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Area	Laboratory-Blood Bank
Applicability	Dearborn

Quality Control & Preventative Maintenance of the Helmer UltraCW Automatic Cell Washing System - Dearborn Blood Bank

Document Type: Procedure

I. PURPOSE AND OBJECTIVE:

This document will identify and provide policy and instructions for the preventative maintenance (PM) that is required for the Helmer UltraCW™ Cell Washer Automatic Cell Washing System.

II. INTRODUCTION:

A. The Helmer UltraCW™ Automatic Cell Washing System Operation Manual indicates that routine maintenance procedures should be performed on a regular basis, with the specific time interval determined by the user and based on instrument usage. The instructions also indicate that the following preventative maintenance checks and cleaning procedures be performed regularly:

1. Inspection
2. Cleaning
3. Decontamination
4. Adjustment of the saline flow volume, periodically and after replacing the saline supply

III. CLINICAL SIGNIFICANCE:

A. Antihuman globulin (AHG) is inactivated readily by unbound immunoglobulin. The red blood cells (RBCs) to which AHG will be added must be washed free of all proteins and suspended in a protein-free medium. A properly functioning cell washer must add large volumes of saline to each tube, resuspend the cells, centrifuge them adequately to avoid excessive RBC loss, and decant the saline to leave a dry cell button. The preventative maintenance described in this document will help ensure

that the cell washer is functioning properly.

IV. SCOPE:

The Helmer UltraCW™ Automatic Cell Washing System will only be used with 12 x 75 mm test tubes.

V. DEFINITIONS/ACRONYMS:

A. Weekly: every week, within 7 ± 2 days of the previously performed weekly task.
B. Monthly: within the first two weeks of each calendar month.
C. Semi-Annual: twice a year.
D. Yearly: within a twelve month period. For example, the tubing must be replaced within 12 months from the time that the tubing was most recently replaced.
E. RPM: Revolutions per Minute

VI. POLICIES:

A. The saline fill volume is checked each day of use as described in the *Saline Fill Volume* procedure below and is documented on *Cell Washer Daily Maintenance Log*.
B. The saline supply will be confirmed as adequate each of day of use as described in the *Saline Supply Check and Replacement* procedure below and is documented on the *Cell Washer Daily Maintenance Log*.
C. The tubing and drain will be inspected each day of use for damage or obstructions. These checks will be documented on Cell Washer *Daily Maintenance Log*.
D. Each day of use, the system will be flushed with distilled water and documented on the the *Cell Washer Daily Maintenance Log*.
E. Each day of use, the interior of the cell washer will be cleaned and dried to prevent corrosion and contamination. The cleaning will be documented on the *Cell Washer Daily Maintenance Log*.
F. The rotor fill ports will be inspected and cleaned weekly as described in the *Weekly Fill Report Maintenance* and is documented on *Cell Washer Weekly Maintenance Log*.
G. The system will be flushed and cleaned weekly with bleach as described in the *Weekly Cleaning* procedure below and is documented on *Cell Washer Weekly Maintenance Log*.
H. Saline flow volume check,will be performed monthly and after saline supply change as directed in the *Saline Flow Volume Check* and is documented on the *Cell Washer Preventative Maintenance Log*.
I. Monthly inspection and cleaning, as described in the *Monthly Inspection and Cleaning* and is documented on the *Cell Washer Preventative Maintenance Log*.
J. Cell Washers are calibrated upon receipt, after major adjustments or repairs, and yearly as described in the *Functional Calibration* below to ensure proper washing and packing of the red cell button.
K. Semi-annual rotor speed calibration checks will be performed by Biomedical Engineering and is documented in the Biomedical Equipment logs and/or on the *Cell Washer Preventative Maintenance Log*.

L. Yearly supply and drain tubing replacement, will be performed as described in the *Supply & Drain Tube Replacement procedure below and is documented on the Cell Washer Preventative Maintenance Log.*

M. If any part of the preventative maintenance reveals that the system is not functionally properly or deemed unsatisfactory then the equipment will be:

1. Removed for service and not returned for use with patient samples until issues are resolved.
2. Tag the cell washer with the "Equipment of Service" form.
3. Beaumont Health Biomedical Department will be contacted to arrange for equipment repair
4. Blood Bank Lead Technologist and/or Supervisor will be made aware of the issue.
5. The Equipment failure will be documented on an internal variance.

VII. SUPPLIES:

A. 12 x 75 mm test tubes
B. Blood Bank Saline
C. Disposable pipettes
D. Plastic specimen rack
E. Distilled Water
F. 10% bleach solution (1:9 ratio of household bleach to water, or 1 part commercial sodium hypochlorite to 9 parts water)
G. Non-abrasive liquid cleaner (with a pH between 5 to 8)

VIII. EQUIPMENT:

A. Bypass tool (provided by Helmer)
B. Flat-head screwdriver
C. Graduated cylinder (100 mL)
D. Pump tubing assembly (ordered from Helmer Technical Service)

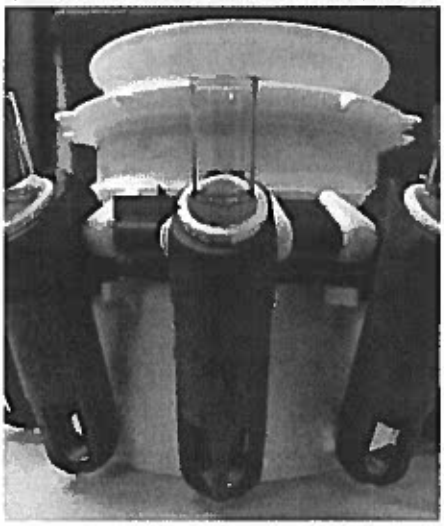
IX. PROCEDURE:

A. Saline Fill Volume

1. Lift the lid handle to release the lid lock and open the cell washer. The Lid Ready LED must be illuminated in order to open the lid.
2. Load the rotor completely with 12 x 75 mm test tubes.
3. Place the rotor in the cell washer and close the lid latch.
4. Make sure the cell washer is set to Program 4. If it is not set to Program 4, use the up and down arrow buttons (▲ and ▼) to select the correct program.
5. Press START WASH button to begin the run.
6. After the START WASH button was pressed to begin the run, press the CHECK button. At the end of

the fill step, the cell washer will stop, give an audible alert, and allow the lid to be opened.

7. Examine the level of saline in each tube.
8. Determine whether the saline fill volume is acceptable. The approximate volume per test tube is 4.7mL, which fills the tube up to the middle of the opening of the test tube holder. The volume dispensed into the tube is acceptable if the volume is within ± 0.5 cm of this point.



   a. If the saline fill volume check is acceptable, close the lid and press START WASH to continue the run and document on *Cell Washer Daily Maintenance Log* as "S" (satisfactory).
   b. If the saline fill volume check is unacceptable, the following apply:
      i. Check that all tubes are completely seated in tube holder.
      ii. Check for kinks in the tubing and repeat the volume check.
      iii. If the volume is still unacceptable, then temporarily discontinue use of the automatic cell washer; place Equipment out of Service tag on the cell washer until the saline flow volume has been correctly adjusted.
      iv. Complete an internal variance.
      v. Perform the saline flow volume adjustment as described in procedure VIII.G.
      vi. Once the saline flow volume has been correctly adjusted, document the acceptable saline fill volume check on *Cell Washer Daily Maintenance Log.*
9. At the end of the run, the cell washer should display WASH COMPLETE and give an audible alert.
10. Once the Lid Ready LED is illuminated, lift up on the lid handle to open the cell washer lid.

B. Saline Supply Check and Replacement

1. Each day of use verify that the saline supply is sufficient and is with in expiration date.
2. If necessary replace the saline cube.
3. When opening a new saline cube record the open date, the expiration date (1 month from the open date), and the technologist's initials on the saline cube.
4. Insert the small end of the adapter into the open end of the saline supply tubing.
5. Connect the large end of the adapter to the connector on the saline supply container.

6. Perform the saline flow volume check as described in the Procedure G, *Saline Volume Flow Check.*
7. Document the inspection of the saline supply with a √ on the *Cell Washer Daily Maintenance Log.*

C. Tubing and Drain Inspection

1. At the end of the run, once the the Lid Ready LED illuminated, lift on the lid handle to open the cell washer lid.
2. Inspect the tubing and the drain for any possible obstructions.
   a. Clear any obstructions if necessary.
   b. Document the inspection as satisfactory with a √ in the appropriate column on the *Cell Washer Daily Maintenance Log.*
3. Inspect the tubing connections to verify all tubing is securely attached.
   a. If necessary, secure any loose tubing.
   b. If any of the tubing is damaged and needs replacing, refer to Procedure VIII.K *Supply and Drain Tube Replacement.*
   c. Document the inspection as satisfactory with a √ in the appropriate column on the *Cell Washer Daily Maintenance Log.*

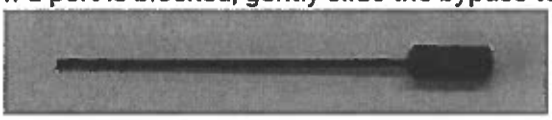
D. Daily Cleaning

1. Use a damp cloth to wipe down the bowl of the cell washer, removing any debris that may be present. It is not necessary to remove the bowl or clean under the bowl.
2. Use a dry cloth to wipe the entire inside of the lid, including the drainage system and painted surfaces.
3. Document completion of this maintenance with a √ in the appropriate column on the *Cell Washer Daily Maintenance Log.*

E. Fill Port Maintenance

The fill ports on the rotor are cleaned weekly to remove any debris that was not removed when the system was flushed. This will prevent debris from clogging the fill ports, preventing saline from entering the tubes.

1. Soak the rotor in clean, warm water or run warm water directly into the top of the rotor for several minutes. Confirm water is flowing freely out of all the fill ports.
2. If a port is blocked, gently slide the bypass tool in and out several times to clean the port.



3. Allow the rotor to dry completely before returning to the cell washer and closing the lid.
4. If the rotor is required for use before it has dried, ensure that all fresh water has been purged from the system and replaced by saline before processing.
5. Document the cleaning of the fill ports on *Cell Washer Weekly Maintenance Log.*

F. Weekly Cleaning

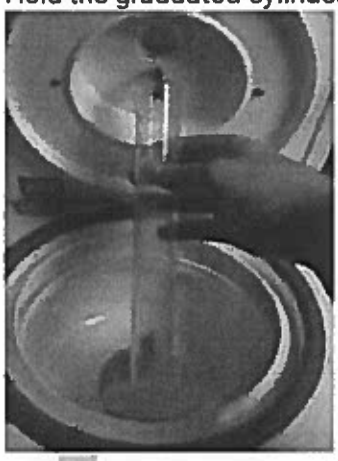
1. Load the rotor with tubes, leaving every other position on the rotor empty.
2. Install the rotor and close the lid. Ensure the Lid Ready LED is illuminated.
    a. Connect the supply tube to the container of 10% bleach solution.
3. The total volume of the bleach solution should be approximately 500 mL.
4. Use the up and down arrow buttons (▲ and ▼) to select the CLEAN program.
5. Press the START WASH button to start the program.
6. When the cleaning sequence is complete, OPEN LID is displayed and the Lid Ready LED will be illuminated. Open the lid. The display will now read Clean proc.DONE.
7. Connect the supply tubing to the container of approximately 1 L of distilled water.
8. Hold a graduated cylinder under the dispensing nozzle on the underside of the lid.
9. Press and hold the SALINE button for about 3 seconds.
    a. The Saline LED will illuminate and REFILL process is displayed on the screen.
    b. 60 mL of residual bleach solution and distilled water is dispensed from the nozzle into the graduated cylinder.
    c. When this process is complete, the Saline LED will no longer be illuminated. REFILL proc. DONE will briefly display, followed by Program 1.
10. Dispose of the purged liquid down a standard sink drain.
    a. Dispose the liquid in a dirty sink, not a clean sink used for hand washing.
11. Repeat steps 4-5 to flush the system with distilled water.
12. Connect the supply tubing to the container of saline solution.
13. Repeat step 9 to purge any remaining distilled water from the system.
14. Select Program 1, and press the START WASH button to run four cycles with saline.
15. Place 12 tubes in the rotor and place 1 drop of any cell suspension (2 – 4%) in each tube. Wash the cells using Program 1, stopping the cell washer after the tubes fill and spin for the last wash. (Hit the Check button while spinning during the last cell wash.)
16. Perform a hemolysis check as follows:
    a. Observe the last wash for hemolysis.
    b. Cell button should be present with no trace of hemolysis in supernatant.
    c. If there is evidence of hemolysis, repeat steps 11 - 16. If still unresolved, ,submit a variance and place Equipment out of Service on the cell washer and notify blood bank management.
17. Document the completion of the system flush as well as the results of the hemolysis check on the *Cell Washer Weekly Maintenance Log.*

G. Saline Volume Flow Check

The saline flow volume check will be performed monthly, anytime the saline supply is replaced mid-

month, or anytime the daily saline fill volume is unacceptable. If the saline supply needs replacing in the first two weeks of the month, then the check that is performed after the saline supply is replaced may also count as the monthly check.

1. Make sure the cell washer is set to Program 1. If necessary, use the up and down arrow buttons (▲ and ▼) to select Program 1.
2. Open the lid.
3. On the control panel, press and hold the SALINE button for about four seconds, until CALIBRATE XXX.X ml is displayed.
4. Hold the graduated cylinder under the nozzle in the lid of the cell washer.



5. On the control panel, press the CHECK button. The Saline LED will illuminate and the volume of saline being dispensed will display.
   a. For Program 1, the volume displayed should be 56.4 mL.
6. When the cell washer is done dispensing the programmed volume of saline, the Saline LED will turn off and the process is complete.
7. Observe the saline volume in the graduated cylinder. If the dispensed saline is within acceptable limits, the saline flow check is complete. If the dispensed saline is unacceptable, proceed to step 8.
   a. The acceptable volume of saline for Program 1 is 56.4 mL ± 5%, resulting in an acceptable range of 56.4 mL ± 2.82 mL (53.6 mL – 59.2 mL).
   b. If it appeared there was air or another obstruction in the saline supply tubing which led to an unacceptable saline volume, it is acceptable to repeat steps 4 - 7 once or twice to see if the saline volume dispensed is corrected. If the saline volume is still unacceptable, proceed to step 8.
8. For unacceptable saline flow volume results, determine the difference in volume of the displayed volume compared to the actual measured volume. Ask the Lead Medical Technologist for assistance with the adjustment process if necessary.
   a. Equation: Displayed – Measured = Difference
9. Use the volume difference calculated in step 8 to determine the adjustment value. Round the adjustment value to the nearest whole number.
   a. Equation: Difference ÷ Measured x 200 = Adjustment Value

10. After the saline adjustment volume has been determined, change the value of the VOLUME ADJUST XX global parameter by the determined amount.
    a. Press and hold the parameter selection button (◄) for about eight seconds.
        i. The VOLUME ADJUST XX parameter is now displayed.
    b. Use the up and down arrow buttons (▲ and ▼) to change the adjusted volume until the desired value is displayed.
    c. Press the START WASH button to save the parameter setting.
11. Following the cell washer adjustment, repeat the saline flow volume to verify it is now acceptable. If necessary, repeat the adjustment process until it is within the acceptable range.
12. Documented the saline flow volume check and any adjustments on the *Cell Washer Preventative Maintenance Log.*

H. Monthly Inspection and Cleaning

1. Inspect the rotor for wear, corrosion, and damage. If any of these conditions exist, the rotor needs to be replaced.
2. Inspect the tube holders for wear and damage. If any of the tube holders appear worn or damaged, they need to be replaced. The tube holders should be replaced at least once every two years. To remove a tube holder:
    a. Remove the rotor from the cell washer.
    b. Turn the rotor upside down.
    c. Move the rotor lock so that it clears the clip.
    d. While holding the tube holder to be removed in the vertical position, firmly press the tube holder down until the clip snaps free from the ring.
3. Clean the exterior of the cell washer using a soft cotton cloth and a non-abrasive liquid cleaner. Dry the exterior with a dry cloth.
4. Document the above inspections and cleaning on *Cell Washer Preventative Maintenance Log.*

I. Functional Calibration

1. Document the cell washer ID (Asset Tag), the date, and initials of the technologist who is calibrating the cell washer on the Cell Washer Calibration Worksheet.
2. To each of twelve (12) test tubes the following reagents:
    a. 2 drops LISS
    b. 2 drops serum
    c. 1 drop Coombs Check Cells
3. Place the tubes in the cell washer and start the wash cycle.
4. After addition of saline in the second cycle, stop the cell washer.
    a. Observe for the following:
    b. There should be an equal volume of saline in all tubes.

c. Tubes should be approximately 80% full.
d. Confirm that the red cell button has been thoroughly resuspended. (Cells should not stream down the sides of the tube.)
e. Record your observations on the *Cell Washer Calibration Worksheet.*

5. Continue the cell washing cycle until just after the addition of saline in the third cycle.
6. After the addition of saline in the third cycle, stop the cell washer.
7. Observe for the following:
   a. There should be an equal volume of saline in all tubes.
   b. Tubes should be approximately 80% full.
   c. Confirm that the red cell button has been thoroughly resuspended. (Cells should not stream down the sides of the tube.)
   d. Record your observations on the *Cell Washer Calibration Worksheet.*
8. Continue the cell washing cycle until the completion of the third cycle.
9. After the third wash and decant cycle, stop the cell washer.
10. Observe for the following:
    a. Confirm that the saline has been completed decanted from all tubes and that the button in each is dry.
    b. Confirm that the size of the cell button is the same in all tubes.
    c. Read and record the reactions. All tubes should show the same degree of agglutination.
    d. Record your observations on the *Cell Washer Callbration Worksheet.*
11. Add 2 drops of AHG to each of the tubes.
12. Centrifuge using the spin cycle.
13. Observe each tube for the following:
    a. Confirm the size of the cell button is the same in each tube.
    b. Read and record the reactions. All tubes should show the same degree of agglutination.
    c. Record the observations on the Cell Washer Calibration Worksheet.
14. Determine if the calibration check is satisfactory or unsatisfactory by referring to the interpretation section below and record whether 3 cell wash cycle is sufficient.
15. If the calibration check fails, the instrument must be taken out of service in accordance with policy Appropriate Actions to take if the Calibration Check is Unsatisfactory

J. Semi Annual Rotor Speed Calibration

Twice a year, the rotor speed must be verified to ensure it is within tolerance. This maintenance is typically done by the Beaumont Health Biomedical Department.

1. Install the rotor.
2. Program the Spin (S) program with a spin speed of 3500 RPM and spin time that is long enough for the speed to be measured.

3. Press the SPIN button. This will start the Spin (S) program.
4. While the rotor is spinning and 3500 is displayed on the message screen, point the tachometer's laser beam through the sight window in the lid. As the rotor spins, the laser momentarily reflects off the optical reference on the rotor.
5. Obtain the reading from the tachometer, and document it on the Cell Washer *Preventative Maintenance Log.*
6. Verify the tachometer reading is within the acceptable range of 3500 RPM ± 20 RPM.
    1. If the tachometer reading is outside of this range, it is considered unacceptable and must be corrected. Refer to the Troubleshooting section (chapter 9) of the Cell Washer Service.

K. Supply and Drain Tube Replacement

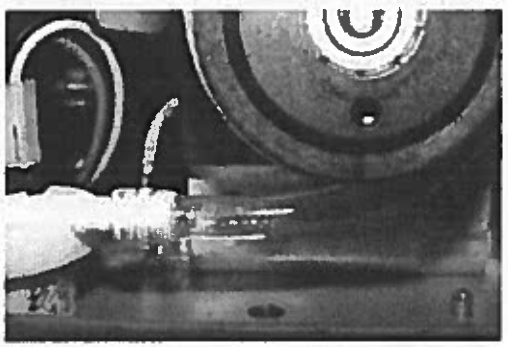
1. Power the cell washer off.
2. Carefully disconnect the ends of the supply and drain tubing from the fittings on the back of the cell washer.
3. The tubing will likely have residual saline in it. Disconnect the tubing slowly and as upright as possible to limit saline spilling out of the tubing.
4. Discard the old tubing into the biohazard waste.
5. Connect a new piece of tubing to the saline inlet fitting, and place the other end in the saline source.
6. Connect a new piece of tubing to the drain outlet fitting, and place the other end in the drain.
7. Perform a saline flow volume check as described in the Procedure VII.G. to remove any air from the saline supply tubing, and to verify the correct volume of saline is being dispensed. If necessary, repeat the saline flow volume check more than once to remove all the air from the tubing.
8. Document the supply and drain tubing replacement on *Cell Washer Preventative Maintenance Log.*

L. Pump Tubing Replacement

1. Power the cell washer off and disconnect the power cord.
2. Disconnect the supply tubing from the saline supply.
3. On the rear of the cell washer, open the access door.

Access door open with pump visible.

Pump tubing detail, routed from pump, through grommet, to lid.



Pump tubing detail, tubing connected to flow meter.

4. Remove the existing tubing assembly:
    a. On the top of the pump, turn the locking lever clockwise until the tubing holder loosens.
    b. Free the tubing and tubing holder from around the pump.
    c. Remove the tubing from the tubing holder.
    d. Disconnect the ends of the tubing from the fittings.
    e. Pull the tubing through the grommet toward the pump, and remove it from the pump area.

Pump with loosened tubing holder.

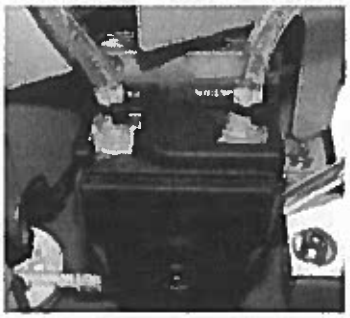
Tubing and holder freed from pump.

Tubing removed from holder.

5. Install the new tubing assembly:
    a. Orient the tubing assembly so the middle section of tubing is aligned with the tubing holder. Press the tubing into the holder.
    b. Wrap the tubing holder around the pump so the middle section of tubing is against the pump.
    c. While squeezing the tubing holder around the pump, turn the locking lever counter-clockwise until it locks into position.
    d. Thread the tubing out through the grommet, then connect it to the fitting on the back of the lid.
    e. Connect the right side of the tubing to the fitting on the flow meter.

Middle section of pump tubing oriented in tubing holder.

Tubing holder wrapped around pump and held captive in position.



Holder locked in position around pump. Right side of tubing connected to flow meter fitting.

The pump tubing assembly is required to replace the pump tubing. The pump tubing assembly may be ordered from Helmer Technical Service.

6. Connect the supply tubing to the saline supply.
7. Plug in the cell washer and power the cell washer on.
8. Perform a saline flow volume check as described in the Procedure VII.G to verify the new tubing is

installed correctly, and the correct volume of saline is being dispensed. During this step, check for leaks around the connections to the fittings.

9. Document the pump tubing replacement on Cell Washer Preventative Maintenance Log.

X. NOTES:

A. Yearly drain and supply tubing replacements may be performed by a technologist following this document or Cell Washer Service Manual, or may be performed by Beaumont Health Biomedical.

B. It is recommended in the Cell Washer Service Manual that the rotor is replaced every four years.

C. It is recommended in the Cell Washer Service Manual that the rotor tube holders are replaced every two years.

XI. REFERENCES:

1. AABB Standards for Blood Banks and Transfusion Services, Current edition.
2. Cell Washer Automatic Cell Washing System Operation Manual, June 2014.
3. Cell Washer Automatic Cell Washing System Service Manual, June 2014.

Attachments

Cell Washer Daily Maintenance Log

Cell Washer Preventative Maintenance Log

Cell Washer Weekly Maintenance Log

Approval Signatures

Step Description	Approver	Date
	Jeremy Powers: Chief, Pathology	5/6/2022
Policy and Forms Steering Committe (if needed)	Kelly Sartor: Supv, Laboratory	5/2/2022
Policy and Forms Steering Committe (if needed)	Gail Juleff: Project Mgr Policy	4/21/2022
	Kimberly Geck: Dir, Lab Operations B	4/21/2022
	Kelly Sartor: Supv, Laboratory	4/21/2022
	Kelly Sartor: Supv, Laboratory	4/21/2022

Beaumont HEALTH

Beaumont Laboratory
Dearborn, MI

Cell Washer Daily Maintenance Log

Month / Year:_____ Cell Washer Model: _____Asset Tag #:_____

Day	Tech	Saline Fill Volume Check (S or U)	*Saline Supply Exp. Date Checked, and Saline Flow Volume Check is on Schedule (√)	Tubing and Drain Inspected and Clear of Obstructions (√)	Tubing Connections Inspected and Secured (√)	Daily H2O Flush (√)	Bowl Wiped with Damp Cloth (√)	Lid and Drainage System Wiped with Dry Cloth (√)
1								
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*The saline flow volume check is documented on *Cell Washer Preventative Maintenance*

QC Review / Date:_____

Refer to Quality Control & Preventative Maintenance of *Helmer UltraCW™ and Quality Control & Preventative Maintenance of UltraCW®II Automatic Cell Washing Systems.*

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Cell Washer Preventative Maintenance

Year:_____ Cell Washer Model: _____ Asset Tag # _____

Saline Flow Volume Check: Monthly(within first 2 weeks)/After Saline Supply Replaced						
Date	**Tech**	**Displayed Saline Volume (mL)**	**Measured Saline Volume Dispensed into Cylinder CW (53.6 – 59.2 mL) CWII (35.0 – 37.0 mL)**	**Adjustment Value if the Measured Saline Volume is Unacceptable (for Calculation, or NA)**	**VOLUME ADJUST XX Parameter Adjusted on the Cell Washer (√ or NA)**	**Post-Adjustment: Measured Saline Volume Dispensed into Cylinder CW (53.6 – 59.2 mL or NA) CWII (35.0 – 37.0mL of NA)**

QC Review / Date:_____

Refer to Quality Control & Preventative Maintenance of the *Helmer UltraCW™ and Helmer UltraCWII Automatic Cell Washing Systems.*

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Cell Washer Preventative Maintenance

Year:_____ Cell Washer Model: _____ Asset Tag#:_____

Monthly Inspection and Cleaning (within first 2 weeks of each calendar month)							
Month	**Date**	**Tech**	**Rotor Inspected for Wear, Corrosion, and Damage (S/U)**	**Tube Holders Inspected for Wear or Damage (S/U)**	**Exterior Cleaned using a Soft Cotton Cloth and Non-Abrasive Cleaner (√)**	**Exterior Dried with a Dry Cloth (√)**	**If Necessary, Additional Comments / Part Replacements**
Ex	1/1/2018	BB	S	S	√	√	
Jan							
Feb							
March							
April							
May							
June							
July							
Aug							
Sept							
Oct							
Nov							
Dec							

QC Review / Date:_____

Refer to Quality Control & Preventative Maintenance of the *Helmer UltraCW™ and Helmer UltraCWII Automatic Cell Washing Systems.*

Cell Washer Preventative Maintenance

Year:_____ Cell Washer Mode: _____ Asset Tag#:_____

Semi-Annual Rotor Speed Calibration						
	Date	Tech	Rotor Speed Displayed on Cell Washer (3500 RPM)	Rotor Speed Recorded by Tachometer (3500 ± 20 RPM)	Rotor Speed is Within the Acceptable Range (S/U)	If Necessary, Additional Comments / Calibration Adjustments
Ex	1/1/2018	BB	3500	3490	S	

QC Review / Date:_____

Part Replacements				
Part	Date of Previous Replacement	Date of Current Replacement	Tech Performing Replacement (or Beaumont Biomedical)	If Necessary, Additional Comments / Replacements
Supply and Drain Tubing (Yearly)				
Pump Tubing (Yearly for CW Model)				
Tube Holders (Every Two Years)				
Cell Washer Rotor (Every Four Years)				

QC Review / Date:_____

Refer to Quality Control & Preventative Maintenance of the *Helmer UltraCW™ and Helmer UltraCWII Automatic Cell Washing Systems.*

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Dearborn, MI

Cell Washer Weekly Maintenance

Month / Year: _____ Cell Washer Model # _____ Asset Tag # _____

Date	Tech	System Flushed with 10% bleach and distilled water using the CLEAN Program (√)	Four Wash Cycles Performed with Saline (√)	Hemolysis Check (S/U)	Rotor Fill Ports Inspected and Cleaned (√)

- Performed every week, within 7 ± 2 days of the previously performed weekly task

QC Review / Date: _____