جامعة المستقبل
كلية التقنيات الصحية والطبية-قسم التخدير

Physiology Practical
Lecture: (8)
Packed Cell Volume

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General Objective of the Lecture:

Understanding Packed Cell Volume (PCV) and Its Importance in Medical Diagnosis

Behavioral Objectives:

1. The student should be able to define PCV after the lecture.

2. The student should explain the importance of PCV in detecting medical conditions such as anemia.

3. The student should identify the normal and abnormal results of PCV values based on age groups.

4. The student should differentiate between the causes of increased and decreased PCV values.

Topics of the Lecture

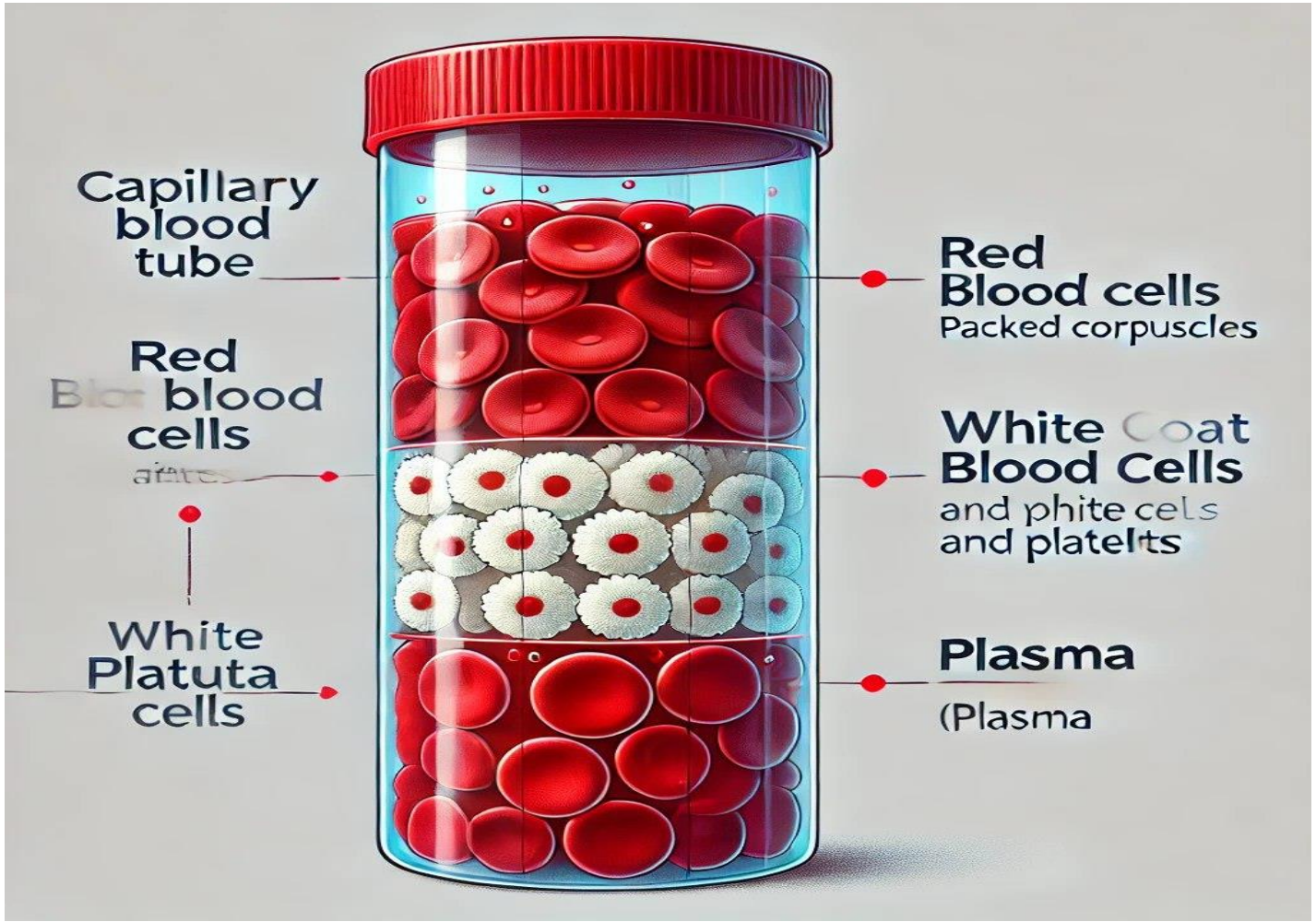
1. Definition of Packed Cell Volume (PCV) and its importance.

2. Measurement methods and the devices used.

3. Interpretation of results and normal values.

4. Medical conditions associated with increased or decreased PCV.

"ما الذي يحدث عند فصل مكونات الدم باستخدام جهاز الطرد المركزي، وكيف يمكن أن يكون لهذه العملية أهمية في التشخيص الطبي؟



What is PCV?

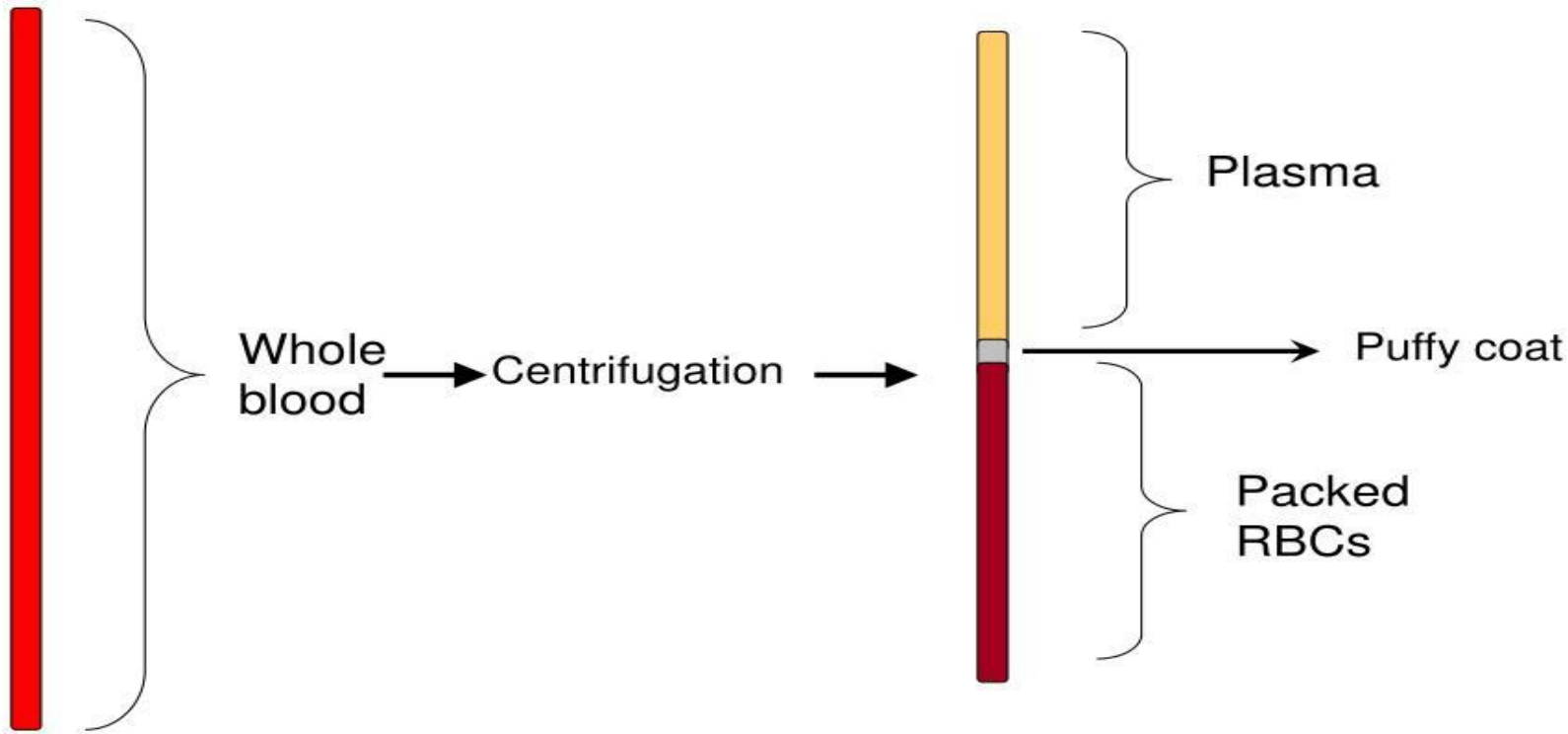
- **The percentage by volume of packed red blood cells in a given sample of blood after centrifugation.**
- **PCV, the volume of packed red cells in milliliters per 100 ml of blood.**
- **usually reported as the volume percentage (%) of red blood cells in blood.**

❖In a centrifuge blood is separated into three layer including :-

1. The mass of the erythrocytes at the bottom which is referred to as packed corpuscles volume (P.C.V).
2. White or gray layer of leukocytes and thrombocytes immediately above the red corpuscles mass that referred to as the buffy coat.
3. The blood plasma.

PCV

Packed Cell Volume



Apparatus and reagent

Heparinized Capillary tube

Microhematocrit centrifuge

Microhematocrit reader

Clay

Procedure

- Capillary tube is used
- The capillary is filled with blood to half of the tube , but not filled too much
- Sealing the capillary with clay
- Centrifugation (10000 rpm at two minute)
- Reading the Hct.

Hematocrit Interpretation

1-Increased PCV

- **Polycythemia: newborns, high altitude, hypoxia due to lung and heart dieases**
- **Congestive heart failure, burns(loss of plasm),dehydration, sever exercise.**

2- Decreased PCV

- **All types of Anamea**
- **Pregnancy**
- **Ingestion of large amount of water**

Assignment

Writing a Two-Page Report Explaining the Importance of PCV in Disease Diagnosis, providing examples of medical conditions such as anemia and dehydration, supported by normal values.

Normal value

- Newborn : 53–65%
- Infants/child: 30–43%
- Adult male: 42–52%
- Adult female: 37–47%

Thank You!