

# 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.



## Weightlifting and Metabolic Syndrome

**W**hen an individual is diagnosed with metabolic syndrome (MSyn), he or she is suffering from multiple cardiovascular and metabolic risk factors for disease. These physiological agitators function synergistically to increase the risk for numerous health complications and early mortality. Some of the major health consequences include type II diabetes, coronary artery disease (CAD), myocardial infarction and stroke. Genetics certainly play a role in the development of the MSyn but lifestyle/environmental issues such as a low physical activity, poor diet and progressive weight gain significantly contribute to risk. Surprisingly, even though the syndrome creates serious physiological issues, and the preva-

lence in the US is believed to be exceptionally high due to its relationship with obesity; at the present time there are no universally-accepted criteria for diagnosis. Various governing bodies have slightly different diagnostic criteria, but currently the criteria set by the American Heart Association (AHA) and the National Heart, Lung, and Blood Institute (NHLBI) are the most commonly followed among American physicians. Figure 1 identifies this syndrome's symptoms and should therefore clarify the important role of exercise in its treatment.

Changes in behavior should be aimed at reducing body fat (large waist due to visceral fat), maximizing caloric expenditure through activity, enhancing cardiovascular function (elevated

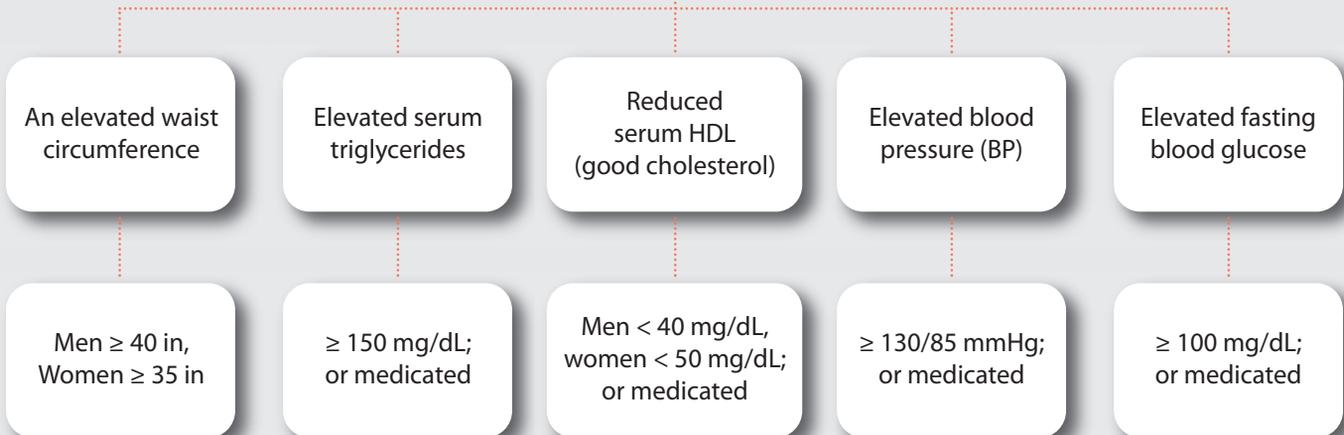
BP, glucose and triglycerides), and optimizing hormonal dynamics/sensitivity (blood glucose). Due to the nature of the problem and the identified solutions these goals are best met via an integrated approach using resistance training (RT), aerobic training, dietary adjustments and applicable lifestyle modifications. RT has received additional attention in recent years as it relates to preventing and managing metabolic diseases and issues (diabetes). Most physicians prescribe aerobic training for individuals with the MSyn due to the associated cardiovascular risk factors, but the importance and synergistic benefits of weightlifting on metabolic dysfunction must not be undervalued. For example, recent evidence showed that RT

performed at least 2 days/week can reduce the risk for and prevalence of the MSyn among US adults.

There is significant evidence that weightlifting can have positive effects on improving glycemic control and fasting blood glucose. Glucose uptake mediated by muscular contractions, increased intramuscular glucose transporter content (GLUT4), as well as increases in lean mass have all been identified as means by which weightlifting helps individuals with glucose intolerance and type 2 diabetes better manage their circulating glucose levels. RT may also reverse impairments to fasting glucose by increasing muscle cell function, cellular sensitivity and endocrine responses; secondarily,

# Metabolic Syndrome FIGURE 1

*MSyn is identified with the presence of three of the following criteria:*



the ability and confidence to engage in various forms of physical activity on a daily basis improves with participation. As it relates to blood lipid profiles (dyslipidemia), aerobic training has been considered most effective for creating positive changes – and while cardiovascular exercise is a relevant intervention tool, weightlifting has also demonstrated an ability to expedite improvements in total cholesterol, serum LDL content (“bad cholesterol”) and serum triglycerides. A reduction in abdominal adiposity is the proposed mechanism for these improvements, observed in individuals with type 2 diabetes as well as those with diagnosed dyslipidemia. Weightlifting has also been shown to create modest improvements in

measures of resting and exercise BP among individuals with hypertension when employed using circuit training. Meta-analysis suggests an approximate 2% reduction in resting systolic BP, and an approximate 4% reduction in resting diastolic BP following four weeks of circuit-based RT. Adjunct RT has also been shown to improve BP responses to maximal exercise as well as recovery heart rates (HR) and BP following intense cardiovascular training. While aerobic training should be emphasized for cardiovascular health and caloric expenditure, RT does play a critical role in improving body composition and metabolic function. For example, RT performed twice a week, in the absence of a weight loss diet was shown to reduce

central girth among older men with type 2 diabetes. RT can provide for both direct and indirect caloric expenditure through the sessions themselves, and increase the potential for gains in lean mass.

The modes used in a RT program for MSyn are generally dictated by time availability, client compliance and any specific limitations. It is recommended to put the client through an integrated program to increase their relative fitness level. Obtaining medical clearance is often necessary due to physical markers and pharmacological intervention; a personal trainer must remember to stay within their scope of practice and make prudent decisions when initiating the program via a comprehensive as-

essment and the subsequent development of an applicable needs analysis. Either way, the personal training program should be reflective of potential side-effects/physiological responses of the medications the client is taking to create a suitable training matrix. Trainers should know when to alter a given session based on the recognition of red flag indicators.

Hypertension is the greatest concern when developing a weightlifting program for clients with the MSyn due to significant BP responses during RT. For example, performance of the leg press to volitional failure has been shown to increase BP to measures as high as 480/350 mmHg. Numerous components of a weightlifting

program can impact the BP response, including the loads utilized, repetition/set schematics (volume), the speed of movement, rest periods and the total quantity of muscle mass used.

### Dealing with hypertension and MSyn:

- Monitor BP before, occasionally during, and after the training session
  - Absolute contraindication = 180/110 mmHg at rest
  - Keep exercise BP <220/<105 mmHg
- Teach and ensure proper breathing technique to help minimize elevations in BP; have the client breathe in during the eccentric and out during the concentric
- Use relatively lighter loads/intensities in a circuit or other moderate/high work volume format
  - Start with 55-65% of the 1RM and progress over time (based on the goal) to 65-70%
  - If employing the Borg RPE scale, maintain an intensity between 11-13
- Consider 7-12 repetitions per set at a controlled pace – 1.5 sec concentric, 1.5 sec eccentric to limit breath holding or the Valsalva maneuver (avoid intense isometric activities)
- Use rest periods of at least one min between sets to allow BP to return close to baseline measures before performance of the next set
- Avoid heavy bilateral lifts known to exponentially increase BP (e.g., leg press)
  - Traditionally bilateral selections that use

significant muscle mass should be performed in a unilateral fashion to elicit less of a hemodynamic response

**In summary** = employ relatively high-volume, low-to-moderate intensity activities (modifying as needed) in circuit fashion. Monitor BP intermittently as well as breathing technique with higher-risk clients.

Impaired fasting glucose (especially with type 2 diabetes) also carries critical considerations for the personal trainer working with a client with MSyn; and in many cases presents with high BP. RT is usually considered contraindicated for those who have ulcerations and/or wound infections due to peripheral neuropathy. This is also true of clients suffering from specific complications associated with retinopathy.

### Dealing with impaired glucose management and MSyn:

- Trainers should ensure the client is well hydrated before a session and use caution if the client's blood glucose level exceeds 300 mg/dL without ketones
- Never use insulin within an hour of working out as it will cause reactive hypoglycemia
- **Be familiar with the signs of hypoglycemia** = weakness, abnormal sweating, nervousness and anxiety, extreme hunger, headache, tingling of the fingers or mouth, visual disturbances, confusion and even seizures or coma (severe cases)
- If the client's glucose level is

<100 mg/dL before a session, the trainer should advise consumption of a 20-30g carbohydrate snack (high-glycemic selection) before starting to reduce the risk of hypoglycemia

- Hypoglycemia risk can also be reduced by encouraging the client to monitor their blood glucose every 30 min during exercise
- Clients with type 2 diabetes should not train late at night to reduce the risk for hypoglycemia during sleep
- It is recommended to first assign lower training intensities for novice clients (e.g., 50-60% of the 1RM), but assign heavier loads (e.g., 70-85% of the 1RM) for non-hypertensive trained individuals to optimize insulin dynamics and glucose control
- Combining RT with endurance training will best optimize glucose management

Excessive abdominal obesity can create unique obstacles and warrant specific training goals as well. Severely obese clients may have difficulty using select machines properly. This should be considered before the client is put in an embarrassing situation. Large machines or free weights should be utilized to allow for proper biomechanics, technique and client comfort. Obese individuals may also experience discomfort performing prone activities (e.g., prone leg curl, opposite raises off the floor). Furthermore, their weight must be considered if stability or balance is required for the activity, or if it involves

notable impact forces. Orthopedic issues such as joint edema, tendinopathy and arthritis are also common among overweight clients, and can force the modification of exercise – such as adding time to the warm-up, limiting the range of motion due to balance or reducing the total load used. As it relates to dyslipidemia, personal trainers should be aware that clients taking lipid-lowering medications may experience additional muscle weakness and soreness (myopathy); especially with heavy eccentric exercise. Health professionals who work with a client who experiences prolonged, severe soreness while taking medications such as Statins should immediately refer them to their physician.

Again, cardiovascular activities should remain a primary emphasis for clients with MSyn, but appropriately-applied RT also provides significant benefits and should be part of a total lifestyle intervention for these individuals. As long as the previous considerations are fully understood and applied, personal trainers should be able to create life-changing benefits in this population over the course of a well-structured, periodized program – which will usually create long-term loyalty/retention as well as word-of-mouth recommendations amongst others who suffer from similar issues.

Keep clients SAFE



# CEU Quiz

## Weightlifting Prescription for Clients with Metabolic Syndrome

- 1. Metabolic syndrome is identified with the presence of \_\_\_\_\_ associated risk factors**
  - a. One
  - b. Two
  - c. Three
  - d. None of the above
- 2. An elevated waist circumference of  $\geq 35$  inches for men and  $\geq 40$  inches for women is a risk factor for metabolic syndrome.**
  - a. True
  - b. False
- 3. What is the appropriate time-under-tension for a hypertensive client during the concentric and eccentric phases of a lift?**
  - a. 1 sec concentric, 1.5 sec eccentric
  - b. 1.5 sec concentric, 2 sec eccentric
  - c. 1.5 sec concentric, 1.5 sec eccentric
  - d. 2 sec concentric, 1 sec eccentric
- 4. Before beginning a training session, a client has a glucose level of  $< 100$  mg/dL. Which of the following would be the appropriate recommendation from a personal trainer in order to reduce the risk of hypoglycemia during exercise?**
  - a. Consume 10-20g of carbohydrates
  - b. Consume 20-30g of carbohydrates
  - c. Consume 30-40g of carbohydrates
  - d. Carbohydrates should not be consumed before exercise
- 5. Which of the following would be the appropriate time to monitor the BP of a hypertensive client?**
  - a. Before the training session
  - b. During the training session
  - c. After the training session
  - d. All of the above are correct
- 6. Which of the following is not a sign of hypoglycemia?**
  - a. Seizures
  - b. Visual disturbances
  - c. Anxiety
  - d. Abnormal sweating
  - e. All of the above are signs of hypoglycemia
- 7. Which of the following exercises would best suit a severely obese client?**
  - a. Single leg MB chest pass on a Bosu
  - b. 12 inch continuous hurdle jumps
  - c. Front loaded MB half squats
  - d. Stability ball prone leg curls using bands
- 8. Cardiovascular activities combined with appropriately-applied resistance training has been shown to provide minimal additional benefit when compared to only performing cardiovascular activities among clients with metabolic syndrome.**
  - a. True
  - b. False
- 9. Which of the following is not a risk factor for metabolic syndrome?**
  - a. HDL levels of 30 mg/dL
  - b. Fasting blood glucose of 120 mg/dL
  - c. Serum triglyceride levels of 165 mg/dL
  - d. Blood pressure of 115/75 mmHg
- 10. Which of the following intensity ranges employed during a circuit would be best suited for hypertensive clients?**
  - a. 55-70% of the 1RM
  - b. 65-80% of the 1RM
  - c. 75-85% of the 1RM
  - d. 80-90% of the 1RM

### CEU Quiz Answer Sheet

#### Weightlifting Prescription for Clients with Metabolic Syndrome

**Directions:** 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. Mail a copy of the completed quiz with a check or money order for \$15 to NCSF, Attn: CEU department, 5915 Ponce de Leon Blvd, Suite 60, Coral Gables, FL 33146

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_ 4. \_\_\_\_\_

5. \_\_\_\_\_ 6. \_\_\_\_\_ 7. \_\_\_\_\_ 8. \_\_\_\_\_

9. \_\_\_\_\_ 10. \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City, State, Zip \_\_\_\_\_

Phone \_\_\_\_\_

Member# \_\_\_\_\_

**Questions? 800-772-NCSF**

# 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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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  
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Coral Gables, FL 33146

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