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## American Heart Month: It's time to "START"



The recent rise in the incidence of CAD, after years in decline, is largely due to the "Two hamburgers and fries with the Metabolic Syndrome to go" mentality. To counteract this trend, the AHA, [www.americanheart.org](http://www.americanheart.org), is sponsoring the "Start" Program, urging people to decrease CV risk by diet and exercise.

In this *Heartbeat* we will review the huge benefits of practicing *Tender Loving Care* (TLC) or Therapeutic Lifestyle Changes, both for ourselves and our patients. We will also highlight a few recent diet and exercise trials that show improved outcomes, urging us to "start," and will outline the recent exercise guidelines.

### Mediterranean Diet Reduces Mortality Risk

**Beneficial Dietary Pattern:** The Mediterranean diet is characterized by a high intake of vegetables, legumes, fruits, nuts and whole grains; a high intake of unsaturated fatty acids, mostly in the form of olive oil; a low intake of

saturated fatty acids; a moderately high intake of fish; a low to moderate intake of dairy products, mostly as cheese or yogurt; a low intake of meat or poultry; and a moderate amount of alcohol (< 2 /day), usually wine generally taken with meals. *We routinely recommend this diet along with the avoidance of "White carbohydrates" sweets and processed foods. This diet has a low glycemic index, which is beneficial for treatment and/or prevention of diabetes and for weight loss programs.*

According to recent research, eating a Mediterranean diet was also associated with a reduced risk of death during a 5 year period. On a nine-point scale used to evaluate compliance with the diet in 380,296 participants, those with higher scores were less likely to die of any cause, or of cancer or heart disease.<sup>1</sup>

### "Pass the grain. Spare the brain."

Another new study has shown an association between following the Mediterranean diet and reduced mortality in patients with Alzheimer's disease (AD).<sup>2</sup> The authors had previously demonstrated that higher adherence to this diet protects people from developing AD, and in this study, the question was whether following it further modifies the course of the disease. Indeed, adherence was associated with prolonged survival.

These studies are just a sampling of the large population studies that suggest that the Mediterranean diet protects against death from

any cause, as well as potentially reducing the risk of AD.

### Why this diet?

Recent study results have shown that a decrease in the oxidative damage to LDL cholesterol is one of the protective mechanisms by which a traditional Mediterranean diet exerts a protective effect on CAD development.<sup>3</sup> The study, say investigators, provides further evidence to recommend the diet, high in fat because of the large amounts of monounsaturated fatty acid-rich olive oil, as a useful tool against atherosclerosis development, particularly in individuals at high risk for CAD.

### Exercise Benefits: “Survival of the fittest”

Several recently published studies have focused on the importance of assessing a patient’s functional capacity, because of the benefits of regular aerobic exercise on CV health.

Exercise capacity (EC) is the maximal oxygen uptake for a stated workload. It is commonly measured in metabolic equivalents (METS), which are multiples of a person’s oxygen consumption at rest. One MET in the average adult person is 3.5 mL/kg of body weight/minute. Because direct measurement of oxygen consumption is impractical during routine exercise treadmill testing (ETT), METS used provide reasonable estimates of the individual’s EC.

EC has been shown to be a strong and independent predictor of death and development of cardiac events among men and women. It correlates significantly with age and gender, which has prevented its widespread use in exercise test interpretation. The same calculated MET value translates into a different EC for an elderly man or a young woman.

A newly published landmark study by investigators from the Cleveland Clinic addressed these very issues.<sup>4</sup> The authors identified different models for predicted or

impaired EC. They then tested them in a new population of asymptomatic men and women who were referred for symptom-limited ETT. The models were compared using four validity assessment methods to identify which ones performed best at predicting time to death.

Two important findings emerged from this study. Men and women with below average EC (inability to achieve 85% of predicted EC) had substantially higher death rates than their counterparts with above average EC (> 85% of predicted EC). Secondly, age—and gender-based nomograms were better predictors of mortality than categorical descriptors and the most suitable models were different for men and women. **Specifically, the St. James Take Heart Project model [Predicted MET = 14.7 - 0.13 x (age)] performed best in women and the VA referral model [Predicted MET = 18 - 0.15 x (age)] performed best in men.** (Calculate predicted MET, your EC, then determine your risk using Figure 1, assuming you know how far you can go on the treadmill, or get an ETT done.)

**Figure1. Exercise Treadmill Test (ETT) Protocol.**

Stage	Duration	Speed mph	% Grade	METS
I	3 min	1.7	10%	5
II	6 min	2.5	12%	7
III	9 min	3.4	14%	10.1
IV	12 min	4.2	16%	12.9

Use of the St. James model in women and the VA model in men to predict expected MET levels and EC could aid physicians to better identify patients who require more aggressive risk factor management, i.e., those with below average exercise capacity. While a negative ETT result in a person with above average EC would be more reassuring, the same negative ETT result in a person with below average EC should intensify clinician and patient efforts to more aggressively modify risk factors, emphasizing better dietary and exercise habits.

## **Fitness reduces death-risk in dose-response fashion ► “Survival of the fittest”**

One of the largest studies ever (15,660) to link exercise capacity to mortality risk should motivate physicians to pay as much attention to patients' EC as they do other major risk factors. This study of both black and white older male veterans (mean age of 59 years, followed over a mean 7.5 years), suggests that the adjusted risk of dying was reduced by approximately 13% for every increase of 1 metabolic equivalent (MET) in exercise capacity.<sup>5</sup> Men with the greatest exercise capacity reduced their mortality risk by 70%.

The study reports that every 1-MET increase was associated with a reduction in mortality that ranged from 15% in black participants to 12% in white participants, after adjusting for age, body mass index (BMI), CV risk factors, and CV medications. Compared to veterans in the lowest fitness category (<5 METS)—not able to complete the first Stage of an ETT (Figure 1.)—those in the highest EC (>10 METS)—able to complete the 3<sup>rd</sup> stage of the ETT—had a 70% lower risk of all-cause death. Even men in the moderate fitness category (7.1-10 METS) had a 50% lower death rate than men with the lowest fitness capacity. ***Simply put, the longer you can go on a treadmill, the longer you'll live.***

The authors point out that ETT is a "standardized procedure used throughout the world," but physicians may under-estimate its prognostic capacity. The study results also underscore, once again, the importance and pay-off of ***regular*** exercise. Those pay-offs may be particularly relevant for people who cannot afford expensive medications, health club memberships, or even foods that would improve their cardiovascular risk profile. Walking daily is free.

### **Fitness vs. Fatness**

In prospective studies, physical activity and adiposity have been shown to have independent effects on cardiovascular mortality. These effects remain significant even after adjusting for

traditional risk factors such as BP, lipids, and diabetes. High adiposity confers an increased risk of CVD at all levels of physical activity. Similarly, low levels of physical activity increase the risk of CVD at all stages of adiposity. Thus, the lowest risk is observed in the “fit and slim” and the highest risk in the “unfit and heavy.”

This has been documented by several prospective studies in middle-aged adults, but a recent study has extended this relationship to adults older than 60 years.<sup>6</sup> However, researchers observed that fit, obese individuals (BMI >30, abdominal obesity or excessive percent body fat) were at lower risk of all-cause mortality than unfit normal weight or lean individuals. This suggests the additional influence of fitness on the relationship between adiposity and mortality. It also reiterates and emphasizes the significant independent predictive ability of cardiorespiratory fitness on mortality. ***Obese people can exercise and be fit and have significantly decreased risk.***

### **Why or how does exercise benefit us?**

The mediating mechanisms underlying the benefit of physical activity to decreasing CVD risk have been very difficult to evaluate. A recent publication helps explain the benefits of regular exercise on CV health.<sup>7</sup> Investigators performed a prospective, observational study of 27,055 apparently healthy women from the Women's Health Study. Participants were older than 45 years and had no prior history of CVD or cancer. The mean follow-up was 11 ± 2 years during which 979 CVD major events (nonfatal MI, ischemic stroke, coronary revascularization or cardiovascular death) occurred.

A linear inverse relationship between physical activity and CVD risk was observed. Differences in known risk factors explained ~60% of the observed inverse association. When sets of risk factors were examined, inflammatory/hemostatic biomarkers (high-sensitivity C-reactive protein, fibrinogen and soluble intracellular adhesion molecule-1) were the largest contributors to lowering CVD risk (~33%), followed by BP

(~27%), traditional lipids such as total cholesterol, LDL and HDL (~19%), novel lipids such as [lipoprotein(a), apolipoprotein A1 and B-100] (~16%), BMI (~10%), and hemoglobin A1c/diabetes (~9%).

### **How much exercise?**

The American College of Sports Medicine (ACSM) and the AHA have recently updated their physical activity recommendations for the types and amount of exercise needed by healthy adults to improve and maintain health.<sup>8</sup> They also include recommendations for older adults.

Most of the benefits of exercise are obtained with 30 minutes of moderate-intensity aerobic activity for a minimum of 5 days each week or vigorous-intensity aerobic activity for a minimum of 20 minutes on 3 days each week. Combining these exercises is also acceptable, so recommendations are met by walking briskly (3-4 mph) or performing an activity that noticeably accelerates the heart rate for 30 minutes twice during the week and then jogging for 20 minutes, or performing any activity that causes rapid breathing and a substantial increase in heart rate on two other days.

In addition to clarifying the frequency of moderate-intensity exercise and incorporating vigorous-intensity exercise into the recommendations, the new guidelines specify that moderate- and vigorous-intensity exercises are complementary to daily living and that even more exercise than the recommended amount provides additional health benefits. Muscle-strengthening activities have also been included in the updated recommendations.

The ACSM/AHA also states that short bouts of activity, 10 minutes or more, can be combined to meet the 30-minute daily goal. A lot of patients have no idea how to incorporate physical activity into their crazy-busy lives. Letting them break up their activities, instead of insisting on a full 30 minutes, helps them think daily exercise is possible.

The recommendations for physical activity needed to improve and maintain health in those 65 years of age and older are similar to the recommendations for the general public, but take into account the older adult's aerobic fitness.<sup>9</sup> Because older adults often have comorbid conditions, such as arthritis, osteoporosis, or chronic CV conditions, the ACSM/AHA guidelines promote activities that maintain or increase flexibility and improve balance. In addition to strength training and aerobic exercise, recommendations include stretching exercises to improve flexibility, as well as those that work on balance, especially for individuals at risk for falls and fracture, thus integrating preventive and therapeutic activities.

Doctors should emphasize to their older patients the importance of reducing sedentary behavior and increasing moderate activity, thus putting less emphasis on attaining high levels of activity and taking a gradual stepwise common-sense approach, "listening to their bodies".

### **Conclusion**



It is quite interesting that with all the expensive medical and pharmacological advances made in the past century, based on the above data, one of the most important and cost-effective things we can still do and/or tell

our patients, regardless of why they come to the office, is to stay mentally active and physically fit and eat a healthy and balanced diet. Regardless of age or medical condition, the importance and pay-off of regular exercise and diet is remarkable for black or white, male or female, slim or fat.

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