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American Heart Association's Statement on Exercise and Physical Activity By James L. Holly, MD
Your Life Your Health *The Examiner* June 2, 2005

In 2003, the American Heart Association issued a statement from the Council on Clinical Cardiology (subcommittee on Exercise, Rehabilitation, and Prevention) and the Council on Nutrition, Physical Activity, and Metabolism (Subcommittee on Physical Activity entitled, "Exercise and Physical Activity in the Prevention and Treatment of Atherosclerotic Cardiovascular Disease." The content of these statements are not surprising but are worth reviewing.

Research has shown that there are three elements in the effectiveness of physical exercise programs recommended by healthcare providers. They are:

1. Physicians and other healthcare providers addressing the need of physical exercise while treating patients or other conditions or concerns.
2. Physicians and other healthcare providers giving patients an exercise prescription which addresses their personal and specific needs.
3. Physicians and other healthcare providers repeatedly addressing the need for physical exercise, monitoring the patient's progress and discussion exercise issues with the patient.

A fourth element which is helpful is a structured exercise program with measurable goals and accountability. At SETMA, we provide the first three and for patients with special needs are able through physical therapy to provide the fourth.

The review of the American Heart Association's statement is a fulfillment of the need to repeatedly and relentless address the need for people to turn the TV off and get moving. The following is taken from the AHA's statement.

Regular physical activity using large muscle groups, such as walking, running, or swimming, produces cardiovascular adaptations that increase: exercise capacity, endurance, and skeletal muscle strength. Habitual physical activity also prevents the development of coronary artery disease (CAD) and reduces symptoms in patients with established cardiovascular disease.

There is also evidence that exercise reduces the risk of other chronic diseases, including:

- type 2 diabetes
- osteoporosis
- obesity
- depression
- cancer of the breast

- colon cancer

The American Heart Association (AHA) Scientific Statement for health professionals focuses on aerobic physical activity and does not directly evaluate resistance exercises, such as weight lifting, because most of the research linking physical activity and cardiovascular disease has evaluated aerobic activity.

Whenever possible, the writing group cited summary articles to support conclusions and recommendations. This evidence supports the recommendation from the Centers for Disease Control and Prevention (CDC) and the American College of Sports Medicine (ACSM) that individuals should engage in 30 minutes or more of moderate-intensity physical activity on most (preferably all) days of the week.

Physical activity and exercise training have important roles in:

1. Preventing atherosclerotic coronary artery disease (CAD)
2. Managing selected CAD risk factors, including elevated triglyceride levels, low HDL-C, hypertension, glucose intolerance, hypertension, obesity, and possibly cigarette use
3. Treating patients with CAD, heart failure, and claudication (decreased blood to the legs)

Healthcare professionals should:

1. Encourage patients to engage in an active lifestyle
2. Encourage schools to teach skills required for physically active lifestyles and communities to develop programs and facilities conducive to physical activity;
3. Be educated about exercise as a therapeutic modality and the importance of lifelong physical activity in their patients;
4. Routinely prescribe exercise and increased physical activity to their patients in accordance with recommendations provided by the Centers for Disease Control, the American College of Sports Medicine and the American Heart Association
5. Perform exercise testing before vigorous exercise in selected patients with cardiovascular disease and other patients with symptoms or those at high risk.

The statement recommends that additional research should:

1. Address behavioral strategies to increase and maintain physical activity over the lifespan;
2. Increase the scientific rationale supporting the importance of physical activity by examining the amount of exercise required to alter CAD risk, the effect of exercise on morbidity and mortality, and its cost-effectiveness.

Definitions:

- ***Physical activity*** is defined as any bodily movement produced by skeletal muscles that

results in energy expenditure beyond resting expenditure. *Exercise* is a subset of physical activity that is planned, structured, repetitive, and purposeful in the sense that improvement or maintenance of physical fitness is the objective.

- ***Physical fitness*** includes cardiorespiratory fitness, muscle strength, body composition, and flexibility, comprising a set of attributes that people have or achieve that relates to the ability to perform physical activity. When defining the amount of physical activity or exercise, an important interrelationship exists between the total dose of activity and the intensity at which the activity is performed.
- ***Dose*** refers to the total amount of energy expended in physical activity, whereas intensity reflects the rate of energy expenditure during such activity.
- ***Intensity*** can be defined in absolute or relative terms. Absolute intensity reflects the rate of energy expenditure during exercise and is usually expressed in metabolic equivalents or METs.
- ***Relative intensity*** refers to the percent of aerobic power utilized during exercise and is expressed as percent of maximal heart rate or percent of O_2max.

    1. ***Moderate-intensity*** activities are those performed at a relative intensity of 40% to 60% of O_2max (or absolute intensity of 4 to 6 METs).
    2. ***Vigorous-intensity*** activities are those performed at a relative intensity of >60% of O_2max (or absolute intensity of >6 METs).

For example, brisk walking at miles per hour has an absolute intensity of 4 METs. In relative terms, this intensity is considered light for a 20-year-old healthy person but represents a vigorous intensity for an 80-year-old person.

Prevention of Atherosclerotic Vascular Disease

During the past half-century, studies of occupational and leisure-time physical activity have consistently documented a reduced incidence of CAD in the more physically active and fit. More recent studies have provided similar data by using measures of exercise capacity such as treadmill performance as an indicator of habitual physical activity.

The most physically active subjects generally demonstrating CAD rates half those of the most sedentary group. The results are consistent with all published studies documenting lower CAD rates in the more active subjects. In many studies, the lower frequency of CAD was independent of other known atherosclerotic risk factors. The results demonstrated beneficial effects of exercise on:

1. atherosclerotic risk factors
2. myocardial function
3. coronary artery size
4. vasodilatory capacity
5. vascular tone
6. vulnerability to ventricular fibrillation

The Harvard Alumni Study suggest that college athletic activity is not protective in later years without lifelong physical activity.

Reduction of Atherosclerotic Risk Factors

Physical activity both prevents and helps treat many established atherosclerotic risk factors, including:

1. elevated blood pressure
2. insulin resistance
3. glucose intolerance
4. elevated triglyceride concentrations
5. low high-density lipoprotein cholesterol (bad cholesterol
6. HDL-C concentrations (good cholesterol)
7. obesity.

Exercise in combination with weight reduction can decrease low-density lipoprotein cholesterol (LDL-C) concentrations and limit the reduction in HDL-C that often occurs with a reduction in dietary saturated fat.

The magnitude of the exercise effect is influenced by characteristics of the exercise intervention, individual variation, and whether exercise produces reductions in body weight. The effect on atherosclerotic risk factors can be large in some individuals and eliminate the need for other interventions.

In general, the effect of exercise on atherosclerotic risk factors is substantially less than that achieved by pharmacological therapies, although the exercise effect can be significantly increased by other lifestyle changes such as changes in dietary composition and weight loss.

Physical activity is also an important adjunct to diet for achieving and maintaining weight loss. The National Weight Control Registry enrolled 3000 individuals who lost >10% of their body weight and maintained this weight loss for at least 1 year. The average weight loss of 65 pounds was maintained for an average of 5.5 years. Eighty-one percent of the registrants reported increased physical activity. Women and men, respectively, reported expending 2445 and 3298 kcal weekly in such activities as walking, cycling, weight lifting, aerobics, running, and stair climbing. (author's note: Walking one mile in twelve to fourteen minutes utilizes approximately 100 calories in excess of normal requirements)

At least 8 studies have examined the adjunctive effect of exercise on smoking cessation, but most trials were small and the results not subjected to meta-analysis. Results are preliminary, but they suggest that physical activity facilitates long-term smoking cessation by increasing the initial quit rate.

Some of the effect of physical activity on cardiovascular risk factors is an acute effect of recent exercise and is not dependent on prolonged exercise training or improvement in fitness.

1. Serum triglycerides are reduced by vigorous exercise for up to 72 hours.
2. HDL-C is also transiently increased by exercise.
3. Vigorous exercise also acutely reduces systolic blood pressure, and this effect may persist for up to 12 hours.
4. Exercise also has favorable acute effects on glucose controll.

these acute effects provide additional support for the recommendations from the CDC and the ACSM that adults should participate in moderate-intensity physical activity on most, if not all, days of the week.

Next week, we will continue with our review of the AHA statement and examine the effect of exercise on those who already have heart disease. Remember, it is your heart, your health and your life. Only you can take care of it.