The 25 Most Significant Health Benefits of Physical Activity & Exercise

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Common health issues that can be positively affected, prevented or controlled by exercise.

People of all ages can improve the quality of their lives and reduce the risks of developing coronary heart disease, hypertension, some cancers and type 2 diabetes with ongoing participation in moderate physical activity and exercise. Daily exercise will also enhance one's mental well-being and promote healthy musculoskeletal function throughout life. Although habitual physical activity is an attainable goal on the path to a healthier life, more than half of U.S. adults do not get ≥ 30 minutes of moderate-intensity exercise per day at least 5 days per week (Centers for Disease Control and Prevention [CDC] 2007a).

A formidable challenge facing many personal fitness trainers and other health and fitness professionals is finding new ways of motivating people to improve their well-being through consistent participation in physical activity and exercise. As indicated, significant health benefits can be obtained by engaging in moderate amounts of physical activity on most, and preferably all, days of the week (American College of Sports Medicine [ACSM] 2006). Fitness programs involving progressively increasing intensities of exercise will elicit even greater cardio protective benefits (Swain & Franklin 2006). There is a growing understanding of how certain levels of physical activity may positively affect cardiovascular, musculoskeletal, respiratory and endocrine function, as well as mental health. This article sums p the evidence on 25 significant benefits linking physical activity to health enhancement. Some of the benefits have been grouped together because of their physiological or metabolic associations.

1. Cardiovascular Disease

The leading health-related cause of mortality for men and women in the U.S. is cardiovascular disease (ACSM 2006). Meaningful cardiovascular health benefits may be attained with long-term participating in cardiovascular exercise. How much exercise is enough? ACSM sought to address that question properly last year when it update its stance on the recommended quantity and quality of exercise for developing and maintaining cardiorespiratory and muscular fitness, and flexibility, in healthy adults (ACSM 2006). Higher levels of cardiovascular fitness are associated with a 50% reduction in CVD risk in men (Myers et al. 2004). Myers and colleagues demonstrated that increasing physical activity to a total of at least 1,000 kilocalories per week is associated with a 20% reduction of mortality in men. Hu and colleagues (2004) showed that physically inactive middle-aged women (engaging in less than 1 hour of exercise per week) doubled their risk of mortality from CVD compared with their

physically active female counterparts. It should be emphasized that Haskell (2003) notes that CVD is a multifactor process and that "not smoking, being physically active, eating a heart-healthy diet, staying reasonably lean and avoiding stress and depression are the major components of an effective CVD prevention program."

2-4. Diabetes, Insulin Sensitivity and Glucose Metabolism

Diabetes has reached endemic proportions, affecting 170 million individuals worldwide (Stumvoll, Goldstein & van Haeften 2005). One unfortunate health consequence of physical inactivity is the weakening of the body's insulin regulatory mechanisms. Elevated insulin and blood glucose levels are characteristic features involved in the development of non-insulin-dependent diabetes mellitus. When insulin function starts breaking down, the body's blood sugar levels rise, leading eventually to the onset of "prediabetes" and then type 2 diabetes. Diabetes incidence is growing among youth and adults, largely as a result of obesity and inactivity. Regular aerobic exercise meaningfully increases insulin sensitivity and glucose metabolism, which means the body's cells can more efficiently transport glucose into the cells of the liver, muscle and adipose tissue (Steyn et al. 2004). Improvements in glucose metabolism with strength training , independent of alterations in aerobic capacity or percent body fat, have also been shown (Pollock et al. 2001). Although the mechanisms for improvement are not fully understood, it appears that both resistance training and aerobic exercise offer a strong protective role in the prevention of non-insulin-dependent diabetes mellitus.

5. Hypertension

Hypertension is a major health problem. Elevated systolic and diastolic blood pressure levels are associated with a higher risk of developing coronary heart disease (CHD), congestive heart failure, stroke and kidney failure. There is a one fold increase in developing these diseases when blood pressure is 140/90 millimeters of mercury (mmHg) (Bouchard & Despres 1995). In many cases, clients can reduce elevated blood pressure by decreasing weight and lowering alcohol and salt intake in their diet. PFT's and fitness instructors can also pass along the good word to clients that moderate intensity aerobic exercise (40% - 50% of VO2max), performed 3-5 times per week for 30-60 minutes per session, appears to be effective in reducing blood pressure (when elevated). The evidence that higher-intensity exercise is more or less effective in managing hypertension is at present inconsistent, owing to insufficient data. In a recent meta-analysis of 54 clinical aerobic exercise intervention trials, findings (in hypertensive men and women) included a reduction, on average, of 3.84 mmHg for diastolic blood pressure (Whelton et al. 2002). Although routine aerobic exercise usually will not affect the blood pressure of normotensive individuals, habitual aerobic exercise may be protective against the increase in blood pressure commonly seen with increasing age (Fagard 2001).

During resistance exercise, systolic and diastolic blood pressures may show steep increases, which indicates that caution should be observed with persons with known CVD or CVD risk factors. These increases in blood pressure are dependent on the intensity of the contraction, the length of time the contraction is held and the amount of muscle mass involved in the contraction. More dynamic forms of resistance training, such as circuit training, that involve moderate resistance loads and high repetitions with short

rests are safe and associated with reductions in blood pressure (Pollack et al. 2001). Although there is relatively little research on blood pressure and resistance exercise as compared to aerobic training/blood pressure studies, one recent metaanalysis of resistance exercise intervention trials found decreases of 3.2 mmHg and 3.5 mmHg for systolic and diastolic blood pressures, respectively (Cornelissen & Fagard 2005).

6. Blood Triglycerides, HDL Cholesterol and LDL Cholesterol

The link between cholesterol and CHD has been fairly well established through long-term studies of individuals with high levels of blood cholesterol and the incidence of CHD. As high-density lipoprotein cholesterol (HDL-C) (good cholesterol) levels increase, they are independently associated with lower risk of CHD (Neiman 2003). It is also well established that a sedentary lifestyle contributes significantly to the development of CHD and to unfavorable elevation of blood fats and cholesterol levels; physical activity plays an important role in decreasing these health risks.

The exercise thresholds established from longitudinal and cross-sectional training studies indicate that 15-20 miles per week of jogging or brisk walking, which is equivalent to 1,200 -2,2000 kilocalories of energy expenditure, may decrease blood triglycerides by 5-38 milligrams per deciliter (mg/dl) (Durstine et al. 2002). That same threshold of exercise (15-20 miles per week of jogging or brisk walking gas been shown to elevate HDL-C (a positive alteration) by 2-8mg/dl. Durstine and colleagues further conclude that exercise training studies rarely show a decrease in total cholesterol or LDL-C (the bad cholesterol), unless there is a loss of body weight or a decrease in dietary fat (or both). The serum level of LDL-C has been shown to be significantly reduced among women (a decrease of 14.5±22.2mg/dl) and men (a decrease of 20.0 ±17.3 mg/dl) randomly assigned to a diet- plus-exercise group, as compared to a control group (women had a decrease o 2.5±-16.6mg/dl; men had a decrease of 4.6±21.1mg/dl) (Stefanick et al. 1998).

Although some studies have shown a favorable impact of resistance training on blood lipids, others have reported no change. It may be that the resistance programs that best modify blood lipid profiles incorporate larger muscle mass and multisegment exercises with a high total-volume (reps x sets x load) prescription. Additional research needs to be conducted that controls for body composition changes, day-to-day variations in lipoproteins, dietary factors and possible other training adaptations, to provide a more credible summary of the effect of resistance training on blood lipids and lipoproteins.

9. Stroke

Physical activity exerts a positive effect in lessening the risk of stroke in men and women. Individuals who engage in moderate to high amounts of physical activity have a lower risk of stroke incidence compared with people who accumulate little exercise. Statistics show that those who are moderately active have a 20% lower risk of stroke while those who are highly active have a 27% lower risk of stroke (Sacco et al. 2006). Sacco and colleagues suggest that moderate to high levels of physical activity tend to lower blood pressure (if high); reduce body weight (if over fat); enhance vasodilatation of blood vessels (widening of interior of blood vessels); improve glucose tolerance (how

body breaks down glucose); and promote cardiovascular health . The implementation of progressive aerobic exercise (for cardiovascular health) and strength training (for mobility and balance) is recommended to reduce the risk of stroke on recurrent stroke (Sacco et al. 2006).

10-13. Colon, Breast, Lung and Multiple Myeloma Cancers

Physical activity and exercise are correlated with a lower incidence of colon cancer in men and women, and breast cancer in women. Lee (2003) reports that moderate to vigorous physical activity has a greater protective effect than lower intensities of physical activity. She notes that physically active men and women have a 30% - 40% reduction in relative risk for colon cancer compared with their inactive counterparts. It seems that about 30-60 minutes of moderate to vigorous exercise per day is needed for this risk reduction, with higher levels of exercise showing even lower risk. In addition, physically active women have a 20% - 40% reduction in relative risk for breast cancer compared with their inactive counterparts. It also appears that the 30-60 minutes of moderate to vigorous exercise per day is needed to elicit this level of risk reduction. Although more research is needed, it appears that physically active individuals may also have a lower risk of lung cancer, although lung cancer is relatively uncommon in non-smokers (Lee 2003).

Multiple myeloma cancer is more common in persons after the age of 50 (Robert-McComb 2007). Robert-McComb explains that with multiple myeloma, genetic damage occurs to plasma cells, transforming them into malignant or myeloma cells. Chronic fatigue is frequently reported and is a distressing side effect of multiple myeloma—as it is of many cancers. However, patients who walk 3-5 days per week for 15-30 minutes per session and do light resistance exercise (2-3 times per week) have demonstrated an increased overall quality of life.

The research is clear that there is no association between the incidence of rectal cancer and exercise (Lee 2003). The data is also somewhat inconsistent regarding whether exercise can have a positive influence on lowering the risk of prostate cancer in men. Clearly, the present research on physical activity and cancer prevention indicates that exercise has a different association with various site-specific cancers.

14. Osteoporosis

Physical activities that stimulate bone growth need to include progressive overload and must address variation and specificity of load. Specificity of load refers to exercises that directly place a load on a certain region of the skeleton. With osteoporosis, a degenerative disease characterized by a loss of bone mineral density resulting in a susceptibility to bone fractures and health problems, it appears that resistance training and weight-bearing aerobic exercise may provide the needed stimulus for bone formation (Kohrt et al. 2004). Progressive overload is necessary so the bone and associated connective tissue do not exceed the critical level that would place them at risk. Exercise programs to maintain and increase bone growth should be full-body in nature, including exercises such as squats and lunges, which direct the forces through the axial skeleton and allow for greater loads to be used. In addition, evidence does suggest that moderate weight-bearing activity, such as brisk walking done regularly, and on long-term basis, is effective in averting age-related bone loss. Harder relative intensities of effort and greater volumes of physical

activity are more effective in increasing bone density. Kohrt and colleagues recommend doing weight-bearing endurance activities 3-5 times per week and resistance exercise 2-3 times per week for a total of 30 -60 minutes of exercise per day to preserve bone health during adulthood.

15-16. Musculoskeletal Health and Sarcopenia

Muscle mass, strength, power and endurance are essential contributing factors for the improvement of musculoskeletal health and the enhancement of movement capabilities (Marcell 2003). Although these components of musculoskeletal health show substantial decreases with age, it has been suggested in the Marcell research that this is due largely to a decrease in physical activity, and not solely to age.

Sarcopenia is the age-related loss of muscle mass and strength (Marcell 2003). Marcell adds that the rate of muscle loss with age is relatively consistent, approximately 1%-2% per year starting at age 50. He notes that there is a linear relationship with loss of muscle strength and loss of independence, contributing to falls, fractures and admissions into nursing homes. In addition, there is a decrease in metabolic rate and maximal oxygen consumption (owning to the loss of muscle mass).

Improved musculoskeletal health may allow elderly persons to perform activities of daily living more effectively and with less effort (ASCM 2006). ACSM's 2006 resistance training guidelines for elderly persons suggest performing at least 1 set of 8-10 exercises that use all of the major muscle groups. Each set should include 10-15 repetitions that elicit a somewhat hard intensity for the active older exerciser. For sarcopenia prevention, multijoint exercises on machines are recommended, because these exercises require less skill and may allow the user to more easily control the exercise range of motion.

17-18. Body Composition and Obesity

Obesity has risen to epidemic levels in the U.S., with more than 65% of adults overweight and 31% obese (ACSM 2006). According to the CDC (2007b), overweight and obesity are associated with increased risk for hypertension, osteoarthritis, abnormal cholesterol and triglyceride levels, type 2 diabetes, coronary heart disease, stroke, gallbladder disease, sleep apnea, respiratory problems and some cancers (endometrial, breast and colon).

The most favorable approach to weight loss is one that includes committed cardiovascular exercise, resistance training and caloric restriction within a sound behavioral-modification delivery program. Weight loss is achieved most effectively when cardiovascular exercise is increased up to 200-300 minutes of moderate-intensity activity accumulated over 5-7 days per week (which is equivalent to expanding ≥2,000 kilocalories per week exercising) (ACSM 2006).

Resistance training and circuit training research has shown meaningful changes in body composition (Marx et al. 2001). One of the noteworthy benefits of resistance exercise, as it relates to body composition, is the positive impact of maintaining or increasing fat-free body mass while encouraging the loss of fat body weight in a progressive overload resistance training program.

19. Arthritis

Arthritis is a broad term referring to more than 100 rheumatic diseases. Of the many types of arthritis, osteoarthritis (a degenerative joint disease) and rheumatoid arthritis (an inflammatory disorder affecting multiple joints) are the two most prevalent (Maes & Kravitz 2004). Arthritis is a health problem commonly characterized by stiffness, pain and loss of joint function, and it affects people of all ages, genders and ethnic groups. It may imperil the physical, psychological, social and economic will-being of individuals, depriving them of their independence. Physicians commonly prescribe exercise as a treatment modality for arthritis. Consistent exercise improves aerobic capacity, muscle strength, joint mobility, functional ability and mood, without apparent increases in joint symptoms or disease. (Finckh, Iversen, & Liang2003). Exercise has been proposed to have a pain-relieving effect similar to that of a pharmacological treatment for some people. However, Finckh and colleagues suggest guarded caution when designing exercise for patients who have significant joint damage, especially in their weight-bearing joints. The authors add that high-impact exercise is contraindicated in many cases of arthritis and should be replaced with swimming, aquatic walking and biking, or other aquatic exercise—which are much safer on the weight-bearing joints. Exercise programming for clients with arthritis should focus on gradually increasing cardiovascular conditioning progressively overloading resistance exercise and steadily increasing flexibility and joint stability (Maes & Kravitz 2004).

20. Stress

A growing body of research over the last 10 years substantiates that physical activity and exercise also improve psychological well-being (Dubbert 2002). It is important to clarify that much of the research presented here is correlational, which means that the scientists studied the associations that exist between exercise and mental health variable, and not the causal relationships. Published investigations conclude that individuals with improved levels of fitness are capable of managing stress more effectively that those who are less fit (Hassmen, Koivula & Uutela 2000). The data suggest an inverse relationship: higher physical fitness is associated with lower levels of stress. It appears that the method of exercise that most benefits stress reduction is cardiovascular exercise. Studies describe the role of exercise in managing stress as a preventive intervention as opposed to a corrective intervention. The research indicates that moderate-intensity aerobic exercise, performed 3 times a week (sessions lasting over 20 minutes) for up to 12 weeks, has the most influence on stress management. Although the specific mechanisms explaining the improved stress levels from aerobic exercise are unclear at this time, possible theories include the involvement of physiological, biochemical and psychosocial factors (Callaghan 2004).

21. Mood State

Frequently, fitness professionals hear clients say that they exercise because it makes them “feel good.” Because mood state is influenced by psychosocial, psychophysiological biochemical and environmental factors, explaining the exercise-induced mechanism is quite difficult. However, it appears that cardiovascular and resistance exercise can positively affect various mood states, including tension, fatigue, anger and vigor (a

psychological variable defining vitality or energy) in normal and clinical populations (Lane & Lovejoy 2001; Fox 1999). In addition, even acute bouts of exercise may improve a person's present mood state. It has been shown that a single bout of 25-60 minutes of aerobic exercise (at low, moderate or high intensities) increases positive mood feelings while also decreasing negative mood feelings. Implications from these data denote the incorporation of habitual exercise in a person's lifestyle for the enhancement of positive mood state. The use of resistance training to improve mood state requires further research.

22. Depression

The antidepressant action is one of the most commonly accepted psychological benefits of exercise. Individuals with clinical depression tend to be less active than healthy, active adults and have a reduced capacity for physical exertion (Fox 1999). Since people suffering from depression are not predisposed to participating in exercise, it is challenging for fines professionals to introduce physical activity to this population. However, patients diagnosed with depression have credited exercise as being a most important element in comprehensive treatment programs for depression (Dunn et al. 2002). Cardiovascular and resistance exercise seem to be equally effective in producing antidepressive effects (Brosse et al. 2002). Therefore, the inclusion of resistance exercise, circuit training, calisthenics and different modes of aerobic exercise in treatment programs should be encouraged.

It also appears that both acute exercise bouts and chronic exercise training programs have positive effect on people with clinical depression (Dunn et al. 2002). The research does imply, though, that the greatest antidepressive effects seem to occur after 17 weeks of exercise, although observable effects begin after 4 weeks (Scully et al. 1998). In addition, the effects of exercise on depression seem equivalent in both genders and are uninhibited by age or health status. Although no research guidelines exist for an actual exercise prescription, the evidence supports following ACSM's updated exercise guidelines for healthy adults.

23. Anxiety

According to the dictionary, anxiety is "distress or uneasiness of mind caused by fear of danger or misfortune." It is a stage of apprehension. The results of over 30 published papers substantiate a link between acute and chronic exercise and the reduction of anxiety (Scully et al. 1998). Most of the research on exercise and anxiety involves aerobic training regimens. The few studies involving resistance training and flexibility have also shown a slight decrease in anxiety, but additional research is needed in this area. However, the data does indicate that aerobic exercise is more beneficial for the reduction of anxiety. In reference to the actual aerobic exercise prescription, there appears to be much debate about whether low-intensity, moderate-intensity or high-intensity exercise is most beneficial. For participant adherence, exercise intensity should be set at an adjustable level agreed on by the individual in consultation with a PFT or fitness instructor. It appears that even short bursts of 5 minutes of cardiovascular exercise stimulate anti-anxiety effects. The research also indicates that individuals who train for periods of 10-15 weeks receive the greatest beneficial effects.

24. Self-Esteem

Exercise also has a positive influence on self-esteem (Callaghan 2004). The effect appears to be more potent in those with lower self-esteem. Studies indicate that aerobic exercise may have a more pronounced effect than anaerobic exercise, but that may be because there is little research available on resistance training exercise and self-esteem. However, self-esteem is quite complex, and studies suggest that certain subcomponents—including perceived sport competence, physical condition, body image and strength—contribute to self-esteem (Scully et al. 1998). Because of the many variables involved, it is important to note, for example, that a person may highly value his physical condition and yet have a negative evaluation of his body. Current research provides little direction regarding the type of exercise and dose recommendation for improving self-esteem (so perhaps the best thing is to follow the 2006 ACSM guidelines for now). In relation to exercise, it is interesting to note that important factors influencing a person's self-esteem are perceptions of their body attractiveness and physical condition (McAuley et al. 2000).

25. The "Weekend Warrior"

All position statements on physical activity center their messages around the importance of consistent physical activity and exercise throughout the course of the week. Yet there is a subpopulation of exercisers, affectionately labeled "weekend warriors," who do only one or two bouts o exercise a week (perhaps because of time or choice). Although many hypotheses and suppositions have been suggested about the health of this subpopulation of exercises, most recently a rather large scientific investigation revealed some interesting findings. Lee and colleagues (2004) found that weekend-warrior exercisers who had no major risk factors (and expended at least 1,000 kilocalories in the sporadic exercise pattern) had a lower risk of dying prematurity than their sedentary counterparts. However, individuals with one or more CHF risk factors may not benefit from this sporadic approach to physical activity, should be encouraged to get their physical activity and exercise throughout the course of most days of the week.

Directions for the Future

As fitness professionals expand their professional direction, the core model of the programs we develop and endorse will surely be directed toward the enhancement of health for our clients. Also, the rapid growth of the computer and communication technologies is making it easier to disseminate more education and information about health, fitness and quality-of-life issues to our interested and growing audience. As a profession we need to combine our creative capabilities in exercise programming with our highly developed technologies and utilize these research applications to design new strategies for getting more people, of all ages, physically active and exercising.