

RBC INDICES

e.g 1 unit of blood is taken

1. Anticoagulate it

2. then centrifuge it

It will have 0.45 cell.

this is PCV

PCV (Hematocrit)

The Volume of blood occupied by Packed RBC.



0.45 L/L

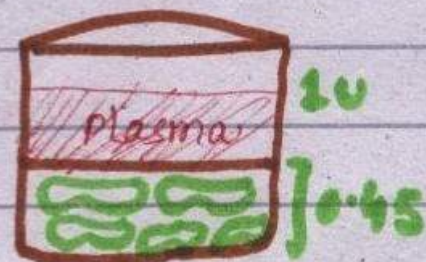
RBC Count:

No of RBC in 1 unit^{vol} of blood

In healthy Person

1 ml = 5 Million RBC

100 ml = 500 Million RBC



E.g

① In both cases

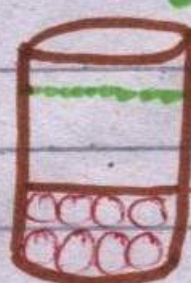
Hematocrit is Equal

but

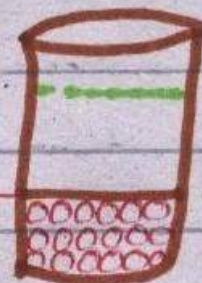
RBC Count is

less in Macrocytic

& more in case of Microcytic



Macrocytic



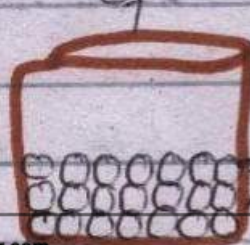
Microcytic

②

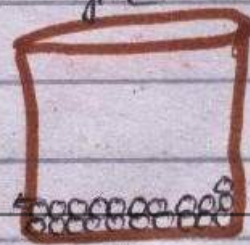
RBC Count is Equal

in both cases

but PCV is diff



PCV

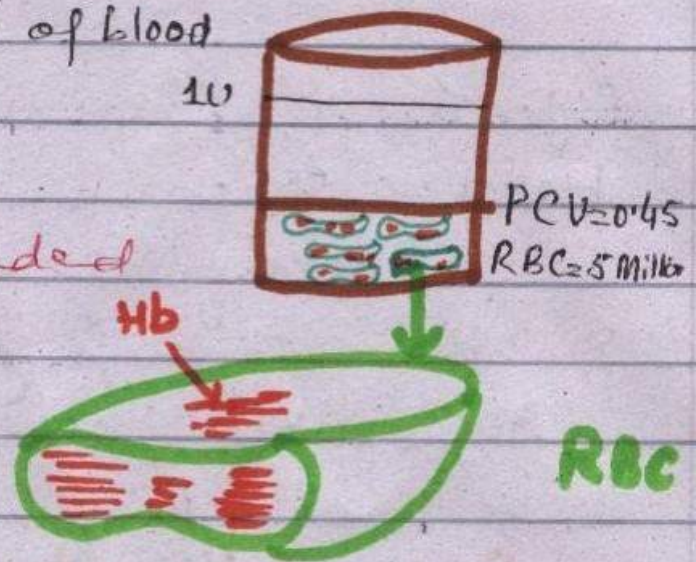


PCV

Hb Concentration: Conc of Hb ^{per} 100 ml of blood

RBC is bag of Hb
but not 100% full
1/3rd of them are loaded
with Hb.

b/c this is the
total metabolic capacity
of given cells to
make Hb.



Conc of Hb per 100 ml of blood.

100 ml blood = 45 ml RBC

∴ 1/3 of RBC is Hb

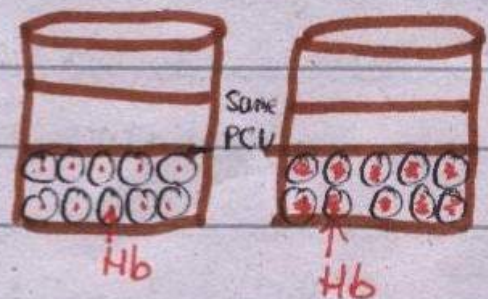
$$\frac{45}{3} = 15$$

blood
100 ml have = 15% of Hb

or 15 g/dl

It is not Necessary that 2 pts who have
RBC count & Hematocrit Same also
have same Hb Conc.

b/c It depends of
Hemoglobinization of Cells.



Mean Corpuscular Volume (MCV)

Mean Volume of one RBC.

Mean Corpuscular Hb Concentration (MCH)

Amount of RBC Hb in each RBC

Mean Corpuscular Hb Conc (MCHC)

Concentration of Hb in each R.B.C.

$$M.C.V = \frac{P.C.V}{\text{Red Cell Count}} = \frac{0.45}{500,000} = 90 \times 10^{-15} \text{ L}$$

$$M.C.V = 90 \text{ femto L}$$

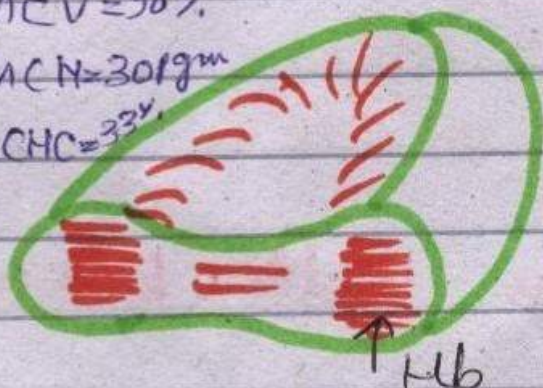
$$M.C.H = \frac{\text{Total Hb}}{\text{Red cell Count}} = \frac{15}{500,000} = 30 \text{ pgm}$$

$$M.C.H = 30 \text{ pgm}$$

$$MCHC = \frac{\text{Total Hb}}{\text{Total vol}} = \frac{15}{0.45} = 33\%$$

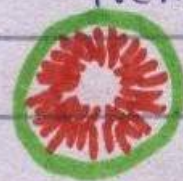
$$MCHC = 33\%$$

MCV = 90%
MCH = 30 pgm
MCHC = 33%



RBC volume.

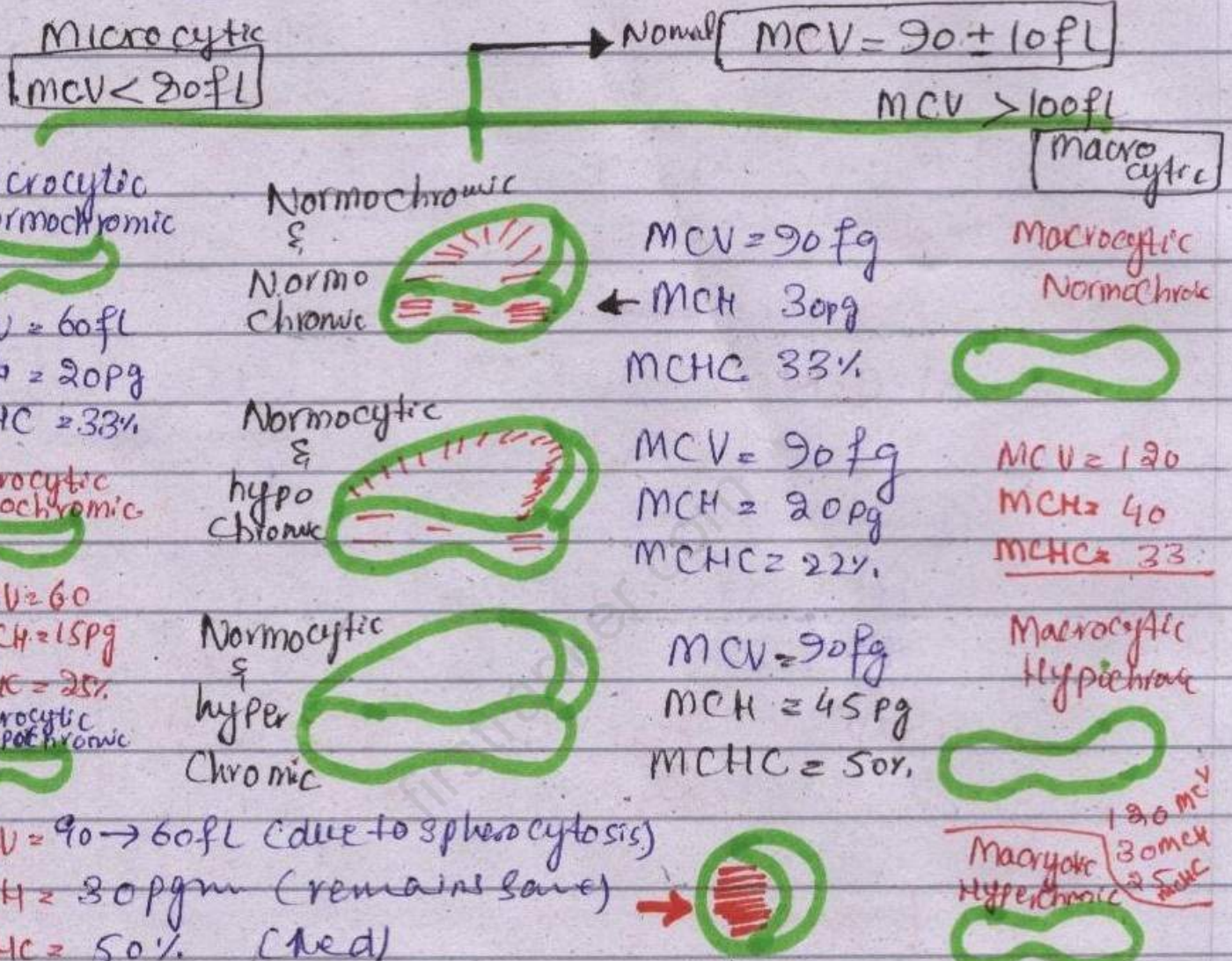
Normochromic



Normally In RBC Hb is more at periphery and less in the center so center is pale. (1/3rd of cell is pale)

Such a cell looks red → Normochromic

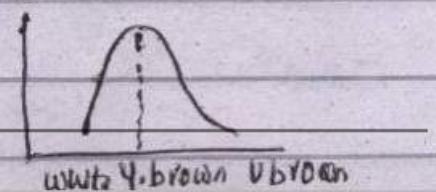
In this cell Size/Volume is also normal. So it is Normocytic & Normochromic (i.e. MCV & MCH is Normal)

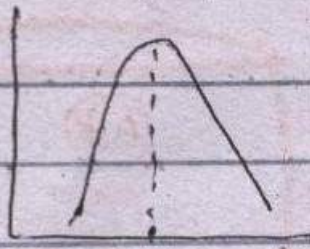


Spherocytosis:
 RBC membrane was lot while they are passing through Narrow Capillaries.

Red Cell Distribution Width: R.D.W

There is variation according to Size of size of cells.
 Normal Distribution Curve is bell shaped.



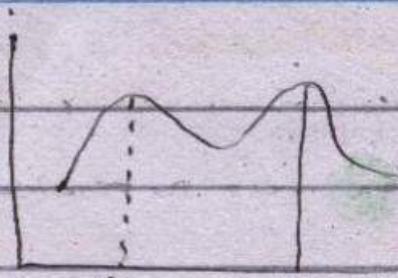


$MCV = 90$

All RBC are of same size

$MCV = 90$

width of Distribution Curve is less



MCV

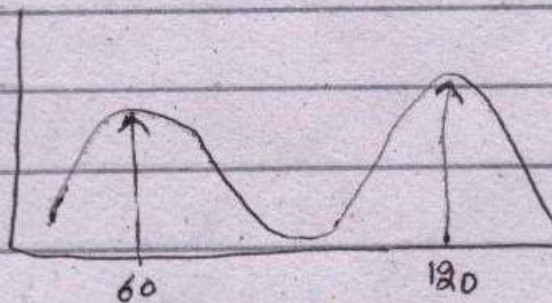
An Isocytosis

i.e

Cells are of not equal size
width of Distribution Curve is more

(e.g. a person is Microcytic & injected with Normocytes blood now he has two type of cells)

width of Distribution is Wide



Seen in pt with double Anemia

e.g. pt have

Iron def Anemia +
B₁₂ def Anemia

Iron def A (RBC → microcytic)

B₁₂ def A (RBC → Macrocytic)