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LIPID PROFILE TESTS

Introduction:

Cholesterol is a soft, waxy, fat-like substance that is a natural component of all the cells in the body. We need it to build cells and make hormones, but too much cholesterol causes problems. Cholesterol comes from two sources: from the body (specifically the liver), which makes 70 - 80% of all the cholesterol needed, and from foods that are high in saturated and trans-fat.

Lipid profile tests are done by testing the following:

Total Cholesterol: cholesterol is needed to make hormones, Vitamin D, and to maintain the health of cells in the body. However, high cholesterol is one of the major risk factors for coronary heart disease, heart attack and stroke. Other risk factors may increase the risk even more, these include smoking, high blood pressure or diabetes.

LDL cholesterol (Low Density Lipoprotein): is the 'bad' cholesterol. Too much of LDL increases the chances that cholesterol will start to slowly build up in the inner walls of arteries that feed the heart and brain. This increases the risk of heart disease and stroke.

HDL (High Density Lipoprotein): is the 'good' cholesterol that removes extra cholesterol from blood and delivers it to the liver to be removed from the body.

Non-HDL Cholesterol: is the HDL, 'good' cholesterol, subtracted from the total cholesterol number, giving the total of bad cholesterol. This number should always be low.

TG (Triglycerides): are a type of fat found in the blood. When a person eats, the body converts any calories it doesn't need to be used right away into triglycerides and stores them in the fat cells. High

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levels of triglycerides can raise the risk of heart disease, and pancreatitis (inflammation of the pancreas). High levels of triglycerides and a combination of high blood pressure, high blood sugar, too much fat around the waist, and low HDL ("good") cholesterol is referred to as metabolic syndrome.

Why is the test done?

- Commonly ordered as part of a general physical examination, once a year for normal cases.
- To assess the risk of developing heart disease.
- To monitor treatment.

Who should be tested regularly?

- If you have a family history of heart disease.
- Children with a known family history of certain types of high cholesterol (familial hypercholesterolemia) should be tested at the age of 2-10 years.
- Adults with high total cholesterol and low HDL cholesterol levels. The treating physician will decide when the test should be done.
- Anyone who had a heart stroke.
- People who have diabetes.

Specimen/Sample Type:

- Blood.
- Fasting shall not be required, unless triglyceride level is more than 4.5 mmol/l

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The most important risk factors for high cholesterol (Hyperlipidemia) are:

- Being overweight or obese.
- Eating a diet high in saturated fat and trans-fat.
- Not getting enough exercise.
- Family history of heart disease and/ or stroke.
- High blood pressure.
- Smoking.
- Diabetes.
- Certain genetic disorder.

Managing high cholesterol:

Lowering the cholesterol level reduces the risk of heart disease and stroke. Studies show that for every 1% reduction in cholesterol levels there is a 2% reduction in the rate of heart disease.

This can be achieved by:

1. Eating a well-balanced diet.
2. Regular exercise.
3. Losing weight.
4. Medications commonly used to treat high cholesterol include:

- Statins: Side effects may include muscle pain and stomach upset.
- Bile acid sequestrants: used to treat high levels of LDL. Common side effects include bloating, constipation, heartburn.

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- Ezetimibe (cholesterol absorption inhibitors): a medication that limits how much LDL cholesterol can be absorbed in the small intestine. Side effects include headaches, nausea, and muscle weakness.
- Fibrates: medicines that are effective at lowering triglyceride levels and moderately effective at lowering LDL. They are used to treat high triglycerides. Side effects include muscle pain, stomach upset, sun sensitivity, gallstones, and irregular heartbeat.
- PCSK9 inhibitor: a very potent biological therapy used to treat high cholesterol that does not respond adequately to standard therapies. They are given as injections. Side effects include flu-like symptoms such as cold, nausea, soreness, or itchiness where you give the injection and muscle pain.

Complications:

Several complications may occur if high cholesterol is left untreated. These include:

1. **Heart disease:** High cholesterol levels more than double the risk of heart attack.
2. **Stroke:** Low levels of HDL ("good") cholesterol have been associated with an increased risk of stroke.
3. **Insulin resistance:** 80% of people with low HDL and high triglycerides may develop insulin resistance which leads to high blood sugar levels and develop diabetes.

References:

National Cholesterol Education Program. Executive summary of the third report of the National Cholesterol Education Program (NCEP) expert panel on detection, evaluation, and treatment of high blood cholesterol in adults (Adult Treatment Panel III). JAMA. 2001;285(19):2486-2497.