

TUI University

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Health Through the Life Span

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Thank you very much for celebrating this milestone with me. I would like to share one of my favorite papers I wrote for my Master's program.

Here's to your Health!

Sincerely,



A balance between a healthy diet and physical activity is important for prevention of cardiovascular disease. Cardiovascular disease is the leading cause of death in the United States. According to the Center for Disease Control and Prevention, almost 700,000 people die of heart disease each year (CDC, 2008). Though genetics play a role in cardiovascular disease, a healthy lifestyle that includes a balanced diet and exercise has proven to gain optimal results in cardiovascular disease prevention. Not only can these measures prevent cardiovascular disease, it is also known that a lifestyle change, which includes a healthy diet and exercise can reduce risk factors associated with cardiovascular disease i.e. stroke, Type 2 Diabetes, hypertension, and high blood cholesterol levels.

Cholesterol is found in the bloodstream and in every cell in the body. A healthy level of cholesterol is important for the body as it is used to “form cell membranes, some hormones and is needed for other functions (AHA,2008).” On the contrary, high levels of cholesterol in the bloodstream cannot dissolve in the blood and need to be transported via lipoproteins (the carrier) (AHA, 2008). These carriers are known as High density-lipoproteins (HDL) and Low density-lipoproteins (LDL), Very low-density lipoproteins (VLDL) and Intermediate-density lipoprotein (IDL). Optimal total cholesterol level is 200mg/dL or below (AHA, 2008). This includes two factors, High density-lipoprotein (HDL) and Low density-lipoprotein (LDL). HDL is called *good cholesterol* and it is optimal to have 60 mg/dL or higher to protect against heart disease (AHA, 2008). LDL is called *bad cholesterol* and less than 100 mg/dL is optimal to lower risk associated with heart disease and stroke (AHA, 2008). Triglycerides on the other hand are the chemical form of fats that exist in food as well as the body (AHA, 2008). Triglycerides in the blood plasma come from carbohydrates. Normal levels of triglycerides are less than 150 mg/dL (AHA, 2008).

Total cholesterol, High density-lipoproteins and Low density-lipoproteins, and triglycerides can benefit from a healthy diet. HDL can be elevated through a diet that is rich in monounsaturated fats i.e. canola oil, avocado oil, olive oil and peanut butter. Foods that are rich in Omega-3 (fish) are also good for raising HDL levels. To add, soluble food rich in fiber i.e. oats, oatmeal, oat bran, beans, peas, rice bran and barely are also beneficial (AHA, 2008). HDL assists LDL by picking-up LDL and transporting it to the liver for recycling. By this interference, it is considered *good cholesterol*. Many of the same foods have the opposite effect on LDL level, which means a diet rich in soluble and insoluble fiber can reduce LDL level. Insoluble fibers are whole-wheat breads, wheat cereals, seed and nuts, dark green vegetables, and fruit skin (ADA, 2008). When LDL level is high in the bloodstream, it is taken-up by scavenger cells in the arterial walls. Once there, they encourage the creation of

smooth muscle tissue in the arterial wall. Inflammatory effect accompanies this process. Over time, when calcium is added, this plaque hardens and the person develops atherosclerosis, which makes the presence of fiber extremely important. The soluble fiber dissolves in water, fermenting when acted on by bacteria in the colon. The suction action may reduce cholesterol as it suctions up cholesterol and adds solidity to stool. The insoluble fiber is non-dissolving in water, and not fermenting when acted on by bacteria in the colon. This causes a scraping action necessary for removal of fecal waste. Sterols found in plants are also a natural way of reducing cholesterol absorption (Andersson H., Andersson H., Ellegard, R., Normen, L., Jan., 2007). Triglycerides can be reduced by eliminating or limiting sugars. These sugars can come in the form of alcohol, sugar, jams, jellies, candies, cakes, ice cream etc. Cutting down red meat, especially when fried, is also recommended. Adding a diet rich in fiber (soluble and insoluble), broiled poultry and fish, dark green vegetables, and fruits is strongly suggested.

Physical activity has proven to have a positive effect on both men and women (Warburton, D., Whitney, N., Bredin, S., 2006). “For instance, being fit or active was associated with a greater than 50% reduction in risk (Warburton, D., Whitney, N., Bredin, S., 2006).” To add, an increase of energy expenditure from physical activity of 1,000kcal per week has also shown a 20% benefit in mortality rate (Warburton, D., Whitney, N., Bredin, S., 2006). On the other side of the coin, inactivity in middle-aged women (> 1 hour per week) has a 52% increase in all mortality and doubling in cardiovascular disease (Warburton, D., Whitney, N., Bredin, S., 2006). In one study, it was proven that those who were once unfit and became fit over a five-year period reduced their risk factors by 44% over those who remained unfit (Warburton, D., Whitney, N., Bredin, S., 2006). Once cardiovascular disease has been diagnosed, physical activity continues to be important. Though in the past, it was thought rest and inactivity was good for heart disease, in recent studies an energy expenditure of 1,600kcal per week has been effective in halting the progression of cardiovascular disease (Warburton, D., Whitney, N., Bredin, S., 2006). To add, expending 2,200kcal per week can reduce plaque that is associated with heart disease (Warburton, D., Whitney, N., Bredin, S., 2006).

In closing, a balance between a healthy diet and the minimal recommended amount of physical activity can lower cholesterol, triglyceride levels, blood sugar levels, and blood pressure, which are all associated with cardiovascular disease. Many industrialized countries are at an all time high for cardiovascular disease (Kuller, L., Feb., 2006). Though it is not diet and lack of physical activity alone, cigarette smoking and diabetes are factors to consider. However, through a healthy diet and

physical activity, many countries are not experiencing the same epidemic. For example, in some Asian countries where the prevalence of cigarette smoking is high yet the diet is low in saturated fat and cholesterol, LDL is low with less risk of cardiovascular disease (Kuller, L., Feb., 2006). The Mediterranean diet has an increase intake of omega-3, which may also contribute in helping the prevention of cardiovascular disease (Kuller, L., Feb., 2006). Both countries are physically active in their lifestyle. To summarize, when thinking about a healthy diet:

1. Monounsaturated fats lower LDL cholesterol while maintaining HDL (olive oil, canola oil, and oil in nuts).
2. Polyunsaturated fats, particularly omega-3 promote the development of body-friendly eicosanoids, which reduce inflammatory effect and promote health (Safflower oil, sunflower oil, soybean oil, and corn oil).
3. Saturated fats raise LDL and should be used sparingly (mostly animal products i.e. butter lard, beef, coconut oil and palm oil).
4. Trans fats also raise LDL by modifying the chemical structure of the fat. This results in less friendly eicisanoid chemicals (margarine).
5. Fiber is the rake in the arteries and it scrapes LDL out of the arteries and exit through by way of feces. Fiber is very important in maintaining a healthy digestive system and maintaining a healthy cholesterol level (Insel, P., Turner E., Ross, D., 2002)

And when thinking about physical activity:

- “2 hours and 30 minutes (150 minutes) of moderate-intensity aerobic activity (i.e., brisk walking) every week **and**
- muscle strengthening activities on 2 or more days a week that work all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms)” are recommended (CDC, 2009).

Though there are other combinations for physical activity that are more intense with less duration, for cardiovascular disease moderation is important. A healthy lifestyle requires a commitment between a healthy diet and physical activity!

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