Cognitive Domain

1. Spell and define the key terms
2. List the parameters measured in the complete blood count and their normal ranges
3. State the conditions associated with selected abnormal complete blood count findings
4. Explain the functions of the three types of blood cells
5. Describe the purpose of testing for the erythrocyte sedimentation rate
6. List the leukocytes seen normally in the blood and their functions
7. Analyze a table in the interpretation of healthcare results
8. Distinguish between normal and abnormal test results
9. Explain the hemostatic mechanism of the body
10. List and describe the tests that measure the body's ability to form a fibrin clot
11. Explain how to determine the prothrombin time and partial thromboplastin time

5. Determine a Westergren erythrocyte sedimentation rate (Procedure 42-5)
6. Obtain information on proper collection methods for hematology testing
7. Practice standard precautions
8. Use medical terminology, pronouncing medical terms correctly, to communicate information
9. Instruct patients according to their needs to promote disease prevention
10. Prepare a patient for procedures
11. Document patient care
12. Respond to issues of confidentiality
13. Perform within scope of practice
14. Practice within the standard of care for a medical assistant
15. Document accurately in the patient record
16. Perform quality control measures
17. Perform hematology testing
18. Screen test results

Affective Domain

1. Display sensitivity to patient rights and feelings in collecting specimens
2. Explain the rationale for performance of a procedure to the patient within parameters set by the physician
3. Show awareness of patients’ concerns regarding their preceptions related to the procedure being performed
ABHES Competencies

1. Apply principles of aseptic techniques and infection control
2. Collect and process specimens
3. Perform selected CLIA-waived tests that assist with diagnosis and treatment
4. Dispose of biohazardous waste
5. Practice standard precautions
6. Perform hematology testing
7. Document appropriately
8. Use methods of quality control
9. Adhere to OSHA compliance rules and regulations
MULTIPLE CHOICE

Circle the letter preceding the correct answer.

1. Hematopoiesis is:
   a. the ability of a person’s blood to form a clot.
   b. creation of new blood cells.
   c. the proportion of red blood cells to plasma.
   d. a protein released by the kidneys to stimulate red blood cell creation.
   e. the shape of red blood cells.

2. Leukocytosis is most likely caused by:
   a. chemical toxicity.
   b. inflammation.
   c. nutritional deficiencies.
   d. infection.
   e. anticoagulant therapy.

3. What indicates a vitamin B₁₂ deficiency?
   a. The presence of bands
   b. Neutrophils with more than five lobes in their nuclei
   c. High numbers of lymphocytes
   d. Erythrocytes that lack a nucleus
   e. Microcytosis or a mean cell volume (MCV) less than 80 fl

4. Which white blood cells produce antibodies?
   a. Neutrophils
   b. Lymphocytes
   c. Monocytes
   d. Eosinophils
   e. Basophils

5. Where in the body are red blood cells produced?
   a. Bone marrow
   b. Fatty tissue
   c. Liver
   d. Kidney
   e. Heart

6. Which food is a good natural source of folate?
   a. Chicken
   b. Leafy green vegetables
   c. Liver
   d. Oysters
   e. Root vegetables

7. A parasitic infection is indicated by increased numbers of which leukocytes?
   a. Neutrophils
   b. Lymphocytes
   c. Monocytes
   d. Eosinophils
   e. Basophils

8. Which condition could be caused by chemotherapy?
   a. Anemia
   b. Folate deficiency
   c. Leukocytosis
   d. Monocytosis
   e. Thrombocytopenia

9. One symptom of vitamin K deficiency is:
   a. left shift.
   b. macrocytosis.
   c. prolonged ESR.
   d. prolonged PT.
   e. thrombocytosis.

10. ESR tests should be read:
   a. after 1 minute.
   b. at 15 minutes.
   c. at 30 minutes.
   d. at 60 minutes.
   e. at any time; the exact time is not important.
11. Which of the following is true of thrombocytosis?
   a. It indicates bacterial infection.
   b. It indicates bleeding.
   c. It is benign.
   d. It results from nutritional deficiency.
   e. It is a warning sign of embolism.

12. Microcytosis indicates:
   a. B<sub>12</sub> deficiency.
   b. The presence of gamma globins.
   c. Liver disorders.
   d. Iron deficiency.
   e. Sickle cell anemia.

13. Patients with iron deficiencies should be encouraged to eat:
   a. Dairy.
   b. Fish.
   c. Fruit.
   d. Liver.
   e. Tofu.

14. Erythropoiesis is driven by chemical signals from:
   a. The brain.
   b. The kidneys.
   c. The liver.
   d. The marrow.
   e. The spleen.

15. What is the most direct measurement of the blood’s ability to deliver oxygen available in the CBC?
   a. RBC count
   b. Hemoglobin (Hgb) determination
   c. Hematocrit (Hct) determination
   d. Mean cell volume (MCV)
   e. Mean corpuscular hemoglobin (MCH)

16. A patient has a platelet count of 75,000/mm<sup>3</sup>. What visible symptom might appear on the patient?
   a. Circular rash
   b. Edema
   c. Bruising
   d. Sloughing of skin
   e. Hair loss

17. Increased numbers of which leukocyte correspond to allergies and asthma?
   a. Neutrophils
   b. Lymphocytes
   c. Monocytes
   d. Eosinophils
   e. Basophils

18. Which is a normal platelet count for women?
   a. 4,300 to 10,800/mm<sup>3</sup>
   b. 200,000 to 400,000/mm<sup>3</sup>
   c. 4.2 to 5.4 million/mm<sup>3</sup>
   d. 4.6 to 6.2 million/mm<sup>3</sup>
   e. 27 to 31 million/mm<sup>3</sup>

19. Which is the normal RBC count for women?
   a. 4,300 to 10,800/mm<sup>3</sup>
   b. 200,000 to 400,000/mm<sup>3</sup>
   c. 4.2 to 5.4 million/mm<sup>3</sup>
   d. 4.6 to 6.2 million/mm<sup>3</sup>
   e. 27 to 31 million/mm<sup>3</sup>

20. Which is the normal WBC count for men?
   a. 4,300 to 10,800/mm<sup>3</sup>
   b. 200,000 to 400,000/mm<sup>3</sup>
   c. 4.2 to 5.4 million/mm<sup>3</sup>
   d. 4.6 to 6.2 million/mm<sup>3</sup>
   e. 27 to 31 million/mm<sup>3</sup>
### MATCHING

Match each key terms with the correct definition.

<table>
<thead>
<tr>
<th>Key Terms</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>21. adhesion</td>
<td>a. tests performed for a patient outside of a central laboratory</td>
</tr>
<tr>
<td>22. band</td>
<td>b. red blood cells or RBCs</td>
</tr>
<tr>
<td>23. basophil</td>
<td>c. white blood cells or WBCs</td>
</tr>
<tr>
<td>24. coagulation</td>
<td>d. platelets</td>
</tr>
<tr>
<td>25. complete blood count</td>
<td>e. yellow liquid part of the blood that is 90% water</td>
</tr>
<tr>
<td>26. eosinophil</td>
<td>f. the functioning unit of the red blood cell</td>
</tr>
<tr>
<td>27. erythrocytes</td>
<td>g. influences RBC production when it is released from the kidneys</td>
</tr>
<tr>
<td>28. erythrocyte indices</td>
<td>h. cell type that makes up only a small portion of the number of white blood</td>
</tr>
<tr>
<td>29. erythrocyte sedimentation rate</td>
<td>i. cells active at the end of allergic responses and of parasite elimination</td>
</tr>
<tr>
<td>30. erythropoietin</td>
<td>j. third most abundant leukocyte that engulfs foreign material</td>
</tr>
<tr>
<td>31. folate</td>
<td>k. cell that defends against foreign invaders by engulfing them</td>
</tr>
<tr>
<td>32. hematocrit</td>
<td>l. deficiency causes hypersegmented neutrophils</td>
</tr>
<tr>
<td>33. hemoglobin</td>
<td>m. a younger, less mature version of the neutrophils</td>
</tr>
<tr>
<td>34. leukocytes</td>
<td>n. critical elements of clot formation</td>
</tr>
<tr>
<td>35. monocyte</td>
<td>o. contains WBC count and differential, RBC count, hemoglobin (Hgb)</td>
</tr>
<tr>
<td>36. morphology</td>
<td>determination, hematocrit (Hct) determination, mean cell volume (MCV),</td>
</tr>
<tr>
<td>37. neutrophil</td>
<td>mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration</td>
</tr>
<tr>
<td>38. plasma</td>
<td>(MCHC), and platelet count</td>
</tr>
<tr>
<td>39. platelets</td>
<td>p. 100 WBCs are counted, tallied according to type, and reported as</td>
</tr>
<tr>
<td>40. point-of-care testing (POC or</td>
<td>percentages</td>
</tr>
<tr>
<td>POC)</td>
<td>q. how cells appear under the microscope</td>
</tr>
<tr>
<td>41. sickle cell anemia</td>
<td>r. the disease caused by a defect in the globin chains resulting in an abnormal hemoglobin</td>
</tr>
<tr>
<td>42. spherocytosis</td>
<td>s. percentage of RBCs in whole blood</td>
</tr>
<tr>
<td></td>
<td>t. measurements indicating the size of the RBC and how much hemoglobin</td>
</tr>
<tr>
<td></td>
<td>the RBC holds</td>
</tr>
<tr>
<td></td>
<td>u. RBC's are small and round</td>
</tr>
<tr>
<td></td>
<td>v. the rate in millimeters per hour at which RBCs settle out in a tube</td>
</tr>
<tr>
<td></td>
<td>w. process which changes blood from a fluid to a solid</td>
</tr>
<tr>
<td></td>
<td>x. platelets stick across the injured surface</td>
</tr>
<tr>
<td></td>
<td>y. blood clotting inside a blood vessel</td>
</tr>
</tbody>
</table>
43. _____ thrombocytes
44. _____ thrombosis
45. _____ WBC differential

**FILL IN THE BLANK**

List the parameters measured in the complete blood count and their normal ranges.

<table>
<thead>
<tr>
<th>Test</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>46.</td>
<td></td>
</tr>
<tr>
<td>47.</td>
<td></td>
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<tr>
<td>48.</td>
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<td>49.</td>
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<td>50.</td>
<td></td>
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<td>51.</td>
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<tr>
<td>52.</td>
<td></td>
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<tr>
<td>53.</td>
<td></td>
</tr>
</tbody>
</table>

**MATCHING**

Match each condition with the correct abnormal finding.

- 54. _____ Increased bleeding
- 55. _____ Infection
- 56. _____ Anemia
- 57. _____ Low iron level
- 58. _____ Dehydration

- Abnormal Findings
  - a. hemoglobin of 10 g/dL
  - b. thrombocytopenia
  - c. hematocrit of 55%
  - d. leukocytosis
  - e. macrocytosis
  - f. red cell count of 3.9 million/mL
59. Liver disorders
60. Microcytic anemia
61. Thalassemia

62. body’s primary defense against bacteria found inside cells
63. contribute to inflammatory reactions
64. critical elements of clot formation
65. defend against foreign invaders by engulfing them
66. important parts of the body’s immune response
67. may indicate any of a variety of acute conditions that necessitate immediate attention
68. plug can arrest bleeding
69. process the antigens and through a series of cell transitions, produce the antibodies that can now fight that antigen in the body
70. release carbon dioxide that was picked up from the tissues and then bind oxygen
71. signal of a viral infection
72. transport gases (mainly oxygen and carbon dioxide) between the lungs and the tissues

73. Fill in the blanks in this description of the purpose of testing for the erythrocyte sedimentation rate.
   The reference interval for men is ________________, and for women, it is ________________. Elevations in ESR values are ________________ or any other condition that causes increased or altered ________________ in the blood (e.g., rheumatoid arthritis). The more ________________ the RBCs fall in the column, the greater the degree of inflammation. The ESR can be elevated with infection and ____________________.
79. Analyze a graph in the interpretation of health care results.

You have centrifuged your capillary collection tubes to calculate the patient's hematocrit.

a. _____ Which tube is placed correctly on the measurement grid? (Place the letter identifying the correct tube in the space provided.)

b. How did you verify the correct placement of the tube on the grid?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

c. Because this graph is difficult to interpret, estimate the approximate hematocrit for this patient.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

List the leukocytes seen normally in the blood and their functions.

<table>
<thead>
<tr>
<th>White Blood Cell Type</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>74.</td>
<td></td>
</tr>
<tr>
<td>75.</td>
<td></td>
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<tr>
<td>76.</td>
<td></td>
</tr>
<tr>
<td>77.</td>
<td></td>
</tr>
<tr>
<td>78.</td>
<td></td>
</tr>
</tbody>
</table>
Indicate whether each laboratory result is normal (N) or abnormal (A).

80. _____ Platelet count = 150,000/mm³
81. _____ Hemoglobin in a male = 16 g/dL
82. _____ Hematocrit in a male = 49%
83. _____ MCV = 75 fL
84. _____ MCH = 29 picograms
85. _____ MCHC = 35 g/dL
86. _____ RBC in a female = 3.71 x 10¹²/L
87. _____ WBC = 5.9 x 10⁹/L
88. _____ ESR = 5 mm/hr
List the four main steps of hemostasis.

89. __________________________________________________________________________________
90. __________________________________________________________________________________
91. __________________________________________________________________________________
92. __________________________________________________________________________________

COG IDENTIFICATION

Indicate whether each statement is related to a prothrombin time (PT) or a partial thromboplastin time (PTT).

93. _____ normal range is 12 to 15 seconds
94. _____ prolonged in certain factor deficiencies, especially those that cause hemophilia
95. _____ normal range is 32 to 51 seconds
96. _____ prolonged by liver disease, vitamin K deficiency, and warfarin (Coumadin; oral anticoagulant) therapy
97. _____ primary monitor of Coumadin anticoagulant therapy
98. _____ reported along with its corresponding international normalized ratio (INR) to standardize results
99. _____ point-of-care instruments allow medical assistants to perform this test in the medical office

PSY AFF CASE STUDIES FOR CRITICAL THINKING

1. Men over age 35 years and alcoholics frequently have difficulty absorbing vitamin B. What symptoms would you expect to see in an older male who drinks, and how could these be best addressed?

_________________________________________________________________________________________
_________________________________________________________________________________________
_________________________________________________________________________________________
_________________________________________________________________________________________
2. A trauma patient arrives in the hospital with extensive bleeding and internal injuries. The next day you are asked to run lab tests on this patient’s bloodwork. How do you expect her results to differ from those of a healthy patient?

3. Your patient presents with a persistent headache and nasal congestion. His WBC count is normal, but the eosinophil count is high. What is the probable cause of the patient’s complaint?

4. You are performing an erythrocyte sedimentation rate. After 60 minutes you look at the tube to report the test results. You cannot determine the separation between the cells and the plasma. The separation is not straight, and there are bubbles in the tube. What are the probable causes of your problem?

5. You are preparing to collect a fingerstick specimen from your patient for a PT and INR test. The puncture wound continues to bleed heavily after the specimen is completed. How do you stop the bleeding and reassure the patient?
6. Explain the rationale used when explaining a procedure to the patient within parameters set by the physician.

7. Your patient arrives for a fingerstick hematocrit test. She tells you she is worried because she continues to have anemia and treatment does not seem to be helping. How do you show awareness of the patient’s feelings within the scope of practice of a medical assistant?
**PROCEDURE 42-1 Making a Peripheral Blood Smear**

**Name:** ___________________________  **Date:** __________  **Time:** __________  **Grade:** __________

**EQUIPMENT/SUPPLIES:** Clean glass slides with frosted ends, pencil, well-mixed whole blood specimen, transfer pipette, hand disinfectant, surface disinfectant, gloves, biohazard container

**STANDARDS** Given the needed equipment and a place to work, the student will perform this skill with ______% accuracy in a total of ______ minutes. (Your instructor will tell you what the percentage and time limits will be before you begin practicing.)

**KEY:**

- 4 = Satisfactory
- 0 = Unsatisfactory
- NA = This step is not counted

**PROCEDURE STEPS**

<table>
<thead>
<tr>
<th>PROCEDURE STEPS</th>
<th>SELF</th>
<th>PARTNER</th>
<th>INSTRUCTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Wash your hands. Put on personal protective equipment.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2. Assemble the equipment and supplies.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3. Obtain a recently made dried blood smear.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>4. Place the slide on a stain rack blood side up.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>5. Place staining solution(s) onto slide according to manufacturer’s instructions.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6. Holding the slide with tweezers, gently rinse the slide with water. Wipe off the back of the slide with gauze. Stand the slide upright and allow it to dry.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>7. Properly care for or dispose of equipment and supplies. Clean the work area. Remove gloves and wash your hands. <strong>Note:</strong> Some manufacturers provide a simple one-step method that consists of dipping the smear in a staining solution, then rinsing. Directions provided by the manufacturer vary with the specific test.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

**CALCULATION**

- **Total Possible Points:** ______
- **Total Points Earned:** ______ Multiplied by 100 = ______ Divided by Total Possible Points = ______ %

**PASS**  **FAIL**  **COMMENTS:**

- ☐  ☐

**Chart Documentation** ____________________________

**Student’s signature** ____________________________  **Date** ______

**Partner’s signature** ____________________________  **Date** ______

**Instructor’s signature** ____________________________  **Date** ______
# PSY Procedure 42-2: Staining a Peripheral Blood Smear

**Name:**

**Date:**

**Time:**

**Grade:**

**EQUIPMENT/SUPPLIES:** Staining rack, Wright stain materials, prepared slide, tweezers, hand disinfectant, surface disinfectant, gloves

**STANDARDS** Given the needed equipment and a place to work, the student will perform this skill with _______% accuracy in a total of ________ minutes. *(Your instructor will tell you what the percentage and time limits will be before you begin practicing.)*

**KEY:**

4 = Satisfactory  
0 = Unsatisfactory  
NA = this step is not counted

<table>
<thead>
<tr>
<th>PROCEDURE STEPS</th>
<th>SELF</th>
<th>PARTNER</th>
<th>INSTRUCTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Wash your hands. Put on personal protective equipment.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2. Assemble the equipment and supplies.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3. Obtain a recently made dried blood smear.</td>
<td>☐</td>
<td>☐</td>
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<tr>
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<td>☐</td>
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<td>5. Place staining solution(s) onto slide according to manufacturer’s instructions.</td>
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</tr>
<tr>
<td>6. Holding the slide with tweezers, gently rinse the slide with water. Wipe off the back of the slide with gauze. Stand the slide upright and allow it to dry.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>7. Properly care for or dispose of equipment and supplies. Clean the work area. Remove gloves and wash your hands. Note: Some manufacturers provide a simple one-step method that consists of dipping the smear in a staining solution, then rinsing. Directions provided by the manufacturer vary with the specific test.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

**CALCULATION**

Total Possible Points: _______

Total Points Earned: _______ Multiplied by 100 = _______ Divided by Total Possible Points = _______%

**PASS**  

**FAIL**  

**COMMENTS:**

☐  

Chart Documentation

Student’s signature: ___________________________ Date: ________

Partner’s signature: ___________________________ Date: ________

Instructor’s signature: _________________________ Date: ________
### Procedure 42-3: Performing a Hemoglobin Determination

**Name:** ____________________________________  **Date:** ________  **Time:** ________  **Grade:** ________

**Equipment/Supplies:** Hemoglobin meter, applicator sticks, whole blood, hand disinfectant, surface disinfectant, gloves, biohazard container

**Standards:** Given the needed equipment and a place to work, the student will perform this skill with ______ % accuracy in a total of ______ minutes. (Your instructor will tell you what the percentage and time limits will be before you begin practicing.)

**Key:**
- 4 = Satisfactory
- 0 = Unsatisfactory
- NA = This step is not counted

<table>
<thead>
<tr>
<th>Procedure Steps</th>
<th>Self</th>
<th>Partner</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Wash your hands. Put on personal protective equipment.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2. Assemble the equipment and supplies.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3. Review instrument manual for your hemoglobin meter. Turn meter on and validate quality control before testing patient specimen.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>4. Obtain an EDTA (lavender-top tube) blood specimen from the patient, following procedures in Chapter 41.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>5. Place well-mixed whole blood into the hemoglobin meter chamber as described by the manufacturer.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6. Slide the chamber into the hemoglobin meter.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>7. Record the hemoglobin level from the digital readout.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>8. Clean the work area with surface disinfectant. Dispose of equipment and supplies appropriately. Remove gloves and wash your hands. <strong>Note:</strong> This procedure may vary with the instrument.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

**Calculation**

Total Possible Points: ________

Total Points Earned: ________ Multiplied by 100 = ________ Divided by Total Possible Points = ________ %

**Pass**  **Fail**  **Comments:**

☐  ☐

Chart Documentation ____________________________________________

Student’s signature ___________________________________________ Date ________

Partner’s signature ___________________________________________ Date ________

Instructor’s signature _________________________________________ Date ________
**PROCEDURE 42-4 Performing a Microhematocrit Determination**

Name: ___________________________ Date: ________ Time: ________ Grade: ________

**EQUIPMENT/SUPPLIES:** Microcollection tubes, sealing clay, microhematocrit centrifuge, microhematocrit reading device, hand disinfectant, surface disinfectant, gloves, biohazard container, sharps container

**STANDARDS:** Given the needed equipment and a place to work, the student will perform this skill with ____% accuracy in a total of _______ minutes. *Your instructor will tell you what the percentage and time limits will be before you begin practicing.*

**KEY:**

- 4 = Satisfactory
- 0 = Unsatisfactory
- NA = This step is not counted

**PROCEDURE STEPS**

<table>
<thead>
<tr>
<th>SELF</th>
<th>PARTNER</th>
<th>INSTRUCTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Wash your hands. Put on personal protective equipment.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2. Assemble the equipment and supplies.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3. Draw blood into the capillary tube by one of two methods:</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>a. Directly from a capillary puncture (see Chapter 41) in which the tip of the capillary tube is touched to the blood at the wound and allowed to fill to three quarters or the indicated mark.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>b. From a well-mixed EDTA tube of whole blood; again, the tip is touched to the blood and allowed to fill three-quarters of the tube.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>4. Place the forefinger over the top of the tube, wipe excess blood off the sides, and push the bottom into the sealing clay.</td>
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<tr>
<td>5. Draw a second specimen in the same manner.</td>
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<tr>
<td>6. Place the tubes, clay-sealed end out, in the radial grooves of the microhematocrit centrifuge opposite each other. Put the lid on the grooved area and tighten by turning the knob clockwise. Close the centrifuge lid. Spin for 5 minutes or as directed by the centrifuge manufacturer.</td>
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<tr>
<td>7. Remove the tubes from the centrifuge and read the results; instructions are printed on the device. Results should be within 5% of each other. Take the average and report as a percentage.</td>
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<tr>
<td>8. Dispose of the microhematocrit tubes in a biohazard container. Properly care for or dispose of other equipment and supplies. Clean the work area. Remove gloves and wash your hands. Note: Some microhematocrit centrifuges have the scale printed in the machine at the radial grooves.</td>
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</tbody>
</table>
CALCULATION

Total Possible Points: _______
Total Points Earned: _______ Multiplied by 100 = _______ Divided by Total Possible Points = _______ %

PASS  FAIL  COMMENTS:

☐  ☐

Chart Documentation ________________________________

Student’s signature ____________________________, Date ______

Partner’s signature ____________________________, Date ______

Instructor’s signature ____________________________, Date ______
**PROCEDURE 42-5 Performing a Westergren Erythrocyte Sedimentation Rate**

Name: ___________________________ Date: ________ Time: ________ Grade: ________

**EQUIPMENT/SUPPLIES:** Hand disinfectant, gloves, EDTA blood sample less than 2 hours old, ESR kit, sedimentation rack, pipette, timer, surface disinfectant, biohazard disposal container, sharps container

**STANDARDS:** Given the needed equipment and a place to work, the student will perform this skill with ________% accuracy in a total of ________ minutes. (Your instructor will tell you what the percentage and time limits will be before you begin practicing.)

**KEY:** 4 = Satisfactory 0 = Unsatisfactory NA = This step is not counted

<table>
<thead>
<tr>
<th>PROCEDURE STEPS</th>
<th>SELF</th>
<th>PARTNER</th>
<th>INSTRUCTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Wash your hands. Put on personal protective equipment.</td>
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<tr>
<td>2. Obtain an EDTA lavender-stoppered tube collected from your patient.</td>
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<td>3. Gently mix EDTA lavender-stoppered anticoagulation tube for 2 minutes.</td>
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<td>4. Using a vial from the ESR kit and a pipette, fill vial to the indicated mark. Replace stopper and invert vial several times to mix.</td>
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<tr>
<td>5. Using an ESR calibrated pipette from the kit, insert the pipette through the tube’s stopper with a twist and push down slowly but firmly until the pipette meets the bottom of the vial. The pipette will autozero with the excess flowing into the holding area. If the blood column does not reach the autozero point, discard used materials and start again at Step 4.</td>
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<tr>
<td>6. Place the tube in a holder that will keep the tube vertical.</td>
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<tr>
<td>7. Wait exactly 1 hour; use a timer for accuracy. Keep the tube straight upright and undisturbed during the hour.</td>
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<tr>
<td>8. Record the level of the top of the RBCs after 1 hour. Normal results for men are 0–10 mL/hour; for women, 0–15 mL/hour.</td>
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</tr>
<tr>
<td>9. Properly care for or dispose of equipment and supplies. Clean the work area. Remove gloves, gown, and face shield. Wash your hands.</td>
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</tr>
</tbody>
</table>

**CALCULATION**

Total Possible Points: ________

Total Points Earned: ________ Multiplied by 100 = ________ Divided by Total Possible Points = ________ %

**PASS** ☑ **FAIL** ☐ **COMMENTS:**

Chart Documentation ____________________________

Student’s signature ____________________________ Date ________

Partner’s signature ____________________________ Date ________

Instructor’s signature __________________________ Date ________