SOP from a Massachusetts BLOOD BANK DONOR/TRANSFUSION SERVICE

COMPONENT SECTION MANUAL

THE PROCEDURE FOR THE PREPARATION OF WHOLE BLOOD FOR NEONATAL EXCHANGE TRANSFUSION

I. PURPOSE:

To describe the steps necessary to prepare reconstituted whole blood for neonatal exchange transfusion.

II. MATERIALS REQUIRED:

A. "Whole Blood, Reconstituted, Leukocytes Reduced" label

B. Mixed ABO Type label

C. "Not for Transfusion" label

D. Red Blood Cells

E. Fresh Frozen Plasma

F. Hemostat

G. Blue Clip

H. 300ml transfer pack

I. 600ml transfer pack

J. Plasma transfer set

K. Test tubes

L. Pedi red top tubes

III. EQUIPMENT REQUIRED:

A. Computer

B. Sterile connecting device

C. Plasma extractor

D. Scale

E. Heat sealer

F. Jouan Centrifuge

IV. RECORDS/FORMS:

A. LB system "I"nventory

V. PROCEDURE:

A. Preliminary Requirements

1. Ask the ordering physician the volume required for this exchange and whether future exchanges are anticipated.

2. Obtain medical director approval prior to any component preparation.

3. Note all of the above on the shift report.

B. Product Preparation

1. Select a group O CPD or washed Adsol LRBC unit that is < 7 days old or a DRBC. More than one unit may be needed to fulfill volume requirement. If using washed LRBC, see Special Note B. See Special Note D for babies with sepsis or who are in DIC.

2. The unit(s) must be antigen negative if the mother has a restriction to receive antigen negative units. See mother's antibody history file.

3. Choose an appropriate unit of AB plasma from the available inventory and thaw according to SOP #A5.001.

4. Proceed according to product type:

a. If using CPD LRBC units:

1) Test unit(s) for Hemoglobin S according to SOP# C3.004. All units must be Hemoglobin S negative. Hemoglobin S controls must sit at room temperature for 30 minutes prior to testing. Check to see if controls need to be reconstituted or take controls out of the refrigerator before proceeding.

2) Using the sterile connecting device, attach a 300ml transfer pack to each unit of LRBC according to SOP # C1.018. Break the seal between the two bags to verify that the weld is secure. Close the line with a blue clamp. Label the transfer pack with a "Not for Transfusion" label.

3) Hard spin the unit(s) in the Jouan centrifuge. (Program 9)

4) Place spun unit in plasma extractor. Break seal and express all plasma into the attached transfer pack, heat seal and discard the plasma in the biohazard trash.

5) Weigh the red cell unit, subtract 37gms for the weight of the bag, write the net weight on the unit label.

b. If using washed LRBC units:

1) Test unit(s) for Hemoglobin S according to SOP# C3.004. All units must be Hemoglobin S negative. Hemoglobin S controls must sit at room temperature for 30 minutes prior to testing. Check to see if controls need to be reconstituted or take controls out of the refrigerator before proceeding.

2) There is no need to hard pack the unit(s). Transfer (spike) the LRBC into an appropriately labeled 600ml transfer pack.

3) Weigh the LRBC unit, subtract 37 gms for the weight of the bag, write the net weight on the unit label.

c. If using DRBC units:

1) There is no need to test for Hemoglobin S. However, a note should be written on the shift report stating that a DRBC was used and Hemoglobin S testing is not required.

2) There is no need to hard pack the unit(s). Transfer (spike) the DRBC into an appropriately labeled 600ml transfer pack.

3) Weigh the DRBC unit, subtract 37 gms for the weight of the bag, write the net weight on the unit label.

5. Determine the hematocrit of each unit:

a. Mix the red cell unit thoroughly.

b. Strip the tail of the unit, then mix the unit prior to releasing the blood back

into the segment. Repeat 5 times.

c. Heat seal a small section of the tail and remove the newly formed segment.

d. Cut the contents of the segment into a pedi red top tube labeled with the unit number.

e. Take the tube to the hematology lab and request a STAT hematocrit.

6. Calculate the RBC mass:

   RBC Mass = net weight of red cell unit × hematocrit of unit.
   (Example: unit weighs 350g, hematocrit is 80%, multiply 350 x .80 = 280g)

7. Calculate the final WBR volume:

   Final WBR volume = RBC mass × 2.
   (Example: 280g x 2 = 560g)

8. Calculate the volume of group AB plasma required:

   Volume of AB plasma required = final WBR volume – net weight of red cell unit.
   (Example: 560g – 350g = 210ml)

9. If FFP is to be split, use "IN"ventory "CV".

10. Using the sterile connecting device, attach the thawed AB plasma to the red cell unit according to SOP # C1.018.

11. Place the red cell bag on the scale, tare the scale and allow the appropriate volume of plasma to flow into the red cell bag.

12. Mix the reconstituted unit of whole blood.

13. Take a sample and check hematocrit by following steps V. 5. a-e above. The hematocrit should be 50% +/- 5%. Consult a senior tech or supervisor if the hematocrit is not between 45 and 55%.

14. Heat seal the plasma bag, label with "Not for Transfusion" label and discard in the biohazard trash.

15. Relabel the red cell bag with a "Whole Blood Reconstituted, Leukocytes Reduced" label. Record the total volume of WBR, the volume of red cells and FFP used and the final hematocrit on the label.

16. Place a Mixed Type label on the bag. Record the expiration date and time of the product on the label. The expiration date and time is the expiration date and time of the FFP or the red cells, whichever expires first. Record the ABO/Rh of the red cells used and the name of the red cell product on the label. (Example: O Neg deglycerolized red blood cells.) Record the ABO/Rh of the FFP and the name of the product. (Example: AB Neg FFP.) See Appendix A.

C. Computer work:

1. "I"nventory option "P"ool.

2. Patient ID: Enter medical record number of baby.

3. Product: Enter LRBC or DRBC.

4. Unfilled red cell orders on file: Enter "Y"es if correct or "N"o to enter red cell order.

5. Enter/Edit Patient Order: "N"o.

6. Unit:

   UN1: Enter LRBC or DRBC unit number.
   UN2: Enter FFPT unit number.

7. Pool:

   Date: Press enter to default to current date or enter appropriate date.
   Time: Enter appropriate time.

8. Unit number: RBC unit number// Press enter if RBC unit number is displayed or enter the RBC unit number.

9. Expiration date: Date// Enter the expiration date of the unit.

10. Expiration time: Time// Enter the expiration time of the unit.

11. Special feature SF1: Enter any appropriate special features.

12. Reserve unit: Y// Press enter.

13. Reserve until date, time: // Enter date, time of expiration.

14. Ready to transfuse: Yes // Enter "N"o, further work needs to be completed.

15. Status of order: U// Press enter.

16. Key: Enter your Key.

D. Irradiate the unit according to SOP# A5.007.

E. Under “I”nventory “LE” Enter/Edit Blood Unit File check that all appropriate special features (i.e., irradiated, HbS Negative) are in the computer file.

F. Crossmatch unit according to SOP# B2.020.

G. Edit the order to make the WBR ready and print requisition as follows. Reserve only one WBR per order.

1. Blood bank option: "O" Enter/Edit Patient Order.

2. Patient ID: Enter medical record number of the baby.

3. Unfilled orders on file: Press enter.

4. Edit: Enter "UN1".

5. UN1: Enter unit number.

6. Reserve unit: Y // Press enter.

7. Reserve until Date, Time: // Press enter.

8. Ready to transfuse: Yes // Press enter.

9. Edit: "S"tatus.

10. Status of order: U // Enter "F"illed.

11. Print requisition? Enter "Y"es.

12. Regular or backup printer? R // Enter "R"egular or "B"ackup.

13. Key: Enter your key.

14. If the unit was crossmatched with the mother’s plasma only, it will be necessary to place an “X” in the box at the bottom of the blood transfusion record and write “crossmatched with the mother’s plasma”.

VI. REFERENCE VALUES:

N/A

VII: SPECIAL NOTES:

A. Do not reserve products prior to pooling.

B. If washed LRBC's are used be sure to special feature the LRBC as washed and NOT convert the LRBC to WRBC.

C. If more than one WBR is required to fill the total volume requested, split the volume in the computer when issuing. Do NOT put the total volume requested with each unit issued.

D. Babies with sepsis require CMV negative (non-leukoreduced) red cells that are 6-8 hours old that have been stored at 22-24^{o}C. Babies who are in DIC require leukoreduced red cells that are 24-48 hours old. The Supervisor and Medical Director will arrange for the provision of these products. CMV testing can be performed at CHMC in the Blood Bank.

VIII. REFERENCES:

A. AABB Technical Manual, 14th edition, 2002.

B. AABB Standards for Blood Banks and Transfusion Services, 22nd edition, 2003.

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(Submitted to CBBSweb, Nov. 10, 2003)