Beaumont Laboratory
Clinical Pathology
Royal Oak

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WASHING PLATELET COMPONENTS

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Purpose

The purpose of this document is to provide the Blood Bank staff with stepwise instructions for preparing washed platelet components.

Scope

Washed platelet components may be clinically indicated for the following:

- Recipients with antibodies against immunoglobulin A (IgA) when IgA-deficient components are not available,
- Recipients who have experienced multiple allergic reactions to past transfusions, and
- Neonates or fetal intra-uterine recipients, most often in cases of Neonatal Alloimmune Thrombocytopenia (NAIT). The transfusion of unwashed platelet components procured from the mother to these recipients is strongly discouraged.

Principle

One of the most common indications for washed platelets is Neonatal Alloimmune Thrombocytopenia (NAIT). In this syndrome, fetal platelets are destroyed by maternal antibody that is made in response to an incompatible fetal platelet-specific antigen (inherited from the father). Affected fetuses and neonates are at risk of bleeding complications, including intracranial hemorrhage.

Management for NAIT may involve maternal intravenous immunoglobulin (IVIG) therapy, fetal/neonatal transfusion of washed maternal platelets, cordocentesis, or transfusion of HLA-specific negative platelets or random donor apheresis platelets. Maternal platelets are known to be antigen negative and washing them removes / dilutes the offending maternal antibody. During cordocentesis, the fetal platelet count may be measured and platelets may be immediately transfused, if necessary. Due to the inherent risks of cordocentesis, platelet preparation (irradiation, washing, aliquoting into a syringe) should begin before the procedure.

Policies

If the washed platelet is intended for a neonate, then the platelet shall be split in half into a satellite prior to washing, and the satellite half shall be washed first.

If the platelet is not first transferred into a satellite bag, then the expiration time of washed platelets is four (4) hours from the time that the 0.9% sterile saline is added.

The *Procedure for Washing Platelet Components* described in this document is considered an open system. Aseptic techniques shall be used throughout this procedure.

The technologist performing this procedure shall document all observed values, calculations, and manufacturers' lot numbers on F-230a, *Washing Platelets: Component Processing Log.* This log will be signed and dated, and will be stored by the MT Lead QC.

Washed platelets must be irradiated and must also meet the requirements described in:

- P515, *Policies for the Selection of Blood Components for Neonatal Transfusion*, or
- P226, Sp*ecial Transfusion Requirements for Patients Greater than Four Months Old.*

Component Labeling During the Washing Process

The components should be labeled during the washing process. The following labels (stickers) shall be used, as applicable. In the alternative, these labels may be handwritten.

- F-230b: This form should be applied to the attached bag containing the plasma / saline extract; as described in step 18 of the procedure.

Unit # _____
This bag contains plasma/saline extract.
DO NOT TRANSFUSE THIS BAG
08/11/2020 RC.BB.CP.FRM.230b r01

- F-230c: This form should be applied to the washed platelets. Immediately after centrifugation, during the time period of undisturbed rest, as described in steps 18 – 24 of the procedure. This label should be removed after this time period, before the washed platelet is dispensed from the Blood Bank.

Unit # _____
DO NOT DISTURB THIS BAG (60 minutes)
Remove this label from this bag containing washed platelets before dispensing.
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Definitions and Acronyms

- **Open system:** A system, the contents of which are exposed to air and outside elements during preparation and separation of components.
- **SCD:** Sterile Connection Device
- **MT Lead QC:** The Medical Technologist Lead assigned to Quality Control.

Specimen Collection and Handling

Specimen collection and compatibility testing will be performed according to standard operating procedures. Refer to:

- P101, *Triaging and Identifying Acceptable Samples for Testing*
- P507, *Neonatal Compatibility Testing Guidelines*

Reagents and Supplies

- 600 mL transfer bag
- 300 mL transfer bag
- 1000 mL bag sterile saline (0.9%)

- Balance bags and weights
- Hemostats
- 30cc or 60cc neonatal/pediatric syringe set (if requested)

Equipment

- Sorvall BP8 centrifuge set at 22°C ± 2°C. Alternatively, the Sorvall RC 3B Plus refrigerated centrifuge can be set to 22° and used (see *Before You Begin* section).
- TSCD-II Sterile Connection Device (if a syringe is requested)
- Heat sealer
- Plasma extractor
- Trip balance
- Electronic scale for weighing blood (2000g capacity). An electronic scale must be used for this procedure. In most cases, it will be necessary to use a scale with a capacity greater than 500g.

Forms

- F-230a, *Washing Platelets: Component Processing Log*
- F-230b, See the policy *Component Labeling during the Washing Process*
- F-230c, See the policy *Component Labeling during the Washing Process*

Copies of this log and the stickers are located in the cabinet labeled as *Platelet Processing Logs* / *Stickers*, in the blood processing area.

Quality Control

Using the Heat Sealer

Before each use of the heat sealer, hemostats or clamps will be placed on each side of the anticipated seal. This action will maintain the integrity of the component in the event of tube leakage.

Using the Sterile Connection Device (SCD)

With each use of the TSCD-II sterile connection device, the technologist will comply with P327, *Sterile Connection Device: Weld Integrity Test and Cleaning.*

Before You Begin

24 Hours before Washing

- Make sure that temperature of the Sorvall BP8 centrifuge is set at 22°C ± 2°C. Alternatively, the Sorvall RC 3B Plus can be used.
  - It is very important to adjust the temperature of the Sorvall centrifuge to room temperature (22C ± 2C) at least **24 hours in advance of washing** the platelets. Keep the lid of the centrifuge open and place a note on it indicating to “Keep at room temperature for washed platelet procedure.”
  - Before using, the rotor needs to be pre-warmed to the temperature set. To do this:
- Set the centrifuge to 580g.
- Set the timer dial for 20 minutes.
- Set the temperature at 22°C.
- Press start and allow it to complete its cycle

- Make sure that all of the required supplies and equipment are available. Some of the equipment or supplies may require some time to obtain (make sure that a 2000 g capacity electronic scale is available).
- Begin to locate a suitable platelet component; it may take several days to coordinate the collection of a maternal pheresis with the blood supplier if a directed donation is indicated.

Approximately 1 hour before washing: Gather supplies and equipment, and begin to documentation F-230a

Gather the following supplies and document the manufacturers' lot numbers on F-230a:

- 1000-ml bag 0.9% sterile saline (include the expiration date)
- 600-ml transfer pack
- 30cc or 60cc neonatal / pediatric syringe set (if requested)
- Document the patient's name, medical record number, the component donor identification number, and the component product code on F-230a.

Approximately 1 hour before washing: Communicate with the patient's physician

- **For all patients**, communicate with the patient's physician or caregiver to avoid unnecessary wastage of the washed platelet component. Communicate regarding the following:
  - Platelets may be from a rare donor, and
  - Set up a firm time for transfusion; considering the expiration time of the platelets. This expiration time is four (4) hours from the time that the 0.9% sterile saline is added to the platelets; see step 10 of the procedure.
  - If the patient is not a neonate, then the patient's physician may decide whether the entire platelet pheresis, or half of the pheresis, shall be washed. If only half of the pheresis is washed, then after the pheresis is split in half the steps of the washing procedure remain unchanged.

- In addition, for **neonatal or fetal/intra-uterine recipients**, then communicate with the patient's physician regarding the following:
  - Ask the physician whether the platelets should be kept in a transfer bag, or drawn / filtered into a syringe by the Blood Bank or at the bedside. If the Blood Bank prepares the syringe, ask what volume the physician would like to be drawn into the syringe.
  - Because a Type & Screen will be performed on the maternal sample (if applicable), it may be helpful to ask if the mother has received IVIG therapy.

- **Immediately Before Washing**
  - If the component is a **pheresis** with a primary and satellite bag, then transfer entire component into the primary bag immediately before washing.
    - For neonates, because the platelet will be so concentrated after the washing process, the platelet should always be split in half, into a satellite bag using the sterile connector device, prior to washing. If necessary, refer to P203, *Syringe and Aliquot Preparation and P803, Sterile Connecting Device Operation*. This also allows the other half to be used if the patient's physician may request another platelet for the patient, while

limiting donor exposure. After the platelet is split in half, the steps of the washing process remain unchanged.

- If the component is **random donor platelets concentrates**, then pool the platelets together immediately before washing. If necessary, refer to P212, *Pooling Blood Products*. Transfer the platelet pool into a 600-ml transfer pack; it is important to have a bag with at least a 550g capacity (see step 19).
- Expiration dates at this point are determined by standard operating procedures.

Procedure - Note that the step numbers of the procedure are included on F-230a.

<table>
<tr><th>Step</th><th colspan="2">Action</th><th>Notes</th></tr>
<tr><td>1</td><td colspan="2">Verify that the temperature of the Sorvall BP8 centrifuge is at room temperature (22C ± 2C) and document this temperature on F-230a.</td><td>See Before You Get Started section. If the temperature has not stabilized to room temperature, do not proceed; consult a manager/supervisor.</td></tr>
<tr><td>2</td><td colspan="2">Load the platelet process program on the Sorvall BP8 centrifuge and document on F-230a:
• Centrifugation rate to 580g and
• Centrifugation time to 20 minutes.</td><td></td></tr>
<tr><td>3</td><td colspan="2">Obtain the platelet component to be washed.</td><td></td></tr>
<tr><td>4</td><td colspan="2">If not already done so, irradiate the platelet component. In some cases the blood supplier will irradiate the platelet component before shipping.</td><td>If necessary, refer to P217, Irradiation of Blood Components using the Raycell® Mk2 X-Ray Blood Irradiator.</td></tr>
<tr><td rowspan="4">5</td><td colspan="2">Document the net volume of the platelet component on F-230a.</td><td rowspan="4">• The net volume is usually indicated by the blood supplier on the face label.
• If not indicated on the face label, weigh the component and obtain the net volume. Remember to subtract the weight of an empty bag.</td></tr>
<tr><td>If the volume of the platelet component is:</td><td>Then proceed to:</td></tr>
<tr><td>≤ 350 ml</td><td>Step 5.</td></tr>
<tr><td>> 350 ml</td><td>Remove the volume that is in excess of 350 ml before proceeding. If the volume is greatly in excess of 350 ml, the component should be split into 2 halves and both halves should be washed.</td><td>If necessary, refer to P203, Syringe and Aliquot Preparation.</td></tr>
<tr><td>6</td><td colspan="2">Weigh an empty 600-ml transfer pack. Document this weight on F-230a.</td><td>Do not place the attached tubing on the scale when weighing.</td></tr>
<tr><td>7</td><td colspan="2">Spike the 1000-ml bag of 0.9% saline with the spike of the 600-ml transfer bag.</td><td>• Be sure that the expiration date of the saline has been documented on F-230a.
• See the Notes section near end of this SOP, Using a 600 ml Transfer Pack.</td></tr>
</table>

8	Allow 200 ml of saline to flow into the transfer pack. Place a hemostat on the tubing, near the transfer bag port. Place both bags so that the ports are facing upward.	It may be helpful to have another person help with these steps.
9	Remove the tubing from the port of the 0.9% saline bag using care not to contaminate the spiking end of the transfer tubing. Immediately place the open 0.9% saline bag in a sink, as it is open. Discard the 0.9% saline bag when time permits.	

Step	**Action**	**Notes**
10	Spike the platelet component bag with the transfer tubing of the 600-ml transfer pack (which now contains 200 ml of saline). Document this time on F-230a.	The **new expiration time** of the platelet component is 4 hours from this point.
11	Open the hemostat to allow the entire contents of the platelet bag to flow into the 600-ml transfer pack (which now contains 200 ml of saline). **Important:** Do not detach the now-empty platelet bag from the now-full transfer pack. Place 2 hemostats on the tubing between the 600-ml transfer pack and the now-empty platelet bag.	The now-empty platelet bag will be used to collect the plasma/saline mixture in step 19.
12	Weigh the following and document on F-230a: • The now-empty original platelet bag • The full platelet/saline bag (including the bag).	
13	Remove 2 cups from the centrifuge and place them on opposite sides of the trip balance.	
14	Balance the cups as follows, wrapping all contents that are placed inside the cups in clean plastic bags: • Cup 1: place the platelet/saline bag **in an upright position** along with the attached, now-empty platelet bag. • Cup 2: balance the trip scale with balance bags and weights, as needed.	All contents are wrapped in clean, plastic bags to contain potential leakage/breakage.
15	Place the 2 balanced cups back into the centrifuge, close the lid and start the centrifuge. Record the start time on F-230a.	
16	While centrifuging, calculate the **target weight of the plasma/saline bag**; document on F-230a. This target weight will be used in step 19.	Target weight = +Volume of saline (200cc) + Original volume of PLTs + Weight of empty PLT bag – Desired volume of washed PLTs (50cc)
17	Document the time that the platelets are removed from the centrifuge on F-230a.	Centrifuge takes approximately 5 minutes to brake; do not manually brake.

18	Once the centrifuge stops, gently remove the platelet/saline bag. • Place the platelet/saline bag upright in the plasma extractor. Place bag so that the "platelet aggregates" are visible (facing towards you). • Place the now-empty platelet bag on the scale and attach F-230b to the empty bag. • Gently attach the F-230c label to the bag containing the washed platelets.	Platelets will appear as cloudy, white aggregates on the bottom of the bag. **Be careful** not to mix the platelets back into the plasma/saline.

Step	Action	Notes
19	**In this order**, first open the hemostats and then close the press on the plasma extractor. Express the plasma/saline mixture into the empty bag until the scale reaches **the targeted weight**, as calculated on F-230a. As you are extracting the plasma/saline, make sure that the platelets are not being extracted.	**Important: See F-230a to determine the targeted weight of the extracted plasma/saline bag before you perform this step.**
20	Close the clamps and weigh the bag of washed platelets: (platelets + bag). Then calculate the volume of washed platelets; see F-230a. Document both on F-230a.	The goal is to have approximately 40 ml ± 10 ml washed platelets (not including the bag). If the platelet is not 40 ml ± 10 ml, carefully adjust the plasma/saline volume until this goal is achieved.
21	Separate the bags using the heat sealer.	See quality control, *Using the Heat Sealer*.
22	Allow the bag of washed platelets to rest undisturbed on the counter for 60 minutes at room temperature. Document the beginning and ending rest times in F-230a.	
23	While the platelets are resting undisturbed, it may be time-efficient to modify the component in the computer, and to prepare component labels and a crossmatch tag. Document the washing process and syringe preparation (if requested) in the computer, but do not physically pull platelets into syringe at this point.	After the washing process is documented in the computer and a new face label is prepared, the plasma/saline bag may be discarded. If necessary, refer to • *Triage* CDM *Washed Platelets*. • *Triage* CDM *Syringe Preparation*.
24	After the resting period, gently manipulate by hand to achieve uniform re-suspension of the platelets. Remove F-230c from the bag and label the washed platelet with the appropriate washed face label. Place the platelets on the platelet rotator for at least 30 minutes. Document the time that the platelets were placed on, and removed from, the platelet rotator on F-230a.	

25	After rotating for at least 30 minutes, 1. Visually inspect to ensure the platelet is swirling and that no platelet aggregates are present. If it is not swirling or aggregates are visible, continue rotating for up to 2 hours. If not swirling or aggregates remain visible after 2 hours, do not dispense; consult a manager/supervisor. 2. Pull the desired volume of washed platelets into a syringe and label with the appropriate syringe face label, if necessary (for neonatal or fetal transfusion).	Document whether the visual inspection is satisfactory (S/U) on F-230a. The washed platelets must also meet the requirements listed in P401, *Dispensing Blood Components*.
26	Label the component with the appropriate transfusion tag.	If necessary, refer to P225*, Tagging Blood Components.*
27	Call the patient's physician or caregiver as soon as the component is available for transfusion.	

Notes

Using a 600 ml Transfer Pack

A 600-ml transfer pack should be used to centrifuge the platelet/saline component in the Sorval BP8 centrifuge. Using the bag that a platelet is normally supplied in does not work well for several reasons:

- Due to its large size, this bag must be folded before placement in the centrifuge; the platelets may not spin to the same spot in the bottom of this bag due to the multiple folds.
- The bag must be unfolded when placing on the plasma extractor, resulting in re-mixing of the platelets with the plasma/saline and a loss of platelets during extraction.

Sterile Connecting 2 Liquid-Filled Segments Together

The backup SCD in the processing room is not capable of connecting one liquid-filled segment to another liquid-filled segment. If it appears necessary to do so in order to prepare a syringe, then the TSCD-II sterile connection device must be used.

References

- AABB*, Technical Manual*, current edition.
- AABB, *Standards for Blood Banks and Transfusion Services*, current edition.
- Manufacturer's Directions, *Sorval RC 3B Plus, Rotor Precool*
- Manufacturer's Directions, *Sorvall RC BP8*

Authorized Reviewers

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Manager/Supervisor, Blood Bank

WASHING PLATELET COMPONENTS

Document Control

Location of Master: Master electronic file stored on the Beaumont Laboratory server under S:/ Master printed document stored in the *Transfusion Medicine Standard Operating Procedures Manual.*

Number of Controlled Copies posted for educational purposes: 0

Number of circulating Controlled Copies: 1

Location of circulating Controlled Copies: In the blood processing room, cabinet labeled as *Platelet Processing Logs / Stickers.*

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Manager:				
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