

## Questions for Abnormal CBC Nighttime Curriculum

1. Which of the following iron profiles are most consistent with iron deficiency anemia?

- A. low iron level, low iron saturation, high total iron binding capacity, low ferritin
- B. low iron level, high iron saturation, high total iron binding capacity, high ferritin
- C. low iron level, low iron saturation, low total iron binding capacity, and low ferritin

2. True or False? The Mentzer index can be used to distinguish between iron deficiency anemia and hemolytic anemia.

3. You are admitting a patient to the hospital for severe anemia. He was prescribed oral ferrous sulfate two months ago for presumed iron deficiency anemia. You are trying to determine if he has been taking his iron properly. What questions do you want to ask the family related to his medication and diet history?

4. A 13-year-old girl presented to an outside facility with petechiae and epistaxis. She is being transferred to your service for further evaluation of an abnormally low platelet count. The presumed diagnosis from the other facility was idiopathic thrombocytopenic purpura (ITP). What abnormalities on the CBC might cause you to consider other diagnoses?

5. True or False? Patients with thrombocytopenia are more likely to present with mucocutaneous bleeding and petechiae than they are to present with hemarthroses.

6. Of the following disorders that result in thrombocytopenia, which one can be attributed to decreased platelet production?

- A. Infiltrative bone marrow diseases
- B. Drug-induced thrombocytopenia
- B. Neonatal alloimmune thrombocytopenia
- C. Kasabach-Merritt syndrome
- C. Idiopathic Thrombocytopenic Purpura (ITP)

## Answers for Abnormal CBC Nighttime Curriculum

1. Answer A is correct. In iron deficiency anemia the iron level and the iron saturation will be low. The iron saturation is calculated by dividing the iron level by the total iron binding capacity. The total iron binding capacity will be high and the ferritin, which is a marker of iron stores, will be low. One must keep in mind that ferritin is an acute phase reactant, and could be elevated if there is inflammation in the body due to other processes.
2. False. The Mentzer index is calculated by dividing the MCV by the RBC count. It is used to help determine if a microcytic anemia is more consistent with iron deficiency or Thalassemia. Typically a value  $>13$  is more consistent with iron deficiency anemia. In iron deficiency the bone marrow is producing a small quantity of small sized cells. A value  $<13$  is more consistent with Thalassemia because the marrow is making a large number of cells (larger denominator) but the volume of the cells are small.
3. Compliance with oral iron therapy can be affected by numerous factors. You will want to ask detailed information about dosing to ensure that the family is giving an adequate amount of iron. For severe anemia, the targeted dose should be 6mg/kg/day of elemental iron. Dietary factors can affect iron absorption. Milk based products can decrease absorption. Food or drinks that are high in Vitamin C can enhance absorption. Gastrointestinal side effects (constipation or upset stomach) may decrease compliance as well.
4. Idiopathic thrombocytopenic purpura (ITP) is typically associated with a very low platelet count (often less than 20) but an otherwise normal hemoglobin, white cell count and white cell differential. Therefore, if the hemoglobin or white cells are abnormal, one must consider other diagnoses that could affect multiple cell lines. The differential diagnoses would include oncologic processes, infectious processes and autoimmune disorders.
5. True. If bleeding is to occur due to abnormalities of platelets (either defects in quantity or quality), the bleeding usually manifests as mucocutaneous bleeding, bruising or petechiae. Deeper bleeding, such as hemarthroses or intramuscular bleeding, is more typical of diseases from other abnormalities of the clotting cascade.
6. The correct answer is A. The differential diagnosis of thrombocytopenia is often categorized by processes that decrease platelet production, increase platelet destruction, or cause platelet sequestration. Infiltrative bone marrow diseases can cause decreased production of platelets. Drug-induced thrombocytopenia, neonatal alloimmune thrombocytopenia, Kasabach-Merritt syndrome and Idiopathic Thrombocytopenic Purpura (ITP) are all due to increased platelet destruction.