Nutrition:
Knowing Your Total Cholesterol

A number of factors can increase your risk for coronary heart disease. To make an accurate assessment your doctor will determine your lipid profile, overall health, weight, diet, blood pressure, amount of exercise and risk factors such as smoking, alcohol consumption, family history of heart disease and cholesterol levels. Cholesterol is one of several proteins that form your lipid profile. Cholesterol is comprised of both "good" and "bad" cholesterol. The "good" cholesterol is called High Density Lipoprotein (abbreviated as HDL). It actually prevents and reduces the build-up of fat in your veins and arteries. Large amounts of HDL are found in the omega fatty acids of fish. The "bad" cholesterol is called Low Density Lipoprotein (abbreviated as LDL). High levels of LDL are found in many processed foods. Any products containing coconut oil, palm oil or partially hydrogenated oil may be high in LDL.

Triglycerides (a combination of fatty acids and glycerol) are another component of your lipid profile. Body fat contains high levels of triglycerides, which are used when the body needs extra energy. After eating, your triglyceride and glucose levels increase significantly. If your body processes the fat efficiently, the level of triglycerides naturally decreases. Your doctor will carefully examine the test results of your lipid profile (cholesterol, LDL, HDL, triglycerides) to fully determine your risk for coronary heart disease.

PERIODIC TESTING.
Your HDL and LDL levels can be changed by exercise and food selection. When altering your diet it is important to increase consumption of food products high in high fiber (grains, fruit, vegetables, beans) and to lower consumption of food products that are high in saturated fat (butter, meat, nuts, cream, egg yolks). This process can actually be monitored by periodic testing at your local pharmacy, physicians office, or health care professional.

LEVELS FOR DIAGNOSTIC TESTS.

You can reduce the risk of heart disease if your lipid profile is within the following limits:

- A total cholesterol level of less than 200 mg/dL
- A low density lipoprotein (LDL) level below 130 mg/dL
- A high density lipoprotein (HDL) level of greater than 60 mg/dL
- A total cholesterol/HDL ratio of 4.5% or less
- Fasting triglyceride level below 200 mg/dL

IDENTIFYING RISK FACTORS.

There are a number of risk factors associated with coronary heart disease. Your medical professional can provide advice and possible preventive treatment for any of the below risk factors.

- **Family History of Premature Coronary Heart Disease (before age 55)** Some families seem to be prone to heart disease. The cause may be genetic or caused by learning poor eating habits from your parents.
- **Low HDL (less than 35 mg/dL)** Increase your level of good cholesterol by eating more foods high in omega fatty acids and eating less food high in saturated or hydrogenated fat.
- **High Blood Pressure (above 140/90 mm Hg)** A stressful job, high intake of salt, smoking, no exercise, eating foods high in saturated or hydrogenated fat (junk food)-can all lead to increased blood pressure.
- **High Blood Sugar Level (Diabetes Mellitus)** High blood sugar has very serious long term complications. Self-testing devices to monitor your sugar level have made diabetes much easier to manage. Consult your doctor for details.

OVERWEIGHT.

Excess fat in the food you eat and lack of exercise cause weight gain. You must change the kinds of food you eat or increase your level of exercise to lose weight. Restrict your intake of simple or refined carbohydrates and do not eat any foods high in saturated fat or containing hydrogenated oil. Shedding excess pounds can help raise your HDL and lower your LDL levels, as well as improve glucose levels in Type II diabetes mellitus.

CIGARETTE SMOKING.
Smoking lowers HDL levels and increases blood pressure. There are a number of new therapeutic programs that can help you to stop smoking. If you do not want to stop, at least try to lower the number of cigarettes you smoke per day.

AGE — MALE OVER 45.
Many men reduce physical activity when reaching middle age. Lack of exercise coupled with the natural thickening of arteries, caused by cholesterol or lipid build up, puts males over 45 at an increased risk of heart disease.

AGE — FEMALE AFTER MENOPAUSE.
Estrogen is a key hormone that regulates multiple body functions. Recent studies have indicated that estrogen replacement therapy for menopausal women improves general health.

INACTIVITY AND LACK OF EXERCISE.
Walking is still considered one of the best general exercises. Try to walk before work, at lunch or after dinner. Hopefully this will lead to more active endeavors-biking, hiking, tennis, swimming, aerobics.

HIGH STRESS ENVIRONMENT.
We all learn to deal with stress. Your medical professional can provide a number of suggestions to modify your life style to reduce stress. Severe cases may need more aggressive solutions ranging from biofeedback/acupuncture to pharmacological medications.

COMMON TERMS.
TC, TOTAL CHOLESTEROL.
is a measure of the total amount of cholesterol in your blood at a given time. It is usually measured in milligrams per deciliter (mg/dL). This test does not require you to fast (go without food or drink). It is widely available, accurate, inexpensive and safe to perform.

HDL, HIGH DENSITY LIPOPROTEIN.
 is the so-called "good" cholesterol because it helps to clear excess lipids from the arteries.

The higher this number is, the better. An HDL of 60 mg/dL or more is beneficial and considered a negative risk factor; an HDL of 35 mg/dL or less is considered a risk factor for heart disease. An HDL test does not require you to fast. HDL should be measured whenever your cardiac risk is being assessed.

TCIHDL RATIO.
A comparison of total cholesterol to your HDL cholesterol. A ratio of 4.5 or less is desirable. The lower the ratio, the less risk you have of developing heart disease.

LDL, LOW DENSITY LIPOPROTEIN.
The "bad" cholesterol because it contributes to the buildup of fat deposits in arterial walls (arteriosclerosis). About 65% of the cholesterol in your blood is in the form of LDL. An LDL level of less than 130 mg/dL is desirable. If you have a personal history of coronary heart disease, your LDL cholesterol should be below 100 mg/dL.

TRIGLYCERIDES.
Composed of fatty acids and glycerol. Like cholesterol, they circulate in your blood but are stored in body fat. When you eat a meal, your triglyceride (and glucose) levels increase significantly. Gradually, if your body processes the fat efficiently, the level of triglycerides will decrease. Since triglycerides increase after eating the test is normally given after fasting for 12 hours. While your triglyceride and glucose measurements are significantly affected by how recently you've eaten, total cholesterol and HDL are only slightly affected. Clinical consensus is that triglycerides should be below 250 mg/dL.

LIPID PROFILE OR LIPOPROTEIN ANALYSIS.
A more detailed measure of the fats (lipids) in your blood. It consists of measuring your total cholesterol, HDL cholesterol and triglycerides and calculating your LDL cholesterol. Your doctor will usually order a lipid profile if the results from your total cholesterol test are above normal, or if you have other risk factors such as a low HDL, family history of heart disease, high blood pressure, smoking, or diabetes. You should fast for accurate lipid profile results.

BODY FAT PERCENTAGE.
Body fat percentage refers to the amount of body fat mass as part of the total body weight described as a percentage.

   Body fat percentage (%) = (Body Fat Mass in Pounds / Body Weight in Pounds) x 100

ESTIMATED BODY FAT PERCENTAGE.
Hydrodensitometry, or underwater weighing, has been the established method for accurate evaluation of body composition. However, more recently relataively accurate devices termed body impedence analysis can calculate body fat percentage. These devices use the following parameters to measure body fat percentage: electric resistance, height, weight, age, and gender.

BODY MASS INDEX (BMI).
BMI is an internationally used index to show body composition by determining the balance between the height and the weight.

Body Mass Index (BMI) Formula:
                (weight in pounds x 703) / height in inches / height in inches

BODY FAT RANGES FOR STANDARD ADULTS.

Gender	Age	Low BMI < 18.5	Normal BMI 18.5-24.9	High BMI 25.0- 29.9	Very High BMI ≥ 30
Female	20-39	< 21.0	21.0 – 32.9	33.0 – 38.9	≥ 39.0
	40-59	< 23.0	23.0 - 33.9	34 - 39.9	≥ 40.0
	60-79	< 24.0	24.0 - 35.9	36 - 41.9	≥ 42.0
Male	20-39	< 8.0	8.0 - 19.9	20.0 - 24.9	≥ 25.0
	40-59	< 11.0	11.0 - 21.9	22.0 - 27.9	≥ 28.0
	60-79	< 13.0	13.0 - 24.9	25.0 - 29.9	≥ 30.0

Based on NIH/WHO guidelines for BMI

Based on gallagher et al., American Journal of Clinical Nutrition, Vol.72, Sept. 2000

BMI	BMI Level
Less than 18.5	Low
18.5 or more and less than 25	Normal
25 or more and less than 30	High
30 or more	Very High

Designation by the WHO