PLATELETPHERESIS **Administrative Procedure BB 2403.A**

PURPOSE

To describe the policies and procedures for obtaining platelets for transfusion.

POLICY

To meet regulatory agencies and UCDMC requirements:

1. Platelets are transfused for treatment of bleeding due to a critically decreased platelet count or functionally abnormal platelets. They may be transfused prophylactically to patients with rapidly decreasing or low platelet counts[1].

2. Platelets[2] are either ABO identical or compatible whenever possible. When ABO incompatible random platelets must be transfused due to unavailability, the patient's physician is notified and given options.[3]

3. PAS (Platelet Additive Solution) platelets have 65% of plasma removed and replaced with PAS.

    - Due to the reduced plasma, these platelets may be used on any ABO type.
    - PAS platelets may contain some red cells, follow policies pertaining to RH type of patient.
    - Due to the reduced plasma, PAS platelets are sometimes preferred for patients that have had urticarial transfusion reactions.
    - If the patient requires type specific platelets, PAS platelets should be ABO matched.

4. Platelets are stored, continuously agitating, at room temperature (20° to 24° C). The plateletpheresis contains $\geq 3x10^{11}$ platelets in a volume ranging from 100-500 mL.

5. Rh negative women of childbearing age receive Rh negative platelets whenever available[4].

[1] Platelet transfusion is indicated in patients with platelet counts of <10,000/μL or selected post-operative cases (eg: count <50,000/μL). Platelets should not be transfused if the platelet count is >100,000/μL unless the platelets are non-functioning.
[2] At this time, all platelet products are collected by apheresis process from one single donor. One plateletpheresis is equal to 4-8 platelet packs. A plateletpheresis can be split into two portions for pediatric patients or adult patients who need small volume transfusions.
[3] Inquire whether the physician would rather wait until the ABO compatible pheresis could be available. Refer to Transfusion Services physician or designee if the physician has additional questions. Document in the patient's LIS history that Dr. _____ Okayed use of type ___ for this patient.

6. All adult Rh negative men may receive Rh positive platelets if Rh negative platelets are not available or in short supply. Notify Transfusion Services physician or designee, via Path Review, if Rh negative platelets could not be supplied for male patient less than 18 years of age.[5]

7. Refer to BB2407 − *Selection of ABO & Rh Compatible Blood & Components* when type specific is not available. The blood type with the least amount of naturally occurring incompatible anti-A or anti-B has priority transfusion.

8. Universal donor type AB (Rh neg is preferred) is transfused to pediatric patients (less than 12 years old) without known blood type or when the 2nd specimen blood type verification has not been completed and need is urgent. Contact Transfusion Services physician or designee if AB platelet pheresis is not available.

9. Type 'A' platelets are selected to use as universal donor[6] for patients 12 years of age and older who have not had a blood type performed and the need is considered too urgent to wait for a blood specimen to type. Type 'A' is issued when the Massive Transfusion Guideline protocol is initiated.

10. Type specific or ABO compatible platelets may be given before the second blood type verification sample is typed for patients ≥ 12 years old.

11. If multiple containers are available from a single donor collection, do not give more than one from the same donor within a 2 hour period.

12. All platelets are checked for bacterial contamination[7] and are leukoreduced[8] at the collecting facility.

13. Plateletpheresis inventory is assessed twice a day. Order additional products from blood supplier as needed, taking into consideration the standing order. Routine platelet standing order is delivered on the 2200-2300 run. STAT platelet orders will be delivered as needed.

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[4] Rh Immune Globulin is available for those patients deemed candidates due to receiving Rh positive platelets. One vial of RhIG will destroy 15 mL red cells; FDA allows 2 mL of red cells in a plateletpheresis before crossmatch must be performed.
[5] Create an **ADBBP** for all Rh positive platelets given to Rh negative patients. Make a comment in **Specimen Comment** section, print an **Internal Inquiry** (short form) and place in Path Review folder.
[6] Type 'A' platelets may be used as universal donor units without Transfusion Services physician approval except for pediatric patients < 12 years old.
[7] Refer to **H**. *Plateletpheresis with positive culture detected at collecting facility*.
[8] To be considered "leukoreduced", the post-filtration leukocyte count must be $<5x10^6$. The platelet count must be >85% of pre-filtration content.

14. Plateletphereses are termed "random", "crossmatch compatible", "HLA (Human Leukocyte Antigen) matched", and "HLA Selected Antigen". Most patients receive random platelets unless they become refractory.

15. Contact the Transfusion Services physician or designee if informed of a patient refractory to platelet therapy.

    - If a patient does not respond (getting the appropriate platelet count increase) to random platelets, give fresh, type specific platelets next.
    - If the patient does not respond to type specific platelets, a platelet crossmatch and HLA antibody screen may be recommended by the Transfusion Services physician.
    - If crossmatch compatible platelets are transfused; if still no response, HLA selected antigen negative or HLA matched may be indicated. Refer to Transfusion Services physician.
    - If HLA matched platelets are not available and patient has HLA antibody(ies), HLA Selected Antigen platelets may be given[9] (as directed by Transfusion Services physician or designee).

16. Most plateletphereses that need to be irradiated are done so @UCDMC unless short staffing or heavy workload deem it necessary to order from blood supplier. Crossmatch compatible, HLA matched, and HLA Selected Antigen negative platelets are irradiated by the blood supplier before release.

17. In rare circumstances, when BloodSource irradiator is malfunctioning, UCDMC Transfusion Service staff irradiates platelets for them. Use **Example 1** logsheet.

18. CMV negative platelets are transfused to patients which meet the indications for CMV negative products. Refer to BB2413.A *Indications for CMV Negative Blood*

    - CMV negative platelets are provided pending CMV testing.
    - CMV negative platelets are provided to all obstetric patients and infants $\leq$ 6 months old.
    - CMV untested products are provided to patients in which CMV negative is not indicated or the patient is known to be CMV positive.

19. Patients with CHF or potential circulatory overload may require volume reduced platelets. Contact Transfusion Services physician or resident for approval of these

[9] Crossmatch compatible, HLA matched, and HLA Selected Antigen platelets might not be ABO identical or ABO compatible due to the priority of the other attributes.

requests. Careful coordination of care is required as a volume reduced platelet pheresis has a 4 hour outdate from the time of the start of the preparation procedure.

20. Patients with IgA deficiency or history of anaphylactic transfusion reaction may require washed platelet pheresis. Contact Transfusion Services physician or resident for approval of these requests. Careful coordination of care is required as a washed platelet pheresis has a 4 hour outdate from the time of the start of the preparation procedure.

21. Once issued, the plateletpheresis may be returned to Transfusion Services and returned to stock if:

- The container closure and labeling have not been disturbed.
- The records indicate that the blood component has been reissued, and that it has been inspected prior to reissue.
- The platelet component has been stored between 20-24 ºC.
  - ➢ If the product has not been stored in a validated platelet storage bag, take the temperature of the product on the flatbed thermometer on return. Document temperature on the Blood Order form.
- If returned after 4 hours or up to 24 hours, platelets must be returned to The continuous rotator for 2 hours and are suitable for reissue if there are no visible clumps and swirling characteristic is visible.

PROCEDURE

- ***Always review the patient's blood type, usage, and special needs in the LIS history.***
- ***When the plateletpheresis is received, create an inventory card[10]; write the recipient's name, medical record number, and anticipated transfusion situation on the card.***

A. For routine, random platelets:

1. For patients anticipated to need 2 or more plateletphereses quickly such as during surgery or during a trauma situation, **do not give a second or third unit from the same donor within less than 2 hours** in case the recipient should have a suspected TRALI reaction to the first unit that is not detected before another plateletpheresis is given.

[10] Refer to BB2367.A — *Donor Unit Processing and Resulting*

2. Use existing stock from the standing order or evaluate units reserved for other patients who may not need them.

3. When ordering 2 or more plateletpheresis units for a surgical or trauma patient, specify clearly in comment section that units not be from same donor.[11]

4. Irradiate the unit(s) at UCDMC if appropriate.

B. For crossmatch compatible platelets:

1. For any new orders, contact the Transfusion Services physician or designee for approval. Have the patient's recent platelet counts, hematocrit results, and transfusion usage available.

2. **First time request submi**t:
   - **3 x 4 mL lavender top tubes to** American Red Cross with a completed *Immunohematology Consultation Request form*. (**Example 2**). Select **Platelet Crossmatch** and note date/time product(s) needed. Place specimen and paperwork into a plastic specimen bag and then place into a brown paper bag. Attach appropriate send out label to bag. If STAT, place a STAT sticker on bag. Place specimen in designated specimen pick-up container and complete Send Out log. Request online specimen pick up and immunohematology testing.
   - **7-10 mL red top tube to ARC's HLA department.** Submit sample with ARC's *Request for HLA / Platelet Serological studies and Special Platelet Products* form (**Example 3**) and select **Platelet Refractoriness.** This is done in case patient has high percent of incompatibility with crossmatch testing or to decide if HLA matched platelets are required rather than crossmatched platelets. Place specimen in a separate plastic specimen bag and then place into a brown paper bag. Attach appropriate send out label to bag. If STAT, place a STAT sticker on bag. Place specimen in designated specimen pick-up container and complete Send Out log. Request online specimen pick up and HLA testing.
   - Note information on the *Patient Information Sheet* and update as needed (see **Example 4**). Requisition an **ADBBP** and place in Path Review folder. Update patient history.

3. **For additional requests**:
   - If a specimen for crossmatch has been submitted to ARC within 30 days,[12] place an order to ARC and note "Specimen previously sent (date)".

[11] Refer to Attachment I *TRALI risk mitigation when transfusing multiple plateletpheresis units into a surgical patient.*

- If additional specimen is needed, send a new specimen accompanied by the appropriate form as in B.2. above.

4. Advise the clinician that the turn-around-time is at least 8 hours, depending on the patient's percent compatibility, special needs, and available platelet inventory.

C. For HLA matched platelets:

1. For any new orders, contact the Transfusion Services physician or designee for approval. Have the patient's recent platelet counts, hematocrit results and transfusion usage available.

2. If the blood supplier[13] has the patient's HLA type on file:
   - Place an online product order to ARC.
   - ARC will evaluate their known platelet inventory for coincidental HLA matching or will contact a historically matched HLA donor to be drawn.

3. If HLA typing is not available:
   - Transfusion Services physician or designee will notify patient's physician to order: **HLA- typing (Class A & B)** [30 mL ACD-A (pale yellow top)] and **Platelet Refractoriness Testing** (10 mL red top).[14]
   - Submit sample with ARC's *Request for HLA / Platelet Serological studies and Special Platelet Products* form (**Example 4**) and select **Platelet Refractoriness and HLA Typing**. Place specimen in a separate plastic specimen bag and then place into a brown paper bag. Attach appropriate send out label to bag. If STAT, place a STAT sticker on bag. Place specimen in designated specimen pick-up container and complete Send Out log. Request online specimen pick up and HLA testing.
   - Place online product order.

4. Once HLA type is known, ARC will evaluate their known platelet inventory for coincidental HLA matching or will contact a historically matched HLA donor to be drawn.

5. If an HLA match can't be found and patient has specific HLA antibodies, a donor lacking the corresponding HLA antigens may be requested after consulting medical director or designee (HLA Selected Antigen).

[12] ARC separates the EDTA tubes and freezes the plasma to be used within a 30 day time period. Any request after 30 days or if the original is qns (quantity not sufficient) will require a new specimen.
[13] As of 10/1/16, American Red Cross is the blood supplier contracted with UCDMC.
[14] If not able to collect 30 ml of ACD-A blood, contact the HLA department for guidance. Give them the patient's WBC and percent of lymphocytes so they can calculate how many ACD tubes are required.

6. Advise the clinician that the turn-around-time could be approximately 12-48 hours, depending on the availability of HLA matched donors.

7. If the patient is in critical need for the product, the patient's physician and the Transfusion Services physician may request Emergency Release of the product to send the product before the viral testing is completed[15].

D. For patients needing smaller volumes:

1. Order the product to be split into two portions at ARC for volumes ~50-200 mL (halves).

2. Order the product to be type AB so the remaining portions will be transfusable to most ABO recipients. If possible, request a unit which tests negative for CMV (cytomegalovirus) antibodies.

3. Some patients may need extremely small plasma volumes. Full plateletpheresis may be reduced in volume by removing most of the plasma[16] at ARC. The Transfusion Services physician or designee must approve this product order. Allow a 2-3 hour turn-around-time for this product. A **Volume Reduced Plateletpheresis** has a 4 hour expiration time from unit entry. Careful patient care coordination is needed.

4. Evaluate the need to crossmatch the child with the platelet. Refer to: BB2650 – *Minor Crossmatch*.

E. For patients requiring platelets with plasma removed:

1. For these situations, order washed platelets:

- IgA deficient patients
- Patients who are minor crossmatch incompatible with plasma products[17].
- Hemolytic Uremic Syndrome patients
- Patients who have had consistent adverse reactions to plasma products

[15] ARC will fax to us their "Authorization for Emergency or Exceptional Release" form for either the Transfusion Services physician or patient's physician's authorizing signature. When signed [the Transfusion Services physician may designate a CLS (Clinical Laboratory Scientist) to sign for her], fax the form back to ARC and file the form in the department office file cabinet in the "Emergency Release" folder.
[16] Typically, these products are reduced to 50 mL.
[17] Patients (e.g., Hemolytic Uremic Syndrome) getting washed plateletpheresis no longer require minor crossmatch of the product.

2. Transfusion Services physician or designee must approve this product order. Allow a 2-3 hour turn-around-time for this product.

3. Advise the clinician of a 2-3 hour turn-around-time; the product has a 4 hour expiration time from unit entry[18]. Careful patient care coordination is needed.

F. For visually bloody plateletpheresis (containing >2 mL red cells):

1. The collecting facility will supply a pilot tube for crossmatch.

2. Requisition a PPH.CX in the LIS.

3. Crossmatch the unit red cells with the recipient's plasma (Refer to BB2630.T – *Crossmatch Methodologies*).

G. For plateletpheresis going to the operating room or dispensed with MTG set (in which a portable refrigerator or validated blood cooler is in use):

1. Attach the notice "***Do Not Put this Plateletpheresis in the Refrigerator***!" to the patient's unit tag. (See **Example 5).**

2. Place platelet pheresis in a platelet storage bag.

3. Caution: When sending expiring platelets to the Operating Room near the end of the evening, verify with the OR staff that the product will definitely be transfused before midnight.

H. Plateletpheresis with positive culture detected at collecting facility:

1. Blood supplier will notify Transfusion Service of positive results for all units that have been consigned to UCDHS.

2. Immediately perform a unit inquiry for unit and any other related components from the same donation. See BB2557.A *Unit Inquiry in LIS*. Notify blood supplier as soon as possible with the status of the unit.

a. **If unit has not been transfused:**
- Quarantine and return unit and any other related units to blood supplier. Refer to BB2371.A *Quarantine &Disposal of Blood Components*.

[18] The transfusing nurse must be ready to transfuse the unit upon arrival; the product will have only 1-2 hours before expiration once it arrives.

- Print out a unit inquiry report, note "positive culture" and place in Component Retrieval folder in file drawer located in dispensing area of room 2P340.

b. **If unit has been transfused:**
- Search for any related units from same donor and quarantine as above.
- Print out a unit inquiry report, note "positive culture- transfused unit" and place in Path Review folder.
- **Notify the Transfusion Services physician or Pathology resident (assigned to dept. or on-call as appropriate) IMMEDIATELY (at time of notification).**
- The Transfusion Services physician or resident will notify the clinical staff caring for the patient to discuss the need for antimicrobial therapy or further testing.
- The Transfusion Services physician will follow-up with blood supplier for results of follow up testing on positive cultures for products that have been transfused.

3. Blood supplier will phone or fax results of Gram stain, culture, ID and susceptibility results of transfused units to Transfusion Services as soon as possible.

Non-Serological Crossmatch

Addendum to:
BB2403.A Plateletpheresis
BB2451.A Crossmatches
BB2630.T Crossmatch Methodologies
BB2883.A FFP Assigning & Thawing
BB2885.T Cryoprecipitates Assigning, Thawing, & Pooling

Purpose of the Non-serological Crossmatch:

- Achieve recipient/donor unit tracking in the LIS/EMR (Electronic Medical Record) interface
- Display the unit(s) as "ready" status for the nursing staff

Plasma Products (Fresh Frozen Plasma, Platelets, Cryoprecipitates)

1. Receive EMR order for specific component (FFP, PPH5, CRYO, or CRYO-P). You must wait for the order to be received from the EMR; do not create a new requisition.

2. The mnemonic for the crossmatch (XM.PLASMA) will reflex into the requisition. Do not delete it.

3. Select the appropriate unit and result the crossmatch (must be performed by a CLS). Refer to BB2585.A *Resulting Patient Data in LIS*.

   b. "Yes" will auto-result at ABO Compatible? Press Enter
   c. Enter "Y" at Compatible? Press Enter
   d. Default the "Y" at File? Verify results.
   e. The unit will come to "Ready" status.
   f. Print the *Issue /Transfusion card* in the same key strokes as for adult red cells using either Result or Spreadsheet modes.
   g. Compare the information on the tag to the information on the bag for accuracy. Add 'irradiated, CMV negative or irradiated and CMV negative' as indicated by patient need. Tag the unit.[19]
   h. Store the unit on the appropriate storage unit, specific to its temperature requirements.

4. Issue the unit in LIS and print PDF when dispensing. Refer to BB2368.A *Dispensing Blood and Components*

[19] For platelet phereses,tag the unit prior to dispense when the nursing staff comes to pick up the unit.

REFERENCES

AABB *Technical Manual* (AABB) Current Edition. AABB, 8101 Glenbrook Road, Bethesda, Maryland, 20814-2749.

Standards Committee (AABB, Standards for Blood Banks and Transfusion Services, Current Edition. AABB, 8101 Glenbrook Road, Bethesda, Maryland, 20814-2749.

Code of Federal Regulation. Food & Drug Administration. Title 21, 640.2. http://www.fda.gov.

CAP www.cap.org Transfusion Medicine (TRM) 40710, 42480 Waukegan Road, Northfield, IL 60093

Reference SOPs:

BB2371.A -*Quarantine &Disposal of Blood Components*
BB2367.A - *Donor Unit Processing and Resulting*
BB2368.A- Dispensing Blood and Components
BB2407.A – *Selection of ABO & Rh Compatible Blood & Components*
BB2413.A -Indications for CMV Negative Blood
BB2557.A -*Unit Inquiry in LIS*
BB2585.A -*Resulting Patient Data in LI S*
BB2630.T – *Crossmatch Methodologies*
BB2650 .T– *Minor Crossmatch.*

PROCEDURE HISTORY

Date	Written/ Revised by	Revision	Approved by	Approved date
2/14/12	R Perry	TRALI reduction, update order process for HLA, Crossmatch comp platelets	Hanne Jensen, MD	2/15/12
		Reviewed	Hanne Jensen, MD	12/30/14
		Reviewed	Hanne Jensen, MD	10/26/16
11/4/16	D Richardson	Revised: ARC updates, add vol red and washed plts 4 hr outdate;PAS plts no need to match ABO;add CMV indications	Hanne M. Jensen	11-8-16