By Name Of Allah

RBC's

#RBC's :

- Are biconcave in appearance.

- They don't have nuclei.

- They contain a red pigment (Hemoglobin).

**Their function is** : to combine with Oxygen as well as Carbon dioxide and transport them through the blood vessels.

RBC's can be functionally active for **120 days.**

RBC's count: -

* Male 4.5-6 million/ cubic millimeter.
* Female 4-5.5 million/ cubic millimeter .

**Principle of the test:**

We want to count RBC's in each 1 cubic millimeter .

The number of them is very large , so we must dilute our sample with : ISOTONIC SOLUTION (HAYEM's SOLUTION).

We use for this test :

1-RBC's count pipette:

- Consists of stem and bulb.

- Has 3 marks(0.5,1.0 and 101).

- Has a red bead.

2-Hemacytometer:

- Distance between the bottom of the cover slip and the surface of the counting area is 0.1 mm.

- It's a counting chamber , its surface contains two square ruled areas separated by an H-shaped moat , they are identical , each one with a surface area of 9 mm^2 ( 9 primary squares each one of an area of 1 mm^2 ) .

- The central primary square is used for RBC's count , it consists of 25 secondary squares , each one of these secondary squares is divided into 16 tertiary squares .

**Procedures**:

1- filling the pipette with 0.5 mm^3 of blood then complete to 101 with HAYEM's solution .

2- mixing them for 2-3 minutes .

3- charging hemacytometer: by placing the tip of the pipette at the edge of the central platform of hemacytometer slide and letting a drop of diluted blood run between the hemacytometer slide and cover slip by a capillarity .

4-letting cells to settled down .

|  |  |  |
| --- | --- | --- |
| Magnification (objective) | You can see | # of squares you can see |
| 4X | Primary | 9 |
| 10X | Secondary | 25 (just in the middle one) |
| 40X | Tertiary | 16 (just here) |

**Note while counting** : count all cells that touch any of the upper and left lines , and don't count any cells that touch a lower and right lines .

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#RBC's/mm^3 = #cells in 5 (secondary) squares X volume correction factor (VCF) X dilution factor (DF)

1. DF= total volume(T.V) / sample volume(S.V)
2. VCF = 1 mm^3 / total volume of the 5(secondary) squares
3. Total volume of the 5(secondary squares) = volume of each tertiary square X # of tertiary squares
4. Volume of each tertiary square = width X length X height
5. Total # of tertiary squares = # of secondary squares X # of tertiary square for each secondary square

If the question don't give us these info.s ,, we should use them like this :

DF=200 ,,,, VCF=50

**Anemia** : a decreased # of RBC's below normal range .

**Polycythemia**: increased # of RBC's above normal range .

\*Physiological polycythemia :up to 8 million cells / mm^3

 due to :

1- age : for example , at birth RBC's count is 8-10 million cells / mm^3.

2- high altitudes.

\*pathological polycythemia :

-Primary : RBC's over 14 million cells / mm^3

This occur in bone marrow malignancy .

-Secondary : RBC's are 8 million cells / mm^3

This is due to :

1- respiratory disease.

2- heart disease.

3- chronic carbon dioxide poisoning.

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