PROCEDURE

Title: Centra-W Cell Washer

Procedure #: 2015BLOODBANK77

Institution: Highlands Regional Medical Center

Address: 3600 Highlands Avenue, Sebring Florida 33870

Prepared by: Anita Smith Date: 6/12/2015

Title: Laboratory Administrative Director

Accepted by: G Cell, MD Date: 6/12/15

Title: Laboratory Medical Director

Date Patient Testing Implemented: 10/1/2005

Review of procedure every two years

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Highlands Regional MEDICAL CENTER

Policy Name: Centra-W Cell Washer **Department: Blood Bank-Lab**

Departmental Review: **Policy #:**

INITIATE DATE	DATE REVIEWED/REVISED	PAGE 1 of 6
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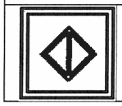
PURPOSE:
The Centra W Cell Washing Centrifuge automatically performs the washing phase of the anti-globulin procedure in tests using up to six drops of blood sample and the final agglutination spin. A peristaltic pump dispenses the saline solution used for the wash cycle.

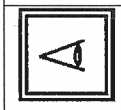
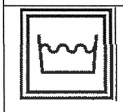
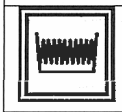
In the normal wash cycle, after placing two or three drops of a prepared 2 – 5% red cell/saline suspension into each tube, the cell washer will automatically add saline, spin at high speed to concentrate the cells, decant saline and agitate to resuspend the washed cells for the addition of coombs reagent. The Centra W cell washer is also capable of being used manually as a low speed centrifuge, spinning at either of two preset speed ranges.

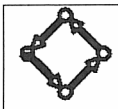
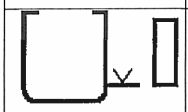
The Cell Washer can be programmed to run up to four wash cycles. Each basic 80-second wash cycle run is stored in the Cell Washer system memory until the CLEAR key is pressed, the power switch is pushed, the power is interrupted or the wash mode parameters are changed. The user programs the required number of wash cycles. The system automatically eliminates the "agitate" step from a single, or, the final wash cycle so that the clean pellet is well defined at the completion of the run.

Each wash cycle consists of four steps:

1. FILL-Low Speed: Saline wash solution is drawn from the reservoir by the peristaltic pump up through the flow control valve, the flow switch and the cover saline dispensing nozzle. The nozzle feeds the saline into the inlet porthole in the rotor distributor. There the filler tubes feed the saline into the test tubes in a directed stream for maximum resuspension of cells.
2. SPIN-High Speed: The system rapidly accelerates to full speed to pellet the red blood cells. Automatic dynamic braking at the end of this step provides rapid deceleration to prevent resuspension or dislodging of the cell button.
3. DECANT-Low Speed: The rotor holds the tubes at a slight negative angle and spent saline is expelled from the test tubes by low centrifugal force. This action retains virtually all cells in the tubes while effectively removing almost all residual saline. Decanted waste solution is directed, by the splash guard in the cover, into the drain-hole in the chamber (guard bowl) and into the drain tubing which carries the waste out of the Cell Washer and into a waste container or drain.
4. AGITATE: (except in a single or final wash cycle) This phase is included on all but the final, or a single, wash cycle. By a rapid "stepping" motion of the rotor, cell pellets are disrupted (broken up) for resuspension of the cells during subsequent wash cycles. If desired, the agitation sequence may be manually added at the end of the run.

ITEM	NAME	FUNCTION
Rocker switch	On-Off	Located at the front lower right of the cabinet. When ON, the STOP and the OPEN COVER LED will light and zeroes appear in the TIME and CYCLE displays.
	Run	Used to start the wash or spin run. The indicator to the left of this key will light when the RUN key is pressed, indicating that the instrument is in the run mode.

	Stop	May be used at any time and in any mode to stop a run. The indicator to the left of this key will light when the stop key is pressed, indicating that the unit is in the brake mode. **Note** No changes can be made during a run. All keys are disabled except for the STOP and CHECK keys
	Check	This key is used to temporarily interrupt a wash cycle at the end of its current phase. The cover may be opened (OPEN COVER key) for access to the rotor. Closing the cover and pressing the RUN key will resume the wash cycle run where it was interrupted. The check function can only be used in the wash mode. The indicator to the left of this key lights when the CHECK key is pressed.
	Open Cover	This key is used to power the cover solenoid and open the cover. The indicator to the left of this key will light whenever the Power Switch is in the On position and the rotor is stopped. Press the OPEN COVER key to release the cover.
	Clear	This key is used to clear the current displayed TIME or CYCLE numbers.
	Numbers	These keys are used to select the desired number of wash cycles(s) in the wash mode (1 -4) Or to select the duration of timed (1 – 999 seconds) spin mode. The selected time in seconds will appear in the TIME display
	Hold	This key is used to select an indefinitely timed spin run.
	Wash	This key is used with the 1, 2, 3, or 4 number keys to enter the desired wash cycle(s). The indicator to the left of this key will light when the WASH key is pressed, indicating that the instrument is in the wash mode. A beep will sound at the end of the wash cycle.
	Spin	This key is used with the appropriate number (0 through 9) key(s) to use the Cell Washer as a centrifuge at 2800 rpm (50 Hz) or 3400 rpm (60 Hz) in a timed (from 1 to 999 seconds) run or in an untimed run using the HOLD key. The indicator to the left of this key lights when the SPIN key is pressed indicating that the unit is in the spin mode.
	Agitate	This key is used to select a six-second agitation for resuspension of the cell button.
	Calibrate	This key is used to select the calibrate mode in order to set the correct volume of saline solution dispensed for each test tube. It is also used in priming the peristaltic pump.
	Time	This digital display will show the total time of the spin, or wash, cycle(s) at the start and the remaining time while running. Time shows a maximum of 999 seconds or 000 for HOLD.

	Cycle	This digital display will show the number of wash cycles initially selected. During a run it displays the number of remaining wash cycles.
	Saline	This indicator lights when the saline solution reservoir is depleted. An alarm also sounds. The Cell Washer defaults to the check mode, allowing you to hand- fill the tubes, and to prime the pump system. Pressing the RUN key will resume the run.

POLICY:
To guarantee accurate test results, the proper use of the Cell Washer must be followed.

PROCEDURE:
Operator Keypad: Located on the instrument's front panel. The controls register commands visually and audibly. The switches beep when pressed. Indicators light when corresponding keys are pressed.

No changes can be made during a run. All keys are disabled except for the STOP and CHECK keys.

1. Press the POWER switch to the ON position. – The STOP LED and the OPEN COVER LED will light and the TIME and CYCLE displays will show zeroes.
2. Press the OPEN COVER key and raise the cover. – The solenoid plunger should be installed upon use but if it is removed and requires re-installation: install the solenoid plunger n the drive assembly shaft. Turn the solenoid plunger counterclockwise until the slot in its underside completely engages the shaft. The solenoid plunger is correctly seated when it cannot be turned independently of the motor shaft.
3. Place tubes symmetrically in the rotor. – **The rotor must be run with a balanced load or damage to the rotor and instrument can occur**
4. Close the cover and press the WASH Key. Press the desired number of washes (1-4). – The selected cycle number will appear on the CYCLE display. Also, the TIME display will show 80, 160, 240, or 320 seconds for the respective 1, 2, 3, or 4 washes
5. Press the RUN Key to initiate the wash cycle. – The RUN LED will light, and the TIME display will show run time remaining.
6. The STOP LED, and the OPEN COVER LED will light when the wash cycle(s) is complete. Press the OPEN COVER key and raise the cover. – The run may be manually stopped by pressing the RUN key for immediate braking or the CHECK key to pause after the current step. If the STOP key was used, then the wash cycle will start from the beginning when restarted. NOTE: if the saline flow is interrupted or depleted, the run stops, and alarm sounds and the ADD SALINE LED lights.
7. Add the appropriate amount of anti-human serum to the tubes.
8. Close the cover. Press the SPIN key and, if desired, the AGITATE key. (If AGITATE key is pressed the tubes will be agitated for six-seconds and then spun).
   NOTE: the Centra-W can also be used as a high speed centrifuge for timed or untimed (HOLD) intervals.
   - For timed interval press the SPIN key and enter the desired time. Press RUN. If agitation is desired prior to spinning; press SPIN, press AGITATE, press the run time keys and the instrument will perform a 6 second agitation prior to centrifugation.

- For an untimed interval, press the SPIN key and then press the HOLD key. Press the RUN key and the instrument will spin until the STOP key is pressed.

9. ENTER the number of seconds for the desired cycle time.
10. Press the RUN key to begin the spin cycle.
11. At the end of the entered time the STOP LED and the OPEN COVER LED will light. When the spin cycle(s) is complete; press the OPEN COVER key and raise the cover. Remove the tubes and read the results.
12. Add IgG-sensitized control cells to all negative reactions and replace the tubes in the rotor. Be sure the load is symmetrically balanced.
13. Repeat steps 10 and 11.

PROCEDURE NOTES:

Erroneous antiglobulin readings can result from any of the following:

- The sample serum/cell ratio is improper.
- The red cells were not sufficiently washed.
- The saline solution was improperly decanted.
- The volume calibration has shifted due to change in the saline level or restriction in the feed tube.
- The antiglobulin serum is inactive or outdated.
- The antiglobulin serum was not added to a tube(s).
- The final centrifugation (spin) was improper.
- The reading or recording of results is inaccurate.

MAINTENANCE:

DAILY

1. Inspect tubing and connections. Make sure all tubing is securely connected and free from obstructions.
2. Make certain that drain tubing is not restricted and that saline waste can flow through freely by gravity. Inspect interior bowl (Remove guard bowl).
3. Make certain that the bowl is clean and free of dried saline crystals and other debris. It is important to wipe out the bowl daily with a damp sponge or cloth.
4. Check saline fill volume.
5. Using the CALIBRATE key and a graduated cylinder, make certain the unit delivers 40 mL of saline if using 10 x 75 mm tubes or 54 mL if using 12 x 75 mm tubes. It the volume delivered is below the required amount adjust the saline flow valve (clockwise to decrease the amount of saline and counterclockwise to increase the flow).

WEEKLY

1. Flush tubing with a 1:10 solution of household bleach (0.5% Sodium Hypochlorite).
2. Prepare enough diluted bleach to run through four wash cycles (approximately 200 ml).
3. Install the rotor and plunger.
   CAUTION Do not run wash cycles without the rotor and plunger installed. Damage to the bearing

may result.

4. Remove the saline supply tube from the saline reservoir.
5. Press the CALIBRATE key until all saline is pumped out of the line.
6. Connect the saline supply line to the bleach solution and program the unit to Wash 4 (four) times.
7. Remove the saline supply line from the bleach solution and again empty the line by pressing the CALIBRATE key. Then connect the saline supply tubing to at least one liter of distilled water and fill the line by pressing the CALIBRATE key.
8. Run the unit through enough Wash cycles to use all of the distilled water. Again clear the line using the CALIBRATE key.
9. Reconnect the saline supply line to the saline reservoir and prime the unit using the CALIBRATE key. Make certain that the inner bowl is wiped out to remove any excess moisture before resuming use of the Cell Washer.
10. Clean the rotor and solenoid plunger. Remove the solenoid plunger and wash with plenty of warm water and a mild detergent (paying particular attention to the bore.) Rinse thoroughly under warm water. Take a damp cloth and wipe any saline residue from the well that the plunger sits in.
11. Replace the solenoid plunger.
12. Remove rotor from the unit and wash with warm water and a mild detergent. Direct running water into the hole in the top of the rotor for several minutes and make sure water is flowing freely out of all filler tubes. Direct water into the slot of each tube holder and the shaft hole in the bottom. Install and spin the rotor in the Cell Washer for approximately 20 seconds to remove excess water.

QUARTERLY

1. Check motor speed.
2. Set the power switch to ON. Press the SPIN key. Press the HOLD key. Press the START key. Allow the motor to accelerate to speed. Shine a stroboscope or tachometer through the viewport in the cover to verify the speed as indicated below.
3. If the motor is not spinning at the correct speed, you should notify your Service Representative. Press the STOP key. Set the power switch to OFF. Replace the solenoid plunger and rotor.

Power Frequency	RPM
50 Hz	2800-3000
60 z	3400-3600

4. Check spin time.Press the SPIN key and enter the length of spin time. Press RUN. As soon as the spin cycle starts (start of spin can be determined by listening for hum), start the stopwatch. Stop the stopwatch when the time display reads 000. Verify that spin time is correct.

REFERENCES:

Centra-W Cell Washer Operators Manual, Thermo Electron Corp, Needham Heights, MA 01494 OM2392, Revision 8, 11.

Highlands Regional MEDICAL CENTER

Policy Name: Centra-W Cell Washer **Department: Blood Bank-Lab**

Departmental Review: **Policy #:**

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10/2005 **05/2013**

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	5-28-15		
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Reason: _____

Reviewed by: _____ Signatures on file _____ Date: 9-4-13
Department Supervisor

Reviewed by: Angela Lanston Date: 9/4/13
Department Adm. Director

Reviewed by: NA Date: _____
Department Chief Technologist

Reviewed and Approved by: _____ Date: 9/5/13
Department Medical Director

Highlands Regional MEDICAL CENTER

Policy Name: Centra-W Cell Washer Maintenance **Department:** Blood Bank-Lab

Departmental Review: **Policy #:**

INITIATE DATE 10/2005 **DATE REVIEWED/REVISED** 10/12/14 **PAGE 4 of 4**

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Department Supervisor

Reviewed by: Angela Lawster Date: 10/30/14
Department Adm. Director

Reviewed by: NA Date: _____
Department Chief Technologist

Reviewed and Approved by: _____ Date: 10/31/14
Department Medical Director