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Effects of Exercise and Diet on Chronic Disease Part VII

Conclusions

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Your Life Your Health

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Today, we conclude our review of the article in the November, 2005 issue of *Journal of Applied Physiology* entitled, “Effects of exercise and diet on chronic disease.” We have looked at the effect of diet and exercise on heart disease, hypertension, diabetes, the Metabolic Syndrome and cancer. As we conclude our review of this excellent study, we are reminded that diet and exercise can prevent illness and they can improve our health if we already have a chronic disease. It is worthwhile to note that the most beneficial steps you can take for your health do not involve pills or physicians; they are: get active and eat right.

Given that more than 55% of US adults do not engage in regular physical activity and more than 75% do not consume at least five fruits and vegetables a day, it is no surprise that chronic diseases are the most common cause of preventable death in the United States. The evidence is overwhelming that physical activity and diet can reduce the risk of developing numerous chronic diseases, including:

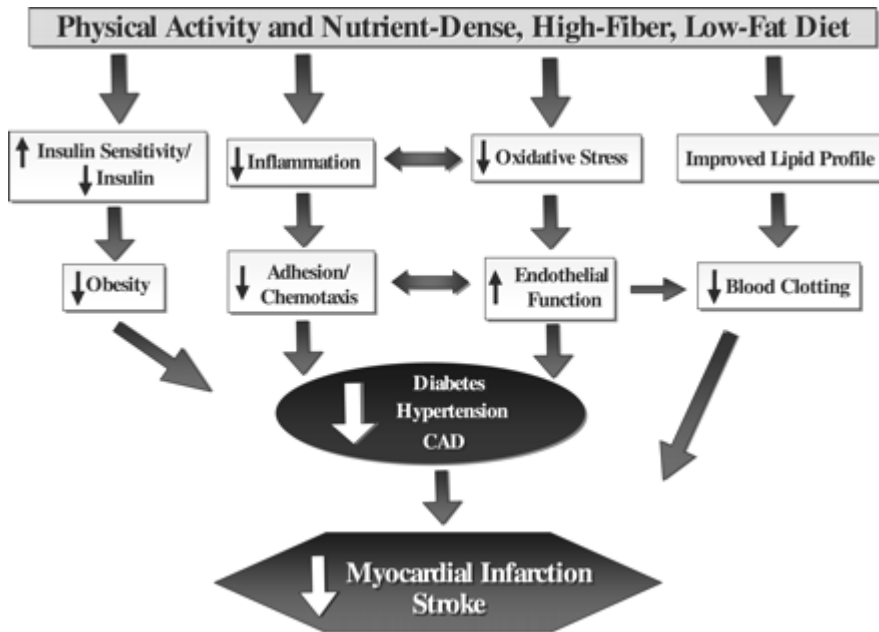
- Coronary artery disease
- Hypertension
- Diabetes
- Metabolic syndrome (Cardiometabolic Risk Syndrome)
- Several forms of cancer

In many cases diet and exercise can in fact reverse existing disease. Furthermore, risk of several other chronic diseases may be ameliorated by physical activity and diet, including musculoskeletal diseases such as sarcopenia, osteoporosis, and arthritis, as well as stroke and congestive heart failure, chronic renal failure, Alzheimer’s disease, and erectile dysfunction.

For instance, it has been reported that only 16% of American women aged 45–64 and less than 10% of women over 65 years of age report ever engaging in strengthening activities. As discussed, especially in the case of hypertension and metabolic syndrome, several studies have shown that physical activity favorably affects chronic disease, but relatively few trials have simultaneously examined both dietary modification and physical activity. Consequently, further studies using combined interventions that attempt to maximize benefits are warranted, as recommended by the ATP III guidelines. Additionally, the

molecular mechanisms by which physical activity and diet protect against chronic disease are not completely understood, and future studies are needed.

This figure summarizes various potential mechanisms by which physical activity and diet may improve cardiovascular-associated chronic disease risk.



Hypothesized mechanisms by which physical activity and diet reduce the risk of coronary artery disease (CAD), hypertension, and diabetes.

Many studies apply a whole-diet approach, and it cannot be determined whether the benefits noted are due to a higher intake of antioxidants, phytochemicals, minerals, and/or fiber, a lower intake of fat, and/or changes in the dietary fatty acid composition, in carbohydrate type, and/or protein source; however, most likely all of these factors contribute.

For example, when one macronutrient is removed, another is added, and whether the benefit is due to the added nutrient, the removed nutrient, or a combination of both is unknown. However, the evidence suggests that numerous dietary changes contribute to the reduction in chronic disease risk, including elimination of refined carbohydrates and fatty foods, such as fast food and sugar-containing beverages, and substitution with a diet based largely on whole foods high in fiber and nutrient density. For example, processing whole grains increases caloric density by ~10% and decreases fiber and protein by ~80 and 30%, respectively.

A concerted effort to increase primary prevention of chronic disease through the translation of research data on the value of exercise and diet to the general public and

legislation to urge implementation of primary prevention strategies as opposed to opportunistic care are essential. It is commonly argued that it is difficult to change the lifestyle of obese and sedentary people, but such pessimism may not be justified. For a successful public health approach to chronic disease prevention, we cannot rely on pharmaceuticals but must implement long-term, sustainable behaviors that encourage healthy lifestyles. It is possible to achieve primary prevention of chronic disease by means of a nonpharmacological intervention that can be implemented in a primary health care setting.

Chronic disease not only impacts life expectancy but also may significantly blunt quality of life years. Additionally, recommendations have been questioned on the basis of their practicality. For example, the Institutes of Medicine recommendation for physical activity of 60 min/day has been questioned on the basis of its feasibility. It is known that 30 min provides important benefits; however, this may be inadequate for maximal health benefits. Similarly, diets recommending higher fruit and vegetable intakes (≥ 7) and lower fat consumption have been criticized as a result of the perceived inability of patients to adhere to more intensive guidelines. It is essential to make recommendations that are effective and to strive to achieve them, knowing that even some modification, i.e., performing 30 min of activity per day and consuming five fruits and vegetables, will possess important health benefits.

In addition, weight loss is a beneficial side effect of diet and exercise, and focus should be shifted to chronic disease reduction because many patients will experience modest weight loss (2–5%) and in the majority of cases still be classified as overweight or obese, yet will significantly reduce their chronic disease risk profile independent of significant weight loss.

Finally, as we look to the role of diet and physical activity in preventing chronic disease in the future, modifying the lifestyle of children is paramount to reducing chronic disease risk. Most children consume diets high in fat, especially saturated fat, refined sugar, including fast food, soft drinks, and high-calorie fruit juices, and there are known interactions between diet and activity patterns and between in utero and postnatal lifestyle influences and risk of future metabolic disease. Furthermore, children are performing less activity as computers, televisions, and video games become more commonplace, combined with elimination of school physical education programs. Encouraging healthy diets and activity in our nation's children is critical to winning the war against chronic disease.

In a presentation made at the Annual Scientific Meeting of the Association of Medical Endocrinologists of Quebec, data was presented which showed a linear increase in age-related deaths as the body mass index went up. Above a BMI of 35 (height of 5 feet weight of 180 pounds, or height of 6 feet and weight of 260 pounds), the age-related death rate went up dramatically in both males and females.

The medical complications (the chronic diseases) of obesity (defined as a BMI above 30, height of five feet weight of 153 pounds; height of six feet weight of 220 pounds) are numerous, including:

- Sleep apnea
- Abnormal Pulmonary function
- Decreased breathing
- Fatty liver disease
- Gall Bladder disease
- Infertility
- Polycystic ovarian disease
- Abnormal menses
- Osteoarthritis
- Cataracts
- Stroke
- Increased pressure in the brain
- Coronary Heart Disease
- Hypertension
- Abnormal cholesterol and Triglycerides
- Pancreatitis
- Cancer of breast, uterus, cervix, colon, esophagus, pancreas, kidney, prostate
- Phlebitis
- Gout

The presentation reported that the 10-year risk of developing chronic disease rose dramatically with increase in BMI.

- The relative risk for developing diabetes in women rose from 1 for women with a BMI less than 25 to over 17 for women with a BMI over 35. This meant that women with a BMI over 35 increased their risk of developing diabetes by over 17 fold.
- The relative risk for developing diabetes in men went from 1 for a BMI less than 25 to over 24 for a BMI over 35, a 24 fold increase.
- The relative risk for developing hypertension in women rose by 2 times from less than 1 for a BMI less than 25 to over 2 for those with a BMI over 35. A similar pattern was seen in men.
- The risk for colon cancer in women rose from 1.3 to over 2 times normal over ten years.

Obesity is caused by lack of exercise and/or physical activity and by poor nutrition with excess calories and inadequate healthy nutrients. Thus, many of the negative health consequences of a sedentary life style are the result of obesity.

All of these negative events can be avoided by eating less, eating better and exercising more. Remember, it is your life and it is your health – and it is your choice.