

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.



Exercise Programming for **Special** Populations

Dynamic changes in the health of the country are leading more people to the services and knowledge of a certified personal trainer. Personal trainers are finding greater responsibilities related to providing the appropriate exercise prescription for each of a wide variety of special populations. Most personal trainers are very comfortable training a client who is apparently healthy, between 18-40 years of age without any major medical conditions. When presented with the additional challenges of programming for what are collectively referred to as special populations, some trainers may fall short in their programming due to a lack of knowledge about a certain niche group, in particular the programming considerations necessary for safe and effective exercise prescription for children, older adults, and those individuals with pre-existing medical conditions such as diabetes. This article will provide an overview of the key points to keep in mind when considering program objectives for these populations.

Children

Children can be a difficult, yet very rewarding, population to work with as a personal trainer. Depending on the specific type of training, children may experience different responses to the activity when compared to the adult population. In addition, due to developmental concerns, a personal trainer will want to adhere to accepted practices specific to working with this population. There are four primary goals each trainer should focus on when working with children: 1) improve overall health and fitness; 2) initiate an active lifestyle habit that will hopefully continue throughout life; 3) decrease disease risk; and 4) make it fun. Specific programming recommendations for children include an accumulation of at least 60 minutes and up to several hours of age-appropriate physical activity most days of the week. In addition, 15 minutes of vigorous activity, done on

an intermittent basis, should be included during each day of activity. Trainers should also offer a variety of activities to make sure that their young clients stay interested in the program and are exposed to a wide array of activities. This will increase the likelihood of a child staying active on a regular basis, and will also assist in motor skill acquisition.

Children exhibit a few acute and chronic adaptations to exercise that are worth noting. Compared with an adult population, children are similar in their acute response to exercise in VO_2 (max) and the utilization of their creatine phosphate and ATP stores. This means that endurance activities, as well as short duration, intense exercises can be handled well by children. However, it is important to note that when compared to an adult population, children have a reduced capacity to utilize ATP via glycolysis, translating into a reduced ability to perform intense activity lasting between 10-120 seconds. In addition, children often have a reduced ability to dissipate heat and regulate internal body temperature. Trainers need to be aware of this when programming activity to prevent heat-related illnesses. An interesting characteristic of children is their collective ability to reach steady-state levels of oxygen uptake quicker than adults. This corresponds with a lower oxygen deficit at the onset of exercise and a correspondingly low oxygen debt, thereby reducing recovery time back to baseline.

Chronic exposure to exercise will result in a variety of adaptation responses in children, which for the most part, are very similar to those seen in an adult population. Over 60% of studies examining children's response to exercise have found that chronic adaptations include improved musculoskeletal and cardiovascular health, improvement in levels of adiposity in those who are overweight, and decreases in blood pressure for those who were mildly hypertensive at the start of a program. Additional long-term effects include improved self-confidence and academic performance, reduced levels of anxiety and depression, and

improved blood pressure and lipid profiles. In broad perspective, children are one of the most important niche markets for personal trainers, especially as activity levels in schools continue to decrease, while levels of childhood obesity and the early onset of Type II diabetes rises. Trainers who can program exercise effectively can be very successful working with this population, and many find the work to be extremely rewarding, particularly when looking at the long-term adaptations that can occur.

Older Adults

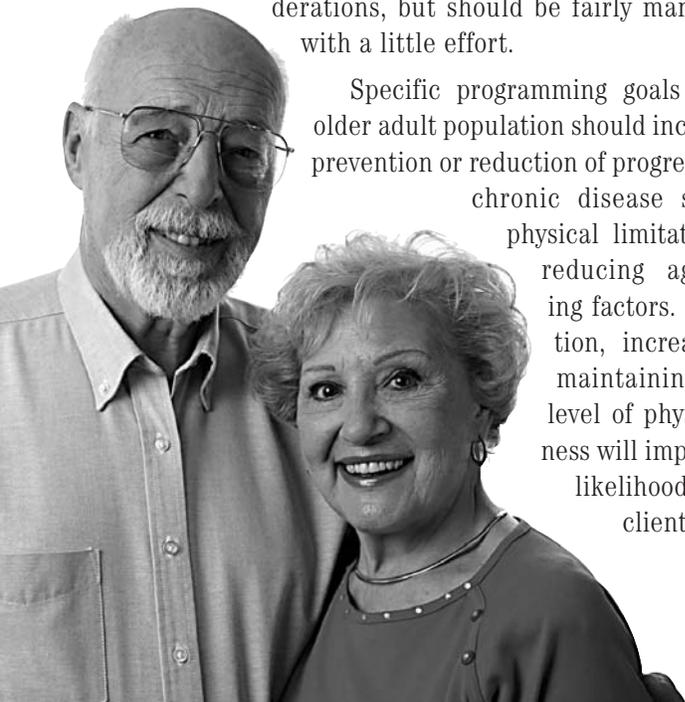
On the other end of the age spectrum, one of the largest developing markets for personal trainers may be working with the older adult (classified as >65 years of age). As with any special population, the older adult has a number of characteristics specific to exercise programming that are important to note for safe and effective exercise participation. Each and every client you work with will present different abilities or limitations. However, there are some statistics that can provide a general overview of this population. Nearly 55% of individuals over the age of 65 report having at least one disability, with just over a third (37%) reporting a severe disability. Disabilities are classified as conditions that limit an individual's ability to perform activities of daily living (ADLs) such as cooking and shopping. In addition to the likelihood of working with a client who has a disability, the probability is also high that they will have at least one chronic medical condition such as hypertension (49%), arthritis (36%), heart disease (31%), or diabetes (15%). Exercise programming that accounts for these conditions may require additional considerations, but should be fairly manageable with a little effort.

Specific programming goals for the older adult population should include the prevention or reduction of progress of any chronic disease state or physical limitation and reducing age-limiting factors. In addition, increasing or maintaining the level of physical fitness will improve the likelihood that a client will be

able to maintain or improve their level of independence, a common goal of all older adults. Many adaptations to exercise are similar in older adults as are observed in younger adults. Improved blood lipid profiles, decreased level of body fatness, lower blood pressure, and improved glucose tolerance and insulin sensitivity will result from regular exercise participation.

Two key components of physical fitness a trainer should focus on specific to this population are aerobic capacity and bone density. Aerobic capacity (VO_2 max) decreases approximately 1% per year in both men and women due primarily to reduced cardiac output in conjunction with reduced oxygen extraction capabilities. Regular aerobic conditioning can maintain current levels of aerobic capacity, and over time has been shown to actually improve VO_2 by 10%-30% if the level of training is of high enough intensity to foster adaptation responses. Accelerated decreases in bone mineral density are also a concern for the older adult, mostly due to reduced levels of activity and decreased amounts of calcium in the diet. Exercise prescription should include weight-bearing activities and resistance training. This will increase bone stress, positively affecting bone density. Prescribing exercise that will increase the strength of all muscle groups will also increase bone density, due to the stress placed on the attachment points of the bone during force production. If osteoporosis is a concern, be cautious of the wrist, vertebrae, and hip as they are often most affected by the disease. Likewise, if osteoarthritis is a factor, use longer warm-ups and lower volumes and intensities.

Due to general functional decline with age, exercise programs focusing on improving balance and coordination can have excellent results related to a reduction in falls and the consequent injuries. It is important to evaluate individual clients for adequate baseline levels of muscular strength and endurance, as well as aerobic capacity. Strength training for the older adult should utilize a repetition range of 10 to 15, with an associated rate of perceived exertion (RPE) of 12-13. The exercise routine should be completed at least twice a week, with 48 hours of rest between training sessions. As with any population, proper lifting technique should be stressed as well as moving through a pain-free range of motion. Activities centering on balance training, resistance training, walking, and weight transfer, when completed consistently will result in an older adult less likely to fall. Independent factors such as vision, medications, and environmental factors may also need to be addressed prior to programming. A personal trainer has many tools in his/her repertoire to pull from when working with this population. Ideally, a combination of strength training utilizing total body movements and a selection of



the most functional activities possible will result in positive adaptations for older adults.

Diabetes

The probability of a trainer encountering a client with either type I or type II diabetes is increasing everyday. It has recently been estimated that more than 20 million Americans have diabetes, with nearly 90% of those cases being type II diabetes. Although the development of type II diabetes can be related to genetics, a large portion of those individuals with type II diabetes can trace their development of the disease to low levels of activity, being overweight or obese, and having poor nutritional habits. It should not be surprising that personal trainers can play a large role in the prevention and reduction in risk of individual development of type II diabetes by programming for increased levels of activity and recommending a decreased caloric intake along with healthier food choices. However, once an individual has been diagnosed with diabetes, there are a few guidelines personal trainers must follow to ensure safe and effective exercise programming.

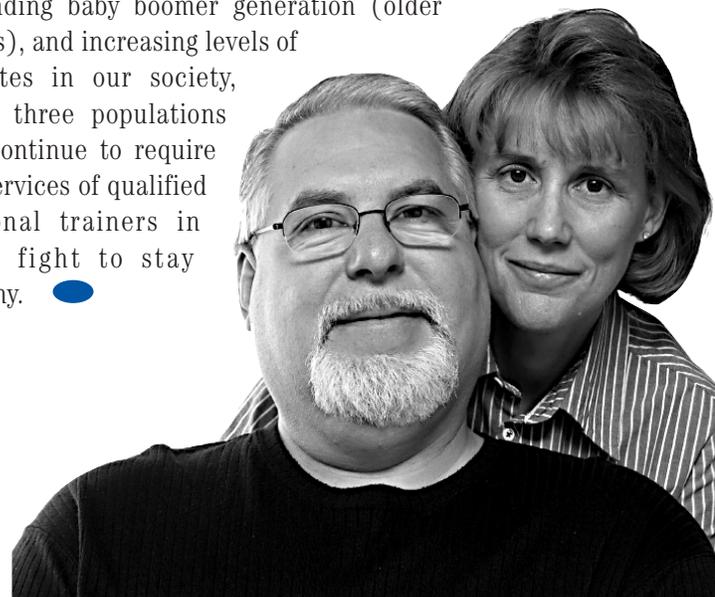
Although exercise cannot prevent or cure type I diabetes, regular exercise participation should be encouraged to reduce the consequences of the disease and improve health status. Exercise will lead to improvements related to insulin sensitivity and an overall reduction in the risk of disease development, a similar occurrence to what is observed in a healthy population with exercise. Prior to exercising a client with type I diabetes, certain precautions should be taken to avoid exercise-induced hypoglycemia: measure blood glucose immediately before and 15 minutes after exercise, avoid exercise during times of peak insulin action, reduce insulin dose on days of planned exercise, avoid exercise late at night due to the possibility of hypoglycemia occurring at night, and extend the warm-up and cool-down periods.

Exercise can be beneficial in both the prevention and treatment of type II diabetes. Two of the more common traits of individuals with type II diabetes are obesity and physical inactivity. Research shows that individuals who exercise regularly are 30% to 50% less likely to develop type II diabetes compared to their less active counterparts. Among the list of benefits of regular physical activity for those with type II diabetes are: lower fasting blood glucose concentrations, improved glucose tolerance and insulin sensitivity, increase in lean mass and a reduction in fat mass, improved lipid profile and blood pressure, and lower risk of cardiovascular disease. Ideal programming for an individual with type II diabetes should require the individual to expend at least 1,000 kcals/week from aerobic activity. At least 3

nonconsecutive days are recommended, although individuals looking to maximize caloric expenditure and glucose control may exercise daily. A typical exercise session should last at least 15 minutes, with an ultimate goal of total accumulated time between 30 to 60 minutes. While walking or jogging are great methods to increase caloric expenditure, swimming and other non-impact exercise may be necessary for those with peripheral nerve damage.

Resistance training is also a suggested mode of exercise for individuals with type II diabetes. Weight training will result in the maintenance or even increase of muscle mass, thereby resulting in an increased resting metabolic rate and positively affecting caloric balance and weight management. In addition, weight training will improve an individual's glucose tolerance and insulin sensitivity. Resistance training programs for individuals with type II diabetes should focus on 8-10 major muscle groups and utilize repetition ranges of 10 to 15 at least 2 days/week. Oftentimes these individuals have a history of poor levels of physical activity and nutrition. Goals should be realistic, exercise prescription should progress at a slow pace, and the client's needs and preferred activities should be included in a well-designed exercise program.

Personal trainers need to be aware of programming considerations for all populations they may come in contact with in a gym or fitness facility. Understanding the training adaptations and any special exercise considerations is necessary in order for safe and effective programming. If individual considerations are ignored when dealing with a special population adverse effects may result. Children, older adults, and individuals with diabetes represent only a few of the special populations one may encounter in personal training. Given the current trends within the fitness industry such as childhood obesity, an ever expanding baby boomer generation (older adults), and increasing levels of diabetes in our society, these three populations will continue to require the services of qualified personal trainers in their fight to stay healthy. ●



CEU Quiz

Exercise Programming for Special Populations

- One of the primary programming recommendations for a trainer working with children is the accumulation of at least _____ minutes of physical activity.
A. 15 B. 30 C. 60 D. 120
- Due to children's _____, they may have difficulty performing intense exercise lasting between 10-120 seconds.
A. decreased VO_2 max
B. decreased utilization of ATP via glycolysis
C. increased utilization of ATP via glycolysis
D. increased VO_2 max
- Children more readily reach _____ when compared to an adult population.
A. VO_2 max
B. steady-state of oxygen uptake
C. repetition maximums
D. all of the above are correct
- Nearly _____ of individuals over the age of _____ report having at least one disability.
A. 35%; 65 B. 45%; 55 C. 55%; 65 D. 65%; 55
- A 1% reduction, per year, in aerobic capacity occurs in both sedentary men and women as a result of _____.
A. improved flexibility
B. reduced cardiac output and oxygen extraction capabilities
C. increases in bone mineral density
D. reduced levels of body fatness with age.
- To appropriately combat functional decline with age, personal trainers should incorporate _____ into their training matrix for older adults.
A. balance training
B. strength training
C. load-bearing exercises
D. all of the above are correct
- The development of type II diabetes can be linked with all of the following except:
A. poor nutritional habits
B. low levels of physical activity
C. being overweight
D. regular exercise participation
- _____ is(are) a result of regular exercise participation for individuals with type I diabetes.
A. Improved insulin sensitivity
B. Better nutrition
C. Decreases in flexibility and strength
D. Decreased blood glucose control
- All of the following are positive adaptations that result from regular exercise participation for individuals with type II diabetes, except:
A. decreased blood glucose control
B. improved lipid profile
C. lower fasting blood glucose
D. decreased risk of cardiovascular disease
- Which of the following correctly portrays a resistance training program for an individual with type II diabetes?
A. focus on lower body, 6-8 exercises; complete 10-15 repetitions, everyday
B. focus on upper body, 8-10 exercises; complete 3-5 repetitions, at least twice/week
C. focus on total body, 10-12 exercises; complete 6-8 repetitions, once a week
D. focus on total body, 8-10 exercises; complete 10-15 repetitions, at least twice/week

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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Account No. _____

Exp. Date _____

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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