

Nutrition for preventing and managing cardiovascular disease

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Cardiovascular disease: assessing history, signs and symptoms, assessing fitness and prescribing exercise

– A course for health professionals who provide activity-based programmes for people with cardiovascular disease, or at-risk populations

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Comment by Gary: Although these nutritional guidelines are written specifically for the prevention and management of cardiovascular disease, they apply equally well to everyone. Consult your health professional, if you are under their care for a medical condition that might be affected by nutritional strategies to improve health.

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Introduction

Everyone is familiar with the advice that we should eat a low-fat, high-fibre diet with plenty of complex carbohydrates and moderate amounts of protein. However, we can modify this advice in the light of the most recent research information.

The myth of the low-fat diet

We have been told for a long time that dietary fat is an enemy, and cholesterol is the chief culprit. Neither of these ideas is correct. We need a certain amount of fat in our diet, particularly the types of fat that contain "essential fatty acids". One reason for the idea that we should minimize the fat in our diet, is that high levels of fat, both body fat (as in obesity) and blood lipid levels, are risk factors for heart disease. However, dietary fat is not the only cause of these risk factors. Just as much fat may be synthesized in our bodies from non-fat sources. So it is important to understand the circumstances under which our bodies make harmful fats.

It has been known for many years, and written in biochemistry textbooksⁱ, that insulin stimulates the enzymes that synthesize fats in our cells. Insulin is secreted under conditions of high carbohydrate intake. Even complex carbohydrates such as grains (especially if they are refined) can cause a burst of insulin to be secreted. What is less well-known is that our fat-synthesizing enzymes are inhibited by the presence of fat in the dietⁱⁱ. In other words, a high-carbohydrate low-fat diet (the type of diet recommended by many doctorsⁱⁱⁱ for avoiding heart disease) stimulates the formation of more fats in the human body! On the other hand, the biochemistry shows us that a more equal balance between fats, proteins and carbohydrates is likely to decrease fat synthesis.

Cholesterol

High levels of LDL-cholesterol are no longer considered to be the strongest indicator of coronary risk. Blood levels of homocysteine (to be discussed later) correlate more strongly with coronary risk, than LDL-cholesterol. It has also been noted that the LDL-cholesterol that becomes incorporated into the fatty deposits in our arteries, is in the oxidized form. The culprit is therefore most likely to be the *oxidation of fats*, rather than the fats themselves^{iv}.

Antioxidants

In order to avoid unwanted oxidation of cholesterol and other fats in the body, we need to eat plenty of antioxidants. The antioxidant vitamins are vitamins A, C and E, all of which are found in fresh vegetables. Several studies show that higher levels of vitamin E than we would normally find in food, have preventive value for heart disease risk, suggesting that a supplement may be in order^v. Minerals can support the functioning of our own antioxidant enzymes that we make within our cells. In particular, trace minerals such as zinc, copper, manganese and selenium are important for this function^{vi}. If we eat plenty of green leafy vegetables grown on rich soil, they will increase our chances of obtaining enough of these trace minerals.

It is not enough just to eat one or two antioxidants and hope that they will do the job of protecting our fats from oxidation. Our modern environment is polluted, and this causes us to be exposed to many "free radicals", chemical agents that are found in the body as a result of environmental pollution. There are so many different types of free radicals that, for maximum protection from them, we need as many different types of antioxidants as we can eat^{vii}.

Therefore, in addition to the vitamins and minerals mentioned above, we need to eat plenty of molecules with names such as "bioflavonoids" (found in fresh fruit and vegetables, especially citrus), "oligomeric proanthocyanins" (OPCs) (found in grape seeds, and therefore in red wine as well as in many dietary supplements)^{viii}, "catechins" (found in green tea)^{ix}, "lycopenes" (found in tomatoes), and some powerful antioxidants found in virgin olive oil, to name just a few.

Such antioxidants are found in abundance in the type of diet eaten traditionally in Mediterranean countries, and their presence explains why more people live long and healthy lives in these countries compared with ours; this has been called the "French Paradox"^x. However, we can achieve beneficial levels of antioxidants simply by increasing whatever fruits and vegetables are available in our local area^{xi}.

It may also be important to protect ourselves against free radical damage by taking a supplement that contains not only anti-stress multi-vitamins with all the B vitamins, but also with a few mg each of coenzyme Q10 and alpha lipoic acid every day. The biochemistry of cellular energy production is such that the B vitamins may not be able to do their jobs in our bodies without those two components^{xii}! We will

be hearing more in the news media about coenzyme Q10 and alpha lipoic acid over the years to come, because they are powerful antioxidants that are effective in protecting us against a multitude of chronic degenerative diseases, especially heart disease^{xiii}.

What other foods should we eat?

The importance of eating enough fresh fruits and vegetables because of their high natural content of vitamins, minerals and antioxidants, cannot be over-emphasized. If possible, they need to be grown organically on rich soil. A recent suggestion that fruit and vegetables should be at the lowest (and therefore the largest amount eaten) level of the "Food Pyramid" is an excellent way for us to naturally increase our levels of much-needed micronutrients. For this reason, 2 servings of fresh, whole fruit, 2 servings of fresh, green leafy vegetables and 2 servings of other vegetables will go a long way towards protecting us from cardiovascular disorders.

Dietary fibre

The dietary goal for fibre intake is higher in the United States than it is in New Zealand. It is hard to understand why this should be so. The amount recommended in the US is 30 – 50 grams, or 1 – 2 ounces. This is not an enormous amount to eat, and it is highly beneficial. The type of dietary fibre that is soluble (e.g. pectin, found in oat bran and fruit) can bind on to the cholesterol in your digestive tract (both the dietary cholesterol and the cholesterol that comes from the bile that your liver secretes to help you to digest fats), and this prevents you from absorbing it^{xiv}. This lowers your blood levels of cholesterol. But, perhaps more importantly, large amounts of this type of soluble dietary fibre may also protect you against colon cancer.

The health benefits of dietary fibre provide yet another reason for emphasizing our need to eat large quantities of fruits and vegetables. However, I always like to make sure that my breakfast fulfils my dietary fibre needs for the day, by stirring some sort of bran (it is good to rotate between rice bran, oat bran and wheat bran) and ground flaxseeds into unsweetened yoghurt. Some companies sell proprietary blends of mixed fibres, with natural fruity flavourings, and these can be stirred into the yoghurt for a change. It is most important to make sure that you drink large quantities of water before or after eating a high-fibre meal of this nature.

Carbohydrates

With the suggestion that fruits and vegetables should be at the lowest level of the food pyramid, the carbohydrate foods such as grains and

bread is relegated to a position of being eaten in smaller quantities. It may be best if we only eat rice, bread or potatoes with one meal each day. Even whole grains have a relatively high "glycaemic index"^{xv}, meaning that they can turn to sugar all too easily and stimulate an insulin rush which, in turn, can cause dangerous fats to form in the body.

One reason why I only recommend one meal with starchy carbohydrates each day, is that we are human, and everyone is going to want to enjoy something sweet each day! So, let's face it, people will then end up eating carbohydrates twice each day, because they will probably include one sweet treat such as a cookie or a dessert. Remember not to have second helpings of the dessert, though! And if you are tempted to have more than one sweet treat in a day, just let yourself anticipate how good it will be to look forward to having it tomorrow instead.

Fats or oils

Earlier on, we mentioned that some fat or oil intake each day is needed, simply to prevent our fat-synthesizing enzymes from being too active. The best choice of fat is undoubtedly olive oil, which has been shown to reduce cardiovascular risk^{xvi}. However, it is nonetheless important only to use one teaspoonful at a time, and never to eat fried foods. If you eat meat, cut off the fat to minimize your intake of saturated fats, and remember that butter is actually safer and healthier than margarine, according to Dr. Udo Erasmus, the expert on fats and oils^{xvii}.

Essential fatty acids

It is also important to eat some of the highly unsaturated fats that are found in the oil of certain cold-water fish such as tuna and salmon, every day. These "essential" fats are the most powerful in thinning the blood and protecting us from unwanted blood clots, as well as helping us to avoid inflammatory disorders. Vegetable oils such as flaxseed or linseed oil are less likely to "work" in this capacity, than the fish oil. They are available as supplements in gel-caps, containing types of fatty acid referred to as "EPA" and "DHA". EPA and DHA are also available in vegetarian supplements, extracted from marine algae (which is where the fish obtained it).

However, it must be remembered that EPA and DHA can be very powerful in thinning the blood, so if your patient is already taking pharmaceutical blood-thinners from the doctor, appropriate testing must be done on a regular basis so that the doctor can decrease the prescription of the pharmaceutical blood-thinners, in order to avoid the

possibility of dangerous haemorrhaging. It is good to understand that EPA and DHA are natural blood thinners, and are therefore less expensive and less likely to give side effects, than the pharmaceutical blood thinners^{xviii}.

Garlic

Garlic is another feature of the “French Paradox”. Garlic is good for us because it can change our cholesterol profile as well as minimize unwanted clotting. Research suggests, however, that there are ways of preparing it in supplements that can make it more effective than fresh garlic, in protecting us from heart disease. So we can use it without having to smell bad!

Preventing homocysteine build-up

It was noted above that blood levels of homocysteine correlate more strongly with heart attacks than blood cholesterol^{xix, xx}. If there is too much homocysteine circulating in the blood, it initiates the damage to arterial walls that eventually leads to the formation of arterial plaque, or atherosclerosis^{xxi}.

What is homocysteine? It is a sulphur-containing amino acid. Other sulphur-containing amino acids, such as methionine and cysteine, are very good for us, and important components of the diet. However, if the normal metabolism of methionine is not running smoothly, it can cause the dangerous build-up of homocysteine.

It is a very simple matter indeed, to prevent this harmful compound from building up in our blood. All we need to do is to make sure we are eating enough B vitamins every day! In particular, the ones we need to watch are vitamins B6, B12, and folic acid (or folate), all of which are involved in allowing the methionine metabolism to go to its normal completion.

The word “vitamin”, by definition, means that these molecules need to be eaten every day for us to function normally. So, in this case, a normal healthy diet of fresh food can be life-saving, and the modern high incidence of heart disease may be a sad reflection of the modern diet being depleted of normal levels of vitamins and minerals.

Magnesium

No discussion about preventing heart disease would be complete without special mention of magnesium. Magnesium is one of the “macro-minerals”, meaning that, along with sodium, potassium and calcium, we need to eat it in relatively large amounts. The text-books tell us that cardiovascular risk is increased by not eating enough

magnesium^{xxii}, and this information is backed up by vast amounts of research.

However, dietary surveys run by various governments in the Western world repeatedly show that the modern western diet is deficient in magnesium^{xxiii, xxiv, xxv}. The data indicate that more than half of the people are not even eating the amount of magnesium that the governments recommend, and experts are also telling us that we actually need MORE than the amounts recommended by the governments^{xxvi}! So it is not surprising that heart disease is the number 1 killer in a world in which people are not eating enough of the major mineral that could protect us against this type of disorder.

How can we obtain dietary magnesium? The answer is that it is found in two major types of food. These are: (1) green leafy vegetables, and (2) the husks of all types of whole seeds, including grains, legumes, nuts and oily seeds also. It has been said that a diet consisting mainly of meat and white bread will result in a magnesium deficiency^{xxvii}. It would be good for us to remember that statement, if ever we grab a hot-dog or a hamburger for lunch!

It is fortunate that the medical profession has now understood the life-saving impact of magnesium, because intravenous magnesium is administered to patients when they are hospitalised with a heart attack^{xxviii}. But why wait until that happens? It would of course be better for doctors to make sure that the patient is eating enough dietary magnesium, perhaps supplementing the diet with magnesium citrate (or some other magnesium chelate), in order to avoid the heart attack altogether!

The relationship between magnesium and calcium

Calcium and magnesium have a strange relationship within the body, in that the more you eat of one, the more you need of the other. This works both ways. Therefore, one unfortunate upshot of all the publicity about osteoporosis and our need for calcium supplements, is that we are now creating a society of people with magnesium deficiency instead^{xxix}. We may have saved a few people from osteoporosis, but now the heart disease rate soars instead. It is good to remember that you are more likely to survive a broken bone, than a heart attack! The best type of calcium supplement can deal with both misfortunes together, by providing magnesium as well. If your patient already has a history of heart disease or high blood pressure, you should advise taking magnesium and calcium at equal levels for a few months, before settling down into a more "normal" 2:1 ratio of calcium: magnesium. Both minerals should be chelated.

It is good to understand that both calcium and magnesium, in addition to building healthy bones, also have countless other functions in the biochemistry of the body. Deficiencies of either will undermine your health in all manner of ways, and a deficiency of both may shorten your life significantly.

One of the multitude of things that they do is to control the contractions of your muscles. Calcium causes the muscles to contract, while magnesium allows the muscles to relax – an essential preparation so that the next contraction can occur. In relation to such a simple job as maintaining a regular heart-beat, it is easy to understand why both are so important.

You can also imagine how high blood pressure is partly caused by too much contraction of the muscles around the arteries. If there is too much contraction, and not enough relaxation in those muscles, it does not take much thought to understand, from what was said above, that people with high blood pressure may be eating too much calcium and not enough magnesium.

Finally, it is apparent that, of all the people dying of heart disease, at least 2/3 of them are already suffering from Type II Diabetes Mellitus^{xxx}. What can we do to prevent or treat Type II Diabetes? The answer is that all of the dietary suggestions given in these pages will prevent and/or manage this condition. In particular, sufficient magnesium^{xxxii}, together with high levels of dietary antioxidants^{xxxii}, have been shown to help diabetics, and to prevent the devastating complications of diabetes.

Conclusion

A diet rich in fresh fruit and vegetables, especially green leafy vegetables, with plenty of dietary fibre, the complete avoidance of fried foods and minimal amounts of sweet foods, will go a long way towards protecting us from diabetes and heart disease. For those who have already been having cardiovascular disorders, supplementation with as much magnesium as calcium (both chelated) along with B vitamins, trace minerals, and antioxidants (especially coenzyme Q10 and alpha lipoic acid), and fish oil (EPA and DHA) can help to reverse this life-threatening disease and promote a longer and healthier life.

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