

# 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.



# Hypertension in Physically Active People

Most people do not associate cardiovascular disease with people who are physically active, but it is a reality for millions of Americans. High blood pressure is the most common cardiovascular disease found in the United States. It's estimated that one out of ten adults between 20 and 30 and one out of four adults 30-60 years of age have some degree of hypertension. Hypertension is defined as a blood pressure of or above 140 mmHg over 90 mmHg. The dynamics of blood pressure and the lifestyle associated with the western culture make it a component of the cardiovascular system susceptible to the beginning stages of the disease relatively early in a person's life. Although it is true that sedentary people have an increased risk for hypertension, the disease is only 50% less common in individuals classified as physically active. This suggests that although physical activity may play a positive role in reducing the risk of developing the disease, it may not be enough to prevent it alone.

Interestingly, the disorder often begins early in life while many people are at the peak of their activity. Due to the fact that there is an inverse relationship between physical activity and risk of hypertension with age, the problem becomes inherently worse. This explains the statistical evidence of increased risk with age. Personal trainers must become aware of the prevalence of the disorder and the risks hypertension poses to their clients. Many of the clients working with personal trainers fall along a continuum of health and physical fitness levels. Some clients are very fit, while others teeter on sedentary life without the two sessions of PT a week. With this in mind it becomes important that trainers identify individuals with hypertension and those moving towards the disease. This requires proper screening protocols with adequate history that focuses on behaviors that may affect blood pressure.

Individuals that yield elevated blood pressure responses at rest may do so because of routine lifestyle habits. Behavioral factors include a high intake of sodium and saturated fat, regular consumption of alcohol, tobacco, stimulants including diet pills; caffeine and decongestants, all can elevate blood pressure. Individuals taking supplements should be questioned about the contents. Stimulants such as guarana, ma huang, and ephedra are popular substances found in supplements, and all can increase blood pressure response rather significantly. Likewise, stress should be evaluated during the history to identify if certain behaviors or environments make the person more susceptible to elevated blood pressure. Chronic environmental

or social stress often result in higher levels of circulating catecholamines and chronic neurogenic activation of the sympathetic nervous system, leading to elevations of blood pressure at rest.

If resting measures consistently exceed 160/100 mmHg or values close to this reading are repeated on different days the client should be referred to a physician. Many people go about their day without knowing that they are hypertensive, hence the term "silent killer". Personal trainers should make blood pressure assessments a common part of their initial and subsequent assessments of physical fitness.

Individuals with hypertension are often instructed to follow pharmacological and nonpharmacological treatment regimens. Nonpharmacological interventions often include stress management, aerobic exercise, weight loss, salt reduction (the average American consumes more than 2x the RDA), reduced alcohol and caffeine consumption, and recommendations regarding food choices, particularly those high in fiber and low in fat. When the disease is more severe doctors will recommend drug therapy. There are several drugs on the market to treat hypertension. The most common categories include beta blockers, ACE inhibitors, diuretics, calcium channel blockers and alpha blockers. Each drug has a different way of reducing elevated blood pressure. Since blood pressure is a product of cardiac output and peripheral resistance each category acts upon one or more of the factors that effect the equation.

Individuals taking blood pressure medication require a medical referral before engaging in activity. In almost all cases doctors will clear and recommend regular exercise participation. This means personal trainers are all but guaranteed to work with hypertensive clients. For this reason, trainers must become familiar with the drugs and the interactions they have with varying physiological environments. Additionally, other disorders and medications can compound the potential problem. For instance, hypertension often accompanies Type II diabetes, and common over the counter nonsteroidal anti-inflammatory medications decrease the action of some hypertension meds, like beta blockers, ACE inhibitors and diuretics. Personal trainers should know their client's actions and behaviors to make the most educated program decisions.

The first step is identifying the prescription medications taken and how they affect their client's physiology. Due to the fact that some medications have adverse effects on exercise tolerance, trainers and clients should monitor the effects and

make the appropriate adjustments. Each medication has a different effect as they address different components of blood pressure.

Beta blockers are categorized into noncardioselective and cardioselective drugs. Noncardioselective beta blockers (NCSBB) significantly decrease contractility of the heart and decrease the heart rate. They often cause exercisers to perceive greater exertion at relative intensities. Individuals taking these medications will have lower exercise heart rates and therefore cannot use the estimation of maximal heart rate formula for exercise prescription. Some, but not all individuals taking NCSBB will experience a reduced exercise capacity.

Cardioselective beta blockers (CSBB) often have fewer side effects, but still impair cardiac output and maximum oxygen uptake. These meds are often less favorable for physically active persons due to the effect on oxygen uptake. In some cases beta blockers are combined with alpha-blockers to reduce the impairment of muscle blood flow by decreasing systemic vascular resistance. This allows for reduced pressure without the extent of reduced oxygen uptake found with beta blockers alone. Alpha blockers (receptor antagonists) inhibit postsynaptic alpha arteriolar smooth muscle receptors. As mentioned, they serve to decrease systemic vascular resistance without affecting the cardiac muscle. Alpha blockers are often used with combined cases of hypertension and diabetes because they will not exacerbate either condition.

Diuretics have become increasingly common in the treatment of hypertension. Thiazide diuretics are often recommended as the initial treatment of hypertension. They work by decreasing plasma volume, cardiac output, and vascular resistance. They are not as strong as loop diuretics and are considerably less expensive. They may be a valid choice for individuals who only casually engage in moderate activities. They are not ideal for physically active individuals because of their common side effects: muscle cramps, orthostatic hypotension, increased rate of mineral loss and risk of rhabdomyolysis. Loop diuretics are not appropriate for any physically active person. They are much stronger than thiazide diuretics and magnify the side effects. Individuals exercising on diuretics should see their doctor about possibly changing the medication.

ACE inhibitors are another fairly common drug, although few people know what they do. They work by blocking the conversion of angiotensin I to angiotensin II. Angiotensin II is a powerful vasoconstrictor and source of sodium retention. When ACE inhibitors are used they have a mild affect on heart rate (decrease), stroke volume (increase) and total peripheral resistance (decrease). They have little, to no effect on energy metabolism and cause no impairment of cardiac function. For these reasons they are often the first choice for physically active people with hypertension, particularly those with diabetes. One concern though is postural hypotension post exercise. To combat this, trainers should employ longer cool down sessions.

Calcium channel blockers are the last category of hypertensive medications reviewed here. They reduce the calcium concentration in vascular smooth muscle cells, which decreases

systemic vascular resistance and causes general vasodilation. The drugs do this by inhibiting calcium slow channel conduction. They are generally classified as dihydropyridines and nondihydropyridines. Although they do not have a major effect on energy metabolism during exercise and maximum oxygen uptake is generally preserved, they do have some side effects. Dihydropyridines (Norvasc and Procardia) can cause reflex tachachardia, fluid retention, and vascular headaches, while nondihydropyridines can cause heart rate suppression, minor impairment of maximal heart rate, and decreased left ventricular contractility. Calcium channel blockers are usually well tolerated by physically active people particularly the dihydropyridines, which are often used for active blacks with hypertension.

Given this information personal trainers should expect to encounter these and other medications when screening and working with clients. Due to the fact that exercise has a strong effect on high blood pressure it should be a part of nonpharmacology treatment for the management of the disease. The key is to understand how the medications affect the activity, and select appropriate intensities for the client. Clients should make their doctors aware of their activities to ensure their medication is appropriate for their level of training

The exercise recommendations should focus on aerobic exercise as it yields positive effects on resting blood pressure. Regular aerobic activity has been shown to reduce systolic blood pressure by as much as 8-10 mmHg and diastolic blood pressure by 6-10 mmHg, respectively. This benefit is independent of other treatment activities (weight loss and diet), which can contribute to greater reductions, if followed routinely. Exercise can begin to reduce blood pressure fairly rapidly with changes occurring in the first few weeks of activity. Further reductions can occur if the exercise is maintained for more than 3 months.

The intensity of the exercise does not have to be too demanding to be effective. It appears the frequency is the major component. Aerobic exercise should be performed most days of the week. Weight training can also benefit blood pressure by contributing to improved overall health, but trainers should be cautioned to avoid isometric and heavy resistance training with clients. Repetition ranges should be between 10-15 with appropriate volume (1-3 sets). Exercises that require higher amounts of intraabdominal pressure should also be limited. Common examples are the back squat, deadlift and leg press. These exercises cause dramatic increases in pressure and are often accompanied by the valsalva maneuver for increased stability.

There is no question about the link between physical activity and high blood pressure. Hypertension is most common in those who do not engage in physical activity and those with higher levels of body fat. As mentioned earlier sedentary individuals have a 50% greater risk of developing hypertension and have higher death rates than fit individuals with hypertension. Evidence suggests that living a very active lifestyle is one of the best ways to avoid or manage high blood pressure. ●

# CEU Quiz

## Hypertension in Physically Active People

- Hypertension is defined by a resting blood pressure measurement of:
  - 110/70 mmHg
  - 135/85 mmHg
  - 140/90 mmHg
  - 160/100 mmHg
- The risk for a physically active person developing high blood pressure is \_\_\_\_\_% less than that of a sedentary person at the same age.
  - 10
  - 30
  - 50
  - 70
- Which of the following lifestyle habits contribute to hypertension?
  - Smoking
  - Regular consumption of alcohol
  - Frequent caffeine intake
  - Stress
  - All of the above
- Which of the following is a nonpharmacological treatment recommended for hypertensive patients?
  - Aerobic exercise
  - Sodium reduction
  - Weight loss
  - All of the above
- Which of the following medications have notable affect on cardiac output?
  - ACE inhibitors
  - Beta Blockers
  - Calcium Channel Blockers
  - All of the above
- When screening a client, if they are identified as hypertensive and currently taking diuretics to manage the disease what would be the correct course of action?
  - Monitor blood pressure during exercise
  - Increase training intensity to adjust cardiovascular alterations
  - Decrease water intake during exercise to reduce antidiuretic hormone production
  - Refer the client to a physician for clearance into an exercise program
- Which of the following medications is commonly used for diabetic clients with hypertension?
  - Diuretics
  - Ace inhibitors
  - Calcium channel blockers
  - Alpha blockers
- When training previously sedentary clients between the ages of 30 and 60 years what are the chances they will be hypertensive?
  - 5%
  - 15%
  - 25%
  - 50%
- What affect will diet pills containing ephedra, ma huang or guarana have on resting and exercise blood pressure?
  - Decrease
  - Increase
  - No effect
- What type of exercise is the most valid choice for reducing blood pressure at rest?
  - Weight lifting
  - Cardiovascular training
  - Yoga
  - Pilates

# 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