HEALTH HOLDING

HAFER ALBATIN HEALTH CLUSTER
MATERNITY AND CHILDREN HOSPITAL

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

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

2. DEFINITONS:

2.1 Cation: a positively charged ion, i.e. one that would be attracted to the cathode in electrolysis.

3. POLICY:

3.1 Sodium is the major cation of extracellular fluid. It plays a central role in the maintenance of the normal distribution of water and the osmotic pressure in the various fluid compartments.

3.2 Hyponatremia (low serum sodium level) is found in a variety of conditions including the following: Severe polyuria, metabolic acidosis, Addison's disease, diarrhoea, and renal tubular disease.

3.3 Hypernatremia (increased serum sodium level) is found in the following conditions: Hyper-adrenalism, severe dehydration, diabetic coma after therapy with insulin, excess treatment with sodium salts.

4. PROCEDURE:

4.1 **Specimen:**

- 4.1.1 Type:
  - 4.1.1.1 Serum, plasma or urine
- 4.1.2 Tube Type:
  - 4.1.2.1 Gel tube, Plain tube; Li-Heparin, and urine containers
- 4.1.3 Amount Required:
  - 4.1.3.1 2.0 to 3.0 ml blood,24h urine sample
- 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 OHSA standard on blood borne pathogens.

4.2 **Principle:** Indirect potentiometric technique

4.2.1 There are five electrodes used to measure electrolytes on the Dimension system. Three of these electrodes are incorporated into the QuikLYTE® integrated multisensor and are ion selective for sodium, potassium and chloride. A reference electrode is also incorporated in the multisensor. After a diluted sample is positioned in the sensor Na+, K+ and Cl^- ions establish an equilibrium with the electrode surface. A potential is generated proportional to the logarithm of the analyte activity in the sample. The electrical potential generated on a slandered solution, and the concentration of the desired ions is calculated by use of the Nernst equation.

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 print out.

4.5 **Format:**

4.5.1 Numeric

4.6 **References range:**

4.6.1 Serum/plasma 136-145 mmol/L

4.6.2 Urine 40-220 mmol/24h

4.7 **Dilution Information:**

4.7.1 Specimens with values exceeding the linearity range are flagged and diluted with the automatic dilution.

4.8 **Test Limitation:**

4.8.1 Recognizing:

4.8.1.1 Haemolysed sample (HB>500 mg/dl)

4.8.1.2 Lipemia: because of absorbance flagging > 1000 mg/dl

4.8.1.3 Icterus: bilirubin > 94 mg/di

4.8.2 Avoiding Error:

4.8.2.1 Following acceptance criteria of the sample

4.8.2.2 By following the maintenance protocol. Daily, weekly, month

4.8.2.3 Run control before starting the tests

4.8.3 Error Correction:

4.8.3.1 Look for a fibrin clot or air bubbles

4.8.3.2 Repeat the sample from the original tube

4.8.3.3 Ask for another sample

4.9 **Specific Performance Characteristics:**

4.9.1 Assay range:

4.9.1.1 Serum/plasma 5-200 mmol/L

4.9.1.2 Urine 5-300 mmol/L

5. MATERIALS AND EQUIPMENT:

5.1 **Reagent:**

5.1.1 QuikLYTE® Standard A

5.1.2 QuikLYTE® Standard B

5.1.3 QuikLYTE® Flush Solution

5.1.4 QuikLYTE® Sample Diluent

5.1.5 QuikLYTE® Dilution Check

5.1.6 Salt Bridge Solution

5.2 **Calibration:**

5.2.1 Refer to insert sheet of QuikLYTE® integrated multisensor

5.3 **Quality control:**

5.3.1 Normal and pathological control. One time in 24 hours (once per day)

5.3.2 If more frequent control monitoring is required, follow the established quality control procedures your laboratory

5.3.3 If quality control results do not fall within an acceptable range defined by your laboratory, may be affected and corrective action should be taken

5.3.4 Quality Control retention:

5.3.4.1 Unopened control vial is stable up to expiry date printed on the label when stored at cold room.

5.3.4.2 Opened control vial is stable for: After reconstituting and tightly capped at 2 — 8 °C All analytes will be stable for 7 days except Bilirubin (Direct) for 4 days.

5.3.5 QC Procedure:

5.3.5.1 Verify that the correct QC values have been entered into the QC file. For details refer to Operator Guide of Dimension.

5.3.5.2 Allow QC to come to room temperature.

5.3.5.3 Gently remove the stopper to avoid loss of the lyophilized pellet and add exactly 5.0 ml distilled or de-ionized water.

5.3.5.4 Leave to stand for 20 minutes. Mix bottle several times by inversion to allow homogeneity.

5.3.5.5 Gently invert just prior to use. Avoid foaming.

5.3.5.6 Open the bottle, place a minimum of 1000 ul of each level in separate sample cup, and place on the assigned positions.

5.3.5.7 Cap the bottle tightly and store at 2-8°C. Immediately after use.

5.3.5.8 Perform QC as indicated in Operator Guide of DimensionEXL200 ,Synchron DXC700 and Atelica CI .

5.3.6 QC Expected Values:

5.3.6.1 Refer to the Biorad Lyphochek assayed chemistry controls value sheet for Dimension.

6. RESPONSIBILITIES:

6.1 Chemistry shift on charge is responsible for, running calibration and control and samples of Na

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

7. APPENDICES:

N/A

8. REFERENCES:

8.1 Tietz Text Book of clinical chemistry and molecular diagnostics 4th Edition,2006

8.2 Company Leaflets of reagents, and machine operator.

9. APPROVALS:

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