movements and conditions. Muscle training could effectively be accomplished by going to a fitness facility and using the machines. Each selectorized or plate loaded machine is designed for a different prime mover based on an anatomical movement. For instance, a seated shoulder press machine applies resistance to humeral abduction, but so does a standing dumbbell press. A lat pull-down is simply shoulder adduction with arm flexion, and so is a pull-up. A prone leg curl represents isolated knee flexion, and so does a leg curl on a physioball. Although the actions are similar in nature the stress placed upon the body is different and so are the resultant adaptations. Take humeral adduction for instance; upon review of the muscle activity the pull-up demonstrates much better activation of the prime mover and requires increased stability. The knee flexion on the machine localizes motor unit recruitment whereas the leg curl on the ball increases motor unit contribution as the muscle experiences resistive forces from both insertion locations and needs to activate more tissue in the trunk to maintain dynamic control. Whereas machines are great for body building exercises that utilize the body as a machine, closed chain exercises show better improvements in free living conditions.

A seated shoulder press machine places specific and localized stress on the deltoids and assistive structures. The repeated action causes recruitment from particular motor units

and, based on the time under tension and volume of exposure to the stress, increases in anabolic response and over time a subsequent increase is tissue mass. An adaptation occurs but it is limited in scope. Machines allow for heavier loads because the body is stable during the performance of the movement. The problem is the body can only reproduce the effort in the same environment. The same exercise performed in a seated position with a barbell and without the support of the machine or back rest will require less loading than can be accomplished when utilizing the machine. The free weight movement will encourage hypertrophy in the same set/rep range but will provide better shoulder and trunk stability than the machine. When the barbell is exchanged for two dumbbells the resistance will decrease once again but the challenge to the shoulder and trunk stabilizers will increase. If the exerciser stands, the situation again will require a reduction in the loading as the energy created in the ground (ground reaction force) must be transferred across many joints before manifesting in the hands pressing against the bar. If the bar is exchanged for two dumbbells the reduction is again experienced as the glenohumeral joints must now function independent of one another.

The decision to use a seated dumbbell press or a standing barbell press (military press) should be dependent on the goal. An easy way to determine the effort is to analyze the chains and the circuits. This is not referring to barbell chains or conditioning circuits but kinetic chains and stability circuits. Seated and machine exercises are considered open chain activities because the application of force does not occur from a distally fixed position. An easy example of this is to look at the body versus the resistance. In a squat the body moves toward and away from the ground whereas in a leg extension the body remains still and the weight moves. A squat is closed chain as the body is responsible for stabilizing the system while the leg extension is open chain because the kinetics extend to the machine for support. A pull-up and push-up are closed chain because the body is required to stabilize, neutralize, and move, whereas a lat pull-down and bench press are open chain because both exercises utilize an external system of support. The former requires the body to manage the environment whereas the latter is controlled by external factors and only the prime mover has

significant responsibility.

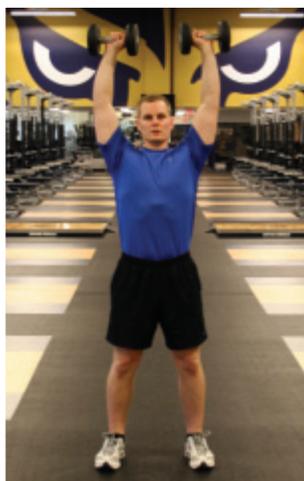
Understanding the differences helps with exercise selection. If the goal is improved force coupling, synergistic force contribution and improved stabilization, closed chain exercises should be used. If the goal is isolation and muscle specific loading, use open chain exercises. Free living conditions experience greater improvements in efficiency from closed chain environments. The addition of circuits allows for more emphasis on load or stability depending on the goal. Recall the seated press versus standing press example from earlier. The Seated Press is open chain while the Standing Press is closed chain. Now consider the load. A barbell is a closed circuit and dumbbells are an open circuit. Due to the nature of the closed circuit, bilateral stability overlaps and allows for more force to be produced. An individual's bench press is always higher in maximal load compared with their Dumbbell bench press. The total load of a standing military press is always heavier than the maximal combined load used in the standing dumbbell press. Again open circuits create independent, stabilizing systems. This concept is demonstrated even further when a unilateral open circuit is used. When a single side load is employed the body cannot use the counter weight symmetry for stability assistance. Therefore if one wants to optimize the

stability of a movement segment, use one loaded side versus employing the more common bilateral lift.

The following chart depicts the varying stress from each exercise adjustment and the associated adaptational outcome. Moderately heavy, stable, isolated lifts promote hypertrophy. Heavy, moderately stable, coordinated lifts promote strength. Moderate weight, unstable, unilateral lifts encourage joint stability. Although each has an independent purpose they also function to support the other. For instance, when a muscle gets bigger it also gets stronger. When a joint becomes more stable it can transfer more load. When a musculoskeletal system becomes more efficient at producing force, greater loads can be used triggering increased anabolic hormone. Based on these facts it may warrant employing all of these tactics to reach different goals using a more periodized approach.

When prescribing exercise, select the best scenario to accomplish the goal with consideration for individual capabilities, movement aptitude and training tenure. The more complex the activity, the more the resistance will decline and therefore new experiences warrant an initial adjustment in load. Regardless of the variation, correct technique is the basis of the plan and therefore proper acclimation and spotting can be very assistive to positive outcomes. ●

Load stability variations	Exercise example	Primary Goal
Open chain closed circuit	Seated machine overhead press	Hypertrophy
Open chain open circuit	Seated dumbbell press	Hypertrophy stability
Closed chain closed circuit	Standing military press	Strength
Closed chain open circuit	Standing dumbbell press	Strength stability
Open chain Open circuit Unilateral	Seated single arm dumbbell press	Local Stability
Closed chain Open circuit Unilateral	Standing single arm dumbbell press	Global Stability



*Closed-Chain
Open-Circuit*

*Open-Chain
Open-Circuit*



*Closed-Chain
Closed-Circuit*

*Open-Chain
Closed-Circuit*



CEU Quiz

Kinetic Chain for Goal Attainment

- The decision to select a particular exercise for inclusion in an exercise program should be based upon _____.
 - trainer's experience
 - manager's preference
 - individual client need
 - latest equipment advances
- Which of the following is an example of a question that a trainer should ask themselves about an exercise prior to inclusion in their client's program?
 - Should the prime mover experience higher loads?
 - Does the individual have the musculoskeletal aptitude to perform the exercise?
 - Is range of motion an issue?
 - All of the above are important questions.
- Common programming errors occur when the emphasis is placed on training _____ rather than movements and conditions.
 - muscles
 - speeds
 - flexibility
 - stabilizers
- The lat pull-down exercise utilizes which two joint actions during the concentric phase?
 - Shoulder rotation and arm extension
 - Shoulder elevation and arm flexion
 - Shoulder abduction and arm extension
 - Shoulder adduction and arm flexion
- Which of the following describes a physiological stress-related difference between performance of a leg curl using a selectorized machine and knee flexion on a stability ball?
 - The machine focuses solely on prime mover while the use of the ball increases motor unit contribution and more tissue activation for dynamic stability.
 - The machine utilizes loads that are much lower than what is used when the movement is performed on the ball.
 - The exercise on the ball is great for bodybuilding because it focuses on the prime mover while the machine based exercise requires stability and balance.
 - There is no discernible difference between the two exercises.
- Machines allow for _____ because the body is stable during the performance of the movement.
 - greater range of motion
 - heavier loads
 - decreased speeds
 - greater flexibility gains
- When performing the shoulder press exercise, the trunk stabilizers will be activated to a greater extent if _____.
 - the exercise is performed seated in a machine
 - a barbell is used
 - the exerciser is standing and using dumbbells
 - the load is very heavy
- Seated and machine-based exercises are considered _____ because the application of force does not occur from a distally fixed position.
 - open chain
 - closed chain
 - mid chain
 - half chain
- Closed chain exercises should be utilized if the goals of the training include _____.
 - synergistic force contribution
 - improved force coupling
 - improved stabilization
 - all of the above are correct
- Moderate weight, unstable, unilateral lifts encourage _____.
 - Power
 - Stability
 - Strength
 - Speed

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