|  |  |  |  |
| --- | --- | --- | --- |
|  | **Washing Red Blood Cells** BB.COMP.1006.6 | **Dept:**  | 324311 |
| **Dept Name** | Blood Bank |
| **Effective Date:** | 3/7/02 |
| **Revised Date:** | Title21 |
| **Name & Title**: CLIA Laboratory Medical Director | **Contact:** | BB Management |
| **Signature:** |  Refer to Title21 | **Date:** | **Title21**  |

**1. General Procedure Statement:**

1. **Purpose:** Washing a unit of red cells with 1-2 liters of sterile normal saline removes about 99% of plasma proteins, electrolytes, antibodies. Washed red cells may also be requested for patients with anaphylactic reactions and study protocols. Patients on the ECMO heart/lung bypass machines will frequently receive washed red cells.

 **B.** **Responsible Department/Scope:**

 i Procedure owner/Implementer: Julie H. Simmons/Christina S. Warren

 ii. Procedure prepared by: Larry W. Waldron

 iii. Who performs procedure: Department staff/management

 **C. Definitions:**

 SCC: Soft Computer System, Blood Bank Information System

XM--Crossmatch

IS--Immediate Spin

NOGR--Unable to determine ABO Group/Type

ECMO--Heart/lung support system

SDD--Sterile Docking Device

 **D. Sections**:

1. **Loading Blood on Cobe**
2. **Washing Blood**
3. **Computer Functions for Washing Blood**
4. **Labeling/Label Check**

 **E. Protocol:**

1. Red cells are washed in order to remove any plasma proteins, electrolytes, or antibodies that may be

present prior to transfusion.

* 1. Units may be washed for Dr. Otaki (pediatric heart surgeon) for his operating room cases. When these units are not used in surgery, they are released back into inventory to ensure that they get utilized.
	2. Patients on the ECMO machines may also receive washed red cells, particularly at the initiation of the protocol and at times when the circuits are changed.
	3. The Medical Director may request washed red cells for patients that have a history of anaphylactic transfusion reactions.
1. A request for washed red cells for patients, other than ECMO, pediatric heart surgery or anaphylactic reactions, will be reviewed by the Medical Director or designee to ensure that the patient should be receiving washed red cells.
2. Washed red cells have an expiration of 24 hours and are stored at 1-6°C after washing.

3.1 If washed red cells are transferred out of the COBE set used for washing into another satellite container the expiration shall not exceed the storage time limit specified in the package insert. If no package insert is available, the component shall have an expiration time of 4 hours after transfer from the COBE set container.

1. All saline solutions/supplies used must be in date and have acceptable appearance.
2. Sterility must not be compromised during preparation.
	1. All heat seals must have hemostats at neck of unit and heat sealed.
	2. All units must have at least two seals on unit when disconnected.
3. All units must be completely labeled and label checked before separating the source bag and the newly washed unit.
4. Quality control is done annually on each Cobe to ensure adequate removal of protein.

 6.1 Refer to ***80% Recovery Procedure*** in Section D of Quality Control Manual (BB.QC.1008).

**7.0** All washed red cells prepared on site and/or received from outside facility must be tested for the

following before issue (***this includes units washed here and sent to outside facility and units washed at outside facility and shipped here):***

7.1 Acceptable hemolysis check.

7.2 An ABO recheck on the unit after washing.

1. Group O red cells are washed for all neonate patients and those babies that are greater than 4

 months of age but whom are still in the Intensive Care Nursery.

* 1. Those greater than 4 months of age can receive group specific blood; however it is easier

 to utilize group O units in the event that they are not transfused to the intended recipient.

**2. Procedure:**

 Chemical Risk Assessment: none

 Biological Risk Assessment: moderate

 Protective Equipment: Lab coat, gloves

 **Supplies:** COBE processing set, Hemostats, Metal tube clip, Pliers

  **Reagents:** 1000mL container 0.9% saline

 **Equipment:** COBE/IBM 2991 cell processor, Hematron III heat sealer

 **Specimen Requirements:** N/A

**I. Loading Blood on COBE**

| **STEPS** | **INSTRUCTIONS** | **CHANGE/****APPROVAL** |
| --- | --- | --- |
| **1.0** | **Verify that the COBE selected has been primed.***Refer to BB.CP.Installing IBM/COBE Processing set* |  |
| **2.0** | **Select the appropriate blood unit for washing and obtain one of each of the following:*** 1. 0.9% 1000mL saline
	2. COBE Processing set
 |  |
| **3.0** | **Examine the saline for correct type, appearance, and expiration date.**3.1 Confirm saline type on bag label. 3.2 Check appearance of bag. a. Acceptable=clear, no leaking or open ports, free of particulate matter. b. Unacceptable=opaque, any leaks or open ports, any particulate matter. 3.3 Expiration date of bags must be in date. |  |
| **4.0** | **Document the supplies used (saline, Cobe set) in SCC.***Refer to Section II: Computer Functions.*4.1 Utilize the *Component Prep Worksheet* and document the following:1. Date/time washing started
2. Unit donor number
3. Unit’s blood group/type
4. Lot number and expiration date of saline bags
5. Lot number and expiration date of COBE processing set
6. Record the protocol as “Wash red cell.”

4.2 Enter the supplies from Component Prep Worksheet into SCC and initial that this has  been done. 1. The Component Prep Worksheet is utilized as a downtime worksheet when SCC is down also.
 |  |
| **5.0** | **Install the COBE processing set and make certain that a hemostat is placed on the clear tubing below the red cell detector and above the white hexagonal seal.**5.1 Refer to: ***Installing COBE/IBM Processing Set*** procedure (BB.COMP.1005.2).NOTE: For 2L wash, attach an additional 1000ml of saline to the yellow line. |  |
| **6.0** | **Using aseptic technique, connect the saline container to the GREEN striped tubing.**6.1 Hang on the right hanging bar.NOTE: When performed a 2L wash, the additional 1000ml bag of saline should be placed on the yellow line.  |  |
| **7.0** | **Using aseptic technique, connect the blood bag to the RED striped tubing.**7.1 Leave the blood bag on the sliding doors of the COBE. |  |
| **8.0** | **Press PREDILUTE.****Protective Equipment: Face Shield/Goggles** 8.1 Allow 150-200mL of saline to enter the blood bag. |  |
| **9.0** | **Press STOP/RESET.** **Protective Equipment: Face Shield/Goggles**9.1 Mix thoroughly then hang the blood bag on the left hanging rod. |  |
| **10.0** | **Remove the hemostat and press BLOOD IN to allow the blood to enter the processing bag.****Protective Equipment: Face Shield/Goggles** |  |
| **11.0** | **Press AIR OUT to remove excess air from the processing bag.****Protective Equipment: Face Shield/Goggles**11.1 DO NOT press STOP/RESET after AIR OUT! |  |
| **12.0** | **When air is out of the line to the blood bag, press BLOOD IN to allow the rest of the blood to enter the processing bag.****Protective Equipment: Face Shield/Goggles** |  |
| **13.0** | **Press STOP/RESET before air enters the processing bag.****Protective Equipment: Face Shield/Goggles** |  |
| **14.0** | **Proceed to section II. *Washing Blood*.** |  |

**2. Procedure: II. Washing Blood**

 Chemical Risk Assessment: none

 Biological Risk Assessment: moderate

 Protective Equipment: Lab coat, gloves, face shield/safety goggles

 **Supplies:** COBE processing set, Hemostats, Metal tube clip, Pliers

  **Reagents:** 1000mL container 0.9% saline

 **Equipment:** COBE/IBM 2991 cell processor, Hematron III heat sealer

 **Specimen Requirements:** N/A

| **STEPS** | **INSTRUCTIONS** | **CHANGE/****APPROVAL** |
| --- | --- | --- |
| **1.0** | **There are four different washing blood protocols that each has its own COBE setting:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Protocol | Program # | See Attachment |
| 1.1 | Washing Blood (1L) | 3 | Attachment 2 |
| 1.2 | Washing Whole Blood (1L) | 7 | Attachment 2 |
| 1.3 | Washing Pedi Units | 6 | Attachment 2 |
| 1.4 | Washing Blood (2L) | 8 | Attachment 2 |

 |  |
| **2.0** | **Press START/SPIN.****Protective Equipment: Face Shield/Goggles** |  |
| **3.0** | **When the audible alarm sounds, press STOP/RESET.****Protective Equipment: Face Shield/Goggles** |  |
| **4.0** | **Proceed to clamp and heat seal as specified.****Protective Equipment: Face Shield/Goggles** 4.1 Clamp off the non-striped tubing near the hexagonal seal with a hemostat. 4.2 Clamp off all tubing to saline bag(s), original unit, and waste bag with hemostats before making 2 seals on each bag with the heat sealer. 4.3 Create at least 3 segments on the non-striped tubing with the heat sealer.**COBE3** |  |
| **5.0** | **Cut the tubing to the saline bag(s) and waste seals.****Protective Equipment: Face Shield/Goggles** |  |
| **6.0** | **Lift the seal weight and open the COBE doors.** **Protective Equipment: Face Shield/Goggles** 6.1 Remove the centrifuge cover. 6.2 Remove the alignment blocks. |  |
| **7.0** | **Remove the processing bag and original unit, still attached.****Protective Equipment: Face Shield/Goggles**7.1 Clamp the tubing between the bag and the hexagonal seal with a metal clip  and pliers or heat seal. |  |
| **8.0** | **Disassemble and remove processing set and discard all saline and waste bags in large biohazard bin.**  |   |
| **9.0** | **Proceed to section III. *Computer Functions for Washing Blood.*** |  |

**2. Procedure: III. Computer Functions**

 Chemical Risk Assessment: none

 Biological Risk Assessment: none

 Protective Equipment: Lab coat, gloves

 **Supplies:** NA

  **Reagents:** NA

 **Equipment:** Computer/ISBT printer

 **Specimen Requirements:** N/A

| **STEPS** | **INSTRUCTIONS** | **CHANGE/****APPROVAL** |
| --- | --- | --- |
| **1.0** | **Click in the Inventory Icon  from the Main Menu.*** 1. Click: Edit>cr\_Product>Change.
 |  |
| **2.0** | **Scan the original product code in the first Org field**2.1 Alternately, click on the drop down arrow and select the original product code  from the list of products that can be changed. |  |
| **3.0** | **Select from the drop down, the correct code in the first PRD field that the unit(s) will be changed to.**3.1 Click F12 -Accept. |  |
| **4.0** | **Scan in the unit number and product code (if required) of all units to be changed.** 4.1 Click on F12-Accept unit list.  |  |
| **5.0** | **Review the Product Change Confirmation Screen.**5.1 Edit the date and time of creation, expiration, date or volume if needed.5.2 Click the white box to the right inside the product confirmation screen to print a  full face label.  a. The number may be changed if more than 1 label is needed.  |  |
| **6.0** | **Click Ctrl R-Supplies on right hand of screen to select supplies.**6.1 Click the drop down arrow and choose the supply, lot number and quantity used.  a. 0.9% Saline b. Cobe set6.2 Click F12 to accept. 6.3 Repeat steps 6.1 and 6.2 for each supply used.6.4 Click F12 to save. |  |
| **7.0** | **Select correct printer and F12 to accept.**7.1 The system should automatically display the unit to label verify.  |  |
| **8.0** | **Double click on the unit that requires label verification.** |  |
| **9.0** | **Scan in the Donation number, ABORh, Product Code and Expiration date labels into the appropriate field in the box that displays.** 9.1 Click Yes to “Save changes?”9.2

|  |  |
| --- | --- |
| Result | NEXT Steps  |
| Information Matches | 1. Proceed to Step 10.0
 |
| Information Does NOT Match | 1. Exception generated and unit quarantined.
2. Determine cause of Mismatch.
	* If mismatch due to scanning in wrong order: Go to Inventory>Edit>Status and change status of unit to available.
		+ Go to Inventory>Edit >Labels>Print to bring up label
		+ Label Verify.
		+ Proceed to Step 10.0
	* If mismatch due to true problem with unit and label
		+ Leave unit in quarantine status
		+ Write QA
		+ Notify management.
 |

 |  |
| **10.0** | **Proceed to IV. *Labeling/Label Verify*** |  |

**2. Procedure: IV. Labeling/Label Verify**

 Chemical Risk Assessment: none

 Biological Risk Assessment: low

 Protective Equipment: Lab coat, gloves

 **Supplies:** ISBT label, scissors

  **Reagents:** NA

 **Equipment:** Computer

 **Specimen Requirements:** N/A

| **STEPS** | **INSTRUCTIONS** | **CHANGE/****APPROVAL** |
| --- | --- | --- |
| **1.0** | **Place original bag and processing bag side by side.*** 1. Do not detach original bag until processing bag is labeled.
 |  |
| **2.0** | **Unit most likely will be in ISBT format. If unit is in old Codabar format or if the Hematrax printers are down, see Attachment 3 for label example.** |  |
| **3.0** | **Label the washed red cell unit with the same format as the original unit.** 3.1 Record the following on the washed label:

|  |  |
| --- | --- |
| Format | Labeling |
| Codabar | 1. Donor number
2. Expiration date/time (24 hours from start of procedure)
3. ABO/Rh sticker
4. RBC washed sticker (or irradiated)
5. “Collected/Processed by” sticker
6. Any attachments on original bag need to be transferred to processing bag and attached securely, i.e. negative antigens.
7. Any special needs must be transferred to processing bag, such as irradiated, antigen status, CMV, etc.
 |
| ISBT | 1. ISBT label will print on Hematrax printer once computer function is finished.
2. Any attachments on original unit bag need to be transferred to processing bag and attached securely.
3. Any special needs must be transferred to processing bag, such as irradiated, antigen status, CMV, etc.
 |

 |  |
| **4.0** | **Label with any special attributes by using one or more of the following small labels:**4.1Directed Donation* 1. Autologous Donation
	2. Sickle Cell Negative
	3. CMV Negative
 |  |
| **5.0** | **Affix the label securely to the processing bag.** |  |
| **6.0** | **Perform Label Check. (Refer to *Label Check Policy/Procedure* in Component Prep Manual section 10).**6.1 In addition to performing the Label Verify in SCC, a Label Check involves  checking for proper labeling on both the source unit and prepared component. 6.2 Refer to table below for checking label:

|  |  |  |
| --- | --- | --- |
| **S**Source Bag | Processing Bag | Check for: |
| **Unit donor number** | **Unit donor number** | **Identical unit number** |
| **Expiration date/time** | **Expiration date/time** | **24 hour expiration** |
| **ABO/Rh** | **ABO/Rh** | **ABO/Rh label identical** |
| **Collection facility** | **n/a** | **Collection information (See Attachment 3)** |
| **Product code** | **Product code** | **Codabar: Washed label****ISBT: Label will print after computer function.** |
| **Special attributes** | **Special attributes** |  **Directed, Auto, CMV, Sickle Cell**  |

 |  |
| **7.0** | **Cut the prepared washed red cell from the source unit bag.*** 1. There should be two (2) seals to the new product.
 |  |
| **8.0** | **Remove two segments.*** 1. Label one with unit number for ABO recheck.
	2. Order the unit retype in SCC.
	3. Go to Inventory>Orders>New Add
	4. Scan unit number and product.
	5. Esc.
	6. Select Retype from Tests drop down box.
	7. F12 to accept.
	8. Send segment to crossmatch for ABO retype to be performed.
	9. Put a segment in rack in Refrigerator 9.
 |  |
| **9.0** | **Irradiate unit and perform Label Verify in SCC, if necessary.**9.1 Refer to *Irradiation of Blood and Blood Products* (BB.COMP.1022). |   |
| **10.0** | **Unit is ready for allocation and/or placement in appropriate refrigerator.**10.1 Storage is 1-6°C and expiration is 24 hours. |  |

**3. Review/Revised/implemented:**

 All procedures must be reviewed as stated in the Document Control protocol.

 All new procedures that have major revisions must be signed by the CLIA Director.

 All reviewed procedures with minor revisions can be signed by the designated section medical

 director or designee.

**4. Related Procedures:**

CP: Installing IBM/COBE Processing Set

CP: IBM/COBE 2991 Protocol and Description

 Training: Washing Red Cells Procedure Training

**5. References**:

 Technical Manual, revised periodically

**6. Attachments:**

 1. Cobe Diode Pin Configuration and Programs

 2. Label Examples

 **7. Revised/Reviewed Dates and Signatures:**

 Refer to archive history/title 21

**Attachment 1: COBE Diode Pin Configuration and Programs**

1. **Washing Blood (1L)**
2. *For 1L Wash Blood on BMT COBE* set the control panel by placing diode pins in the

 following configuration:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **TIMER** | **STOP** **PC** | **VALVE** | **STOP** **RC** | **RCO** | **RCO** |
|  | **1** | **2** | **1** | **2** | **3** | **LR****units** | **Non-LR** |
| **1** | **●** | **○** | **○** | **○** | **●** | **○** | **○** | **○** | **○** |
| **2** | **○** | **●** | **○** | **○** | **●** | **○** | **○** | **○** | **●** |
| **3** | **○** | **●** | **●** | **○** | **○** | **○** | **○** | **○** | **●** |

b. *For 1L Wash on COBE #3 or COBE #5*: Select program 3.

c. *ALL COBES:*

 Centrifuge speed: 3000 rpm Super Out Volume: 600 mL

 Super Out Rate: 450mL/min Spin Timer 1: 2.5 min

 Minimum Agitate Time: 60 sec Spin Timer 2: 1.5 min

**2.0 Washing Blood (2L)**

1. *For Washing Blood (2L) on BMT COBE* set the control panel by placing diode pins in the following configuration:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **TIMER** | **STOP** **PC** | **VALVE** | **STOP** **RC** | **RCO** | **RCO** |
|  | **1** | **2** | **1** | **2** | **3** | **LR****units** | **Non-LR** |
| **1** | **●** | **○** | **○** | **○** | **●** | **○** | **○** | **○** | **●** |
| **2** | **○** | **●** | **○** | **○** | **●** | **○** | **○** | **○** | **●** |
| **3** | **○** | **●** | **○** | **○** | **○** | **●** | **○** | **○** | **○** |
| **4** | **○** | **●** | **○** | **○** | **○** | **●** | **○** | **○** | **○** |
| **5** | **○** | **●** | **●** | **○** | **○** | **○** | **○** | **○** | **○** |

1. *For Washing Blood (2L) on COBE #5*: Select program 8.
2. *ALL COBES:*

 Centrifuge speed: 3000 rpm Super Out Volume: 600 mL

 Super Out Rate: 450mL/min Spin Timer 1: 6.5 min

 Minimum Agitate Time: 60 sec Spin Timer 2: 1.5 min

**3.0 Deglycerolizing Blood – High HCT**

1. *For Deglycerolizing on BMT COBE* set the control panel by placing diode pins in the following configuration:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **TIMER** | **STOP** **PC** | **VALVE** | **STOP** **RC** | **RCO** | **RCO** |
|  | **1** | **2** | **1** | **2** | **3** | **LR****units** | **Non-LR** |
| **1** | **●** | **○** | **○** | **●** | **○** | **○** | **○** | **○** | **●** |
| **2** | **●** | **○** | **○** | **○** | **●** | **○** | **○** | **○** | **●** |
| **3** | **○** | **●** | **○** | **○** | **○** | **●** | **○** | **○** | **○** |
| **4** | **○** | **●** | **○** | **○** | **○** | **●** | **○** | **○** | **○** |
| **5** | **●** | **●** | **●** | **○** | **○** | **○** | **○** | **○** | **○** |

1. *For Deglycerolizing on COBE #3 or COBE #5*: Select program 1.
2. *ALL COBES:*

 Centrifuge speed: 3000 rpm Super Out Volume: 500 mL

 Super Out Rate: 450mL/min Spin Timer 1: 2 min

 Minimum Agitate Time: 70 sec Spin Timer 2: 1.5 min

**4.0 Extra Wash**

1. *For Extra Wash on BMT COBE* set the control panel by placing diode pins in the following configuration:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **TIMER** | **STOP** **PC** | **VALVE** | **STOP** **RC** | **RCO** | **RCO** |
|  | **1** | **2** | **1** | **2** | **3** | **LR****units** | **Non-LR** |
| **1** | **○** | **●** | **○** | **○** | **○** | **●** | **○** | **○** | **○** |
| **2** | **○** | **●** | **○** | **○** | **○** | **●** | **○** | **○** | **○** |
| **3** | **●** | **●** | **●** | **○** | **○** | **○** | **○** | **○** | **○** |

1. Predilute with 150 to 250ml of 0.2/0.9% saline.

1. *For Extra Wash COBE #3 or COBE #5*: Select program 2.
2. *ALL COBES:*

 Centrifuge speed: 3000 rpm Super Out Volume: 500 mL

 Super Out Rate: 450mL/min Spin Timer 1: 2 min

 Minimum Agitate Time: 70 sec Spin Timer 2: 1.5 min

**5.0 Washing Platelets**

1. *For Washing Platelets on BMT COBE* set the control panel by placing diode pins in the following configuration:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **TIMER** | **STOP** **PC** | **VALVE** | **STOP** **RC** | **RCO** | **RCO** |
|  | **1** | **2** | **1** | **2** | **3** | **LR****units** | **Non-LR** |
| **1** | **●** | **○** | **○** | **○** | **○** | **●** | **○** | **○** | **○** |
| **2** | **●** | **○** | **○** | **○** | **○** | **●** | **○** | **○** | **○** |
| **3** | **○** | **●** | **●** | **○** | **○** | **○** | **○** | **○** | **○** |

1. Spin for 10 minutes
2. *For Washing Platelets on COBE #3 or COBE #5*: Select program 4.
3. *ALL COBES:*

 Centrifuge speed: 3000 rpm Super Out Volume: 400 mL

 Super Out Rate: 200mL/min Spin Timer 1: 5 min

 Minimum Agitate Time: 50 sec Spin Timer 2: 2.5 min

 e. Rest for 20 minutes at 20-24 C prior to agitation

**6.0 Volume Reduce Platelets**

1. *For Volume Reducing on BMT COBE* set the control panel by placing diode pins in the following configuration:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **TIMER** | **STOP** **PC** | **VALVE** | **STOP** **RC** | **RCO** | **RCO** |
|  | **1** | **2** | **1** | **2** | **3** | **LR****units** | **Non-LR** |
| **1** | **●** | **●** | **●** | **○** | **○** | **○** | **○** | **○** | **○** |

1. Spin for 20 minutes
2. *For Washing Platelets on COBE #5*: Select program 5.
3. *ALL COBES:*

Centrifuge speed: 3000 rpm

Spin Timer 1: 2.5 min

Super Out Rate: 200mL/min

Minimum Agitate Time: 50 sec

Super Out Volume = Starting Volume – Desired Volume

(Final volume must be between 50 and 75mL)

**7.0 Washing Pedi Units**

1. Wash approximately half of a unit to ensure sufficient red cell recovery.
2. *For Washing Pedi Units on BMT COBE* set the control panel by placing diode pins in the following configuration:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **TIMER** | **STOP** **PC** | **VALVE** | **STOP** **RC** | **RCO** | **RCO** |
|  | **1** | **2** | **1** | **2** | **3** | **LR****units** | **Non-LR** |
| **1** | **●** | **○** | **○** | **○** | **●** | **○** | **○** | **○** | **○** |
| **2** | **○** | **●** | **●** | **○** | **○** | **○** | **○** | **○** | **○** |

1. *For Washing Pedi Units on COBE #5*: Select program 6.
2. *ALL COBES:*

 Centrifuge speed: 3000 rpm Super Out Volume: 600mL

 Super Out Rate: 450mL/min Spin Timer 1: 2.5 min

 Minimum Agitate Time: 60 sec Spin Timer 2: 1.5

**8.0 Washing Whole Blood (1L)**

1. *For Washing Whole Blood (1L) on BMT COBE* set the control panel by placing diode pins in the following configuration:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **TIMER** | **STOP** **PC** | **VALVE** | **STOP** **RC** | **RCO** | **RCO** |
|  | **1** | **2** | **1** | **2** | **3** | **LR****units** | **Non-LR** |
| **1** | **●** | **○** | **○** | **○** | **●** | **○** | **○** | **○** | **○** |
| **2** | **●** | **○** | **○** | **○** | **●** | **○** | **○** | **○** | **○** |
| **3** | **○** | **●** | **○** | **○** | **●** | **○** | **○** | **○** | **●** |
| **4** | **○** | **●** | **●** | **○** | **○** | **○** | **○** | **○** | **●** |

1. *For Washing Whole Blood (1L) on COBE #5*:

 Select program 7.

1. *ALL COBES:*

 Centrifuge speed: 3000 rpm Super Out Volume: 600 mL

 Super Out Rate: 450mL/min Spin Timer 1: 5 min

 Minimum Agitate Time: 60 sec Spin Timer 2: 1.5 min