Department:	Laboratory and Blood Bank (Chemistry)
Document:	Internal Policy and Procedure
Title:	Analysis of Cholesterol Level
Applies To:	All Laboratory Staff

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HEALTH HOLDING

HAFER ALBATIN HEALTH CLUSTER MATERNITY AND CHILDREN HOSPITAL

1. PURPOSE:

1.1   To provide all information related to the analysis of cholesterol level in blood (serum/plasma).

2. DEFINITONS:

2.1   Cholesterol is a steroid with a secondary hydroxyl group in the C3 position.

3. POLICY:

3.1   This policy provides instructions for performing the quantitative determination of cholesterol in human serum or plasma on DimensionEXL200 ,Synchron DXC700 and Atelica CI

3.2   Cholesterol is a steroid with a secondary hydroxyl group in the C3 position. It is synthesized in many types of tissue, but particularly in the liver and intestinal wall. Approximately three quarters of cholesterol are newly synthesized and a quarter originates from dietary intake.

3.3   Serum or plasma cholesterol level is increased in hyperlipidaemia of type IIa and IIb, obstructive jaundice, alcoholic hepatitis, primary biliary cirrhosis, drugs (e.g. steroids, phenothiazine, oral contraceptives) and diabetes mellitus.

3.4   Serum or plasma cholesterol level is decreased in starvation, hyperthyroidism, sideroblastic anaemia, thalassemia, Cushing's syndrome, hepatic failure, multiple myeloma and malnutrition.
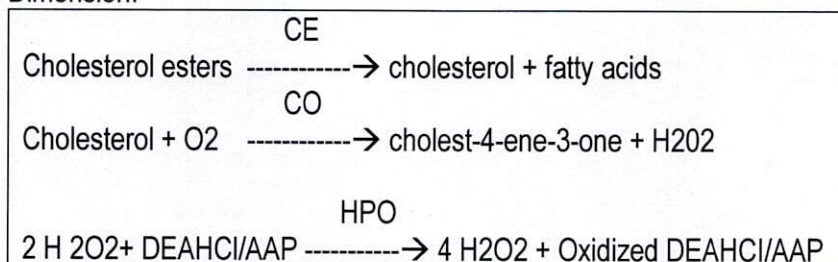
4. PROCEDURE:

4.1   **Specimen:**

   4.1.1   Type:

       4.1.1.1   Serum, or plasma

   4.1.2   Tube Type:

       4.1.2.1   Gel tube, Plain tube, Li-Heparin

   4.1.3   Amount Required:

       4.1.3.1   2.0 to 3.0 ml

   4.1.4   Delivery Arrangements:

       4.1.4.1   Sample to be delivered to the lab as soon as possible. If the sample is serum, ensure complete clot formation before centrifugation. Some specimens, especially those from patients receiving anticoagulant or thrombolytic therapy, may exhibit increased clotting time. If the specimen is centrifuged before a complete clot forms, the presence of fibrin may cause erroneous results.

   4.1.5   Temperature Restrictions:

       4.1.5.1   At room temperature

   4.1.6   Unacceptable Specimen:

       4.1.6.1   See sample rejection criteria policy

   4.1.7   Specimen Retention:

       4.1.7.1   Period of retention: Up to one week after separation of the sample.

       4.1.7.2   Storage condition: Store at 2-8 °C

4.1.8 Safety Precaution:

    4.1.8.1 Treat all samples material as infectious and handled in accordance with the OHSA standard on blood borne pathogens.
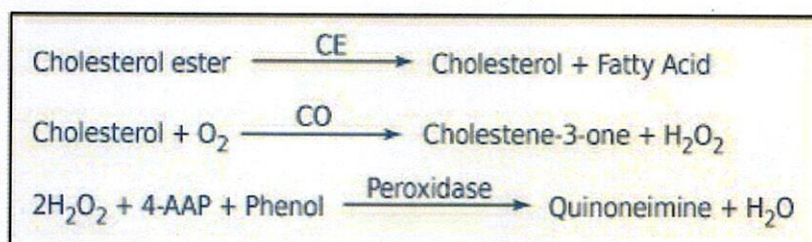
4.9 **Principle:**

    4.9.1 Dimension:

$$\text{Cholesterol esters} \xrightarrow{\text{CE}} \text{cholesterol + fatty acids}$$

$$\text{Cholesterol + O2} \xrightarrow{\text{CO}} \text{cholest-4-ene-3-one + H202}$$

$$\text{2 H 2O2 + DEAHCl/AAP} \xrightarrow{\text{HPO}} \text{4 H2O2 + Oxidized DEAHCl/AAP}$$

        4.9.1.1 The absorbance due to Oxidized DEN HCl/AAP is directly proportional to the cholesterol concentration and is measured using a polychromatic (452, 540, 700) endpoint technique.

    4.9.2 Synchron DXC600:

$$\text{Cholesterol ester} \xrightarrow{\text{CE}} \text{Cholesterol + Fatty Acid}$$

$$\text{Cholesterol + O}_2 \xrightarrow{\text{CO}} \text{Cholestene-3-one + H}_2O_2$$

$$\text{2H}_2O_2 + \text{4-AAP + Phenol} \xrightarrow{\text{Peroxidase}} \text{Quinoneimine + H}_2O$$

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5. MATERIALS AND EQUIPMENT:

5.1 **Reagent:**

    5.1.1 DimensionEXL200 ,Synchron DXC700 and Atelica Cl Refer to company leaflet

5.2 **Regents retention:**

    5.2.1 Dimension: The unopened reagents are stable until the expiration date when stored at 2-8°C. Reagent stability is 30 days if the reagent is unopened and for 5 days if the reagent is opened properly.

    5.2.2 Synchron : CHOL reagent when stored unopened at +2°C to +8°C will obtain the shelf-life indicated on the cartridge label. Once opened, the reagent is stable for 30 days at +2°C to +8°C unless the expiration date is exceeded.

5.3 **Calibration:**

    5.3.1 Refer to company leaflet of DimensionEXL200 ,Synchron DXC700 and Atelica Cl

5.4 **QC:**

    5.4.1 Normal and pathological control. one time in 24 hours If more frequent control monitoring is required, the established quality control procedures is followed If quality control results do not fall within an acceptable range defined by laboratory, patient be affected and corrective action should be taken.

    5.4.2 Quality Control retention procedure and QC Expected Values refer to company leaflet of DimensionEXL200 ,Synchron DXC700 and Atelica Cl.

6. RESPONSIBILITIES:

6.1 Chemistry shift in charge is responsible for, running calibration and control and samples of cholesterol.

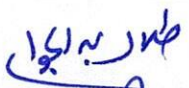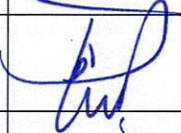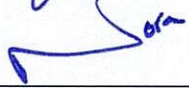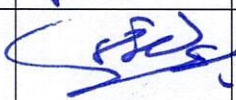6.2 Chemistry staff are responsible for running cholesterol samples all over the day.

7. APPENDICES:

7.1 N/A

8. REFERENCES:

8.1   Tietz Text Book of clinical chemistry and molecular diagnostics 4th Edition, 2006.
8.2   Company Leaflets of reagents.

9. APPROVALS:

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