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# DOCTOR TRAINING: HEMATOCRIT



**1. Determine the normal hematocrit by using the following formula:**

𝑟𝑒𝑑 𝑏𝑙𝑜𝑜𝑑 𝑐𝑒𝑙𝑙 𝑣𝑜𝑙𝑢𝑚𝑒

𝐻𝑒𝑚𝑎𝑡𝑜𝑐𝑟𝑖𝑡 = ∗ 100

𝑡𝑜𝑡𝑎𝑙 𝑏𝑙𝑜𝑜𝑑 𝑣𝑜𝑙𝑢𝑚𝑒

1. Calculate and record the hematocrit of the normal subject. [2 PTs]

1. Calculate and record the hematocrit of person A, B, C and D. [8 PTs]

**2. A device called a hemacytomater is used to measure the amount of hemoglobin present. Red blood cells have the ability to concentrate hemoglobin to about 34 g/100mL of blood. Readings below 15 g/100mL of blood indicate anemia. Blood appears pale if hemoglobin levels are low.**

Which subject (A,B, C or D) has a low level of hemoglobin? Explain. [3 PTs]

1. **Cancer of the white blood cells is called leukemia. Like other cancers, leukaemia is associated with rapid and uncontrolled cell production.**

Which subject (A,B, C or D) might be suffering from leukemia? Explain. [3 PTs]

1. **Although hematocrits produce some information about blood disorders, most physicians would not diagnose leukaemia on the basis of one test.**

What other conditions might explain the hematocrit reading you chose for answer d? Explain? [3 PTs]

1. **Lead poisoning can cause bone marrow destruction.**

Which of the subjects might have lead poisoning? Explain. [2 PTs]

Which subject lives at a high altitude? Explain. [2 PTs]

1. **Recently, athletes have begun to take advantage of the benefits of extra red blood cells. 2 weeks prior to a competition, a blood sample is taken and centrifuged and the red blood cell component is stored. A few days before the event, the red blood cells are injected into the athlete.**

Why would athletes remove blood cells only to return them to their body later? [2 PTs]

1. **A physician notes fewer red blood cells and prolonged blood clotting times in a patient. White blood cell numbers appear to have increased, but further examination reveals that only the granulocyte numbers have increased, while the a granulocytes have decreased. In an attempt to identify the cause of the anomaly, the physician begins testing the bone marrow.**

Why did the physician suspect the bone marrow? [2 PTs]

Predict what might have caused the problem. [2 PTs]

1. **Individuals who work in a chemical plant are found to have unusually high numbers of leukocytes. A physician calls for further testing.**

 Hypothesize about the physician’s reasons for concern. [2 PTs]

Why might the physician check both bone marrow and lymph node areas of the body? [2 PTs]