Total Serum Cholesterol and LDL Cholesterol

Presented by

Lecturer Aseel Ghassan Daoud

M.Sc. In pharmacy/ Clinical Chemistry

What is cholesterol?

- **Cholesterol is a steroid that is essential for life.**

What are the roles of cholesterol in the body?

- **It forms the membranes for cells in all organs and tissues in the body.**
- **It makes hormones that are essential for development, growth and reproduction.**

- **It forms bile acids needed to absorb nutrients from food.**

- **It is necessary for the transport and absorption of fat soluble vitamins ex: A, E, D, K**

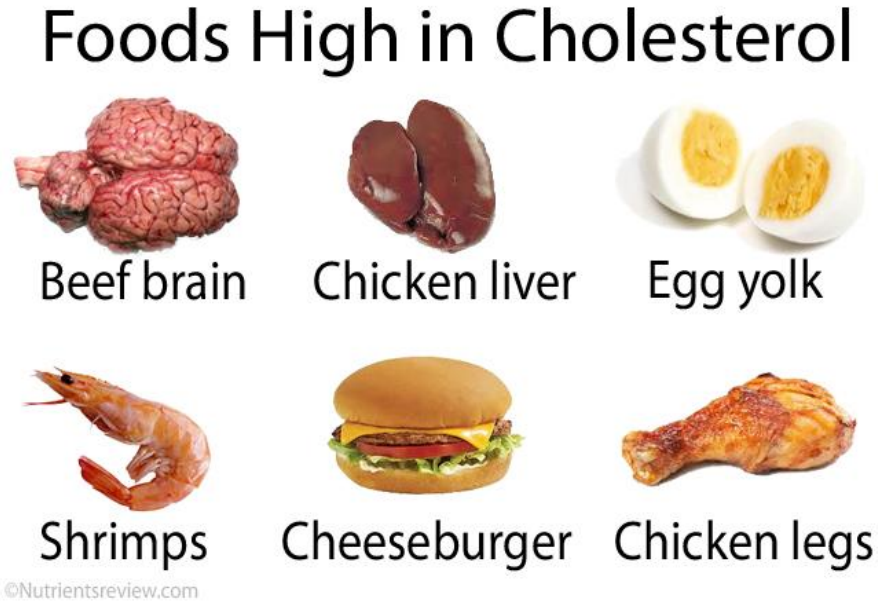
- **Small amounts of cholesterol circulates in blood in particles called lipoproteins which transfer excess cholesterol away for disposal (HDL-C) and some of it deposit cholesterol in tissues and organs (LDL-C).**

What is serum cholesterol test?

- **This test measures total cholesterol (good and bad) that is carried in the blood by lipoproteins.**

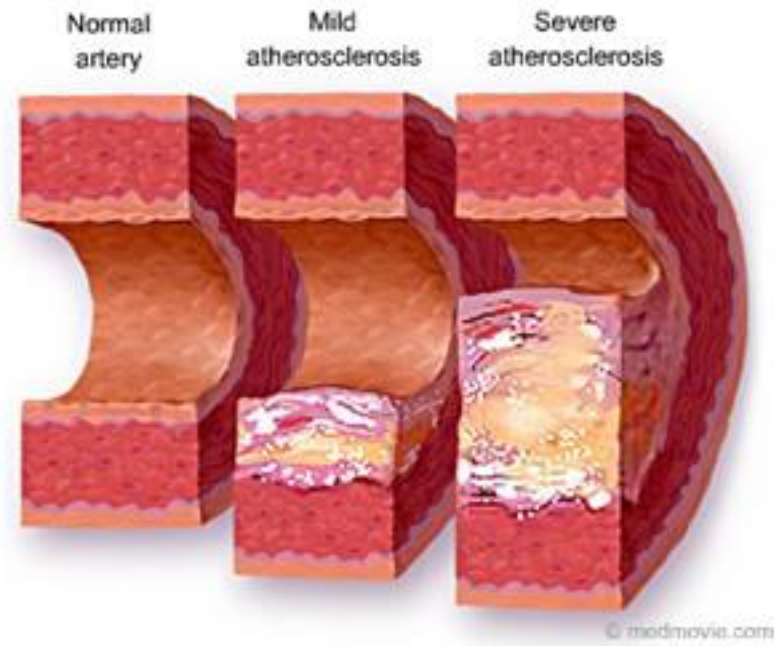
When is blood cholesterol raised?

- **Inherited predisposition for high cholesterol levels.**
- **Eat too much of foods high in cholesterol (saturated and trans unsaturated fats).**



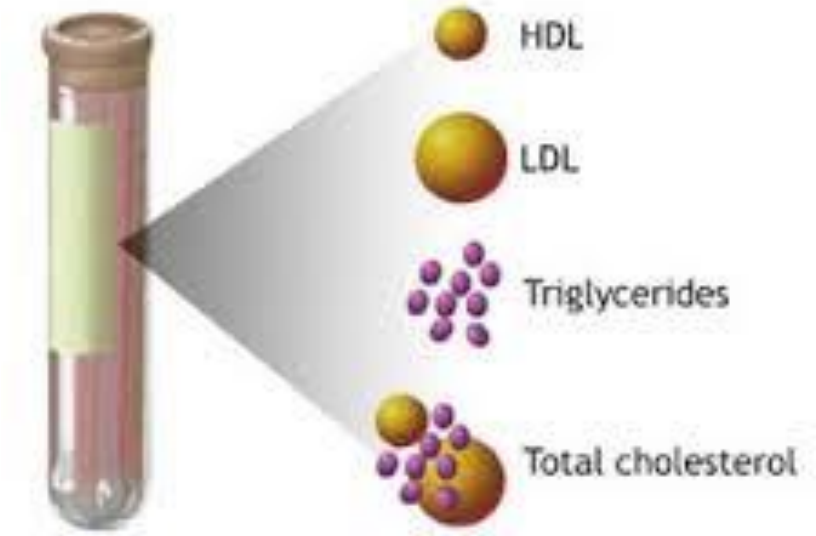
What are the consequences of high blood cholesterol?

- **Extra cholesterol may be deposited in plaques on the walls of blood vessels, these plaques can narrow or block the blood vessels opening leading to atherosclerosis and increasing risk for heart disease and stroke.**

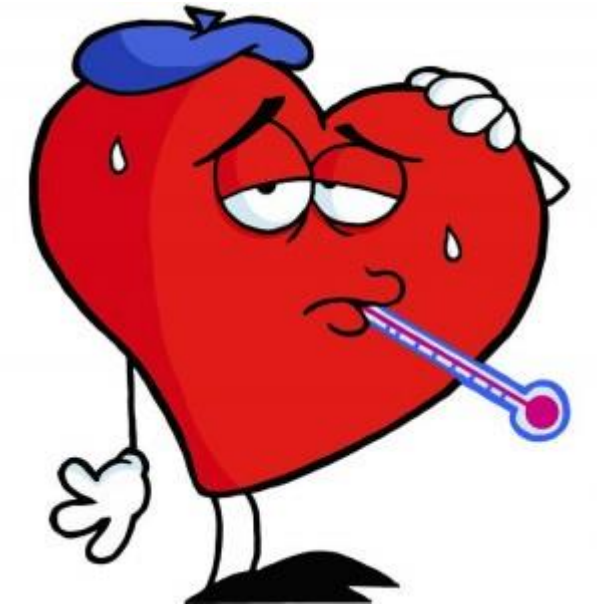


When is cholesterol test recommended?

- ✓ **It is recommended for all adults at least once every five years, it is usually ordered with HDL-C, LDL-C and triglycerides often called a lipid profile**



- ✓ **In patients it is tested several times per year**
- ✓ **In children and youths with increased risk of developing heart disease**



What are the risk factors for heart disease?

- **Smoking**
- **Age**
- **Hypertension**
- **Family history of heart disease**
- **Pre-existing heart disease having had heart attack**
- **Diabetes mellitus**

What are the risk factors for heart disease in children and youths?

- **Family history**
- **Being over-weight or obese**
- **Eat too much cholesterol (saturated and trans unsaturated fats)**
- **Diabetes mellitus**
- **High blood pressure**
- **Smoking**


CHOLESTEROL
DANGER!
TOO HIGH
HIGH
AVERAGE

What does the test result mean?

- **Desirable: cholesterol below 200 mg/dl low risk**
- **Borderline high: cholesterol 200-239 mg/dl moderate risk**
- **High risk: cholesterol ≥ 240 mg/dl high risk**

How many types of lipoproteins are there?

- **There are 5 types from the largest to the smallest size:**

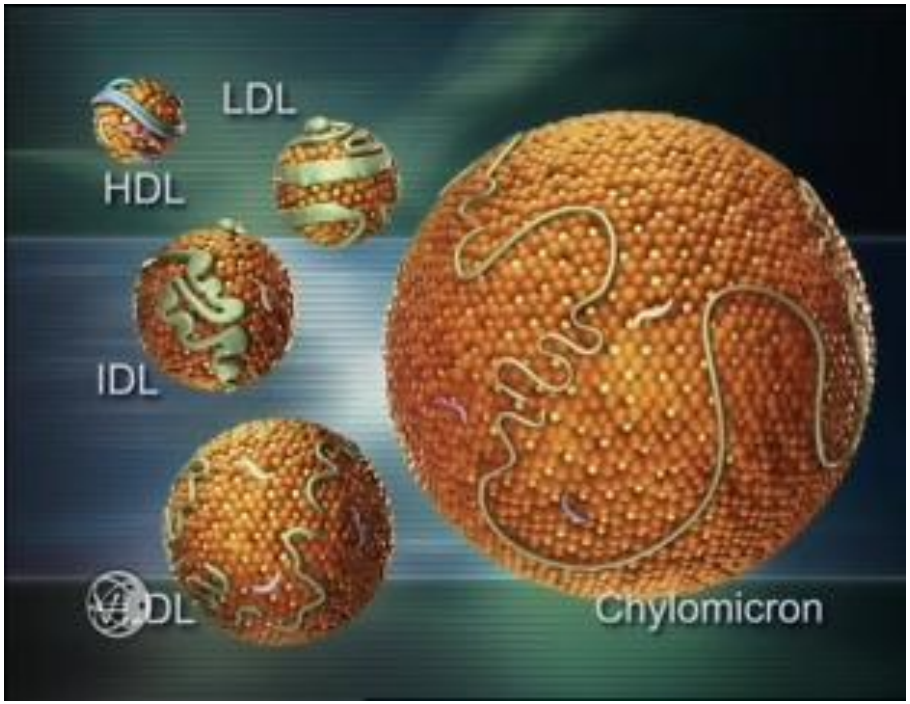
➢ **Chylomicrones**

➢ **VLDL**

➢ **IDL**

➢ **LDL**

➢ **HDL**



What is LDL?

- **It is a type of lipoprotein that carries cholesterol in the blood**
- **It is considered to be undesirable since it deposits cholesterol on the blood vessels walls leading to atherosclerosis and heart disease therefore it is called bad cholesterol**

How can LDL-C level be measured?

- **It can be calculated using the results of lipid profile test**

  LDL-C= TC- HDL-C- (TG/5) mg/dl

- **If the patient is not fasting, LDL-C can be calculated directly for more accurate result**

When LDL-C measurement should be ordered?

- **It should be ordered as a part of lipid profile test in :**

✓ **All healthy adults once every 5 years**

✓ **In those adults having one or more risk factors for heart disease**

✓ **In children and youths with risk factors for heart disease**

✓ **To evaluate the success of lifestyle changes and the effectiveness of drug therapy**

How can LDL-C be evaluated if you have no other risk factors?

- **Less than 100 mg/dl: Optimal**
- **100-129 mg/dl: Near optimal, above optimal**
- **130-159 mg/dl: Borderline high**
- **160-189 mg/dl: High**
- **Greater than 189 mg/dl: Very high**

What are target values for LDL-C if you receive a treatment to lower LDL-C?

- **Less than 100 mg/dl if you have heart disease or diabetes**
- **Less than 130 mg/dl if you have 2 or more risk factors: intermediate risk for heart disease**
- **Less than 160 mg/dl if you have 0 or 1 risk factor: low risk for heart disease**

- **Some organizations recommend that LDL-C should be less than 70 mg/dl if you have heart disease or heart attack**

What are major risk factors for heart disease?

- **Smoking**
- **Age**
- **Low HDL-C**
- **Hypertension**
- **Family history**
- **Pre-existing coronary heart disease**
- **Diabetes mellitus**

What are the causes of low LDL-C?

- **Inherited lipoprotein deficiency**
- **hyperthyroidism**
- **Infection**
- **Inflammation**
- **cirrhosis**

Why LDL-C should be measured when a person is not ill?

- **It is temporarily low during:**
  - **Acute illness**
  - **Immediately following heart attack**
  - **Stress (from surgery or an accident)**
- **So the patient should wait at least 6 weeks after any illness to measure LDL-C**
- **In women, LDL-C rises during pregnancy therefore she should wait at least 6 weeks after baby born**


THANK YOU