

Continuing Education Questions

SUMMER 2017

1. A methodical approach to CBC interpretation that is aimed at medical laboratory professionals differs from one aimed at physicians and other care providers by incorporating steps to:
 - a. correlate numerical values with morphology.
 - b. validate the accuracy and reportability of results.
 - c. correct reticulocyte variables for violations of the underlying assumptions.
 - d. correlate results across the red cell, white cell and platelet portions of the CBC.

2. All of the following, EXCEPT one, are benefits of using a methodical approach to the interpretation of complete blood counts. Select the exception.
 - a. Assists in detection of spurious results
 - b. Avoids overlooking clinically significant results
 - c. Reveals findings in one part such as the red blood cells that can affect results in the other part, like white blood cells
 - d. Saves time in assessing if results can be released

3. Which of the following is the best indicator of the degree of anemia?
 - a. hemoglobin
 - b. red blood cell count
 - c. hematocrit
 - d. mean cell volume

4. Which of the following parameters of an instrument-generated complete blood count is measured directly and not calculated?
 - a. Red blood cell count
 - b. Red blood cell distribution width
 - c. Mean cell hemoglobin concentration
 - d. Mean cell hemoglobin

5. The immature reticulocyte fraction is:
 - a. The portion of red blood cells with the least RNA.
 - b. The portion of the reticulocytes with the least RNA.
 - c. The portion of the reticulocytes with the most RNA.
 - d. The portion of platelets with the most RNA.

Use these data to answer questions 6 and 7. A 42-year-old man presents with the local clinic because of jaundice. His complete blood count results are as follows:

RBC: $3.5 \times 10^6/\mu\text{L}$	(reference range: $4.5\text{-}6.0 \times 10^6/\mu\text{L}$)
Hemoglobin 15.5g/dL	(reference range: 15-17 g/dL)
Hematocrit 36%	(reference range: 45-51%)
MCV 103fL	(reference range: 80-100 fL)
MCH 44.3pg	(reference range: 28-34 pg)
MCHC 43%	(reference range: 32-36%)
RDW 18%	(reference range: 11.5-14.5%)
Relative retic count: 2.0 %	(reference range: 0-5-2.0%)

6. Which of the following is a correct description of these results according to the approach presented in the Focus article?
 - a. No anemia; rbc's are normocytic and normochromic without anisocytosis.
 - b. Macrocytic, normochromic anemia with anisocytosis
 - c. Macrocytic, hyperchromic anemia without anisocytosis
 - d. No anemia; rbc's are macrocytic and normochromic with anisocytosis
7. What is the next step the medical laboratory scientist should take regarding the results presented on the 42-year-old man?
 - a. Report the results routinely since the patient is not anemic.
 - b. Examine a blood smear for possible spherocytes.
 - c. Request a redraw because the Rule of Three does not hold.
 - d. Report the critical value of the MCHC to the ordering physician immediately.

FOCUS: INTERPRETING THE COMPLETE BLOOD COUNT

8. A 35-year-old woman develops anemia. Her test results show the following:
 Relative reticulocyte count: 4%
 Hematocrit: 30%
 Morphology: moderate polychromasia

Which of the following is the best parameter to be used to assess her bone marrow production of red blood cells?

- Hemoglobin content of reticulocytes
 - Relative reticulocyte count
 - Corrected reticulocyte count (CRC)
 - Reticulocyte production index (RPI)
9. A 45-year-old woman develops anemia. Her complete blood count (CBC) results reveal the following:

MCV = 74 fL (reference range: 80-100 fL)
 MCH = 22 pg (reference range: 28-34 pg)
 MCHC = 31% (reference range: 32-36%)

Which of the following terms best describe the type of anemia has she developed?

- Macrocytic normochromic
 - Macrocytic hyperchromic
 - Microcytic normochromic
 - Microcytic hypochromic
10. Calculate the reticulocyte production index on the following patient values. Assume the reticulocytes are taking 3 days to mature in the peripheral blood.
 Hematocrit: 20%
 Relative reticulocyte count: 15%
 Polychromasia present on the blood film
 The RPI is:
- 2.2%
 - 5%
 - 6.7%
 - 7.5%

11. What effect can platelet clumping have on the white blood cell count?
- Simulates absolute leukopenia
 - Creates a relative leukopenia
 - Causes pseudoleukocytosis
 - Generates a relative lymphopenia

12. Refer to Table 1. Applying a methodical approach to the data provided, including use of correct terminology, which of the following is the most accurate description of the abnormalities in the data?

Table 1.

	Patient	Adult Reference Interval	
WBC (x 10 ³ wbc/μL)	12	4.5 – 10.5	
Differential	(%)	ADULT RELATIVE (%)	ADULT ABSOLUTE (x 10 ³ /μL)
Neutrophils	71	40-75	1.8-7.9
Bands	0	0-5	0.0-0.5
Lymphocytes	12	20-40	0.9-4.2
Monocytes	3	0-9	0.0-0.9
Eosinophils	13	1-6	0.05-0.6
Basophils	1	0-2	0.0-0.2
Patient Morphology	13 NRBC/100 wbc's, toxic granulation		

- Leukocytosis, absolute neutrophilia, absolute lymphopenia, relative eosinophilia, absolute eosinophilia
 - Leukocytosis, absolute neutrophilia, relative lymphopenia, relative eosinophilia, absolute eosinophilia
 - Leukocytosis, absolute leukopenia, relative lymphopenia, relative eosinophilia, absolute eosinophilia
 - Leukocytosis, absolute neutrocytosis, relative lymphopenia, absolute basophilia, absolute eosinophilia
13. Determine the corrected white blood cell count from the following information:
- WBC = 45.3 x 10³/μL with 13 NRBC/100 wbc's.
- 25.3 x10³ wbc/μL
 - 32.3 x10³ wbc/μL
 - 40.1 x10³ wbc/μL
 - 51.2 x10³ wbc/μL
14. The platelet count can be falsely decreased due to:
- fragmented red blood cell count (RBC)s
 - platelet satellitosis
 - platelet size variability
 - giant platelets

FOCUS: INTERPRETING THE COMPLETE BLOOD COUNT

15. A platelet estimate was performed when reviewing the peripheral blood smear. The average number of platelets/100X field was 23. Assuming the patient has a normal red blood cell count, what is the platelet estimate?
- 460,000 x 10³/μL
 - 230,000 x 10³/μL
 - 46,000 x 10³/μL
 - 23,000 x 10³/μL
16. If a patient has thrombocytopenia, which test would detect if the bone marrow is responding with increased platelet output?
- Mean platelet volume (MPV)
 - Platelet distribution width (PDW)
 - Immature platelet fraction (IPF)
 - Immature reticulocyte fraction (IRF)
17. Platelet satellitosis was noted on the blood film of a patient seen in the emergency department. Therefore a sodium citrate tube was collected and the resulting platelet count was 153 x 10³/μL. What is the final platelet count for this patient?
- 138 x 10³/μL
 - 168 x 10³/μL
 - 184 x 10³/μL
 - 199 x 10³/μL
18. A patient has a mean platelet volume (MPV) of 15fL (reference interval 8-12 fL) and an immature reticulocyte fraction (IPF) of 11% (reference interval 0.5-7%). These results indicate the presence of:
- small young platelets
 - small older platelets
 - large young platelets
 - large older platelets
19. A decreased immature platelet fraction (IPF) is seen in:
- splenectomy
 - immune thrombocytopenia
 - essential thrombocythemia
 - bone marrow failure
20. If a patient's platelet distribution width (PDW) value is elevated, the blood film should indicate:
- platelets of variable size
 - platelet blebbing
 - platelet satellitosis
 - platelets lacking granularity

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