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Aliquot Preparation - Blood Bank

Document Type: Procedure

I. PURPOSE AND OBJECTIVE:

This document will provide directions to the Blood Bank staff for the preparation and labeling of aliquots (divided components).

II. SCOPE:

Aliquots may be indicated for pediatric patients or patients with conditions that may cause concerns of fluid or cardiac overload; i.e., severe chronic anemia, overt heart failure, or renal failure.

III. INTRODUCTION:

A. Aliquots are ideally made using a closed system in which the contents of the parent component and the aliquot are not exposed to the air or outside elements. A Sterile Connection Device (SCD) is used to maintain the closed system. Tubing from the parent component is welded to tubing from a satellite bag using a wafer that is heated to 500°F, preventing contamination. The expiration date of the parent component remains unchanged, allowing multiple aliquots to be drawn from the parent component over time and reducing the number of donor exposures.

B. If satellite bags or a SCD is unavailable, aliquots may be prepared using an open system. However, this method should not be routinely performed because the contents of the parent component, or aliquot transfer bag may be exposed to the air and outside elements. The original expiration date of the parent component and aliquots will be shortened significantly. This may result in an increased number of donor exposures.

IV. DEFINITIONS/ACRONYMS:

A. **NICU**: Neonatal Intensive Care Unit

B. **SCD:** Sterile Connection Device

C. **ISBT:** International Society of Blood Transfusion, a Netherlands-based international blood banking organization whose mission is "Facilitating knowledge about transfusion medicine to serve the interests of donors and patients."

D. **Open system:** A system whereby aliquots are obtained by spiking the parent unit, the contents of which are exposed to air and outside elements during preparation and separation of components.

E. **Closed system:** A system where sterile connected satellite bags are used and the contents of which are not exposed to air or outside elements during preparation and separation of components.

F. **Parent component:** The component from which an aliquot is removed.

V. POLICIES:

A. **Closed System vs Open System**

1. The use of a closed system is the preferred method for preparing aliquots. An open system should only be used if it is not possible to use a closed system (i.e. a SCD is unavailable).
2. If a SCD is used, the integrity of the weld and maintenance of the closed system must be assessed before preparing the aliquot. For additional information on weld integrity and inspection refer to Transfusion Medicine policy, *Sterile Connecting Device Operation.*
3. If the integrity of the weld is unacceptable or if the SCD is unavailable, the system must be considered an open system.
4. If the system must be considered an open system, then the expiration date must be modified in accordance with the table below:

Expiration Date & Times of Aliquots			
System	**Component**	**Parent Unit**	**Divided Unit (Satellite Bag)**
Closed	RBCs	remains unchanged	Original expiration of the parent unit
	Platelets	remains unchanged	4 hours from the time of weld
	Thawed Plasma	remains unchanged	Original expiration of the thawed parent plasma
	Thawed Cryoprecipitate	remains unchanged	Original expiration of the thawed parent cryoprecipitate

Open	RBCs	24 hours from the time the system was spiked, not to exceed original expiration of the parent RBCs.	24 hours from the time the system was spiked, not to exceed original expiration of the parent RBCs.
	Platelets	4 hours from the time the system was spiked, not to exceed original expiration of the parent platelets.	4 hours from the time the system was spiked, not to exceed original expiration of the parent platelets.
	Thawed Plasma	24 hours from the time the system was spiked, not to exceed original expiration of the parent plasma.	24 hours from the time the system was spiked, not to exceed original expiration of the parent plasma.
	Thawed Cryoprecipitate	4 hours from the time the system was spiked, not to exceed original expiration of the parent cryoprecipitate.	4 hours from the time the system was spiked, not to exceed original expiration of the parent cryoprecipitate.

B. **Additional Aliquots**

1. When preparing an aliquot, ensure that sufficient tubing (generally 3 inches) remains on the products so that additional aliquots may be made or so that additional testing may be performed if necessary.

C. **Divided Platelet and Plasma**

1. Requests for platelet and plasma aliquots must be pre-approved by Medical Director except for NICU patients.
2. Products for NICU patients should be split if applicable to reduce donor exposure for the patient.

D. **Irradiation of All Divided RBCs and Platelets**

1. Divided RBCs and platelets must be irradiated; they should be irradiated before they are divided.
2. It is acceptable to irradiate a previously divided product as long as it is still in the original bag from the blood supplier.
3. It is not acceptable to irradiate divided products in a transfer bag.

E. **Policies Related to Component Labeling**

1. Labeling of the aliquot includes the attachment of a component face label documented with the following information:
    a. Donor unit number
    b. The ABO/Rh of the donor unit
    c. Product description, including the blood product code and suffix

d. Any special attributes (e.g., irradiated, CMV negative, HbS negative, etc.)

e. Expiration date and time

f. When possible, a computer- generated label should be used for this purpose.

g. If it is not possible to use a computer-generated label, then the component shall be labeled with:

i. A donor number sticker from the back of the unit may be used and the suffix should be handwritten.

ii. Downtime ABO/Rh labels

iii. Downtime ISBT component labels

iv. Expiration Date / Time information

F. **Computer Modification**

1. **T**o prepare aliquots in the Blood Bank computer see the Blood Bank CDM, *Dividing Components*

a. After computer modification, a new product description label must be affixed to the parent and to the aliquot.

b. For ISBT units, a product description label will be generated by the computer.

G. **Second Verification (Cosigning) of Aliquots**

1. After labeling an aliquot and after affixing the crossmatch tag, a second technologist must verify the accuracy of the label.

2. To document that this second verification was performed, the second technologist will document the "Cosigner" section on the *Blood Product Division / Aliquot Preparation Log*. The second technologist will verify that the following information on the crossmatch tag and blood product label match:

a. The ABO/Rh of the donor unit

b. Donor unit number

c. Product description, including the blood product code and suffix

d. Any special attributes

e. That the expiration date and time on the blood product label is correct.

i. In order to verify that the expiration date and time on the label is correct, the cosigner must first verify that the preparation date and time is correct as documented on the log.

ii. The cosigner will then independently determine the expiration date and time as indicated in above table *Expiration Dates & Times of Aliquots*.

iii. The cosigner will then verify that the expiration date and time on the labels of both the parent and aliquot are correct.

iv. If for any reason the technologist is unable to obtain a cosigner (e.g., alone in the laboratory on a weekend), then an internal variance must be documented.

H. **Issue the Aliquot before the Parent**

1. An aliquot should be issued before the parent component when aliquot expiration times are shorter than parent unit.
    a. For example: An aliquot is prepared from a platelet pheresis using a closed system. The aliquot has an expiration time of 4 hours from the time the weld was made, and the expiration date / time of the parent remains unchanged. The aliquot is issued before the parent because the aliquot expires before the parent.

I. **Split Units for Transfusion Associated Circulatory Overload (TACO)**

1. Patients that have an increased risk for TACO or a compromised circulatory system may have additional transfusion requirements.
2. The Blood Bank shall honor any request from the patient's caregiver for a half unit, or a specific volume, as per the Nursing Blood Component/Product Administration Procedure.

VI. EQUIPMENT / SUPPLIES / REAGENTS:

A. Parent blood component
B. Parent blood component with attached aliquot bags
C. Transfer bags (150mL or 300 ml)
D. Hemostats
E. Tube sealer
F. Sterile Connecting Device (SCD)

VII. QUALITY CONTROL (QC):

All welds made with the Sterile Connection Device and all seals made with the tube sealer shall be inspected. This inspection shall be documented on the Transfusion Medicine form, *Blood Product Division /Aliquot Preparation Log*. If the weld or the seal closest on the tubing to a component is unsatisfactory, the system must be considered an open system and the expiration date must be modified accordingly.

VIII. PROCEDURE:

A. **Preparation of Aliquot from a Parent Unit with Attached Satellite Bag**

1. Select the parent component from which to prepare the aliquot; mix contents of component gently.
2. Hold or hang the parent unit component upside down making certain that the pinch clamp on the satellite bags remains closed.

3. Place a satellite bag on the scale and tare the scale to zero.
4. Clamp off the bags that you are not filling currently with hemostats.
5. Open the pinch clamp on the system and slowly allow the red blood cells to flow into the satellite bag until the scale reaches the desired weight required for the aliquot plus an additional 5-10cc for priming.
    a. Note: The recommended weight for a standard neonatal aliquot is 45 g with the 5 cc for priming.
6. Close the pinch clamp on the set.
7. Repeat with the remaining satellite bags if appropriate.
8. Separate the aliquot from the parent component by making a couple of seals with the tube sealer. Leave sufficient tubing length on the parent component and/or aliquot for any additional compatibility testing.
9. Inspect the seals. If the inspection of the seal closest on the tubing to the parent or the aliquot is unsatisfactory the system must be considered an open system and the expiration date must be modified accordingly. Refer to the above table, *Expiration Dates & Times of Aliquots*.
10. Weigh and record the volume remaining in the parent bag.
    a. Note: Actual volume equals bag weight minus 30g for a 600mL parent bag
11. Perform the computer modification of the components using Blood Bank CDM, *Dividing Components*.
12. Label the parent and the aliquot and verify the labels in the Blood Bank Computer. *Refer to Blood Bank CDM*, *Dividing Components* and Blood Bank CDM, *Label Verification*.
13. If not immediately issued, return the aliquot as well as the parent component to the appropriate storage location.

B. **Preparation of an Aliquot from a Parent Unit with no Satellite Bags**

1. Select the parent component from which to prepare the aliquot; mix contents of component gently.
2. Select the applicable transfer bag (150 ml or 300 ml).
3. Attach the transfer bag to the parent component.
    a. For a closed system (preferred method), use the SCD to weld the tubing of the parent to the tubing of the transfer bag.
    b. Inspect the weld as described in the Transfusion Medicine policy, *Sterile Connecting Device Operation*. If the weld is determined to be unsatisfactory the component shall be considered to have been made in an open system and the expiration dates of both the parent unit and aliquot must be determined from the table, *Expiration Dates & Times of Aliquots* above.
    c. For an open system, penetrate the parent component with the distal

piercing pin of the transfer bag.

4. Hang the parent component upside down. Allow the required volume to flow from the parent component into the transfer bag.
5. Separate the transfer bag from the parent component by making seals with the tube sealer.
    a. Leave sufficient tubing length (approximately 3 inches) on the parent component so that additional aliquots may be prepared or for any additional compatibility testing.
6. Inspect the seal.
    a. If the inspection of the seal closest on the tubing to the parent or aliquot is unsatisfactory the system must be considered an open system and the expiration date must be modified accordingly.
7. Document the form *Blood Product Division / Aliquot Preparation Log.*
8. Label the parent and the transfer bag and document the transfer bag preparation in the Blood Bank computer.
    a. Refer to Blood Bank *CDM, Dividing Components*.
9. If not immediately issued, return the aliquot and the parent component to the appropriate storage location.

IX. REFERENCES:

1. AABB, *Technical Manual*, current edition.
2. AABB, *Standards for Blood Banks and Transfusion Services*, current edition.
3. College of American Pathologists, *Transfusion Medicine Checklist*, current edition.

Attachments

Blood Product Division Aliquot Preparation Log

Approval Signatures

Step Description	Approver	Date
	Jeremy Powers: Chief, Pathology	4/9/2024

	Masood Siddiqui: Staff Pathologist	3/25/2024
	Ryan Johnson: OUWB Clinical Faculty	3/25/2024
Policy and Forms Steering Committe (if needed)	Kelly Sartor: Mgr, Division Laboratory	3/20/2024
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Applicability

Dearborn, Troy