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Area	Laboratory-Blood Bank
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Selection of Platelets, Plasma, and Cryoprecipitate for Patients Greater Than Four Months Old

Document Type: Procedure

I. PURPOSE AND OBJECTIVE:

This document will provide policies relating to the selection of platelets, plasma, and cryoprecipitate for patients greater than four months old.

II. SCOPE:

A. This document applies only to the selection of platelets, plasma, and cryoprecipitate for patients greater than four months old. For patients less than four months old, refer to Transfusion Medicine Policy, *Selection of Blood Components for Neonatal Transfusion*.

B. The policies in this document relating to volume reduction of platelets apply to platelet pheresis products and to platelet pools.

C. For patients requiring granulocytes, refer to Transfusion Medicine policy, *Granulocytes by Apheresis*.

D. For special transfusion requirements (e.g., cytomegalovirus negative, washed, irradiated, IgA deficient components, etc.) refer to Transfusion Medicine policy, *Special Transfusion Requirements for Patients Greater Than Four Months Old* and for RO only, Transfusion Medicine policy, *Washing Platelet Components*.

III. PRINCIPLE:

A. The transfusion of ABO-plasma-incompatible products could potentially cause an ABO hemolytic transfusion reaction. The risk is higher for the following populations:

1. Group A recipients transfused with group O platelets having a high titer of Anti-A.

2. Pediatric patients (less than 12 years old).
3. Patients who have received a stem cell transplant.

B. The policies in this document are meant to reduce the risk of ABO hemolytic transfusion reactions caused by the transfusion of ABO-plasma-incompatible products.

IV. DEFINITIONS/ACRONYMS:

A. Neonates: Patients from birth to 4 months old.

B. Pediatric patients: Generally, patients from 4 months old through 18 years old. Note that in this document, the appropriate ABO of certain blood components is based on whether the patient is:

1. Greater than 4 months old and less than 12 years old, or
2. Greater than 12 years old.

C. CMV: Cytomegalovirus.

D. ABO-identical component: A component that is of the identical blood group as the recipient.

E. Unexpected antibody: Any antibody (other than naturally occurring Anti-A or Anti-B that is regularly found in normal serum or plasma) that is currently or was historically present in a patient's sample.

F. ABO plasma-compatible: Refers to a platelet, plasma, or cryoprecipitate component that does not contain ABO antibodies corresponding to the recipient's ABO antigens.

G. Rh compatible: A blood component of the following specificity:

1. For a Rh negative recipient, the component is Rh negative.
2. For a Rh positive recipient, the component is either Rh positive or Rh negative.
3. For a recipient with a Rh type that is undetermined for any reason, the component is Rh negative.

H. Bloody Platelets: Platelet components that contain 2 mL or more of donor red blood cells.

I. FFP: Fresh Frozen Plasma

J. CDM: Computer Documentation Manual

K. HIS: Hospital Wide Computer System

L. Passively acquired antibodies: Antibodies that are transferred from the donor(s) to a recipient through the transfusion or administration of plasma-containing components (i.e. RhIg administration).

M. Alloimmunization: The process whereby a recipient forms antibodies in an immune response to foreign antigens on donor RBCs.

V. POLICIES:

A. The policies in this document are summarized in the attachment, *Job Aid:Selection of Plasma, Cryoprecipitate, and Platelets for Patients Greater than 4 Months Old.* Blood Bank technologist

should refer to this attachment when selecting platelets, plasma, and cryoprecipitate.

B. Compatibility Testing

1. The patient must have a complete ABO/Rh type performed on a current properly labeled sample that was collected during the current admission in order to select platelets, plasma, or cryoprecipitate. If antibody screening is also ordered, it is not necessary to wait for the antibody screen results if ordered before selecting or dispensing platelets, plasma, and cryoprecipitate.

C. Thawing Plasma for Therapeutic Apheresis

1. When the Blood bank receives an order for therapeutic apheresis, the following steps should be performed:
    a. Contact the patient's caregiver and ask what time the procedure will begin and what volume of FFP will be used.
    b. After considering the time the procedure will begin and the desired volume of FFP, prepare (thaw / select) the appropriate number of FFP units. Typically, the care giver will place orders for a certain number of FFP units. It is more important for the Blood Bank to thaw the desired volume of FFP than to thaw the number of units that were ordered.
    Note that it is unlikely that the total volume of thawed FFP will exactly match the desired volume; it is better to reach a thawed volume greater than the desired volume (as opposed to a thawed volume less than the requested volume).

D. Transfusion Limits for Patients Receiving ABO-Incompatible Plasma Products

1. Patients receiving significant volumes of plasma containing incompatible ABO antibodies or unexpected red cell antibodies are at an increased risk for adverse effects. Therefore, the number of ABO-incompatible transfusions to a patient within a 24 hour period should not exceed:
    a. 6 units of plasma (including both thawed plasma and liquid plasma).
        i. Ideally, plasma should always be ABO-compatible. However, some situations such as massive transfusions and inventory shortages may require the use of ABO-incompatible plasma.
    b. 10 units of platelets (including both pooled and apheresis platelets; does not include volume reduced platelets). 1 unit of pooled platelets = 5 individual units/donors.
    c. 10 units of pooled cryoprecipitate. 1 unit of pooled cryoprecipitate = 5 individual units/donors.
    d. If the number of transfused ABO-incompatible products exceeds these limits, it shall be reviewed by the Blood Bank Medical Director to determine if any adverse outcomes have occurred.

E. Bloody Platelets

1. Platelet components that contain 2 mL or more of donor red blood cells (referred to as “bloody” platelets) must be crossmatch compatible with the recipient.

2. The blood supplier may identify a platelet as containing 2 mL or more of donor RBCs. In this case, a pilot tube will usually be supplied by the blood supplier for additional testing that may be required by the transfusion service. The *American Red Cross Visual Inspection Reference Guide* located at each site includes photographs of platelets that may be used as a standard to determine whether a platelet potentially contains more than 2 mL of donor RBCs. If the red color or tint of the platelet in question is darker than the standard in the job aid then the platelet is considered to be bloody and a crossmatch is required.
3. If a crossmatch is required for a bloody platelet, a segment from the platelet is obtained and centrifuged, to obtain packed cells. An immediate-spin crossmatch is then performed using the recipient's plasma vs. the donor RBCs. A comment with the crossmatch results should be added to the patient's record, under the CMTXT (comment text) or the applicable downtime document.

F. Large-Volume Platelet

1. Platelets with a volume larger than 300 mL are considered to be large-volume platelets. Large-volume platelets should be issued only in the following situations:
    a. If the patient is currently in the operating room (OR) where patient's vital signs are continually monitored.
    b. If the platelet is being issued as part of a massive transfusion protocol or emergency issue.
    c. With the approval of patient's caregiver . This approval will be added as a patient comment in the Blood Bank computer. Example: limited platelet availability.
    d. When receiving large-volume platelets into inventory, the LGVOL (large volume) attribute is added to the unit, and a notation of the large volume is made on the platelet incubator or communication board.

G. Double-Bagged Platelets

1. A large-volume platelet pheresis may be received from the blood supplier in two bags, to permit adequate gas exchange. If a large-volume platelet is received in two bags, then the bags should be combined immediately prior to dispense. The expiration date of the combined platelet is the shorter of:
    a. The original expiration date (before combining), or
    b. 24 hours from the time that the bags are combined.
    The expiration date is changed as described in Blood Bank CDM, *Combining a Double-Bag Platelet Pheresis*

H. Selection of Platelets based on Rh(D) / Anti-D

1. Females 50 years old or younger, and males 18 years old or younger should be transfused with Rh compatible platelets (to prevent Anti-D / alloimmunization). This policy includes patients with passive D (e.g., due to RhIG administration) or a "DUNK" antibody (unknown whether Anti-D reactivity is due to alloimmunization or recent RhIG administration). If applicable refer to the section Transfusion of Components that are not Rh Compatible below.

2. If a patient has anti-D, it is not necessary to dispense Rh negative platelets unless the platelet has been identified by the blood supplier to contain 2 mL or more of donor red blood cells.

I. Transfusion of Components that are not Rh Compatible

1. The Blood Bank will attempt to dispense Rh-compatible platelets. However, if platelets that are not Rh compatible must be dispensed, then the patient's physician must be notified after the event if the patient is:
    a. a female 50 years old or younger, or
    b. a male 18 years old or younger.
2. In these cases, the technologist shall:
    a. Suggest the use of RhIG or WinRho to the patient's caregivers.
    b. Document a variance report for follow up with the Medical Director. Note: Additional doses of RhIg are recommended after approximately 14 days or 7 Rh positive units have been transfused; the blood bank will notify the caregiver to suggest another dose of RhIG or WinRho, if transfusions will be continuing.

J. Volume Reduction of Platelets

1. In order to reduce the risk of ABO hemolytic transfusion reactions caused by the transfusion of ABO-plasma-incompatible platelets, consultation with the Blood Bank Medical Director is required for platelets that may need to be volume reduced for pediatric patients less than 12 years old whose ABO Type cannot be determined (GND) and are known to be Bone Marrow/Stem Cell Transplant recipient.
2. When indicated, platelets are volume reduced at Royal Oak according to the Transfusion Medicine policy, *Volume Reduction of Platelets.*
3. It is not necessary to volume reduce platelets for the patient who requires the emergency issue or massive transfusion.
4. If volume reduced platelets are indicated, but non-volume reduced platelets are dispensed for any reason other than emergency issue or massive transfusion, then this occurrence shall be documented in a variance report.

K. Guidelines for Platelet Inventory Management

1. Platelets with the shortest expiration date shall generally be issued from the Blood Bank first.
2. ABO plasma compatible units should be issued if type specific units are not available in accordance with the Job Aid: *Selection of Plasma, Cryoprecipitate, and Platelets for Patients Greater than 4 Months Old.*
3. In an emergency issue or massive transfusion the Blood Bank will attempt to issue platelets of the appropriate ABO group.
4. Group O apheresis platelets will be issued preferentially to Group O recipients.

Inventory Management for Group O Apheresis Platelets

Order of Use	1st choice	2nd choice	3rd choice	4th choice
Recipient ABO	O	B	A	AB

a. It is not necessary to obtain approval from the medical director prior to the issue of a Group O apheresis platelet to non Group O recipient.

L. Patients with Special Platelet Considerations (Antibodies or HLA Matched)

1. Platelet Antibodies

a. Platelet studies may be indicated if a patient is refractory to platelet transfusions or in rare situations may be used to help in the diagnosis of Neonatal Alloimmune Thrombocytopenia resulting from maternal antibodies directed against platelet antigens of the neonate inherited from the father. Notify the Medical Director or designee when a request for platelet antibody studies is received in the blood bank. If the patient is an inpatient, consult the the Medical Director or designee immediately.

2. HLA Matched Platelets

a. HLA matched platelets may be indicated if a patient is refractory to platelet transfusions. If an initial order for crossmatched or HLA platelets is received, or if the Blood Bank receives a phone call about the potential use of one of these components, then the Medical Technologist will perform the following:

i. Verify with the nurse that the correct order was placed in EPIC.

ii. The Medical Director or designee shall determine whether HLA matched platelets are indicated. A consult is not required.

a. If Medical Director determines the components are not indicated, add the appropriate special message; "XM/HLA platelets NOT required" in the Blood Bank computer system

b. If Medical Director determines the components are indicated, add the appropriate special message "HLA matched product only" in the Blood Bank computer system and obtain product ordering instructions from the Medical Director.

3. Crossmatched Platelets.

a. The Medical Director or designee shall determine whether crossmatched platelets are indicated. A consult is not required.

i. If Medical Director determines the components are not indicated, add the appropriate special message; "XM platelets NOT required" in the Blood Bank computer system.

ii. If Medical Director determines the components are indicated, add the appropriate special message; "XM platelets required" in the Blood Bank computer system.

VI. SPECIMEN COLLECTION:

A. Testing Performed at Beaumont Health (HLA Department)

1. Two 5mL EDTA (lavender) or one 10mL ACD (yellow) AND one 7mL SST (gold).
2. Specimens do not need to be freshly collected, samples collected on the current admission located in the blood bank, hematology and/or chemistry laboratories may be used.
3. Testing is performed Monday – Friday.

VII. PROCEDURE:

A. Procedure for Receiving Platelet Study Order

1. Notify the Medical Director or designee when a request for platelet antibody studies and/or crossmatched or HLA matched platelets is received in the blood bank. If the patient is an inpatient the Medical Director or designee must be consulted immediately. If request is received for outpatient consultation may occur on the next business day.
2. The Medical Director or designee will consult with the requesting physician and determine appropriateness of requested products.
3. The Medical Director or designee will notify the blood bank technologist of the decided course of action.

B. Procedure for Ordering HLA Matched Platelets

1. The Medical Director or designee will notify the blood bank and HLA Laboratory of the need for patient HLA testing.
   Note: The HLA Class I Antigen Type is not necessary if testing has been performed previously at Beaumont Health.
2. Order HLA Class I Antigen Typing (LAB6421) and HLA Antibody Screen (LAB6420) in EPIC.
   Note: Blood bank technologist may initiate orders on behalf of the Medical Director or designee.
3. Specimens will be collected and received in the Beaker Laboratory System and routed to the HLA Department for testing. The test results will be reported directly in EPIC.
4. The Blood Bank Medical Director or designee will review HLA test results and determine the type and quantity of product that is required based on the results.
5. Order appropriate products through the Versiti Michigan HLA Laboratory as instructed by the Medical Director or designee.
6. Notify the Versiti Michigan HLA Laboratory at (616) 233-8597 with a request for HLA matched platelets.
7. Fax the completed HLA report and Versit Michigan: HLA Laboratory – Special Order Apheresis Platelets Request to the Versiti Michigan HLA Laboratory at (616)

233-8658.

8. The blood bank technologist will relay to the Medical Director or designee the verbal report given by the Michigan Blood HLA Laboratory.

VIII. SPECIAL NOTES:

A. HLA Testing is performed Monday through Friday only. If deemed necessary specimens may be referred to Versiti Michigan HLA Lab with Medical Director Approval. If specimen is approved to testing at Versiti Michigan, the specimen requirements can be found on the Versiti HLA Testing Requisition. Contact with Versiti Michigan HLA Lab should be made to arrange for testing.

IX. REFERENCES:

1. College of American Pathologists Transfusion Medicine TRM.40670, Granulocytes And/or Platelets Crossmatch-Compatible, current CAP standards.
2. College of American Pathologists Transfusion Medicine TRM.40700, Whole Blood/Red Cells/ Plasma, current CAP standards.
3. College of American Pathologists Transfusion Medicine TRM.40710, Rh Transfusion, current CAP standards.
4. College of American Pathologists Transfusion Medicine TRM.40720, Immunohematologic Conditions, current CAP standards.
5. College of American Pathologists Transfusion Medicine TRM.40740, ABO-Incompatible Donor Plasma - Infants, current CAP standards.

Attachments

Job Aid - Selection of Plasma, Cryoprecipitate, and Platelets for Patients Greater than 4 Months Old

Approval Signatures

Step Description	Approver	Date
	Muhammad Arshad: Physician	7/22/2022
	Ann Marie Blenc: System Med Dir, Hematopath	7/22/2022
	Jeremy Powers: Chief, Pathology	7/21/2022
	John Pui: Chief, Pathology	7/19/2022

	Ryan Johnson: OUWB Clinical Faculty	7/19/2022
	Vaishali Pansare: Chief, Pathology	7/19/2022
Policy and Forms Steering Committe (if needed)	Kelly Sartor: Supv, Laboratory	7/19/2022
Policy and Forms Steering Committe (if needed)	Gail Juleff: Project Mgr Policy	7/19/2022
	Kristen Lafond: Mgr Laboratory	7/19/2022
	Ashley Dingess: Mgr Laboratory	7/19/2022
	Katherine Persinger: Mgr Laboratory	7/18/2022
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