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Kidney Function Test

Kidney function test KFT or RFT includes the determination of blood urea , serum creatinine and uric acid . Urea is the detoxification product of the ammonia derived from the deamination of amino acids, therefore, urea is the most common nitrogen containing end product of protein catabolism.

Urea is synthesized in the liver from ammonia and it is then excreted by the kidneys. Urea production is increased when excess protein is ingested or when body protein is catabolized, regardless the cause.

The concentration of urea in the body fluids depends upon the rate of production by the liver and the rate of removal by the kidneys. Changes in urea levels are more dependent upon kidney function than upon liver function.

Clinical significant

Hyperuremia : increase in BUN is not seen only in renal disease but also in a many of other diseases such as shock, dehydration, diabetes, acute myocardial infarction or mechanical obstruction to urine excretion, the obstruction may be caused by stone or tumour .

Hypouremia: Decrease in BUN have been reported in liver disease, impaired absorption and overhydration (increased urinary outflow) .

The normal range of blood urea is 15 - 45 mg/dl.

Enzymatic method of Blood Urea Determenation

By using urease enzyme , urea is converted into ammonium carbonate which can be detected by adding Nessler's reagent (Potassium mercuric iodide).

Assay procedure:

	Test	Blank	Standard
Working solute	**1 ml**	**1 ml**	**1 ml**
Sample	**10 µl**	**----**	**----**
Standard	**----**	**----**	**10 µl**

Wait for five minutes at 37 C. Nessler's reagent 200 µl 200 µl 200 µl Incubate for 10 minutes at 37 C.

Read absorbance at 520 nm.

Calculation

Urea level $= \frac{\text{O. D sample}}{\text{O. D standard}} \times \text{standard concentration}$