**Packed Cell Volume(PCV) OR**

**Hematocrit (HCT) Value**

**P.C.V. :- Is the volume of red blood cells in a 100 ml of whole blood ,**

**The P.C.V. Is also used in conjugation with the Hb concentration to calculate the mean corpuscular Hb concentration when a tube of blood is centrifuged, the erythrocytes pack into the bottom part of the tube with the plasma on top. The white cells and platelets are found in a thin area, (the Buffy layer), above the column of red cells.**

***Introduction and principle***

**Whole blood is centrifuged for maximum red blood cell packing. The space occupied by the red blood cells is measured and expressed as a percentage of the whole blood volume.**

**Factor affectes P.C.V.**

1- haemorrhage  
immediately following an acute hemorrhage, the P.C.V and RBC count may be normal ,but during the recovery phase, the blood volume will increase the (plasma volume) ,so both p.c.v. and r.b.c. count will be reduced.

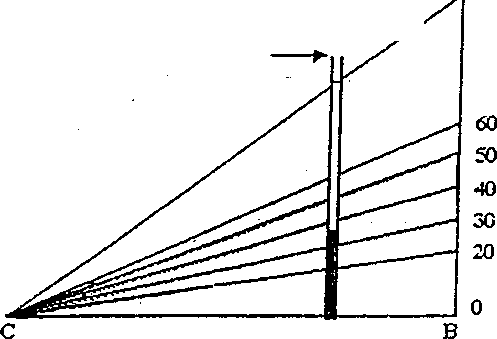
2-dehydration  
will produce increase in P.C.V. and R.B.C. count.  
p.c.v. increased in polycythemia ,either physiological; exhigh attitude or pathological.  
p.c.v. decreased in :  
a-acute anemia .  
b- some liver and spleen disease.  
c- kidney disease.  
d- extra vascular fluid as in, congestive heart failure.

Normal value

* **In adult men / 44-54%**
* **In adult women / 38- 48**

**Microhaematocrit Method**

**Material and Instruments  
1- Microhaematocrit tube 75 mm in length and 1mm in diameter which contain heparin and show a red ring at the end of the tube.  
2- Microhaematocrit centrifuge capable of producing a relative centrifugal force of 10000 to I5OOOg.  
3- Plastic seal or Bunsen burner flame to seal one end of microhaematocrit tube.  
4-microhaematocritrit reader(Fig. 1).**

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**Procedure**

**1-'Blood is drawn into the tubes by capillary phenomenon. By holding theTubes in horizontal manner and allow 2/3 to 3/4 to be filled with blood .Air bubbles denote poor technique but do not affect the results of the test.**

**2- Seal the dry end of the tube by plastic seal or by heating the dry end of the tube rapidly on a fine flame of Bunsen burner combined with rotation.**

**3- The sealed tube is then placed in the radial grooves of the Microhae -matocrit centrifuge with the sealed end away from the center of the centrifuge and centrifuge for 5 minutes.**

**4- When looking at a centrifuged haematocrit tube, you can see three distinct layers. A top layer of clear slightly milky plasma, a thin buffy coat layer (consisting of WBC and platelets), and a dark packed RBC layer ( show Fig. 1 in appendix).**

**5- Obtain the results using the microhaematocrit tube reading device. Adjust the movable line to touch the top of the RBC's in the tube .(show Fig 3 in appendix).**

**Anemia is a deficiency of red blood cells, or insufficient hemoglobin within the red blood cells.**

**(There are many different types of anemia)**

**-Iron-deficiency anemia is caused by a lack of dietary iron ,and there is not enough of this mineral to form sufficient hemoglobin. A person with this type of anemia may have a normal RBC count and a normal hematocrit, but the hemoglobin level will be below normal.**

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**-A deficiency of vitamin B12, which is found only in animal foods, leads to pernicious anemia, in which the RBCs are large, misshapen, and fragile. Another cause of this form of anemia is lack of the intrinsic factor due to autoimmune destruction of the parietal cells of the stomach lining.**

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**-Sickle-cell anemia It is a genetic disorder of hemoglobin, which causes RBCs to sickle, clog capillaries, and rupture.**

**B**

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**-Aplastic anemia is suppression of the red bone marrow, with decreased production of RBCs, WBCs, and platelets. This is a very serious disorder that may be caused by exposure to radiation, certain chemicals such as benzene, or some medications .There are several antibiotics that must be used with caution since they may have this potentially fatal side effect.**

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**-Hemolytic anemia is any disorder that causes rupture of RBCs before the end of their normal life span. Sickle-cell anemia and Rh disease of the newborn are examples. Another example is malaria, in which a protozoan parasite reproduces in RBCs and destroys them. Hemolytic anemias are often characterized by jaundice because of the increased production of bilirubin .**