- **Fredrickson Classification of hyperlipidemias (according to the type of lipoprotein):**

Phenotype	Elevated lipoproteins(s)	Plasma cholesterol level	Plasma triglyceride level	Atherogenicity	Frequency
I	Chylomicrons	Normal to ↑	Highly increased	-	Rare
IIa	LDL	Increased	Normal	Yes	10%
IIb	LDL + VLDL	Increased	Increased	Yes	40%
III	IDL	Increased	Increased	Yes	Rare
IV	VLDL	Normal to ↑	Increased	Maybe	45%
V	VLDL + chylomicrons	Increased	Highly increased	Maybe	5%

- **Other classifications of dyslipidemia:**
  - **Primary vs. secondary:**
    - ✓ Primary: hereditary and majority of cases are polygenic.
    - ✓ Secondary: caused by another disease or might be drug-induced:
      - ❖ *Secondary hypercholesterolemia:*
        - ➢ Diet
        - ➢ Hypothyroidism.
        - ➢ Pregnancy.
        - ➢ Drugs.
        - ➢ Cholestatic liver disease.
        - ➢ Nephrotic syndrome.
      - ❖ *Secondary hypertriglyceridemia:*
        - ➢ Diet.
        - ➢ Diabetes type-II
        - ➢ Visceral obesity.
        - ➢ Chronic renal failure.
        - ➢ Drugs.
        - ➢ Excess alcohol.
        - ➢ Hepatocellular disease.
  - **Monogenic vs. Polygenic**
  - **Pattern of hyperlipidemia (clinically):**
    - ✓ Hypercholesterolemia (treated mainly with statins):
      - ❖ *Familial Hypercholesterolemia:*
        - ➢ Characterized by: xanthelasma, tendon xanthoma, corneal arcus and premature heart disease.

      - ❖ *Familiar defective Apo B100*: similar to familial hypercholesterolemia.
      - ❖ *Hyperalphalipoproteinemia:*
        - ➢ Characterized by: high HDL (good cholesterol) with no cardiovascular risk.
    - ✓ Hypertriglyceridemia (treated mainly with fibric acid derivatives):
      - ❖ *Familial hypertriglyceridemia:*
        - ➢ Characterized by: eruptive xanthoma, lipemia retinalis (creamy appearance of retinal blood vessels), hepatosplenomegaly and pancreatitis.

- ❖ *Lipoprotein lipase deficiency:*
  - ➢ Same features as familial hypertriglyceridemia.
- ✓ Mixed hyperlipidemia:
  - ❖ *Familial combined hyperlipidemia:*
    - ➢ Most common type of inherited dyslipidemia.
    - ➢ There is increased cardiovascular risk.
    - ➢ No unique manifestations.
  - ❖ *Dysbetalipoproteinemia:*
    - ➢ Characterized by: premature cardiovascular disease, palmar xanthoma and tuberous xanthoma.

- **Management of dyslipidemia:**
  - • **Non-pharmacological management:**
    - ✓ Reduce the intake of saturated fat.
    - ✓ Reduce cholesterol to < 250 mg/day.
    - ✓ Reduce energy-dense foods such as soft drinks and fat.
    - ✓ Increase cardioprotective foods such as fruits and vegetables.
    - ✓ Reduce alcohol consumption.
    - ✓ Increase physical activity to lose/maintain weight.
  - • **Pharmacological treatment (check pharmacology note).**