



HEALTH HOLDING

HAFER ALBATIN HEALTH
CLUSTER
MATERNITY AND
CHILDREN HOSPITAL

Department:	Laboratory and Blood Bank (Chemistry)		
Document:	Internal Policy and Procedure		
Title:	Analysis of Iron Level		
Applies To:	All Laboratory Staff		
Preparation Date:	January 06, 2025	Index No:	LB-IPP-165
Approval Date:	January 20, 2025	Version :	2
Effective Date:	February 20, 2025	Replacement No.:	LB-IPP-165(1)
Review Date:	February 20, 2028	No. of Pages:	04

1. PURPOSE:

- 1.1 The purpose of this policy and procedure is to provide all information related to the analysis of Iron level in blood (serum/plasma) on DimensionEXL200 ,Synchron DXC700 and Atelica CI .

2. DEFINITONS:

- 2.1 Ingested iron is mainly absorbed in the form of Fe²⁺ in the duodenum and upper jejunum.

3. POLICY:

- 3.1 This policy provides instructions for performing the quantitative determination of iron in human serum or plasma on Dimension machines.
- 3.2 Ingested iron is mainly absorbed in the form of Fe²⁺ in the duodenum and upper jejunum. The trivalent form and the heme-bound Fe³⁺ component of iron in food must be reduced by vitamin C. About 1 mg of iron is assimilated daily.
- 3.3 Iron increased in excessive iron intake, haemolytic anaemia and hemochromatosis, and decreased in iron deficiency anaemia, infections and malignancy.

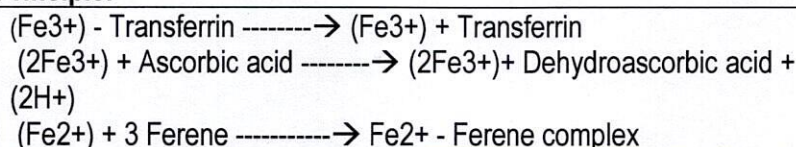
4. PROCEDURE:

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 should be ensuring 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 OSHA standard on blood borne pathogens.

4.2 Principle:



- 4.2.1 Ferene complex The color intensity is directly proportional to the Iron concentration in the sample and is measured photometrically at 600 nm).

4.3 Method:

- 4.3.1 See policy of loading sample on machine (Ref: Operative Manuals' of DimensionEXL200 ,Synchron DXC700 and Atelica CI

4.4 Calculation:

- 4.4.1 Instrument system automatically calculates the Analytic activity and gives results in the form of printout.

4.5 Format:

- 4.5.1 Numeric

4.6 Status:

- 4.6.1 Stat and Routine

4.7 Reference ranges:

- 4.7.1 Serum/plasma 50-175 ug/dl

4.8 Dilution information:

- 4.8.1 Specimens with values exceeding the linearity range are flagged and may be diluted with automatic dilution either automated or manual dilution. Manual Dilution should be performed as follows:
- 4.8.1.1 Use saline (0.85% to 0.90%) to dilute the sample.
 - 4.8.1.2 The operator must enter the dilution factor in the patient order screen. The system dilution factor to automatically correct the concentration by multiplying the result by factor.
 - 4.8.1.3 If the operator does not enter the dilution factor, the result must be multiplied appropriate dilution factor before reporting the result.
 - 4.8.1.4 If a diluted sample result generates a Linear Low (LL) result error code. do result. Prepare an appropriate dilution/concentration and rerun.

4.9 Linearity:

- 4.9.1 Iron is linear up to 1000 ug/dL

4.10 Limit of Detection:

- 4.10.1 The Limit of Detection is 5 ug/dL

5. MATERIALS AND EQUIPMENT:

5.1 Reagent:

- 5.1.1 Iron flex Cat. No. DF85 contains 6 wells with the following ingredients:

Reactive Ingredients	Ingredient Concentration
Liquid (1-4 wells)	
Citric acid monohydrate	150 mM
Thiourea detergent	180 mM
Liquid (5-6 wells)	
Ferene	6.0 mM
Ascorbic acid	240 mM
Thiourea	240 mM

5.1.1.1 Reagent Preparation:

- 5.1.1.1.1 Mixing and diluting are automatically performed by the Dimension system.
- 5.1.1.1.2 Estimated test per cassette, 60 tests
- 5.1.1.1.3 Analytical Range: 5 – 1000 ug/dL

5.1.2 Reagent retention:

- 5.1.2.1 The unopened reagents are stable until the expiration date when stored. Reagent stability is 30 days if the reagent is unopened and for reagent is opened well 1-4 and 14 days for wells 5-6.

5.2 Calibration:

- 5.2.1 Calibration is stable approximately 30 days and required with each change in reagent lot number. Verify calibration curve with at least two levels of controls according to the established Quality Control requirements for your laboratory. Calibration must be done when:

- 5.2.1.1 A complete change of reagents that affects the range used to report patient results or QC value.
- 5.2.1.2 A reagent kit with new lot number is used.
- 5.2.1.3 A new assay file that requires a calibration is installed.
- 5.2.1.4 QC fails to meet the established criteria.
- 5.2.1.5 After major maintenance or service.
- 5.2.1.6 When recommended by the manufacturer.
- 5.2.1.7 Documentation accompanying a new version of an existing file states calibration is required.
- 5.2.1.8 At least every 6 months.

5.2.2 Calibrator retention:

- 5.2.2.1 At 2-8 °C for 24 h. Instability or deterioration should be suspected if there are visible signs of leakage, extreme turbidity microbial growth or if calibration does not meet the appropriate package insert and/or instrument operation manual criteria.

5.2.3 Calibration Procedure:

- 5.2.3.1 Verify that the correct calibrator values have been entered into the calibration file. For details refer to Operator Guide of DimensionEXL200 ,Synchron DXC700 and Atelica CI .
- 5.2.3.2 Allow calibrator to come to room temperature.
- 5.2.3.3 Mix bottle 10 times by inversion.
- 5.2.3.4 Open the bottle, place a minimum of 300 ul of each level in separate sample cup, and place on the assigned positions.
- 5.2.3.5 Cap the bottle tightly and store at 2-8°C. Immediately after use.
- 5.2.3.6 Perform calibration as indicated in Operator Guide of DimensionEXL200 ,Synchron DXC700 and Atelica CI.

5.2.4 Calibration Expected Values:

- 5.2.4.1 Refer to DM IRON CAL for DimensionEXL200 ,Synchron DXC700 and Atelica CI

5.3 Quality control:

- 5.3.1 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.

5.3.2 Quality Control retention:

- 5.3.2.1 Unopened control vial is stable up to expiry date printed on the label when stored at cold room.
- 5.3.2.2 Opened control vial for all analytics will be stable for 7 days except Bilirubin (Direct) for 4 days at 2 — 8 °C, All analytics will be stable for 30 days at -10 to -20 °C.
- 5.3.2.3 Instability or deterioration should be suspected if there are visible signs of leakage, extreme microbial growth or if calibration does not meet the appropriate package insert and/or instrument operation manual criteria.

5.3.3 QC Procedure:

- 5.3.3.1 Verify that the correct QC values have been entered into the QC file. For details refer to Operator Guide of DimensionEXL200.
- 5.3.3.2 Allow QC to come to room temperature
- 5.3.3.3 Gently remove the stopper to avoid loss of the lyophilized pellet and add exactly 5.0 ml distilled or de-ionized water.
- 5.3.3.4 Leave to stand for 20 minutes. Mix bottle several times by inversion to allow homogeneity.
- 5.3.3.5 Gently invert just prior to use. Avoid foaming
- 5.3.3.6 Open bottle, place a minimum of 1000 ul of each level in separate sample cup, and place on the assigned positions.

- 5.3.3.7 Cap bottle tightly and store at 2-8°C. Immediately after use.
- 5.3.3.8 Perform QC as indicated in Operator Guide of DimensionEXL200 ,Synchron DXC700 and Atelica CI.
- 5.3.4 QC Expected Values:
- 5.3.4 Refer to the Bio-Rad Lyphochek assayed chemistry controls value sheet for DimensionEXL200 ,Synchron DXC700 and Atelica CI.

6. RESPONSIBILITIES:

- 6.1 Chemistry shift on charge is responsible for, running calibration and control and samples of Iron.
- 6.2 Chemistry staff are responsible for running iron samples all over the day.

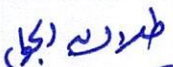





7. APPENDICES:

- 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:

	Name	Title	Signature	Date
Prepared by:	Dr. Talal Abdelgawad	Clinical Pathologist		January 06, 2025
Reviewed by:	Dr. Kawther M. Abdou	Consultant & Lab. Medical Director		January 13, 2025
Reviewed by:	Ms. Noora Melfi Alanizi	Laboratory & Blood Bank Director		January 13, 2025
Reviewed by:	Mr. Abdulelah Ayed Al Mutairi	QM&PS Director		January 13, 2025
Reviewed by:	Dr. Tamer Mohamed Naguib	Medical Director		January 13, 2025
Approved by:	Mr. Fahad Hazam Alshammari	Hospital Director		January 20, 2025