AL-MUSTAQBAL UNIVERSITY

كلية التقنيات الصحية والطبية

COLLEGE OF HEALTH AND MEDICAL TECHNIQUES

قسم تقنيات الكلية الصناعية

kidney dialysis techniques Department

أسست عام ٢٠١٠

Lecture 2/Second Year

Serum Urea

Subject Lecturer

Dr. Tuqa H. Abdallah

Urea

CLINICAL SIGNIFICANCE

Urea is the end product of the protein metabolism. It is synthesized in the liver from the ammonia produced by the catabolism of amino acids. It is transported by the blood to the kidneys from where it is excreted. Increased levels are found in renal diseases, urinary obstructions, shock, congestive heart failure and burns. Decreased levels are found in liver failure and pregnancy

PRINCIPLE

Urease catalyses the conversion of urea to ammonia. In a modified Berthelot reaction, the ammonium ions react with a mixture of salicylate, hypochlorite and nitroprusside to yield a blue-green dye (Indophenol.) The intensity of this dye is proportional to the concentration of urea in the sample.

REAGENT COMPOSITION

UREA REAGENT 1

Phosphate buffer 120 mmol/L

Sodium Salicylate 60 mmol/L

sodium nitroprusside 5 mmol/L EDTA 1 mmol/L

Urease 5 KU/L

UREA REAGENT 2

Phosphate buffer 120 mmol/L Sodium Hydroxide 400 mmol/L Sodium Hypochlorite 10 mmol/L

UREA STANDARD :Urea standard concentration 80 mg/dL or 13.3mmol

PROCEDURE

Pipette into cuvettes	Blank	Standard	Sample
Reagent-1	1000 µL	1000 µL	1000 µL
Sample	--	--	10 µL
Standard	--	10 µL	--
Mix and incubate for 5 minutes at 20-25°C or 3 minutes at 37°C			
Reagent-2	1000 µL	1000 µL	1000 µL
Mix and incubate for 10 minutes at 20-25°C or 5 minutes at 37°C Measure the absorbance of the sample (As) and the standard (Astd) against the reagent blank			

CALCULATION

$$\text{Urea Conc. (mg/dL)} = \frac{\Delta A \text{ sample}}{\Delta A \text{ standard}} \times 80 \text{ (Std.conc.)}$$

Urea (g/24 urine) = mg/dL X volume of 24-hour urine

To convert mg/dL to mmol/L divide by 6.01