

Experiment 4 : Creatinine estimation and creatinine clearance tests

METHOD:

1-Set up a series of test tube as follows:

Chemical	Standard(serum)		Test (serum)		Standard (Urine)		Test (urine)		Blank
	(A)	(B)	(C)	(D)	(A)	(B)	(E)	(F)	
Water	1.5 ml	1.5 ml	1.5 ml	1.5 ml	1.5 ml	1.5 ml	1.5 ml	1.5 ml	2 ml
Standard(serum)	0.5 ml	0.5 ml	-	-	-	-	-	-	-
Serum Sample	-	-	0.5 ml	0.5 ml	-	-	-	-	-
Standard(Urine)	-	-	-	-	0.5 ml	0.5 ml	-	-	-
Urine Sample	-	-	-	-	-	-	0.5 ml	0.5 ml	-
Picric acid	6 ml	6 ml	6 ml	6 ml	6 ml	6 ml	6 ml	6 ml	6 ml

2- Cove the tubes with foil and Mix well

3-Immerse the Tubes carefully in the **boiling** water bath for 40 seconds., **then cool** it under tape

4-Set **another 8 test** tube labeled A- D twice and **transfer 4 ml** of each tube into the new set.

5- Pipette 0.2 ml of NaOH to **all tube**

6- Let the tubes stand for 20 min.

7- Read the absorbance at 520 nm.

Results:

Tube	Standard(serum)		Test (serum)		Test (urine)		Standard(Urine)	
	(A)	(B)	(C)	(D)	(A)	(B)	(C)	(D)
Absorbance at 520 nm								
Average(Mean of Absorbance)								

- Calculations:

- Mean Absorbance of Standard =
- Mean Absorbance of Serum =
- Mean Absorbance of Urine =

$$\text{Serum creatinine} = \frac{\text{Mean Absorbance of Urine} \times \text{concentration of standard}}{\text{Mean Absorbance of Standard}} = \dots\dots\dots \text{mg / dl}$$

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$$\text{Urinary creatinine} = \frac{\text{Mean Absorbance of serum} \times \text{concentration of standard} \times \text{D.F}}{\text{Mean Absorbance of Standard}} = \dots\dots\dots \text{mg / dl}$$

dilution factor= 100

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To compare with normal range, convert from mg/dl to g/24 h

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Find the Creatinine Clearance = if you know that the Volume of urine in 24 h =100 ml and A=1.6 m²

$$\text{3- A- Creatinine Clearance:} = \frac{U.V}{P}$$

U is Urine creatinine

V is Volume of urine in 24 h

P is Serum creatinine

For example:

$$U = 488 \text{ mg/dl}, P = 2.32 \text{ mg/dl}, V = 100 \text{ ml/24 h}$$

$$(488 \text{ mg/dl} \div 2.32 \text{ mg/dl}) \times (100 \div 1440) = 14.6 \text{ ml/min}$$

14.6 ml/ min in 1.73 m² find Cr.Cl in this person who have a surface area = 1.6

$$(14.6 \times 1.6) \div 1.73 = 13.5 \text{ /min/1.73m}^2$$

$$\text{3- B- Creatinine Clearance:} = \frac{(U \times V \times 1.73)}{(P \times 1440 \times A)}$$

$$(488 \text{ mg/dl} \times 100 \times 1.73) / (2.32 \times 1440 \times 1.6) = 15.7 \text{ ml/min /1.73m}^2$$

$$\text{Normal creatinine clearance} = 100\text{-}130 \text{ ml/min/1.73m}^2$$