



HEMATOLOGY - FIRST COURSE

LAB -6- PACKED CELL VOLUME PCV

Sawa University

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قسم تقنيات المختبرات الطبية

Third Stage

المرحلة الثالثة

محاضرة رقم 6

الجانب العملي

Lecture No. 6

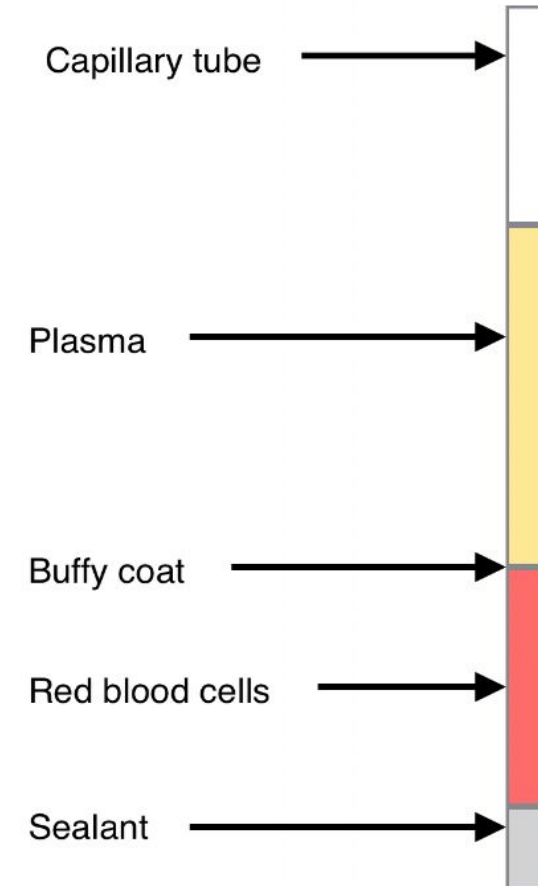
Practical

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Packed cell volume (PCV) Or Hematocrit (HCT)

- ✓ **Packed cell volume (PCV)** : A measure of the volume of red blood cells in a blood sample, expressed as a percentage.
- ✓ **Purpose:** Used to diagnose conditions like anemia (low PCV) or polycythemia (high PCV) and dehydration (high PCV)
- ✓ **also known as hematocrit (HCT)**



P.C.V. test:

❖ Material required:

1. Blood sample.
2. Microhaematocrite centrifuge.
3. Microhaematocrite reader.
4. Wax or paste.
5. Cotton, alcohol.
6. Lancet.
7. Capillary tube.



Procedure :

1. Choose a suitable location that can be easily cleaned, such as in the area below



2. Invert your blood sample a 5-7 times to gently but thoroughly mix the sample and resuspend the red blood cells.



3. Take a microhaematocrit tube to collect your sample.



4. Place your finger over the top of the tube (this helps to prevent air bubbles forming at the other end of the tube). Dip it into the blood at an angle to allow the blood to draw up into the tube by capillary action. Aim for 2/3 of the tube to be filled with blood.



5. Remove the tube keeping your finger on the top.



6. Wipe the surface of the tube with a clean cloth to minimise contamination of the plastic tray.



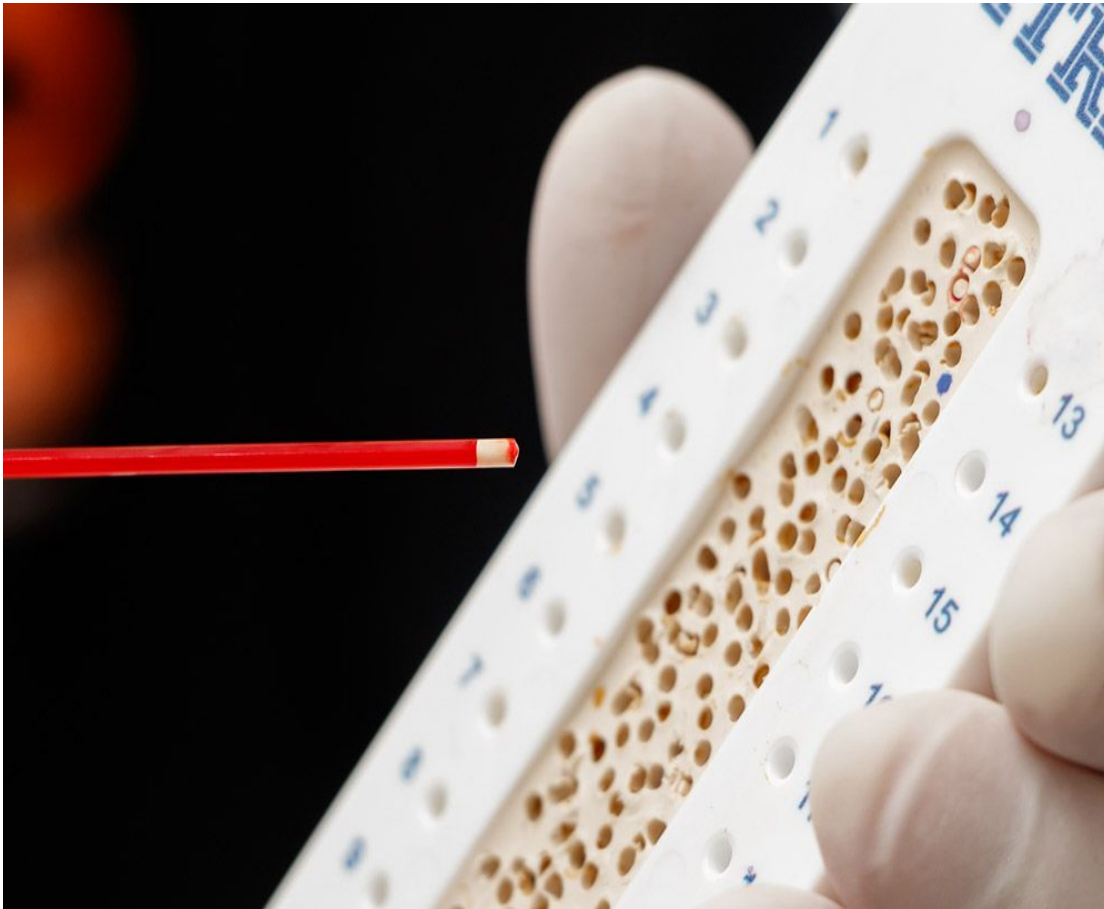
7. Locate an area in the plasticine tray that does not have any holes.



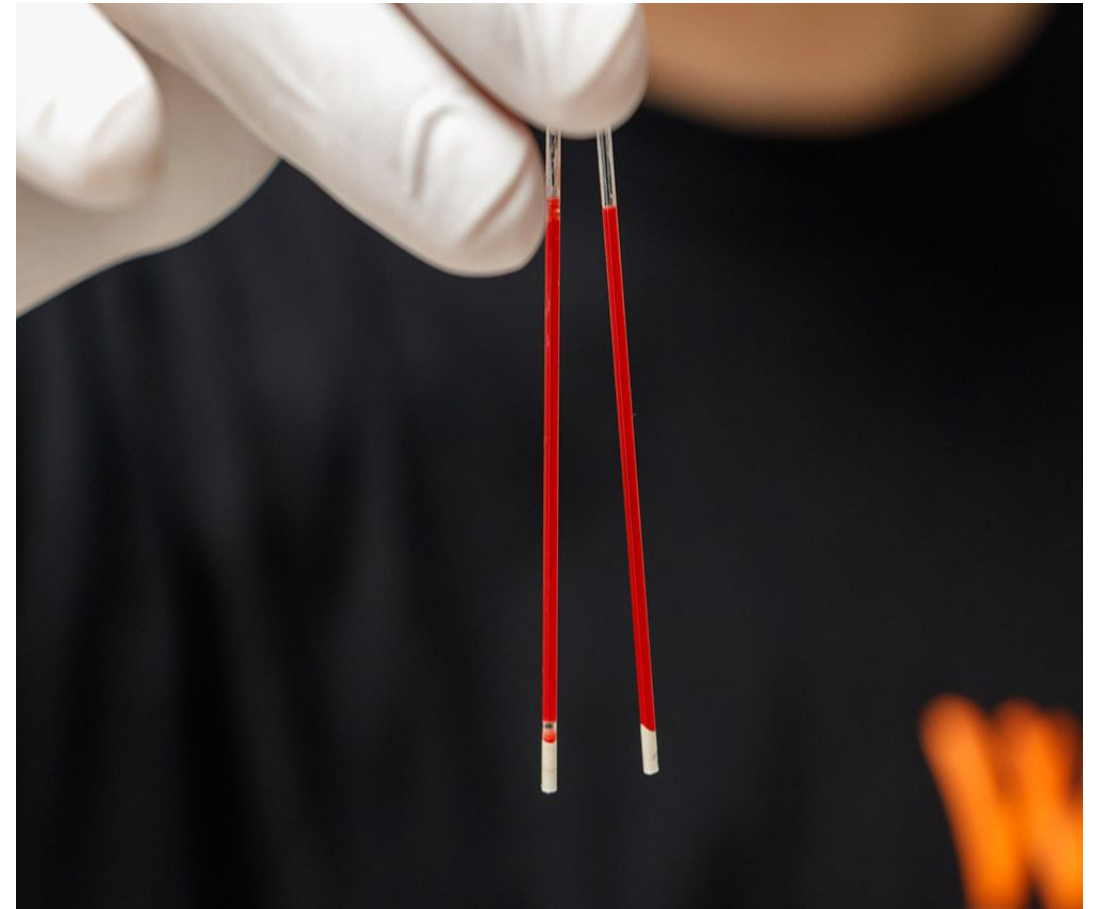
8. Press the end of the tube into the plasticine into this area to seal it; at the same time, remove your finger from the end of the tube. Wipe the surface of the tube with a clean cloth before doing this to minimise contamination of the plasticine tray.



9. Check for the plasticine plug as you remove the tube to ensure the sample is sealed.



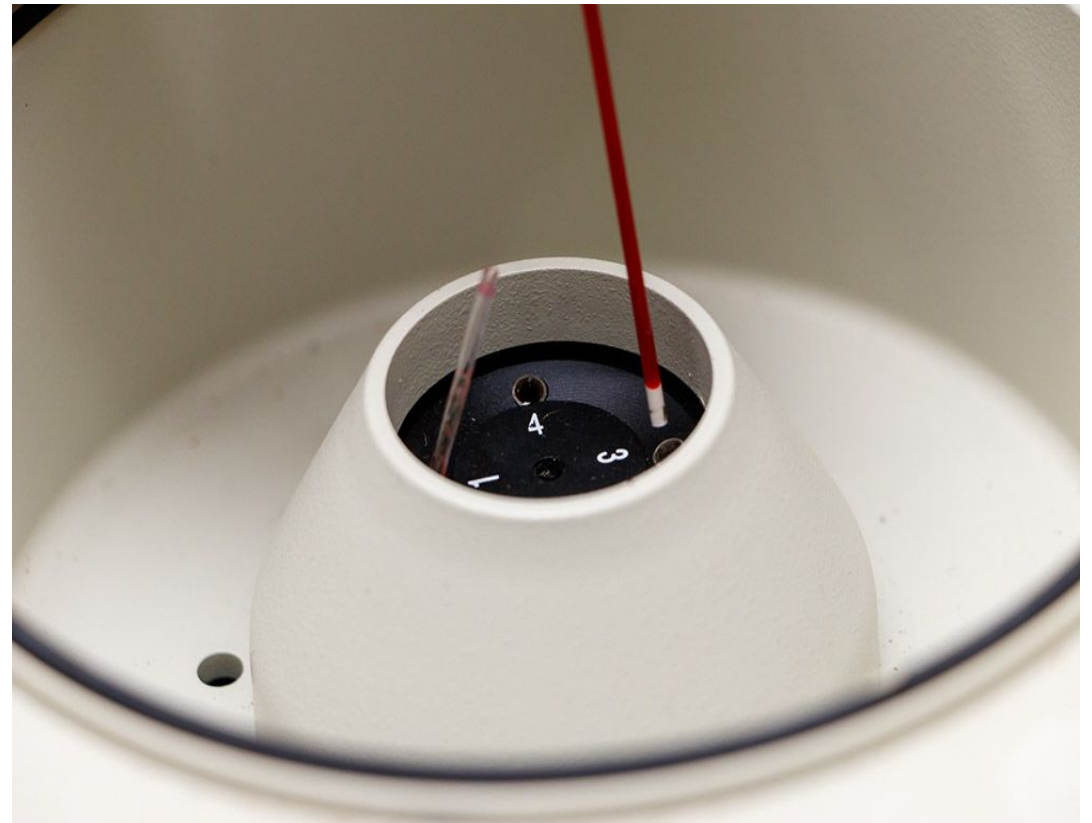
10. Repeat the process so you have two sealed tubes. You will need two to balance the centrifuge.



11. Open the centrifuge door. The type of centrifuge you will need is a microhaematocrit centrifuge (microfuge). Check it is empty and clean.



12. Place your samples opposite each other to ensure the microcentrifuge is balanced correctly. Ensure that you put the sealed ends in first



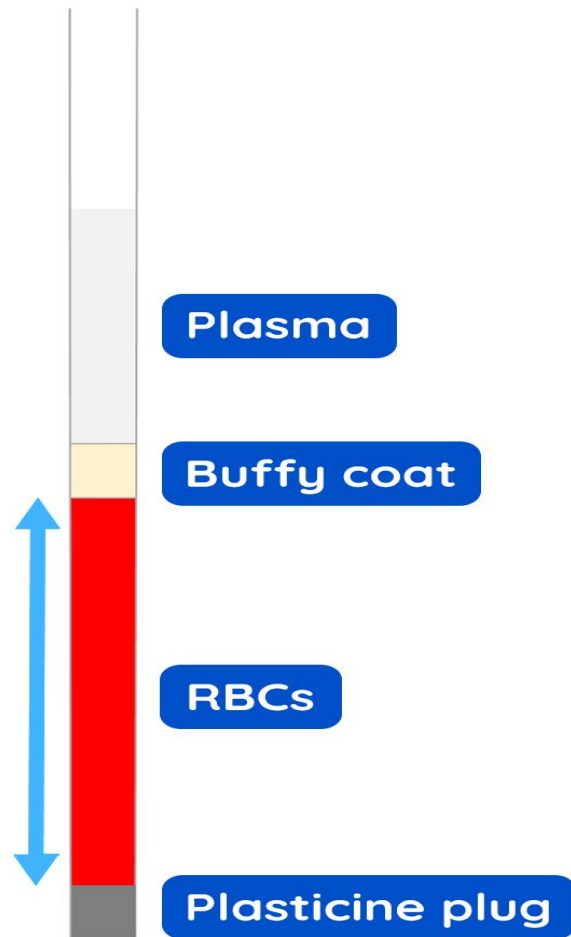
13. The image below shows the two tubes are correctly placed to balance the machine when it is spinning.



14. Ensure the lid is securely fastened. This is important for safety reasons. Then, set the timer for 3-5 minutes to separate the red blood cells from the plasma.



15. Remove the tubes once the machine has finished. This is what the tube will look like:

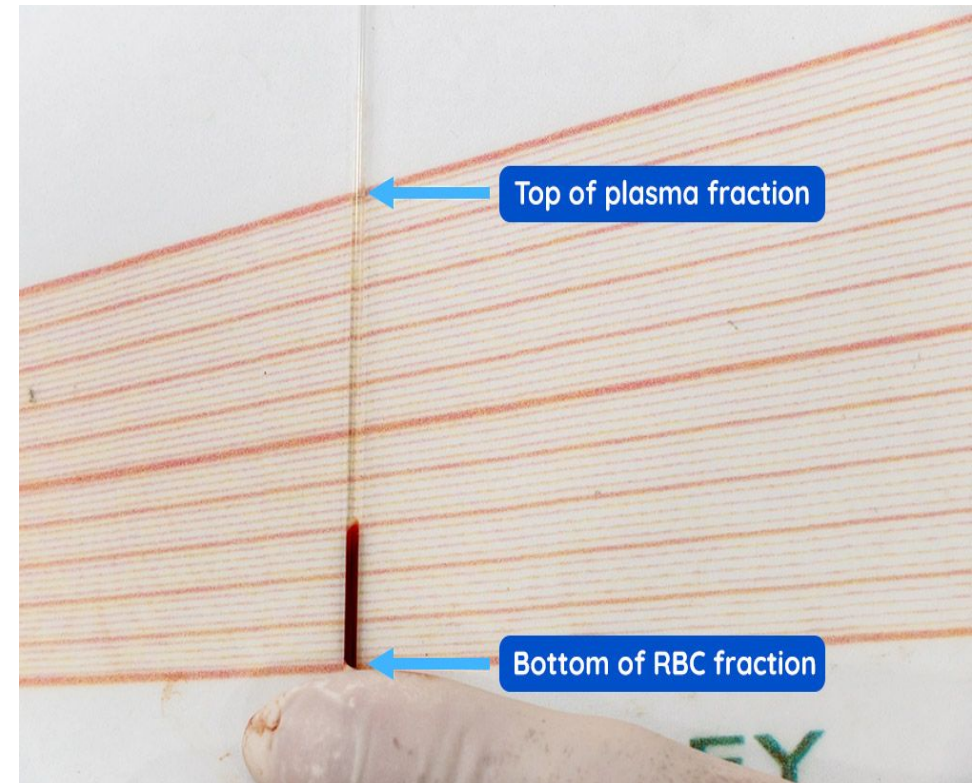


- ✓ The PCV is calculated by dividing the length of the RBCs (blue arrow) by the combined length of the RBCs, buffy coat and plasma (not including the plasticine plug). To do this, use a haematocrit reader card.

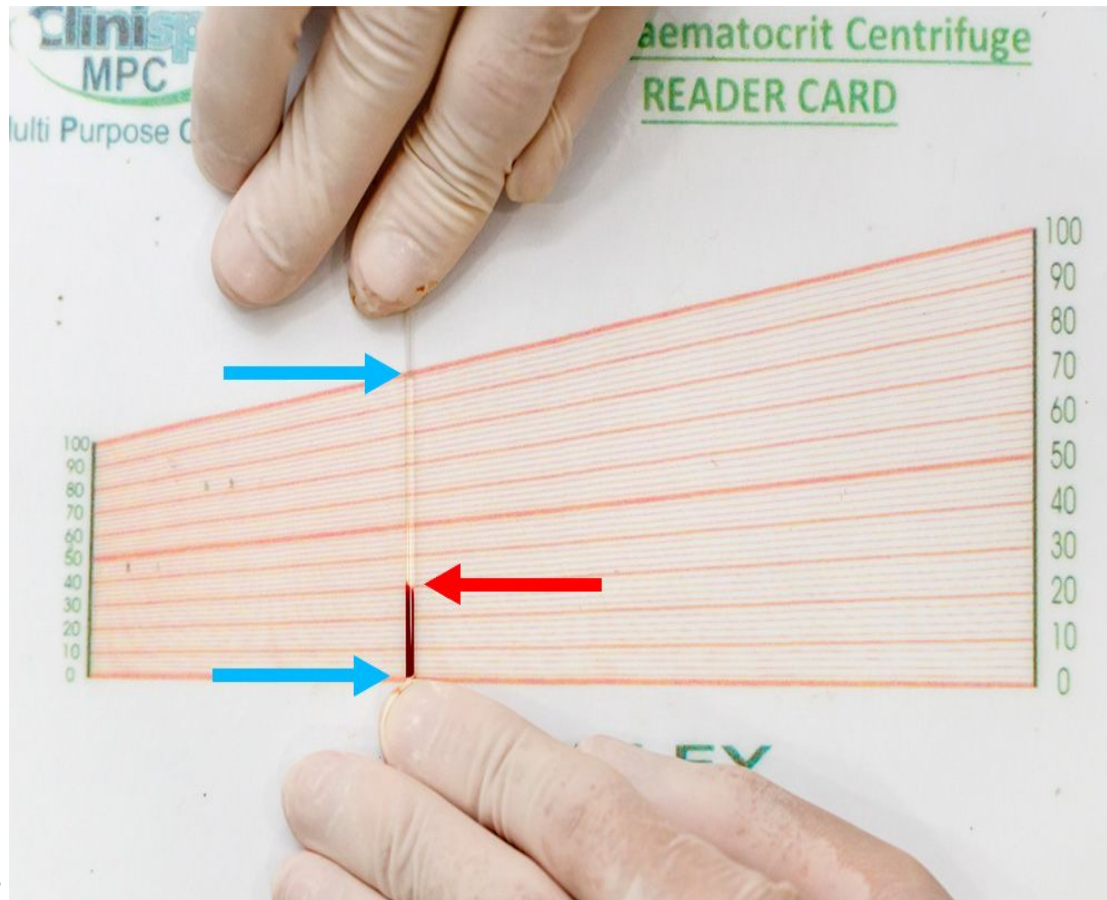
16. Place one tube on the haematocrit reader card.

1. **Align the top of the plasma fraction with the top, sloping line on the card (which measures 100% on the right hand scale).**
2. **Align the bottom of the RBC fraction with the lowest horizontal line (which measures 0% on the right hand scale).**

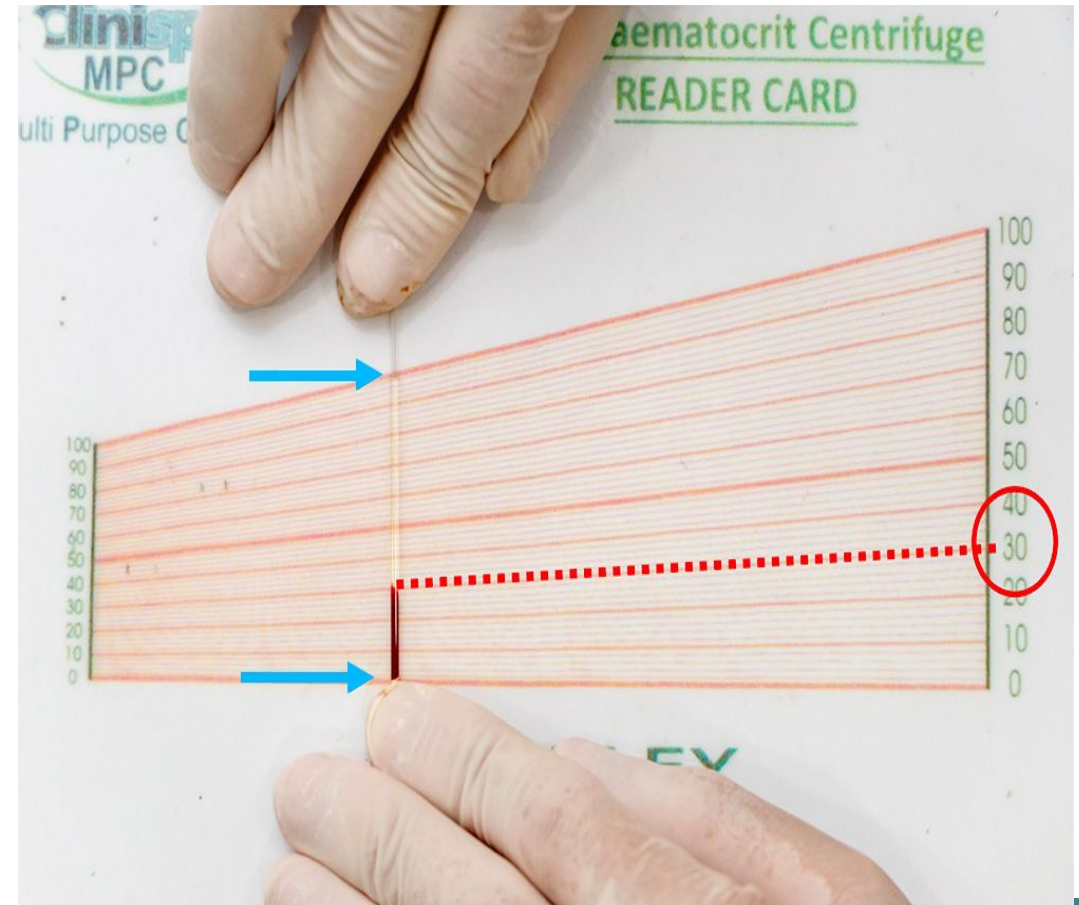
✓ **The tube is now in the correct position for measuring the PCV.**



17. Read the PCV value. To achieve this, identify the red line that is associated with the top of the RBC fraction (red arrow,)



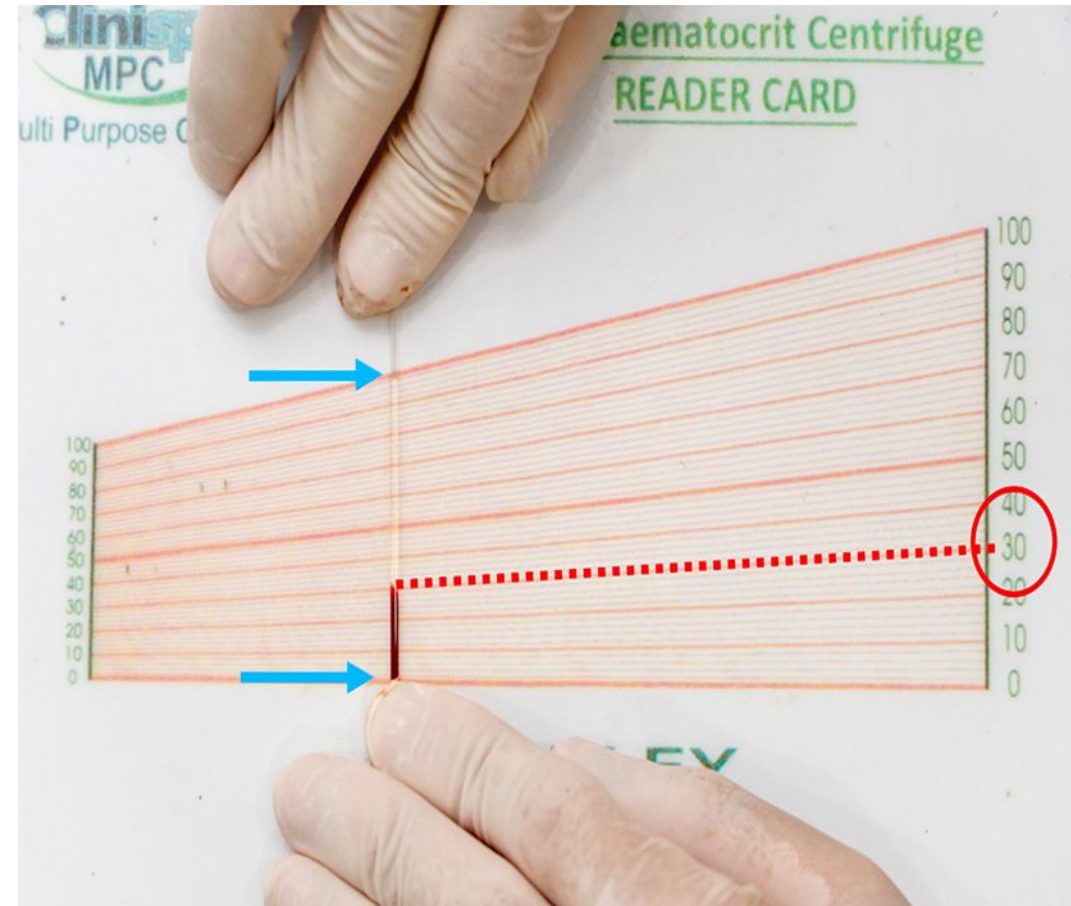
18. Follow this line (shown below in red below) from the top of the RBC fraction to the scale on the right hand side. Note the line is at a slight slant.



- ✓ Take note of the value; this is simply the height of the RBC fraction divided by the height of the total sample and expressed as a percentage. In this example, the value is 30%.

- ✓ **Normal PCV values:**

- For males: Approximately 38.3% to 48.6%, with other ranges such as 40% to 52%.
- For females: Approximately 35.5% to 44.9%, with other ranges such as 35% to 47%.



Quiz

- ✓ **What do we mean by HCT?**
- ✓ **What is the purpose of performing a PCV test?**
- ✓ **Briefly explain the PCV testing procedure.**

Any questions?

