**CASE 1**

1. Verification of abnormal electrolyte levels in serum

1.1 A 75-year-old patient showed an increase in serum potassium (K+) level as 7 mmol/l and serum chloride and bicarbonate levels are within the normal range. In order to verify this abnormality analytically, one of the following actions should be followed.

1. Repeat the serum K+
2. Request additional tests such as renal function tests to verify the serum K+
3. Check the time taken to transport the specimen
4. Call the doctor to alert him to this increase in serum K+
5. Perform serum indices checks (hemolytic index, lipaemia index, and icteric index)

Write the numbers in logical sequence (for example: 1, then 3, then 5)

**ANSWER:** 3 then 5 or 5 then 3.

Either check the transport conditions and time first or check the serum indices first. Other options are not appropriate as the root cause would be usually found in these 2 procedures. After exclusion of these 2 pre-analytical errors, one can continue to assessing renal function etc.

What is not mentioned in the options is the EDTA contamination for which one needs to do serum calcium.

1, 2, and 4 are not recommended if root cause is found in either 3 or 5

1.2 The following reasons are important with respect to increased K+ due to **pre-pre**-analytical variations **except**:

1. Prolonged contact time between cells and serum leading to K+ leaking out of cells
2. Poorly functioning centrifuge may cause damage to the cells, hence falsely high K+
3. Exposure to high environmental temperature causes increase in cell membrane permeation and leads to K+ leaking out of the cells
4. Phlebotomist could injure the blood vessels that may cause hemolysis
5. There was a prolonged application of tourniquet

Choose the most appropriate answer: ……………………………

**ANSWER:** 2 (other options are pre-pre analytical variations).

1.3 The technician who operates the automatic chemistry analyzer reports to you that the raw data of serum Sodium (Na+) are lower than the reference range in 10 patients who he analyzed as one batch. As a lab director, you would respond in following the action(s).

1. Call the doctors who sent these specimens and ask for fresh samples
2. Stop the instrument for all electrolyte testing
3. Check the internal QC results of Na+ for the whole week
4. Evaluate other electrolyte results (for example, of Chloride and Anion gap)
5. Replace the ISE (ion-selective electrodes) module on your instrument

Write the numbers in logical sequence (for example: 1, then 3, then 5)

**ANSWER:** 3 then 4 (5 can follow if problems are detected in the 3 and 4).