**Lab sheet #4**

**-Estimation of Serum Creatinine, Urine Creatinine and Creatinine Clearance -**

**-Objectives:**

* To estimate creatinine in serum and urine.
* To calculate creatinine clearance value.

**-Method:**

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

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Chemical** | **Standard**  **(3mg/dl)** | | **Test (serum)** | | **Test (urine)** | | **Blank** |
| **(A)** | **(B)** | **(C)** | **(D)** | **(E)** | **(F)** |
| **Water** | 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 | - | - | - |
| **Urine Sample** | - | - | - | - | 0.5 ml | 0.5 ml | - |
| **Picric acid** | 6 ml | 6 ml | 6 ml | 6 ml | 6 ml | 6 ml | 6 ml |

1. Cover the tubes with foil and Mix well.
2. Immerse the tubes carefully in the boiling water bath for **40 seconds**, then cool it under tape.
3. Pipette **0.6 ml of NaOH** to all tubes.
4. Let the tubes stand for **20 min.**
5. Read the absorbance at **520 nm.**

**-Results:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tube** | **Standard**  **(3mg/dl)** | | **Test (Serum)** | | **Test (Urine)** | |
| **(A)** | **(B)** | **(C)** | **(D)** | **(E)** | **(F)** |
| **Absorbance at 520 nm** |  |  |  |  |  |  |
| **Mean of Absorbance** |  | |  | |  | |

-Calculations:

**1-Serum creatinine =**

(Mean absorbance of **serum** / Mean absorbance of standard) X concentration of **standard** = ………………. mg/dl

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**2-Urine creatinine =**

(Mean absorbance of **urine** / Mean Absorbance of Standard) X concentration of **standard** X DF (10) = …………….. mg/dl

-To compare with the normal range, convert from **mg/dl** to **g/24h** :

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**-Find the Creatinine Clearance, if you know that: The volume of the urine in 24h =100 ml and A=1.6 m2**

**3- Creatinine Clearance:**

=U.V/ P

**U** is Urine creatinine, **V** is Volume of the urine in 24h, **P** is Serum creatinine.

= [ Urinary creatinine **(mg/dl**) / Plasma creatinine (**mg/dl**) ] X Urine volume (**ml/min**) = **Y**

So:

Y ---------------------------> 1.6 m2 (person surface area)

? ---------------------------> 1.73 m2

-Corrected for surface area= **………….. ml/min/1.73 m2**

--------OR--------

🡺 Creatinine Clearance: = ( U XV X1.73)/ (P X 1440 X A)

**\* Reference Values:**

Urine creatinine:1- 2 g/24h.

Serum creatinine: 0.6–1.2 mg/dL.

Creatinine clearance: 100-130 ml/min/1.73m2