

RBC TERMINOLOGIES

DR. NAJEEB LECTURE NOTES

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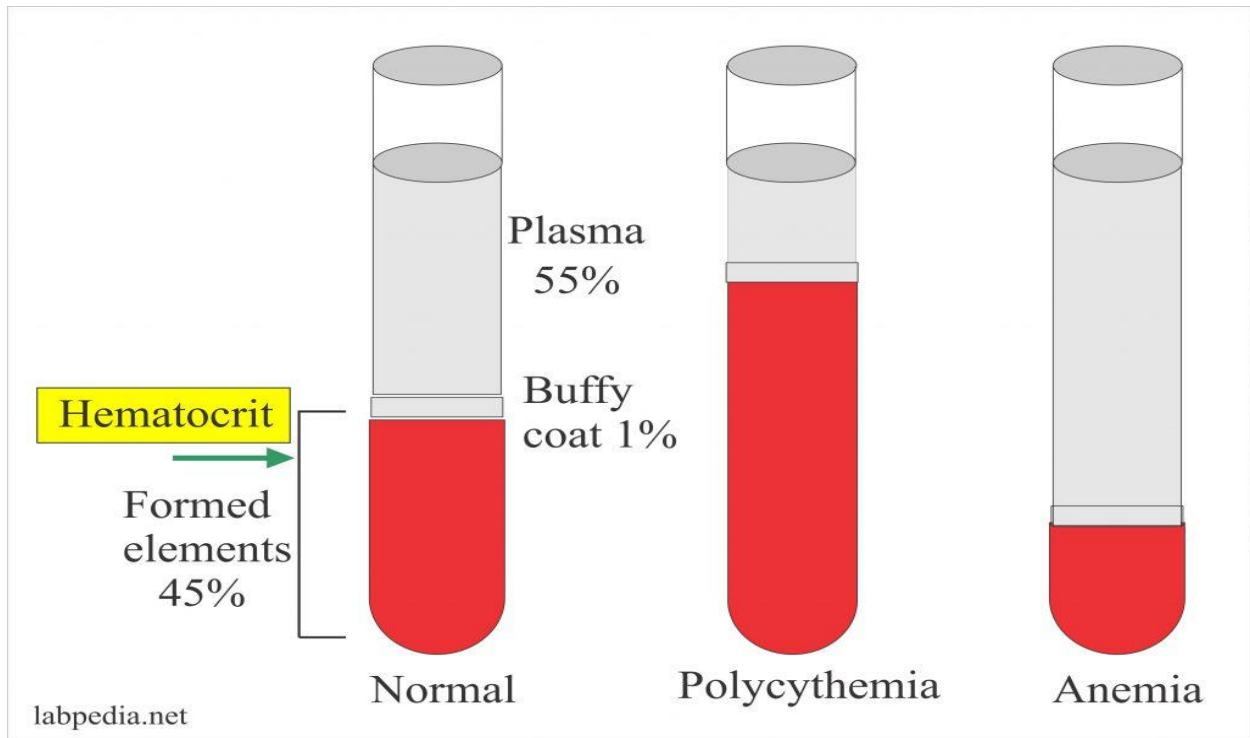
KGMC

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1. PCV (Hematocrit)
2. Hb Concentration
3. Red cell count
4. Mean corpuscular volume (MCV)
5. Mean corpuscular Hemoglobin (MCH)
6. Mean Corpuscular Hemoglobin Concentration (MCHC)
7. Red cell Distributive width (RDW)
8. Microcytic RBCs
9. Normocytic RBCs
10. Macrocytic RBCs
11. Normochromic RBCs
12. Hypochromic RBCs
13. Hyperchromic RBCs

1. PACKED CELL VOLUME (PCV) OR HEMATOCRIT

PCV also known as Hematocrit is the volume occupied by Erythrocytes in the given volume of blood and is usually expressed as percentage of the volume of the whole blood sample



Anticoagulant mixed blood is filled in a tube and centrifuged. Cells settle down towards the bottom because of their greater density leaving the clear plasma on upper side.

The RBCs settle down at bottom and the volume occupied by these RBCs is called PCV or hematocrit. Normal PCV of human RBCs is **45%** of total volume.

2. RED CELL COUNT

To find the number of RBCs in one unit of blood or number of RBCs within PCV.

In 1 ml of blood, there are approximately 5 million RBCs.

3. Hb CONCENTRATION

NORMAL HB CONCENTRATION:

- 15% of total volume
- 15g in 100ml (15g/dL)
- 33% in one RBC (one-third of RBC)

4. MEAN CORPUSCULAR VOLUME (MCV)

The average size/ volume of RBC.

Calculating MCV = total volume occupied by RBCs ÷ number of RBCs

$$= 0.45\text{ml}/5000000 = 9 \times 10^{-15} \text{ L}$$

$$= \mathbf{90 \text{ fL}}$$
 (f for femto)

Normal MCV value = 90 ± 10 fL

5. MEAN CORPUSCULAR HEMOGLOBIN (MCH)

Refers to average quantity of Hb present in a single red blood cell.

Calculating MCH = Total amount of Hb \div number of RBCs

So average amount of Hb per RBC = $15\text{g} / 5000000 = 30 \text{ pg}$ (p for pico)

6. MEAN CORPUSCULAR HEMOGLOBIN CONCENTRATION (MCHC)

The mean corpuscular hemoglobin concentration (MCHC) is a measure of the concentration of haemoglobin in a given volume of packed red blood cell.

Calculating MCHC = Total amount of Hb \div Total volume of RBC = **33%**

7. MACROCYTE

An exceptionally large RBC occurring chiefly in anemias. It is also called megalocyte. In maceocyte MCV is larger than 100 fL.

8. MICROCYTE

An unusually small RBC, associated with certain anemias. MCV value less than 80 fL.

9. NORMOCHROMIC RBC

RBC having normal color i.e. more colored at periphery and pale at center due to presence of Hb at periphery.

10. NORMOCYTIC RBC

The RBC having normal size (90fL) is called normocytic cell.

11. HYPOCHROMIC RBC

MCH and MCHC lower than normal due to which RBC appears paler than normal. Central paler region is seen to be larger than normal.

12. HYPERCHROMIC RBC

MCH and MCHC greater than normal due to increase in Hb and central paler region almost disappears.

13. RED CELL DISTRIBUTION WIDTH (RDW)

The red blood cell distribution width blood test measures the amount of RBC variation in volume and size. Normal RBCs maintain a standard size (6-8 microns) and volume (90fL). The RDW is elevated if range of sizes is large.

High RDW values mean a person may have a nutrient deficiency or anemia.

Anisocytosis is the medical term for having RBCs that are unequal in size. In case of anisocytosis, the patients have increased RDW. Normally, a person's RBCs should all be roughly the same size.

Anisocytosis is usually caused by anemia.

Anemia due to iron deficiency makes cell microcytic.

Anemia due to B12 deficiency makes cell megacytic.