

### Body Fluids Lab 10 - Differentials

**Points:** Ten points are awarded for Pre-test.  
Twenty points for cell differential lab skills when results are within  $\pm 20\%$  of instructor values and include general points awarded for neatness, lab clean-up, teamwork, etc.  
Ten points for completion of cell & inclusion sheet.  
Points are also provided for the successful and timely completion of Study Questions (due by next class meeting, or as directed by instructor).

**Objectives:** According to standards set by the instructor, the student will be able to:

1. Perform differentials on two prepared cytopsin Wrights stained slides. (within  $\pm 20\%$  of instructor values)
2. Scan at least 1 cytopsin slide and identify a possible malignant cell
3. Scan at least 1 cytopsin slide and identify intracellular bacteria.
4. Scan at least 1 cytopsin slide and identify erythrophages, siderophages, & leukophages.
5. Scan at least 1 cytopsin slide to identify inclusions (crystal, organisms, etc.) seen in the macrophages.
6. Use appropriate recording format and applicable QC measures.
7. Answer all pre-test and study questions using related information found in the textbook, lecture guide, and this lab procedure

**Materials:**

1. Microscope
2. Differential Cell Counter
3. Prepared cytopsin Wrights stained body fluid differential slides

**References:** Current hematology course textbook.  
Current UA / BF course textbook(s)  
Lecture and Lab Guides & related course powerpoints.

**Principle:** Cell differentials, along with the WBC and RBC cell counts provide extremely important information for the diagnosis and treatment of diseases involving CSF, serous, and synovial cavities. Infections, hemorrhages, and malignancies are of primary concern. In addition to basic cell identification, cells must be examined for the presence of inclusions that provide information concerning disease possibilities or state.

The body fluid differential count is performed on a stained smear. Due to the low number of cells normally seen, various methods have been employed to concentrate the cells - they include: sedimentation, filtration, centrifugation, and cyto-centrifugation. Due to time constraints, sedimentation and filtration are not routinely used, however, they produce less cell distortion. A routine centrifuged specimen is spun for approximately 5 - 10 minutes, the supernatant removed and saved for chemical testing, if needed. The sediment is placed on a clean slide, allowed to air dry and stained with Wright's stain. One hundred (100) cells are counted and classified. The result is reported as a percentage. When cell numbers are low, fewer cells are classified and calculation is necessary to convert the

numbers into percentages. Cytocentrifuge is an instrument that uses centrifugal force to direct the cells onto a small filter circle on a slide. As with the traditional centrifugation method, cells are likely to become distorted during the process. Cellular distortion may result in the presence of cytoplasmic vacuoles, nuclear clefting, prominent nucleoli, absent or unclear nuclear and cytoplasmic borders, etc. The addition of a small amount of albumin to the specimen before processing may reduce the amount of distortion.

Note: Synovial fluid may need to have hyaluronidase added prior to making the slide to reduce the viscosity and make the slide more uniform.

Consult the textbook for normal and abnormal cells that can be seen in the various body fluids. As a general statement, any nucleated cell that is normally seen in peripheral blood can also be seen in a body fluid. The expected / normal numbers of cells present varies greatly depending on the fluid. In addition, normal cells that line the various body cavity can also be found. Occasionally a cell will have an inclusion in its cytoplasm. These cells will be classified differently than the same cell without the inclusion. (That is to say, if there is an inclusion - the cell gets a different name.) Abnormal cells, such as plasma cells and malignant cells are sometimes also found. Any "suspicious cell" should be brought to the attention of a supervisor.

- Procedure:**
1. Scan prepared slides and differentiate cells present including possible malignant cells, intracellular bacteria, and inclusions in the macrophages. Use course textbook and additional references to assist in cell and inclusion identification as well as guidance for study questions.
  2. Get instructor verification of abnormal cells present.
  3. Complete differential and checkoff report sheets according to instructor's directions.

/20 points

Name \_\_\_\_\_

Date \_\_\_\_\_

### Body Fluid Differentials

	Body Fluid #1	Body Fluid #2
Patient Name		
ID Number		
Type of Fluid		
Differential %	Segs _____	Segs _____
	Lymphocytes _____	Lymphocytes _____
	Macrophages _____	Macrophages _____
	Eosinophils _____	Eosinophils _____
	Basophils _____	Basophils _____
	Other cells - specify	Other cells - specify
	inclusions identified	inclusions identified
Comments:		

Body Fluids Slides  
Cells & Inclusions Checklist

Name \_\_\_\_\_

2<sup>nd</sup> copy

Identify the slide in which the cell / inclusion was found.

Cell / Inclusion	CSF Specimen	Other Body Fluid (specify)
Neutrophil (Segs)		
Lymphocyte		
Macrophage		
Eosinophil		
Basophil		
Plasma Cell		
Ependymal Cell		
Mesothelial Cell		
possible malignant cell		
Intracellular bacteria		
Macrophage Inclusions:		
Erythrophage		
Siderophage		
Leukophage		
Hematoidin crystals		
Others:		
LE cell		

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\_\_\_\_ / 30 points

Name \_\_\_\_\_

Date \_\_\_\_\_

**Body Fluids Study Questions**

Use lecture / lab guides and course textbooks to assist in answering these questions. Unless otherwise noted, each question is worth one point.

(3 pts) 1. What three (3) fluids are referred to as serous fluids?

(3 pts) 2. State three (3) reasons for performing serous fluid analysis?

(2 pts) 3. Complete the following table.

Type of Fluid	Normal Color	Normal Clarity
Serous		
Synovial		

(3 pts) 4. List three (3) reasons for performing semen analysis?

(3 pts) 5. Provide three (3) special requirements or instructions for the proper collection of semen for analysis ?

(2 pts) 6. State the normal values for the following semen procedures.

- a. volume - \_\_\_\_\_
- b. motility - \_\_\_\_\_
- c. morphology - \_\_\_\_\_
- d. sperm count - \_\_\_\_\_

(2 pts) 7. List four (4) reasons for performing an amniocentesis?

(2 pts) 8. What is an L/S ratio and how is it used?

9. What is the diagnostic purpose for the sweat test?

10. State two (2) reasons for performing a gastric analysis.

11. What hormone stimulates the production of gastric HCl?

(4 pts) 12. What would be the significance of finding or noting an increase of the following cells in cerebrospinal fluid?

Cell	Significance	Cell	Significance
Lymphocyte		Macrophage	
Neutrophil		Ependymal	
Eosinophil		Blast	
Monocyte		Malignant cell	

(3 pts) 13. What would be the significance of finding or noting an increase of the following cells in body fluids?

a. Mesothelial cells - \_\_\_\_\_

b. Synovial lining cells - \_\_\_\_\_

c. LE cells - \_\_\_\_\_