



As a nutrition professional not specifically trained in exercise physiology, I am concerned about recommending physical activity for patients and clients. Would you summarize the evidence for physical activity as a behavior that has a positive effect on weight loss, prevention of weight gain and risk for some chronic diseases and suggest prudent counseling strategies for encouraging physical activity?



Maintenance of body weight is ultimately determined by energy balance. If energy intake consistently exceeds energy expenditure, this will result in weight gain. A number of studies have shown that caloric restriction *combined* with physical activity is superior to caloric restriction alone for weight loss and the maintenance of weight loss (1). Furthermore, weight gain resulting from energy imbalance and lack of physical activity may increase many chronic disease risk factors associated with overweight/obesity, including symptoms of cardiovascular disease and diabetes. Therefore, it is important to incorporate some degree of physical activity into any weight management program.

### **Exercise and Weight Loss**

There has been considerable attention given to determining the appropriate duration and intensity of exercise required for weight loss and, ultimately, weight maintenance. It has been thought that moderate intensity exercise of at least 150 minutes per week (~30 minutes per day for 5 days per week) is required for health benefits; however, recent research has demonstrated that 200-300 minutes of exercise per week (~60 minutes per day) is necessary for weight loss in overweight and obese individuals and to maintain weight loss over time (2). Therefore, although there certainly may be general health benefits of exercise at a level of 150 minutes per week, requirements for weight loss and long term maintenance of weight loss are actually much greater.

Research suggests that combining caloric restriction with an increase in various "lifestyle activities" can be just as effective as

caloric restriction combined with a structured aerobic exercise regimen (3). In one study, participants were instructed to increase their levels of moderate physical activity by 30 minutes per day. For instance, participants were instructed to walk instead of drive short distances and to take the stairs instead of elevators. After 16 weeks, there was no statistically significant difference between groups in terms of weight loss (lifestyle group: -7.9 kg vs. aerobic group: -8.3 kg). At a one year follow-up, the lifestyle group regained slightly less weight than the aerobic group (lifestyle group: +0.08 kg vs. aerobic group: +1.6 kg, not significant). The results of this study reiterate the need for some type of physical activity program for successful weight-loss maintenance. Although the exercise prescription in this study was at the minimum 30 minutes per day described above, it is possible that increasing the duration above 30 minutes per day may have resulted in greater weight loss or greater maintenance of weight loss.

### **Exercise and Disease Prevention**

#### *Type 2 Diabetes*

It is estimated that approximately 90%-95% of diabetes cases in the US are type 2 diabetes (4). Although the cause of type 2 diabetes is multi-factorial, and includes both lifestyle and genetic influences, it is thought by some that the most significant behavioral cause of disorders of glucose metabolism leading to insulin resistance and, eventually, type 2 diabetes is physical inactivity (5). Physical inactivity can initiate as well as exacerbate symptoms of insulin resistance (i.e., hyperglycemia), while physical activity can reduce and prevent these same symptoms. Several studies have demonstrated the beneficial role of exercise in both the prevention and treatment of type 2 diabetes.

A recent large scale clinical trial by the Diabetes Prevention Program Research Group compared a lifestyle intervention that involved a reduced-calorie diet combined with moderate-intensity physical activity for at least 150 minutes per week versus an intervention with a diabetes medication (6). At the beginning of the study, participants were considered to have elevated blood glucose levels and be at high risk for development of type 2 diabetes, but not officially diagnosed. The study then assessed the incidence of diabetes diagnosis in the participants for an average of 2.8 years. The lifestyle intervention reduced the incidence of diabetes diagnosis by 58% compared to no intervention, while treatment with medication reduced the incidence of diabetes diagnosis by 31% compared to no intervention. Thus, it was determined that both the

lifestyle intervention and the diabetes medication were effective in reducing the incidence of diabetes in persons of high risk; however, the lifestyle intervention involving increased physical activity along with a reduced-calorie diet was significantly more effective than the drug intervention, suggesting that exercise and diet may be more effective than medication in preventing the onset of type 2 diabetes.

### *Cardiovascular Disease*

The American Heart Association Nutrition Committee recently presented recommendations designed to reduce the risk of cardiovascular disease in the general population (7). Not surprisingly, regular physical activity was regarded as essential for maintaining cardiovascular fitness, maintaining body weight and sustaining weight loss. Regular physical activity improves cardiovascular disease risk factors, such as blood pressure and blood lipid profiles, as well as management of blood glucose. Furthermore, it is also important to note that physical inactivity and a mostly sedentary lifestyle is itself considered a risk factor for cardiovascular disease (7).

Numerous studies have examined the effect of physical activity on cardiovascular disease risk factors. In a recent population survey published in the *Journal of the American Medical Association* (8), low fitness was identified in 33.6% of adolescents and 13.9% of adults. Body mass index and waist circumference were negatively associated with fitness in all age and sex groups. Total cholesterol levels and systolic blood pressure were higher and levels of high-density lipoprotein cholesterol (“good” cholesterol) were lower among participants with low versus high fitness levels.

It should be noted that much of the research cited above supports increasing general lifestyle physical activity for the purposes of weight loss or other disease risk factors; however, many studies have not shown an effect of moderate intensity exercise on blood lipid profiles, at least in the short term. Given this, exercise intensity and duration may have a more profound effect on the reduction of cardiovascular disease risk. A recent intervention trial examined participation in an 8-month exercise program of varying intensity and duration (9). A group of 111 sedentary men and women with mild-to-moderate dyslipidemia were randomly assigned to one of three exercise groups: high-amount/high-intensity exercise (the caloric equivalent of jogging 20 miles per week at 65% to 80% maximum heart-rate); low-amount/high-intensity exercise (the equivalent of jogging 12 miles per week at 65% to 80% of maximum); or low amount/moderate-intensity exercise (the equivalent of walking 12 miles per week at 40% to 55%

of maximum). There was a beneficial effect of exercise on a variety of lipid and lipoprotein variables, such as increases in HDL and improvement in LDL (“bad” cholesterol) subfractions. These effects were seen most clearly with the group that performed a high amount of high-intensity exercise. These improvements in cardiovascular disease risk factors occurred independent of weight loss.

### **Practical Recommendations**

Clearly, physical activity has broad-reaching effects on overall health and wellness. Implementing additional lifestyle activities or structured exercise programs, in conjunction with appropriate dietary recommendations, can have a dramatic effect on weight loss and several disease risk factors. Most likely, more than 150 minutes of exercise per week is necessary for successful weight loss and maintenance of weight loss. Understanding the goals and interests of a particular patient or client should ultimately determine the type of activity to encourage, whether it is structured exercise sessions or increasing lifestyle activities. A convenient resource for helping clients get started is [www.MyPyramid.gov](http://www.MyPyramid.gov). The “physical activity” section located within *Inside the Pyramid* explains why physical activity is important, gives examples of moderate and vigorous physical activities and suggests ways to fit physical activity into a daily routine.

As leaders delivering preventive services in clinical and community settings, nutrition professionals are well positioned to promote recommended levels of physical activity when counseling patients and clients and build awareness of the combined effects of diet and physical activity on achieving positive health outcomes.

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