TRAINING UPDATE

Lab Location:	SGMC & WAH	**Date Distributed:**	6/13/2017
Department:	Core Lab	**Due Date:**	6/28/2017
		Implementation:	**6/20/2017**

DESCRIPTION OF PROCEDURE REVISION

Name of procedure:

Hematology Slide Stainer Cytocentrifuge, Wescor Aerospray® Model 7151 SGAH.H14 v3

Automated Stainer Differential Comparison and Stain Quality Log AG.F379.0

Description of change(s):

SOP:

Section 6: specify comparison process to Sysmex stainer

Section 12: update stain comparison log

New log to document the new comparison process

This revised SOP and new form will be implemented -
June 20, 2017 at SG
June 27, 2017 at WAH

Note: The manual diff-quik stain will be discontinued at SG & WAH.

Document your compliance with this training update by taking the quiz in the MTS system.

Non-Technical SOP

Title	**Hematology Slide Stainer Cytocentrifuge, Wescor Aerospray® Model 7151**
Prepared by	Cynthia Reidenauer Date: 8/27/2012
Owner	Robert SanLuis Date: 8/27/2012

Laboratory Approval

Print Name and Title	Signature	Date
Refer to the electronic signature page for approval and approval dates.		
Local Issue Date:	Local Effective Date:	

Review:

Print Name	Signature	Date

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TABLE OF CONTENTS

1. PURPOSE

This procedure describes the operation and maintenance of the Hematology Slide Stainer Cytocentrifuge, Wescor Aerospray® Model 7151.

2. SCOPE

This procedure applies to all staff assigned to Hematology.

3. RESPONSIBILITY

All staff utilizing the slide stainer must comply with this procedure.
Group Leads are responsible for weekly maintenance review.
The technical supervisor is responsible for monthly maintenance review.

4. DEFINITIONS

None

5. REAGENTS

NOTE: Labeling requirements for all reagents, calibrators and controls include: (1) Open date, (2) Substance name, (3) Lot number, (4) Date of preparation, (5) Expiration date, (6) Initials of tech, and (7) Any special storage instructions. Check all for visible signs of degradation.

The package insert for a new lot of kits must be reviewed for any changes before the kit is used. A current Package Insert is included as a Related Document.

5.1 Reagent Summary

Reagents	Supplier & Catalog Number
Wescor Buffer pH 6.8	Wescor Cat. # SS-071A
Wescor Hematology Reagent B (Thiazin Stain)	Wescor Cat. # SS-071B
Wescor Hematology Reagent C (Eosin Stain)	Wescor Cat. # SS-071C
Aerospray® Reagent Grade Methanol	Wescor Cat. # SS-MeOH
Aerofix® Additive for Methanol. Dilutes to 500mL.	Wescor Cat. # SS-148
Aerospray® Nozzle Cleaning Solution	Wescor Cat. # SS-029CG

5.2 Reagent Preparation and Storage

Reagent	**Wescor Buffer pH 6.8 Reagent A (Rinse)**
Hazards	Consult SDS
Contents	Deionoized water, KOH,Tritonx-100,Maleic acid and Imidazole
Container	3.8 L plastic bottle
Storage	Room Temperature and away from direct light
Stability	Expiration date on package.
Preparation	None. Reagent is ready for use.

Reagent	**Wescor Hematology Reagent B Thiazin Stain**
Hazards	**Flammable.** Store bulk reagents in an explosion proof cabinet.
Contents	Deionized water, Methyl alcohol, Ethanol, TritonX-100, Imidazole Hydrochloride, Azure B and Methylene Blue
Container	500 mL plastic bottle
Storage	Store at Room Temperature away from direct light
Stability	Expiration date on package.
Preparation	None. Reagent is ready for use.

Reagent	**Wescor Hematology Reagent C Eosin Stain**
Hazards	**Flammable.** Store bulk reagents in an explosion proof cabinet.
Contents	Deionized water, Methyl alcohol, Ethanol, Eosin Y, Triton X-100, Potassium Maleate
Container	500 mL plastic bottle
Storage	Store at Room Temperature and away from direct light. Store bulk reagents in an explosion proof cabinet.
Stability	Expiration date on package.
Preparation	None. Reagent is ready for use.

Reagent	**Aerospray® Reagent Grade Methanol**
Hazards	**Highly flammable and toxic**. Keep tightly closed. Keep away from sources of ignition. No smoking in area of use. Wear suitable clothing and gloves. In case of an accident or if you feel unwell, seek medical advice immediately and show the product label, if possible. Toxic by inhalation, in contact with skin, and if swallowed. Danger of very serious irreversible effects.
Contents	Anhydrous Reagent Grade Methanol.
Container	500 mL plastic bottle
Storage	Store at Room Temperature. Store any inventory not in use on the instrument in an explosion-proof cabinet.
Stability	Expiration date on package.
Preparation	See below (Aerofix® Additive for Methanol)

Reagent	**Aerofix® Additive for Methanol**
Hazard	**Irritating** to eyes. Wear suitable protective clothing, gloves, and eye/face protection. In case of contact with eyes, rinse immediately with copious amounts of water and seek medical advice. **Harmful** if swallowed.
Contents	Ethylene glycol, PVP, and Azure B.
Container	135 mL plastic bottle
Storage	Room temperature away from direct light. . Store bulk reagents in an explosion proof cabinet.
Stability	Expiration date on package.
Preparation	Used as an additive to Aerospray® Reagent Methanol (SS-MeOH) to eliminate refractile artifacts in erythrocytes. 1. Add 15mL SS-148 to 500mL Methanol SS MeOH 2. Mix well.

Reagent	**Aerospray® Nozzle Cleaning Solution**
Hazards	**IRRITANT:** Irritating to eyes and skin. Wear suitable personal protective equipment (PPE) including protective clothing, eye/face protection, and gloves. **FLAMMABLE:** Once prepared for use, contents are flammable. Keep away from sources of ignition. No smoking in area of use. See SDS for details.
Contents	Deionized water and oxalic acid.
Container	0.5 U.S. gallon plastic bottle
Storage	Store at Room Temperature. After preparation, store in an explosion-proof cabinet.
Stability	Expiration date on package.

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Preparation	1. Add 250mL Methanol or Ethanol to bottle of SS-029C 2. Mix well 3. Check box on label when mixed. **Once prepared, reagent is flammable. Store the prepared reagent in an explosion-proof cabinet.**

6. QUALITY CONTROL

6.1 Performance Checks

6.1.1. Stain Quality

Examine a smear stained with the Aerospray® slide stainer utilizing a light microscope under an oil immersion lens. Record the stain quality as S (Satisfactory) or U (Unsatisfactory) on the ~~Hematology Differential and Stain Quality Log and the Maintenance Log~~ Automated Stainer Differential Comparison and Stain Quality Log using the criteria below.

A properly stained smear should have the following characteristics:

1. RBC - Pink with central pallor. Note: Erythrocytes normally exhibit less central pallor using the SS-035 and SS-049 than with traditional stains.
2. Platelets – Violet to purple granules
3. NRBC - Dark purple nucleus.
4. WBC
   a. Neutrophil - Dark purple nuclei with light pink cytoplasm dotted with lilac granules.
   b. Lymphocyte - Dark purple nucleus. Cytoplasm with varying shades of blue (robin's egg blue).
   c. Monocyte - Cytoplasm of monocytes stains a faint bluish gray tinge.
   d. Eosinophil - Bright red to orange granules.
   e. Basophil - Very large dark bluish purple granules.

For additional information about the special staining characteristics of the Aerospray® slide stainer, refer to Appendix C of the User's Manual.

6.1.2 Differential Comparison

~~Prepare a blood smear from a specimen analyzed by the automated hematology analyzer. Stain the slide with the Aerospray® Slide Stainer and perform a manual differential. Compare the results of the manual differential with the automated differential.~~
Prepare two (2) blood smears from a specimen analyzed by the automated hematology analyzer. Stain one slide with the Aerospray® Slide Stainer and the other with the Sysmex SP-10 stainer. Perform a manual differential on both slides and compare the results of the differentials to the automated one.

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Record the results on the Automated Stainer Differential Comparison and Stain Quality and verify that the differential meet the criteria given on the log.

6.2 Control Preparation and Storage

Stain a slide on the Aerospray® Slide Stainer. After examination under the microscope for the proper stain quality and differential comparison as outlined above, store in the slide box labeled for the day. Slides are kept for one week.

6.3 Frequency

Stain quality and differential comparison must be performed each day.

6.4 Tolerance Limits

The differential comparison results must be within the established parameters on the ~~Hematology Differential Comparison~~ Automated Stainer Differential Comparison and Stain Quality Log.
The stain quality must meet the characteristics listed above in Section 6.1.1.
Record the Stain Quality as indicated: **S** =Satisfactory and **U** = Unsatisfactory.

Perform remedial actions for unsatisfactory results using the troubleshooting guidelines in the User's Manual. Document the corrective actions on the reverse side of the Preventive Maintenance Chart.

6.5 Documentation

- Document on the Preventive Maintenance Chart.
- Refer to complete policies and procedures for QC documentation and record retention requirements in the Laboratory QC Program.

7. EQUIPMENT and SUPPLIES

7.1 Assay Platform

Not applicable

7.2 Equipment

- Wescor Aerospray® Hematology Slide Stainer/ Cytocentrifuge Model 7151
- Microscope
- Slide Staining Carousel (12-slide capacity) AC-028
- Cytopro® Cytocentrifuge Rotor (AC-160) when using Cytocentrifuge function

7.3 Supplies

- Wescor Nozzle Maintenance Kit AC-077
- Sample Chambers with Caps and Fast (White) Cytopad® Absorption Pads
- Sample Chambers with Caps and Slow (Tan) Cytopad® Absorption Pads
- Isoton®
- 22% Bovine Albumin Solution

- Microscope Slides (25 x 75 mm)

8. PROCEDURE

NOTE: For all procedures involving specimens, buttoned lab coats, gloves, and face protection are required minimum personal protective equipment. Report all accidents to your supervisor.

8.1	Instrument Set-up Protocol
1.	The Wescor Aerospray® Slide Stainer/Cytocentrifuge can be pre-programmed upon installation. SGMC and WAH have customized the settings based on the validation of the stain. Customizing the settings for the stainer: Press PROG from the keypad on the instrument There will be four options available 1 = stain intensity 2 = set fixation 3 = adjust stain 4 = stain mode a. First set the stain intensity by choosing 1. You have the option of 1/9 on the keyboard. Choose 4. This is the validated intensity. b. Press STOP, then PROG c. Next set the adjust stain by choosing 3 and then set T/E ratio to 4; Spin time to 7 and Rinse to 5. d. Press STOP, then PROG e. Lastly set the STAIN MODE by pressing 4. Then choose 2 WRIGHT GIEMSA. f. Press STOP When the settings are customized for SGMC and WAH you should see: WRIGHT GIEMSA #4+ displayed on the LED readout on the front of the stainer. **These settings along with the pH in use were validated and should not be changed except with permission.** **The settings are as follows:** **Intensity: 4** **T/E Ratio : 4** **Fixation: 4** **Spin Time : 7** **Mode: Wright Giemsa** **Rinse: 5** **Stain adjust is locked off with a password…please contact your supervisor**
2.	On installation, the **Automated Reagent Level Monitoring System** is zeroed and calibrated to warn the user when reagent levels drop to approximately 100mL. The instrument will continue running through these warnings, and it is up to the user to visually monitor the reagent levels, and to replenish the reagent before running out completely. **CAUTION: To prevent damage to the pumps, never run a dry pump for more than 10 seconds.**

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8.1	Instrument Set-up Protocol
3.	For complete details of all instrument set-ups, consult User's Manual Section 3.8 and Programming Manual.

8.2	Specimen Preparation
1.	**Whole Blood**: Using a well-mixed sample of whole blood collected in EDTA; prepare blood films according to the standard procedure for wedge pull film technique. Label the slide with patient's name and accession number. Avoid thick smears which can tear during staining. Allow slides to air dry before placing slides in the stainer.
2.	**Body Fluids**: Samples must be processed using the Cytocentrifuge function as described below (Section 8.4) **before** placing slides in the stainer.

8.3	Test Run/Slide Stainer Mode
1.	Select the slide staining carousel. To remove the carousel lid, press the button on the lid handle and lift. Never load chipped or cracked slides into the stainer. Load labeled slides into the carousel. The smears must face clockwise with the labeled end of the slide oriented **TOWARD** the central hub.
2.	**If loading fewer than 12 slides**, balance the rotor by placing slides in opposing positions on the carousel. Use blank slides to even the loading pattern and prevent over-staining.
3.	a. **If staining 8 or fewer slides**: Enter the number of slides to be stained on the numbered Keypad. This will save reagent when staining just a few slides. **NOTE:** ***The stainer defaults to the full carousel setting after each staining cycle.*** b. **If staining 9 or more slides**: The stainer treats 9-12 slides as a full carousel. Therefore, you do **NOT** need to program the number of slides.
4.	Replace the carousel lid by pressing the release button as you lower the lid over the indexing posts. Release the button and press the lid handle lightly until it clicks into place. Place the carousel on the instrument hub. Close the stainer lid.
5.	Press **RUN** to begin staining.
6.	The signal tone sounds at the end of the staining cycle. Remove the rotor and unload the specimen slides for screening. **NOTE: Never press the carousel lid release button while carrying the carousel. This will allow the carousel to drop, which can cause severe damage.**
7.	Examine slides with a microscope. If stain is unacceptable, repeat with new slide after troubleshooting. See the User's Manual troubleshooting Section 6.

8.4	Special Handling: Cytocentrifuge Operation
1.	The Cytocentrifuge function is used to sediment sample cells onto microscope slides in preparation for staining. Refer to the appropriate CSF, Synovial Fluid, and/or Body Fluid SOP for sample preparation and handling.
2.	Select the Cytopro® Cytocentrifuge Rotor (AC-160) with accompanying supplies. Using pre-cleaned slides, label two slides with the patient's name and accession number. Place each labeled slide into a slide bracket with the labeled side facing the rotor. The release levers need not be depressed to load slides

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8.4	Special Handling: Cytocentrifuge Operation
3.	Select a Cytopad® according to the sample: (Cytopads come in two absorption rates.) a. **Low viscosity or low cellularity samples**, such as cerebrospinal fluid: Use the slow (tan) pad b. **Viscous samples**, such as synovial fluid: Use the fast (white) pad.
4.	Using the chamber with selected Cytopad,® depress the release lever and insert a chamber assembly. Release the lever while gently pressing down on the top of the chamber frame to ensure the chamber is squarely seated.
5.	Refer to the specific cell count procedure (CSF, Synovial, or Body Fluid) to determine the volume of sample to place in the chamber. The total volume in chamber (including additives) may not exceed 0.5 mL. The optimum cell recovery is obtained with sample volumes of 0.2 to 0.3 mL.
6.	Load the appropriate amount of sample and prewetting fluid, if needed. Gently apply a chamber cap to minimize contamination and accidents.
7.	Place the lid on the rotor by lifting the locking pin as you place the center pin into the rotor lid receptacle. Press down on the locking pin until it locks.
8.	Carefully transfer the rotor to the Aerospray® stainer, taking care not to bump or tilt the rotor while transferring. Gently lower the rotor into place on the drive hub. If necessary, rotate the rotor until it fits over the drive hub. Be sure the rotor is firmly seated on the hub.
9.	Close the instrument lid.
10.	Press the **CYTO/CENT** button and the pre-programmed settings for the Cytocentrifuge should display. (1000 RPM and 5 MIN)
11.	Press **RUN**.
12.	After the tone signaling the end of the cycle, remove the rotor from the Aerospray® and put it on a flat surface.
13.	Remove the rotor lid by pressing with one hand on the center of the rotor lid while lifting the locking pin with the other hand. Check the chambers for complete absorption of suspension fluid. If the fluid is not completely absorbed, rerun the sample.
14.	Completely depress the release lever and remove the chambers. Discard chambers in a biohazard container.
15.	Remove the slide and air dry until completely dry prior to staining. Stain as described in section 8.3.
16.	Check for any other pending tests on the sample. If not needed by another department, store the remainder of the sample as indicated in the specific body fluid SOP.

9. MAINTENANCE

WARNING! Always wear eye and hand protection when performing preventive maintenance on the Aerospray® Slide Stainer/Cytocentrifuge.

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9.1	**Daily Maintenance: Must Be Performed by All Three Shifts**
1.	Run the Carousel Clean followed by a System Clean cycle. The carousel can also be cleaned manually as needed.
2.	Use a squirt bottle filled with SS-230 or methanol to spray the stainer interior. With a clan paper towel, wipe the nozzle faces and interior surfaces. Use a fine bristled brush as necessary to clean the nozzle orifices (see Section 6.2 and 6.3 of User's Manual for details.)
3.	Spray the exterior case using methanol. Wipe all surfaces clean with a paper towel.
4.	Document actions on the Preventive Maintenance Chart.
5.	Before staining, you **have the option** to run the Spray Pattern Test to verify nozzle performance (See Sections 6.2 and 6.3 User's Manual.)
6.	The instrument requires the lines to be filled with methanol prior to staining. **Run a System (or Carousel) Clean Cycle to prepare for staining**. If you press RUN with any other reagent other than methanol in the lines, a warning display and signal will be given until System Clean is run.

9.2	**Weekly Maintenance**
1.	Perform the **SPRAY PATTERN** and **SPRAY VOLUME** tests as described below in Section 9.3 and 9.4.
2.	Pour 50 mL of SS-230 or methanol into the stainer bowel drain. Wipe down the nozzles, carousel tray and carousel lid using methanol (or SS-230) in a squirt bottle and a clean paper towel.
3.	Flush the instrument drain with 200 to 300 mL of water to prevent buildup of paper fibers, precipitates, etc. (See page 49 of User's Manual.) Verify the drain is allowing the stainer bowl to empty.
4.	Document actions on Preventive Maintenance Chart.

9.3	**SPRAY PATTERN TEST**
1.	Remove the carousel from the instrument.
2.	**Place a plastic cup over the drive hub to protect the drive motor from liquid during nozzle performance tests**.
3.	Hold a sheet of white paper in front of the carousel hub. Press the prime button of the desired reagent to replace the methanol in the line.
4.	Press **MAINT,** then **1** for Pattern Test, then press the prime button of the reagent line to be tested (sprays a short burst of the corresponding reagent onto a clean sheet of paper.)
5.	Run the System Clean after a Volume or Pattern Test to ensure all reagents are ready for use.
6.	The spray pattern must be round and uniform. If the spray pattern is abnormal (see examples on page 65 of User's Manual), a clogged nozzle may be the reason. You can usually resolve this problem by doing one or both of the following: • Press the bristles of the provided nozzle brush into the nozzle orifice. • Run a CLEAN cycle, the repeat step immediately above. • If the above measures do not solve the problem, disassemble and clean the nozzle (refer to Section 6.3 User's Manual).

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9.4	SPRAY VOLUME TEST
1.	Remove the carousel from the instrument.
2.	**Place a plastic cup over the drive hub to protect the drive motor from liquid during nozzle performance tests.**
3.	Press **MAINT.**
4.	Press **1** to select **Volume Test** from the menu.
5.	Hold a 14 mL centrifuge tube from the Aerospray® Maintenance Kit against the desired nozzle.
6.	Press the corresponding **Prime button**. The pump for that position will run for 20 seconds.
7.	Place the centrifuge tube containing the collected reagent in the correct position (A, B,C, or D) in the tube stand of the maintenance kit that corresponds to the reagent line being tested.
8.	Repeat steps 1 through 4 for each reagent.
9.	Record results of the volume test on the Preventive Maintenance Chart. Examine results for satisfactory performance as outlined in section 9.5.

9.5 Tolerance Limits for Volume test

Nozzle	Expected Volume
A Reagent	9.0 to 11.0 mL
B, C, and D Reagents	9.5 to 12.0 mL.

Low Volume: A reduction in volume from a spray nozzle is typically caused by reagent precipitate for foreign matter inside the nozzle. If the CLEAN cycle does not help, the best solution is to manually disassemble and clean the spray nozzle. See User's Manual Section 6.2 and 6.3.

If reagent delivery trends lower and cleaning does not rectify the situation, or if the nozzle plugs immediately after cleaning, the stain mixing system may be fouled. Perform the Line Cleaning Procedure (User's Manual Section 5.1). If this does not remedy the problem, notify your Supervisor and/or call for Service.

Excessive Volume: If you collect excessive volume, make sure the nozzle is assembled correctly (see REASSEMBLY in Section 6.3 of User's Manual.) If this fails to correct the problem, contact your Supervisor and/or call for Service.

9.6	Monthly Maintenance
1.	Disassemble and clean all nozzles as described in the User's Manual Section 6.3. Do not mix or interchange nozzles or nozzle parts.
2.	Reinstall the cleaned nozzles. ALWAYS return nozzles to the same location in the stainer.

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9.6	**Monthly Maintenance**
3.	Perform **SPRAY PATTERN** and **SPRAY VOLUME** tests. Record the results of the end of month Spray Volume test on the PM chart. Run the System Clean cycle to prepare for staining. **NOTE:** As you begin a new month, the "Volume after Monthly Cleaning" becomes the "Previous Month's Ending Volume" and should be transferred to that category on the Preventive Maintenance Chart.

10. TROUBLESHOOTING

Using high quality microscope slides with good nozzle maintenance including frequent use of the Clean Cycles will prevent most staining problems with this instrument.

If you suspect a problem with reagent delivery, you should diagnose the problem by assessing the performance of the stain spray nozzle. Assess the fixation nozzle for fixation problems.

Test spray pattern and spray volume as described above to determine if reagent is being delivered properly. If needed, use the cleaning instructions in the User's Manual to clean the nozzle.

Consult the Troubleshooting section of the User's Manual for additional help with operation and/or sub-optimal staining characteristics.

11. SAFETY

Refer to your local and corporate safety manuals and Safety Data Sheet (SDS) for detailed information on safety practices and procedures and a complete description of hazards.

12. RELATED DOCUMENTS

Safety Data Sheets (SDS)
Laboratory Safety Manual
Quality Control Program, QA procedure
Cell Count and Differential, CSF, Hematology procedure
Body and Synovial Fluid Analysis, Hematology procedure
~~Hematology Differential Comparison and Stain Quality Log (AG.F36)~~
Automated Stainer Differential Comparison and Stain Quality Log (AG.F379)
Hematology Slide Stainer Preventive Maintenance Chart (AG.F173)
Current package insert for stains

13. REFERENCES

1. 7151 Aerospray® Hematology Stainer/Cytocentrifuge User's Manual, Wescor, Inc., 2010.
2. AC-160 Cytopro® Cytocentrifuge Rotor User's Manual, Wescor, Inc. Logan, Utah, 2004.
3. Cytpro Cytocentrifuge Methods Manual M2365-4 revA, Wescor, Inc. 2003.

4. www.wescor.com

14. REVISION HISTORY

Version	Date	Reason for Revision	Revised By	Approved By
000	10/19/12	Section 9.6 Removed cleaning of reusable bottle	CReidenauer	R SanLuis
001	11/20/16	Header: add WAH Section 5: update labeling instruction Section 11: update to new standard wording Section 12: update titles, move log from section 9 Footer: version # leading zero's dropped due to new EDCS in use as of 10/7/13	L Barrett	R SanLuis
2	6/7/17	Section 6: specify comparison process to Sysmex stainer Section 12: update stain comparison log	L Barrett Z Morrow J Negado	R SanLuis

15. ADDENDA AND APPENDICES

None

Automated Stainer Differential Comparison and Stain Quality

☐ Shady Grove Medical Center
☐ Washington Adventist Hospital

Date	Tech	Sample	Source	Poly ± 10	Lym ± 10	Band ± 5	Mono ± 3	Eos ± 3	Baso ± 3	Plt see below	Diff Evaluation	Stain Quality
											S - satisfactory U - unsatisfactory	
			Sysmex XN			n/a						
			SP-10[1]									
			Difference							OK Not OK		
			Wescor[2]									
			Difference							OK Not OK		
			Sysmex XN			n/a						
			SP-10									
			Difference							OK Not OK		
			Wescor									
			Difference							OK Not OK		
			Sysmex XN			n/a						
			SP-10[1]									
			Difference							OK Not OK		
			Wescor[2]									
			Difference							OK Not OK		
			Sysmex XN			n/a						
			SP-10									
			Difference							OK Not OK		
			Wescor									
			Difference							OK Not OK		
			Sysmex XN			n/a						
			SP-10									
			Difference							OK Not OK		
			Wescor									
			Difference							OK Not OK		

[1] Slide stained on Sysmex SP-10, manual differential performed and compared to automated diff
[2] Slide stained on Wescor, manual differential performed and compared to automated diff

Platelet Instructions: Record count from Sysmex. Indicate SP-10/Wescor manual smear as Decreased, Normal, Increased or Clumped.
Criteria: Count <150= Decreased; Count 150-450 = Adequate; Count >450 =Increased; Clumped = plt clumps seen on smear
Circle OK or Not OK to evaluate the automated and manual comparison for each stainer

Supervisor Review _____