APHERESIS MANUAL
Policy and Procedure

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POLICY

1. Therapeutic Platelet Reduction is performed on either inpatients or outpatients under the following circumstances:
   1.1. Only with a Hematologist’s order using the Pre-printed Orders for Therapeutic Apheresis Procedures (PPO0193MR).
   1.2. Only by qualified Apheresis Unit Registered Nurses using the Blood Cell Separator.
   1.3. At the QEII, VG Site, in the Medical Day Unit (MDU), or at the patient’s bedside.
      1.3.1. Procedures that will not be completed prior to 1630 hours or when MDU closes or those scheduled after hours will be performed in the inpatient hospital room.
      1.3.2. Patients who are in Intensive Care or Intermediate Care Unit will have the platelet reduction performed at their bedside.
   1.4. The Registered Nurse (RN) is to adhere to the guidelines and procedures as outlined in subsequent sections, and prior to performing the procedure is to be deemed competent in the following policies:
      • CC 50-049 Non-tunnelled Hemodialysis Central Venous Catheter (CVC) (PELC)
      • CC 50-050 Care of The Tunnelled Hemodialysis Central Venous Catheter (PELC)
      • CC 75-005 Blood Transfusions: Administration of Blood, Blood Components and Blood Products (PELC)
      • CC 80-015 Non-tunnelled Central Venous Access Catheter (multilumen) (PELC)
      • CC 80-016 Tunnelled External Central Venous Catheter (Hickman) (PELC)
      • CC 80-019 Peripheral IV Therapy Initiation and Maintenance (PELC)
      • CC 80-021 Central Venous Access Device (CVAD) Umbrella Policy (PELC)
      • CC 80-022 Care of an Occluded Central Venous Access Device (CVAD) (PELC)
      • CC 85-079 Venipuncture for Blood Specimen/Blood Culture Collection (PELC)
      • MM 30-005 Direct IV Administration of Medication (PELC)

GUIDING PRINCIPLES AND VALUES

1. Platelet reductions are performed for patients who have abnormally high platelet counts – conditions such as essential thrombocytosis, myeloproliferative disorders or reactive thrombocytosis such as post splenectomy, acute hemorrhage, iron deficiency or chronic inflammatory disease. Platelet counts will often be 3-12 times higher than normal.
2. Platelet reductions provide immediate response. They can be repeated daily until adequate response is obtained as determined by the Hematologist.

3. In platelet reductions, disable the Collect Concentration Monitor (CCM) as it is not accurate.

4. The run time for this procedure is defaulted to 120 minutes.

5. The Inlet: AC Ratio defaults to 6:1. This ratio may be adjusted after the interface has been established however; this may result in clumping within the collect lines due to the high number of platelets in the system.

6. The anticoagulant (AC) infusion rate defaults to 0.8mL/min/L total blood volume (TBV).

7. The Blood Cell Separator sets the collect flow rate (CFR) according to the patient's platelet count.

8. Process 1 to 1.5 times the patient’s TBV.

9. Replacement fluids may be required as the volume collected may exceed the volume returned to the patient.

   **Note:** The return volume includes rinseback (190mL) and the anticoagulant volume.

10. The Hematologist determines the volume and type of replacement fluid to be given. Replacement fluid is delivered by IV Infusion Pump via the return line.

11. The Blood Warmer will be used for a platelet reduction. The return line on the kit is attached to the blood warmer tubing. The use of the Blood Warmer may help to decrease citrate reactions (Refer to AU 02-001 Blood/Fluid Warmer).

**GUIDELINES**

1. Ensure informed consent has been obtained from the patient or substitute decision maker prior to initiating the procedure. (Refer to CH 70-045 Consent to Treatment).

2. Perform all platelet reductions using the Extended Life Platelet Kit which requires the use of the dual-stage channel filler and the use of dual needle procedures.

3. Conduct the alarm test on all procedures during the priming sequence. During a platelet reduction do not activate the following alarms:
   
   3.1. spillover detected
   
   3.2. total plasma collected (collect and plasma bag) exceeds specified limit

4. In the event of an alarm, at any stage of a platelet reduction (prime, run or rinseback), address the cause of the alarm as soon as possible. (Refer to the “troubleshooting” section of the Operator’s Manual for the action required to correct the alarm.)

5. Do not operate the Blood Cell Separator under any of the following conditions:

   5.1. Room temperature greater than 27.5° C
   
   5.2. Centrifuge speed is 2400 rpm
   
   5.3. Inlet speed is 25 mL per minute or less
6. In the event of an adverse reaction stop the procedure and follow orders as per PPO 
Therapeutic Apheresis Procedures (PPO0193MR).

7. If the red blood cells in the Extended-Life Platelet Kit can not be returned to the patient, 
inform the Hematologist of the estimated blood loss.

    7.1. The Hematologist makes the decision to transfuse the patient.

**PROCEDURE**

**Equipment**
- Operator’s Manuals
- Blood Cell Separator
- Blood Warmer and blood warmer tubing
- Dual-stage channel filler
- Collect flow path overlay
- Dual-needle ELP (Extended-Life-Platelet) disposable kit
- Anticoagulant – ACD-A-1000 mL
- 0.9% Sodium Chloride – 1000 mL
- #17 fistula needle, # 18 or 20 IV Catheter or supplies necessary to access a central 
  line
- Dravon clamps
- Skin cleansing equipment
- Heat sealer
- Tape
- Gauze
- Alcohol swabs
- Bandaids

1. Upon receiving the referral from the Hematologist, the RN obtains the procedure orders 
and ensures informed consent is obtained from the patient or substitute decision maker. 
(Refer to Consent to Treatment CH 70-045)

2. Whenever possible, use peripheral veins for the platelet reduction. Assess for the 
following conditions which may indicate the need for the insertion of a central line:

   2.1. Small peripheral veins that would not support an adequate inlet speed. (A 16-17 
        gauge butterfly needle needs to be used for the draw and return, allowing the free 
        flow of red cells from the channel and return line through the return needle.)

   2.2. The number of procedures to be done.

   2.3. Inability of the patient to assist in maintaining adequate flow, (I.e. the patient is 
        unconscious or is unable to move or make a fist.)

3. In procedures performed peripherally:

   3.1. Insert the access needle in the antecubital fossa in either the median cubital or 
        basilic vein.

   3.2. Insert the return line in a vein in the antecubital fossa or in the forearm.

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3.3. Insert the return line first in order to obtain any blood for testing purposes.

4. Obtain a CBC, INR, PTT, height and weight prior to starting the procedure in order to determine the patient's Total Blood Volume (TBV).

5. Explain the procedure to the patient. Assess vital signs.

6. Set up and prime the Blood Cell Separator with the Extended Life Platelet Kit according to manufacturer's guidelines. Enter the appropriate patient information.

7. Perform venipuncture as per *Peripheral IV Therapy Initiation and Maintenance (CC 80-019)* or access central venous catheter according to protocol.

8. Refer to the Blood Cell Separators Operator's Manual for Platelet Reductions following the steps outlined.

9. During a platelet reduction, the patient may receive large amounts of Anticoagulant Citrate Dextrose Solution USP – Formula A (ACD-A). Observe the patient for signs and symptoms of citrate toxicity (refer to Documents: Complications of Therapeutic Apheresis and Suggested Management) and treat as per Pre-printed Orders for Therapeutic Apheresis Procedures (PPO0193MR).

10. Red blood cell spillovers may occur during this procedure due to an abnormal red cell size or density related to the patient's condition. If this should occur, follow the Operator's manual recommendations which may include:

   10.1. Reduce the inlet flow rate to increase the centrifugal force acting on the red cells.

   10.2. Reduce the plasma flow rate by increasing the patient's hematocrit in 3% increments until the interface appears at the appropriate level in the channel.

   **Note:** The platelets may be a dusky color seen in the collect line.

11. Following rinseback, remove needles or disconnect the patient from the machine.

12. Ensure a CBC is drawn post procedure – usually 1-2 hours post procedure.

13. Document the procedure and any adverse reactions on the progress notes of the health record. For out-patients, complete the narrative note section of the Nurse's notes.

14. Assess the need for subsequent platelet reductions daily upon receipt of the patient’s blood work.

15. Discard disposable sets for all procedures as biomedical waste. Place the collected waste (platelets) in the white plastic buckets for body fluid waste and label as "Body Fluids" – Biomedical Waste. (Refer to *Biomedical Waste Management CH 90-017*)

**REFERENCES**

Blood Cell Separator Operator’s Manual
Blood Warmer Operator’s Manual
McLeod, Bruce C. *Apheresis: Principles and Practice* AABB Press 2010
Terumo BCT Website and Operators Manuals

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RELATED DOCUMENTS

Policies
AU 01-001  Scheduling of Apheresis Procedures
AU 02-001  Blood/Fluid Warmer
CC 50-049  Non-tunnelled Hemodialysis Central Venous Catheter (CVC) (PELC)
CC 50-050  Care of the Tunneled Hemodialysis Central Venous Catheter (PELC)
CC 75-005  Blood Transfusions: Administration of Blood, Blood Components and Blood Products
CC 80-015  Non-tunnelled Central Venous Access Catheter (multilumen) (PELC)
CC 80-016  Tunneled External Central Venous Catheter (Hickman) (PELC)
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CC 80-021  Central Venous Access Device (CVAD) Umbrella Policy (PELC)
CC 80-022  Care of an Occluded Tunneled Central Venous Access Device (CVAD) (PELC)
CC 85-079  Venipuncture for Blood Specimen/Blood Culture Collection (PELC)
CH 70-045  Consent to Treatment
CH 90-017  Biomedical Waste Management
MM 30-005  Direct IV Administration of Medication (PELC)

Forms
PPO0193MR  Pre-printed Orders for Therapeutic Apheresis Procedures

Other
Apheresis - Emergency Drug Doses
Complications of Therapeutic Apheresis and Suggested Management
(the above are published with this policy under the Documents section)

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