JERSEY SHORE UNIVERSITY MEDICAL CENTER

HEMATOLOGY
POLICIES AND PROCEDURES

DISTRIBUTION: Hematology SOP	SUBJECT: Assessment of RBC morphology and PLT estimate as part of manual WBC differential	
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POLICY

The evaluation of RBC morphology and Platelet estimate must accompany every manual differential that is performed. To this effect, a manual WBC differential cannot be finalized in the computer without RBC morphology and platelet estimate results. In addition, slides may be reviewed specifically for RBC morphology and/or platelet estimate and morphology if they meet certain criteria, even if a manual WBC differential is not warranted

Red Blood Cell Morphology Reporting Procedure

When reviewing blood smears with the
the Olympus BX41 microscope

1. Using the 50 X oil immersion lens
   a. Examine slide for proper staining.
   b. Determine adequacy of smear. Examine slide for even distrit" ition of cells. Remake unacceptable smears.
   c. Examine smear for presence of agglutination or rouleaux.
2. Using the 100X oil Immersion lens
   Determine percentage of red blood cells that deviate from normal.
   a. There are about 250 normal sized RBCs per field
   b. There are about 45 normal sized RBCs inside of Miller disk.

When reviewing blood smears with the cellavision DM96
(see DM96 procedure for complete instructions)

1. The total number of RBC's counted will appear in the lower left corner of the RBC morphology tab. You can calculate the percentage of a particular RBC morphology by counting the number of a particular cell type seen and dividing by the total number of rbc's counted. This number is then multiplied by 100 to get the percentage.

2. Certain cell types (identified with an " * "will be pre-characterized when using the DM96). This pre-characterization can be confirmed, or changed as the technologist sees fit using the guidelines below.

METHOD	#/%of cells			#/% of cells		
Olympus BX41 microscope	1-2 cells up to 1%	3-6 cells 1 - 2.5%	> 6 cells > 2.5%	12-62 cells 5-25%	63-125 cells 25-50%	>125 cells >50 %
Cellavision DM96	Up to 1.5%	1.5-3.5%	>3.5%	5- 14%	15-30%	>30%

MORPHOLOGY	Cells significant in LOW numbers			Cells significant in HIGH numbers		
Polychromasia	1+	2+	3+	-	-	-
Basophlic stippling	1+	2+	3+	-	-	-
Howell-Jolly bodies	1+	2+	3+	-	-	-
Pappenheimer bodies	1+	2+	3+	-	-	-
Acanthocytes	1+	2+	3+	-	-	-
Schistocytes	1+	2+	3+	-	-	-
Sickle cells	1+	2+	3+	-	-	-
Spherocytes	1+	2+	3+	-	-	-
Macroovalocytes	1+	2+	3+	-	-	-
Parasites	1+	2+	3+			
Teardrops	1+	2+	3+	-	-	-
Microcytes	-	-	-	1+	2+	3+
Macrocytes	-	-	-	1+	2+	3+
Ovalocytes	-	-	-	1+	2+	3+
Hypochromia	-	-	-	1+	2+	3+
[illegible]	-	-	-	[illegible]	[illegible]	[illegible]
Echinocytes	-	-	-	1+	2+	3+
Stomatocytes	-	-	-	1+	2+	3+
Crenated cells	-	-	-	1+	2+	3+

Note: 1+ = occasional/few; 2+ = moderate; 3+ = many/marked

Notes:

hypochromia- based on number of RBCs with hypochromia not amount of hypochromia per cell.

Macrocytes & microcytes – terms describe erythrocytes that vary from the normal volume (MCV). These terms are not a measure of how far from normal these cells vary (NOT how large or small the cells are).but how many are large or small. A normal red cell is approximately 6.5 to 8.5 um.

Poikilocytosis - Because individual types of poikilocytosis are evaluated. General evaluation of poikilocytosis is unnecessary.

Anisocytosis- is the variance between the population of erythrocytes NOT their variance from normal. Report as follows if confirmed by visualization of smear:

ROW 18.0 – 19.9	1+anisocytosis
ROW 20.0 – 21.9	2+ anisocytosis
ROW> 22.0	3+ anisocytosis

Rouleaux & agglutination- when using a microscope are evaluated on the feathered edge of smear using **LOW Power** magnification.

WBC morphologies that get resulted out under the RBC morphology tab include: Smudge Cells, Pelger Huet Cells, Toxic Granulation/Vacuoles hypersegmented neutrophils, Dahle Bodies. These morphologies get graded in the same fashion as the RBC morphologies. Smudge cells can be graded using the "cells significant in high numbers" scale listed above.

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Platelet Estimate and Morphology

Performing the Platelet Estimate
(using the Olympus BX41 microscope)

I. First scan slide with the SOX objective to ascertain if there are any clumps present.
2. Switch to the IOOX oil objective and count the number of platelets in each often microscopic fields in different areas of the slide where the RBC's are evenly dispersed.
3. Avoid fields where the RBC's strongly overlap as this will falsely increase the platelet estimate
4. Watch for platelets that may be superimposed on Red Blood cells and include them in your count.
5. Divide the total number of platelets counted in the ten fields by ten to establish the mean figure. Do not truncate the figure e.g. if the mean is 8.6, do not truncate to 9 but leave figure as is.
6. Multiply the mean by 10,000 to get the estimated platelet count.
   Example: 8.6 x I0,000 = 86,000
7. Platelet estimate is made based on where calculated result falls on chart below.

Significantly decreased	1-50,000
Decreased	51,000-139,000
Adequate platelet count	140,000-450,000
Increased	>451,000
Normal size	1-4urn
Large platelets	>Sum
Normal MPV	7.8–12.3

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