|  |  |  |  |
| --- | --- | --- | --- |
|  | **Neonatal Transfusion Practice Protocols and Splitting Procedures**BB.COMP.1016.9 | **Dept:**  | 324311 |
| **Dept Name** | Blood Bank |
| **Effective Date:** | <7/20/09 |
| **Revised Date:** | Title 21 |
| **Name & Title**: CLIA Laboratory Medical Director | **Contact:** | Julie H. Simmons/Christina S. Warren |
| **Signature:** | Refer to Title 21 | **Date:** | **Title 21** |

**1. General Procedure Statement:**

1. **Purpose:**

The Blood Bank will provide blood and blood products for neonates (4 months old or less) that require transfusion(s).  ***This procedure applies to all red cell and component transfusions for neonates from birth through 4 months during any one hospital stay. Discharge and readmission requires repeat testing. Routine Standard Operating Procedures apply to all patients over 4 months of age.***

Because alloimmunization is rare and repeated testing increases iatrogenic blood loss, AABB Standards requires limited pretransfusion serologic testing for infants under 4 months of age. Initial testing must include ABO/Rh typing and antibody screen on plasma or serum from the neonate or mother usually a TSXN. During any one hospitalization, repeat testing may be omitted provided the antibody screen is negative and the patient is not discharged.

PUBS, Percutaneous Umbilical Cord Blood Sampling (also called cordocentesis), is a blood sample collected on an unborn infant. This is testing the infant’s ABO, Rh and DAT for potential blood transfusion. This test will be ordered on the mother’s MRN as the baby cannot be registered until it is born. These tests have been created so that they will not interfere with the mother’s history and that they are identified as testing on the unborn infant.

HDFN (Hemolytic Disease of the Fetus and Newborn) is caused by antibodies from the mother attaching and causing destruction to the infant’s red cells. The mother’s IgG antibody crosses the placenta, attaches to the antigen positive infant red cells and the red cells are destroyed by the infant’s spleen. The infant then responds by increasing red cell production (erythropoiesis). Excess red cell production causes “erythroblastosis fetalis” which in turn causes liver and spleen enlargement. If left untreated this can lead to “hydrops fetalis” causing death.

Treatment for the unborn infant with hemolytic anemia is IUT, Intrauterine Transfusion.

The procedure describes how to split or aliquot blood and platelets for neonates and to label appropriately.

 **B.** **Responsible Department/Scope:**

1. Procedure owner/Implementer: Julie H. Simmons/Christina S. Warren
2. Procedure prepared by: Julie H. Simmons

iii Who performs procedure: Department staff/management

1. **Definitions:**
	* + XM--Crossmatch
		+ DAT--Direct Antiglobulin Test
		+ NOGR RH POS--Unable to determine ABO Group/Type (Rh positive)
		+ NOGR RH NEG-- Unable to determine ABO Group/Type (Rh negative)
		+ NOGR RH Undetermined-- Unable to determine ABO Group/Type
		+ ECMO--Heart/lung support system
		+ SDD--Sterile Docking Device
		+ Neonate--4 months or younger
		+ DAT--Direct Antiglobulin Test
		+ BOP--Blood Order Processing
		+ TSXN—Type/Screen Neonate (test code in computer system)
		+ Mother Unit--Original unit that aliquots are taken from
		+ Psoralen treated platelet pheresis --Chemically treated during preparation that alters the DNA of white cells to be ineffective in graft versus host. This product does not require gamma irradiation and can be issued for patients needing irradiated treated products.
		+ PUBS- Percutaneous Umbilical Cord Blood Sampling (also called cordocentesis), is a blood sample collected on an unborn infant.
		+ MRN: Medical Record Number
		+ HDFN: Hemolytic Disease of the Fetus and Newborn
		+ IUT: Intrauterine Transfusion

**D. Sections**:

1. **Protocol for Neonatal Transfusion**
2. **Protocol for PUBS (Percutaneous Umbilical Cord Sampling Transfusion)**
3. **Splitting Blood for Neonates**
4. **Splitting Platelets for Neonates**

 **V. General Labeling/Label Check for Neonates**

**E. Protocol:**

 **I. Protocol for Neonatal Transfusion**

1. Certain testing is required for neonatal transfusions.
	1. Type and Screen Neonate is the test that should be ordered.

*Refer to Attachment 6: Type and Screen Neonate Flowsheet*

* 1. Properly labeled EDTA tube from the neonate and/or mother, if available.
	2. ABO/Rh, including weak D testing.
	3. IgG Solid Phase DAT or IgG gel DAT.
	4. Antibody screen on plasma/serum or eluate (maternal specimen should be used for antibody screen, if available). However cord plasma/serum is acceptable for testing.

NOTE: *The antibody screen should be tested in gel for 15 minutes for all neonate antibody screens.*

* 1. *If the initial screen for alloantibodies is negative,* it is unnecessary to crossmatch the donor’s red cells for the initial or subsequent transfusions. Repeat testing may be omitted up to 4 months of age during one hospital admission provided patient is not discharged and antibody screen is negative.
1. If you are selecting RBCs to a neonate and you get this message:



Mom has an antibody or positive antibody screen while baby has a negative screen.

1. You must contact management to determine next steps. You will not be able to issue the unit. Determine Mom’s MRN by going to (using baby’s MRN): Patient > Edit > demographics. Review mom’s PCW before calling management so you will have the details.
2. You will either be instructed to give antigen negative blood or unlink baby from mom.
3. If instructed by management to unlink (using baby’s MRN): Patient > Edit > demographics. Delete mothers MRN from box. F12 to save.
	1. *If the initial antibody screen demonstrates clinically significant alloantibodies*, the units must be antigen negative or compatible by antiglobulin crossmatch until antibody is no longer detectable in the neonate’s specimen.
4. Antigen negative blood is the routine practice without crossmatch test. If antigen negative is used and not crossmatched, the crossmatch should be cancelled and then the transfusion tag reprinted. The tag will read “not required” for the crossmatch.
* Red cell units should be selected that are compatible with infant and mother.
1. When antigen negative blood is not possible, crossmatch testing must be performed using a patient specimen within 72 hours.
* Examples include: Warm autoantibodies or unable to identify specific antibody.
* The maternal sample may be used for the crossmatch for the neonate if there is insufficient neonate sample.

NOTE: *The crossmatch should be tested in gel for 40 minutes.*

1. If the antibody screen is positive, then the mother’s history should be obtained to determine what antibodies have been identified in the mother.

NOTE: Maternal sample may be used to identify the antibody.

* 1. If the neonate has received passive alloantibody directed against his/her A or B antigens, the neonate’s plasma/serum shall be tested for anti-A and/or anti-B. Test methods must include an antiglobulin phase.
	2. Neonate is typed for ABO/Rh and antibody screen once when in hospital up to and including 4 months. If neonate is discharged and re-admitted, then the Type/Screen is tested again.
1. One packed red cell MANNITOL free unit will be assigned to each Neonate upon the first order for red cells. Multiple neonates may be assigned to the same packed cell.
	1. If the last amount in a ‘mother bag’ (original bag) is to be given to a neonate, then it should be

transferred to a transfer bag so that the true amount remaining in the bag can be determined. This is considered a split.

1. One A negative apheresis platelet will be routinely maintained in inventory specifically for neonates.

3.1 Aliquots may be prepared for transfusion of neonates that are A neg, A pos, O neg and O pos.

3.2 Neonates of any other blood group/type will receive aliquots from platelet units which are ABO/Rh identical or plasma compatible.

* 1. In the presence of passive alloantibody such as anti-A or anti-B in a neonate eluate, the neonate’s plasma/serum will be tested for anti-A and/or anti-B.
	2. When anti-A and/or anti-B are detected, transfuse group O red cells.
	3. Crossmatching is not required for Red cell products
1. All cellular blood products (packed cells, granulocytes) and platelet products must be irradiated for neonates.
2. The transfusion tag has a detachable label that should not be removed from the tag for infants.
	1. This will allow nursing to use the label on the syringe and meet the AABB/CAP standards that all blood products remain labeled during transfusion.
		1. Split aliquots will be labeled with the transfusion tag. Do NOT remove the label.
		2. Whole units (issued to OR or PICU) need 2 labels in case more than one aliquot is withdrawn.
* Print two transfusion tags and staple the label from one on top of the label on the tag to be attached to the bag as seen in Figure 1.



Figure 1 Transfusion tag with 2 labels

1. See table below for criteria for selection of blood/blood components for neonates.

|  |  |
| --- | --- |
| **Product** | **Selection Guide** |
| ***NEONATE****Packed Red Cells**And**Granulocytes* | **Patient Group/Type** | **1st Choice** | **2nd Choice** | **3rd Choice** | **4th Choice** |
| A pos | O pos | O neg |  |
| B pos | O pos | O neg |
| AB pos | O pos | O neg |
| O pos | O pos  | O neg |
| NOGR Rh pos | O pos | O neg |
|  |
| A neg | O neg |  |
| B neg | O neg |
| AB neg | O neg |
| O neg | O neg |
| NOGR Rh neg or NOGR/No Rh | O neg |
| ***For Red Cells****:** Group O and Rh type of the neonate. Reactions must be 2+ or stronger for Rh pos. If reactions are less than 2+, select Rh negative red cells.
* Red cells must lack antigens corresponding to clinically significant maternal antibody.
* CMV negative ***or*** leukoreduced. Green cards listing collection date, 5/10 day threshold dates, and expiration date will indicate age of unit.
* Mannitol Free - CPDA anticoagulant (</= 7 days old) or AS-3 (</=10 days old) is acceptable. If CPDA or AS-3 not available, notify management.
* Irradiate all blood up to and including 4 months of age and all Neonatal Intensive Care (ICN) patients (regardless of age).
* Irradiated red cells have a 24 hour expiration date for neonates (WFBH policy).
* Directed Donor units must be ABO/Rh compatible and irradiated.
* For exchange transfusion, red cells must be hemoglobin S negative.
* Any neonate >4 months but is still in the Neonatal Intensive Care (ICN) unit should receive group O irradiated blood.
* Neonates undergoing pediatric thoracic surgery require AS-3 or CDPA (mannitol free) red cells ≤5 days old or washed if older red cells must be used.

***For Granulocytes****:** ABO group specific or Group O and Rh type of the neonate. Reactions must be 2+ or stronger for Rh positive. If reactions are less than 2+, order Rh negative granulocytes.
* Granulocytes must lack antigens corresponding to clinically significant maternal antibody.
* CMV negative
* CPDA anticoagulant. AS-3 or AS-1 are acceptable if CPDA not available.
* Irradiate all granulocytes up to and including 4 months of age and all Neonatal Intensive Care (ICN) patients (regardless of age).
* Refer to ***(BB.COMP.1018): Granulocytes.***
 |
| **7.0 Selection of Platelets** |
| **Product** | **Selection Guide** |
| ***NEONATE****Platelets* | **Patient Group/Type** | **NEONATES (Order of preference)** | **NEONATES****ABO Incompatible Washed or *Emergency Release if needed emergently*****(Order of preference)** |
| A pos\* | **A, AB** |  **WASH O,B** |
| B pos | **B, AB** |  **WASH A,O** |
| O pos\* | **A, O, B, AB** |  |
| AB pos |  **AB** | **WASH A,B,O** |
| NOGR Rh pos | **AB** | **WASH A,B,O** |
|  |
| A neg\* | **A neg or AB neg** | **WASH O neg, B neg** |
| B neg | **B neg or AB neg** | **WASH A neg, O neg** |
| O neg\* | **O neg, A neg, B neg, AB neg** |  |
| AB neg | **AB neg** | **WASH A neg, B neg, O neg** |
| NOGR Rh neg or NOGR no Rh  | **AB neg** | **WASH A neg, B neg, O neg** |
| * \*The Current “routine” inventory platelet for Neonates is A negative because it can be issued to A and O patients.
* Patients that are group B will receive B platelets and all patients can receive AB Rh type specific platelets.
* Incompatible platelets must be washed.
* Compatible platelets--donor plasma compatible with patient’s red cells.
* Irradiated (platelet expiration does not change with irradiation).
* CMV negative ***or*** leukoreduced.
* Platelet units are not usually split for neonates if on ECMO or OR heart cases.
* Split platelet units have a 4 hour expiration, with exception of splitting a PHR5 into 2 bags.
* *Refer to* ***(BB.COMP.1019): Platelets***

 **DO NOT IRRADIATE psoralen treated platelets.** |
| **8.0 Selection of Plasma and Cryo** |
| **Product** | **Selection Guide** |
| ***NEONATE****Plasma* | **Patient Group/Type** | **1st Choice** | **2nd Choice** | **3rd Choice** | **4th Choice** |
| A | AB\* | A |  |
| B | AB\* | B |
| O | AB\* | O | A | B |
| AB | AB |  |
| NOGR | AB |
| * Rh does not apply
* \* Current plasma inventory for is AB plasma, divided
* Group AB Pedi Fresh Frozen Plasma (divided into 3 aliquots by the supplier).
* Plasma may also be group specific.
* One frozen AB FFP is kept thawed up to 5 days for use in emergencies.
* One thawed AB is kept in the PEDs ED fridge for use in emergencies.
* Refer to ***(BB.COMP.1032): Plasma*** and ***(BB.COMP.1034): Pedi FFP (PFFP).***

  |
| **NEONATE***Cryo* | **Patient Group/Type** | **1st Choice** | **2nd Choice** | **3rd Choice** | **4th Choice** |
| A | A | AB |  |
| B | B | AB |
| O | O | A | B | AB |
| AB | AB |  |
| NOGR | AB |
| * Rh does not apply
* Group AB or group specific as first choice.
* If group specific not available, any ABO group may be issued.
* Refer to ***(BB.COMP.1030): Cryoprecipitate*** and ***(BB.COMP.1031):******Pooled Cryo.***
 |

9.0 Standing Orders of blood units for neonates arrive at various times during each week, coming from

 both the American Red Cross and/or other supplier (i.e. Blood Connections).

* 1. Group O, leukoreduced red cells are received three times a week.
	2. Group A or AB Rh negative, CMV negative ***and/or*** leukoreduced platelets are received twice a week.
	3. Additional orders may be placed as needed.
	4. Refer to Blood Product Entry procedures to log in blood and components.

 10.0 Expiration dates of split products may need to be altered.

10.1 In a closed system, the original unit and the split unit maintain the same expiration date.

Open systems expire in 24 hours. Regardless of the type of system (open/closed), if no storage time is specified in the package insert or package insert is not available, the component shall have an expiration time of 4 hours after transfer from original container. AABB Standards 33rd edition: 5.7.2.1.3

* 1. Split red cell units irradiated for a neonate expire **24 hours** after transfer from original container and/or irradiation, whichever is sooner (WFBH policy).

 Refer to ***(BB.COMP.1022): Irradiation Procedure.***

a. Maximum storage time in Pedi-quad bags is 24 hours per manufacturer package insert.

b. If other bags are used, the package insert must be checked for maximum storage time. An

 expiration of 4 hours should be assigned if no time is specified or package insert not available.

* 1. Split platelet units with sterile docking another transfer bag with a 4 hour expiration date.
1. PHR5 unit when splitting into two bags, retain original expiration date if platelets remain in their original containers.
2. Refer to ***(BB.COMP.1019): Platelets.***

 11.0 A 150 micron filter (Charter Medical, Part # 03-960-32) is issued along with any product prepared for

 a neonate.

 12.0 When products are prepared for other facilities outside the Medical Center, charge appropriately.

 Refer to ***(BB.Protocol.1013.3):Blood Orders Protocols.***

 13.0 For split requested volumes, add extra minimum of 10 mls for product loss in filter. More than

 ordered should always be given to allow for loss in tubing, filter, etc.

 14.0 Minimum volume for split product is 25mls.

 15.0 Maximum volume for split product is 150 mls.

 16.0 Psoralen Treated platelet pheresis **MUST NOT** be irradiated in the Gamma cell.

 17.0 Split products – ‘mother bag’ must be ‘split’ (transferred to another bag) so that the volume can be

 measured (weighed) AND so that billing is accurate. If there is an adequate volume left in the mother

 bag and it is used without transferring to another bag, then a manual credit must be requested for the

 split charge. The CDM to credit for a split is 50003233.

a. See above (10) for expiration of split products.

 18.0 If a volume is ordered, then give the volume plus a minimum of 10ml extra to account for any loss.

 If a platelet is available that is LESS volume than the volume ordered, then consult with medical

 director or give a different unit with the volume ordered (plus the extra 10ml). Pediatrics may

 transfused based on volume.

 Ex. Order 240ml platelets. Acceptable: >250ml Unacceptable: <250ml

**II. Protocol for PUBS Transfusion**

1. The provider orders the PUBS test on the mother’s MRN. The sample will be labeled with mother’s name and MRN. The Wake One Order is: Intrauterine Transfusion Orders (PUBS).

a. This test includes specially created tests that will not interfere with mother’s history:

PABO, PRH, PDATG

b. Other tests may be added on by Blood Bank staff as needed including titers and antigen testing specific for PUBS testing

|  |  |
| --- | --- |
| **TEST TO BE DONE** | **TEST NAME IN SCC\*** |
| Rh System Antigen testing (C, c, E, e, Cw, V) | PC, PE, PLC, PLE, PCW, PV |
| Kell System Antigen testing (K, k, Jsa, Kpa) | PK, PLK, PJSA, PKPA |
| Duffy Antigen testing (Fya, Fyb) | PFYA, PFYB |
| Kidd Antigen Testing (Jka, Jkb) | PJKA, PJKB |
| MNS System Antigen testing (M, N, S, LS) | PM, PN, PS, PLS |
| Other Antigens not listed above | POT |
| Titers (antibodies to: L, E, D, LC, LE, K, FYA, FYB, JKA, JKB, S, M, N, A, A1, B) | PTAB1 (first antibody)PTAB2 (second antibody) PTAB3 (third antibody) |

\*the P in front indicates it is for PUBS

1. A TSX will also be collected on the mother to identify any antibodies present and crossmatching the unit. The BBID used for this sample will be used for the IUT red cell unit.
	1. Blood Bank technologist must ask the provider what the desired HCT is for the PUBS IUT RC unit.
	2. Document desired HCT (should be a range) on the Wake One order requisition.
2. The IUT red cell unit must be:
	1. Fresh (< 7 days old) if possible
	2. Washed (See step 4.0)
	3. Irradiated
	4. CMV negative equivalent (leukoreduced)
	5. HGBS negative
	6. O Negative (unless infant is O positive and O positive is needed to provide antigen negative)
	7. Antigen negative for the offending antibody
	8. Crossmatch compatible with mother’s TSX sample
	9. Final HCT within requested range.
3. WASHING SPECIAL INSTRUCTIONS
	1. Transfer the unit to a transfer bag after washing and label per SOP.
	2. Obtain a segment from the transfer tubing (it should be well mixed after transfer) and take to BMT lab (if open) for HCT. (Take to Hematology if BMT is closed.)
	3. If current HCT is within desired range
	4. Document HCT on unit bag and as comment in SCC; call to notify that unit is ready.
	5. If HCT needs to be adjusted.
4. Determine final volume of unit:

$$\frac{Current HCT x 200}{Desired HCT}=Final Volume$$

NOTE: use BMT calculator

Example:

 Current HCT = 73.1%

Desired HCT = 82% (desired HCT will be a range: 80-85 so pick a value in between)

 $\frac{73.1×200}{82}=$ 178

|  |  |
| --- | --- |
| Final Volume | Step(s) |
| >200 | Add saline to reach final volume.1. Spike the Unit with a sampling site coupler
2. Clean multi access port with alcohol. Using sterile syringe, draw off desired amount of saline from saline bag.
3. Clean sampling site coupler with alcohol. Using aseptic techniques add saline to RC unit through sampling site coupler.
 |
| <200 | 1. Take bag to BMT.
2. Sterile dock a 400 ml transfer bag onto the RC unit, do not break seal. Fold tubing and secure seal with rubber band.
3. Centrifuge per whole blood packing SOP.
4. Express saline into a transfer bag and seal.
* Place empty transfer bag on BMT scale and tare scale.
* Determine amount of supernatant to express:

$$200-Final Volume=ml of supernatant to express$$Example:$ 200-178=22$Current volume: 200Final volume: 178Express 22mL of supernatant Note: amounts can be small. Use caution to express correct amount!* Carefully hang unit on Plasma expresser.
* Hemostat, Remove rubber band and break seal
* Close Plasma expresser
* Ensure scale weight is 0
* Remove hemostats and allow desired amount of saline to enter satellite bag.
* Hemostat line and seal.

Strip tubing and mix bag. Make a segment and repeat the HCT.Consult management if HCT still out of range.  |

* 1. Document final HCT on bag and as unit comment in SCC; notify provider that unit is ready

for pickup.

1. PUBS will be of limited quantity and normal reflex testing may not be possible.
2. Change expiration of unit to 4 hours from time unit was transferred into container from COBE set.

a. COBE sets allow for 24 hour expiration according to package insert.

b. 400mL transfer bags do not indicate an expiration time, default is 4 hours.

1. A Pedi filter must be given with unit.
	1. In SCC:
		1. Add as a supply when irradiating
		2. Add as an instruction after selecting to patient
2. A second transfusion label must accompany the unit to the floor.
	1. Refer to Section I under Protocol, step 5.1.b.

**2. Procedure: III. Splitting Blood for Neonates**

 Chemical Risk Assessment: None

 Biological Risk Assessment: Moderate

 Protective Equipment: Lab coat, gloves

 **Supplies:** Pedi Quad-pack (Charter Medical, Part # T3000), Pedi bags and /or 400 mL transfer bag (Charter Medical,

 Part # T3000), Hemostats/Scissors

  **Reagents:** N/A

 **Equipment:**  Ohaus Scout Pro Balance, Sterile Docking Device, Hematron III heat sealer

 **Specimen Requirements:** N/A

 **itting Blood for Neonates**

| **STEPS** | **INSTRUCTIONS** | **CHANGE/****APPROVAL** |
| --- | --- | --- |
| **1.0** | **Perform all required testing.*** 1. ABO/Rh (and weak D, if necessary). Refer to ***(BB.R.100): ABO/Rh.***
	2. Antibody screen. Refer to ***(BB.R.1004): Antibody Screen.***
1. If antibody screen is positive, antibody identification panel is needed.
	1. IgG DAT or gel IgG DAT. Refer to ***(BB.R.1022): Direct Antiglobulin Test.***
 |  |
| **2.0** | **Prepare Neonate order (formerly TNEO -Transfuse Neonate) order is received at front desk.** 2.1 Front desk tech will receive order in computer. 1. Check Blood Bank Inquiry for history.
2. Verify BBID number.
3. For infants resulted as No Group, confirm Rh typing.
4. Confirm comment is present for Rh type to be used and Rh is dictated in computer.

 2.2 Take paperwork to component preparation tech. 2.3 CP tech will check unit availability on unallocated neonate shelf in Sera #3. a. Check green card with expiration date, draw date, and 7 to 10 day thresh- hold dates.   |  |
| **3.0** | **Select the correct product and ABO/Rh type on unit.** 3.1 Refer to ***Section E: Neonate Transfusion Practice Protocols*** |  |
| **4.0** | **Determine if unit needs to be split.** 4.1Some mother units that have already been split may only have adequate  volume for current volume requested and only require irradiation.4.2 If the order is:

|  |  |
| --- | --- |
| **A new TNEO order:** | **Using a unit already split:** |
| 1. Select unit based on patient blood type.
2. Gently mix unit well prior to splitting.
3. Sterile dock a neonatal/pedi-quad pack to the main unit. Refer to *(BB.COMP.1026):* *Sterile Docking Device.*
 | 1. Are bags already attached? If yes, proceed to step 4.3.
2. If no, sterile dock a neonatal/pedi-quad pack to the main unit. Refer to *(BB.COMP.1026):* *Sterile Docking Device.*
3. The green card will have the patient information written on it. Refer to attachment 5: Green card
 |

 4.3 Refer to *(BB.COMP.1026):* *Sterile Docking Device.*   G:\Lab_Shared\BloodBankStaff\Staff Projects\Waldron, Larry\LARRY WALDRON\TNEO Procedure\Sterile docker blood.JPGPedi/Quad packUnit to be split1. Clamp off any unused bags with hemostats or rubber bands.
2. Do two seals to each product.

  c. Tare weight of an empty 150 mL bag on Ohaus Digital Scale in component  prep.  d. Refer to ***(BB.COMP.1028): Ohaus Scout Pro Balance.***G:\Lab_Shared\BloodBankStaff\Staff Projects\Waldron, Larry\LARRY WALDRON\TNEO Procedure\NEWEST version of TNEO\tare.JPG |  |
| **5.0** | **Allow desired volume (grams-mL in 1:1 ratio) to drain into pedi bag while still on scale, adding ~10 mL extra to requested volume.**5.1 Minimum volume is 25 mL, maximum volume is 150 mL. |  |
| **6.0** | **Clamp with hemostats once desired volume (mL) is achieved and make four seals in line just above split unit with heat sealer. DO NOT separate units.**G:\Lab_Shared\BloodBankStaff\Staff Projects\Waldron, Larry\LARRY WALDRON\TNEO Procedure\NEWEST version of TNEO\4 seals.JPG |  |
| **7.0** | **Perform divide in SCC by going to Inventory>Edit>Cr\_Product>Divide.** 7.1 Choose label type:

|  |  |
| --- | --- |
| If ISBT unit: | Label(s) will print on Hematrax printer (Refer to Attachment 3 for Examples). |
| If Codabar unit: | Split label will need to be used, with all appropriate information recorded (Refer to Attachment 4 for examples). |

7.2 Split unit that had been sterile docked will have same expiration as original unit or  expiration as listed in package insert for satellite bag, whichever is shorter. 1. Open systems expire in 24 hours. Regardless of the type of system (open/closed), if no storage time is specified in the package insert or package insert is not available, the component shall have an expiration time of 4 hours after transfer from original container. AABB Standards 33rd edition: 5.7.2.1.3
2. After irradiation, expiration becomes 24 hours.

|  |  |  |
| --- | --- | --- |
| Unit | Product | Check for: |
| **Unit donor number** | **All** | **Identical unit number****Division code on splits (i.e. VAO, VBO, VCO, etc.)** |
| **Expiration date/time** | **Blood** | **24 hours (max) for neonates\* see 7.2 above**  |
| **Platelets** | **Split platelets have 4 hour expiration.** *Note: Splitting a PHR5 platelet into two bags* ***DOES NOT*** *change expiration.* |
| **ABO/Rh** | **All** | **ABO/Rh identical** |
| **Anticoagulant** | **All** | **Same type as original and split unit** |
| **Volume** | **All** | **Volumes should reflect amounts that were split and ones remaining** |
| **Product Code** | **All** | **Codabar: appropriate label****ISBT: Label will print after computer function.** |

7.3 Document any materials used by using the Ctrl+R function to add a supply and selecting  the appropriate materials from the list. 1. Document aliquot bag and pedi filter.

 NOTE: Add a an aliquot bag with each individual split, NOT just when the aliquot  bags are initially docked to the mother bag. Select QUAD as the supply and  indicate the number used.  |  |
| **8.0** | **Perform Label Check. Refer to *(BB.COMP.1016.2) Neonates: IV. General Labeling/Label Check for Neonates.*** |   |
| **9.0** |  **Cut the seal with scissors, leaving two segments on both the split unit and line connected to mother bag and irradiate the unit. \*\* Refer to *(BB.COMP.1022:)* *Irradiation of Blood and Blood Products.******G:\Lab_Shared\BloodBankStaff\Staff Projects\Waldron, Larry\LARRY WALDRON\TNEO Procedure\NEWEST version of TNEO\blood segments.JPG*** 9.1 Unit will now have 24 hour expiration if split into pedi-quad bag. 9.2 After physically irradiating ISBT split part, new label will print reflecting  irradiation. It is necessary to only use the bottom half of the newest label on unit. 9.3 Label Check unit once again after irradiation.\*\*NOTE: If using AS-1 bag with no tail and having to dock to segment tail, cut the seal leaving 2 segments on split. The line connected to the mother bag can be used to make additional segments on mother bag. Leave enough room adjacent to bag for any additional docks.  |  |
| **10.0** | **Unit is now ready to be Selected in SCC.***Refer to: SCC-Component Prep Quick Reference Guide*10.1 Select only the split part.  a. Attach unit tag and BBID to unit. Compare ABO/Rh of patient,  ABO/Rh of unit, and ABO/Rh of unit tag.  10.2 Charge for 150 micron filter by charging “PFILTR” as an Instruction on the  unit in Inventory>Product Order Service>Instruction.*Refer to Attachment 1: How to Charge for a Pediatric Filter*1. If filter is not used, then credit the patient by cancelling the instruction in Inventory>

Product Order Service>Instruction.*Refer to Attachment 2: How to Credit a Charge for a Pediatric Filter* 10.3 Place main unit with pedi-pack back in Sera #3. 10.4 Place aliquot on “Allocated Neonate” shelf in Sera #3. a. Place Pedi filter with order slip.   |  |

**IV. Splitting Platelets for Neonates**

 Chemical Risk Assessment: None

 Biological Risk Assessment: Moderate

 Protective Equipment: Lab coat, gloves

 Supplies: Pedi Quad-pack (Charter Medical, Part # T3000), Pedi bags and /or 400 mL transfer bag (Charter

 Medical, Part # T3000), Hemostats

 Reagents: N/A

 Equipment: Ohaus Scout Pro Balance, Sterile Docking Device, Hematron III heat sealer

 Specimen Requirements: N/A

| **STEPS** | **INSTRUCTIONS** |
| --- | --- |
| **1.0** | **Platelet order received by front desk tech.** * 1. Front desk tech checks for ABO/Rh and receives order.
	2. Order is forwarded to Component Prep area.
 |
| **2.0** | **Select unit based on chart below. *An A-neg, irradiated unit is already designated for Neonate use, if ABO acceptable.*** 2.1 Refer to ***(BB.COMP.1019): Platelets.***

|  |  |  |  |
| --- | --- | --- | --- |
| Patient Group | First Choice | Second Choice | Alternative |
| Children up to and including 16 years old | ABO Identical | ABO Compatible | ABO Incompatible either volume-reduced or washed |
| Neonates | See protocol Neonates and platelets. |
| NOGR | AB Platelets | Any group washed |  |

 |
| **3.0** | **Sterile dock a neonatal/pedi-quad pack to the main unit, *if not already done*. Refer to *Sterile Docking Device (BB.COMP.1026).***  3.1 If volume requested is greater than 150mL, use 400mL transfer bag or consider allocating whole unit.G:\Lab_Shared\BloodBankStaff\Staff Projects\Waldron, Larry\LARRY WALDRON\TNEO Procedure\Sterile docker platelet.JPGRubber band used to knot tubing |
| **4.0** | **Allow desired volume (grams-mL in 1:1 ratio) to drain into pedi bag, adding ~10 mL extra to requested volume.**4.1 Minimum volume is 25 mL, maximum volume is 150 mL. 4.2 Clamp off any unused bags with hemostats or rubber bands. 4.3 Tare weight of an empty 150 mL on Ohaus Digital Scale.  4.4 Refer to ***Ohaus Scout Pro Balance (BB.COMP.1028).*****G:\Lab_Shared\BloodBankStaff\Staff Projects\Waldron, Larry\LARRY WALDRON\TNEO Procedure\NEWEST version of TNEO\tare.JPG** |
| **5.0** | **Clamp with hemostats once desired volume (mL) is achieved and make four (4) seals in line just above split unit with heat sealer. DO NOT separate units.****G:\Lab_Shared\BloodBankStaff\Staff Projects\Waldron, Larry\LARRY WALDRON\TNEO Procedure\NEWEST version of TNEO\platelet 4 seals.JPG**4 seal locations |
| **6.0** | **Perform divide function in SCC in Inventory>Edit>Cr\_Product>Divide.** 6.1 Choose label type:

|  |  |
| --- | --- |
| If ISBT unit: | Label(s) will print on Hematrax printer (Refer to Attachment 3 for Examples). |
| If Codabar unit: | Split label will need to be used, with all appropriate information recorded (Refer to Attachment 4 for examples). |

6.2 Split platelet unit will have 4 hour expiration.

|  |  |  |
| --- | --- | --- |
| Unit | Product | Check for: |
| **Unit donor number** | **All** | **Identical unit number****Division codes on splits (i.e. VAO, VBO, VCO, etc.)** |
| **Expiration date/time** | **Blood** | **24 hours for neonates or 28 days for irradiated** |
| **Platelets** | **Split platelets have 4 hour expiration.** *Note: Splitting a PHR5 platelet into two bags* ***DOES NOT*** *change expiration.* |
| **ABO/Rh** | **All** | **ABO/Rh identical** |
| **Anticoagulant** | **All** | **Same type as original and split unit** |
| **Volume** | **All** | **Volumes should reflect amounts that were split and ones remaining** |
| **Product Code** | **All** | **Codabar: appropriate label****ISBT: Label will print after computer function.** |

 6.3 Document any materials used by using the Ctrl+R function and selecting the appropriate materials from  the list. NOTE: Charge for an aliquot bag with each individual split, **NOT** just when the aliquot bags are  initially docked to the mother bag.   |
| **7.0** |  **Physically label unit(s) and perform Label Check. Refer to *Label Check Policy/Procedure (BB.COMP.900).*** 7.1 Split platelet for neonate will have 4 hour expiration. 7.2 Use IRRADIATED sticker in lieu of Radsure or Rad Control for units that mother unit  was already irradiated. **IRRADIATED** |
| **8.0** | **Cut the seal with scissors, leaving two segments on both the split unit and mother unit and Select unit under Inventory>Product Order Service>Select.****G:\Lab_Shared\BloodBankStaff\Staff Projects\Waldron, Larry\LARRY WALDRON\TNEO Procedure\NEWEST version of TNEO\platelet segments.JPG** Note the segment(s) on each bag 8.1 Select only the split part. The main unit does not get allocated, except  special cases such as ECMO or OR heart case.  8.2 Charge for 150 micron filter by charging “PFILTR” as an Instruction on the unit in  Inventory>Product Order Service>Instruction.*Refer to Attachment 1: How to Charge for a Pediatric Filter*1. If filter is not used, then credit the patient by cancelling the instruction in Inventory>

Product Order Service>Instruction.*Refer to Attachment 2: How to Credit a Charge for a Pediatric Filter* 8.3 Place aliquot platelet rotator.  a. Place pedi filter with slip.   |

1. **General Labeling/Label Check for Neonates**

 Chemical Risk Assessment: None

 Biological Risk Assessment: None

 Protective Equipment: Lab coat, gloves

Reagents: N/A

Supplies: N/A

Equipment: N/A

Specimen Requirements: N/A

| **STEPS** | **INSTRUCTIONS** |
| --- | --- |
| **1.0** | **Proper labeling of split units is essential and has already been discussed in prior steps.** * 1. Select label accordingly:

|  |  |
| --- | --- |
| **Codabar** | Select the appropriate split product label (red cells or platelets) that has the correct matching information as the original unit. Transcribe volume and anticoagulant information.  |
| **ISBT** | For ISBT units, the label will print after the splitting function has been done in SCC. Both the new split label and label for original unit will print. The entire label for the split unit will be used and just the lower half of the label for the original unit will be used. |

* 1. On the original unit, do not cover up unit barcodes that nursing needs to scan for blood

administration.* 1. Add the ABO recheck label that prints to unit bag (split).
 |
| **2.0** | **Perform Label Check in SCC.** 2.1 Refer to table below for checking label:

|  |  |  |
| --- | --- | --- |
| Unit | Product | Check for: |
| **Unit donor number** | **All** | **Identical unit number****Division codes on splits (i.e. VAO, VBO, VCO, etc.)** |
| **Expiration date/time** | **Blood** | **24 hours (max) for neonates\* see 7.2 above.** |
| **Platelets** | **Split platelets have 4 hour expiration.** *Note: Splitting a PHR5 platelet into two bags* ***DOES NOT*** *change expiration.* |
| **ABO/Rh** | **All** | **ABO/Rh identical** |
| **Anticoagulant** | **All** | **Same type as original and split unit** |
| **Volume** | **All** | **Volumes should reflect amounts that were split and ones remaining** |
| **Product Code** | **All** | **Codabar: appropriate label****ISBT: Label will print after computer function.** |

 |
| **3.0** | **Unit is now ready for allocation and /or placement back into appropriate refrigerator or platelet rotator.** |

**3. Review/Revised/implemented:**

 All protocols must be reviewed as stated in the Document Control Protocol.

 All new protocols that have major revisions must be signed by the CLIA Director.

 All reviewed protocols with minor revisions can be signed by the designated section medical

 Director or designee

**4. Related Protocols:**

* + - *ABO/Rh* (BB.R.1001)
		- *Antibody Screen* (BB.R.1004)
		- *Direct Antiglobulin Test* (BB.R.1022)
		- *Irradiation of Blood and Blood Products* (BB.COMP.1022)
		- *Platelets* (BB.COMP.1019)

**5. References**:

 Technical Manual, American Association of Blood Banks. Revised periodically.

 AABB Standards for Blood Banks and Transfusion Serviced. Revised periodically.

 **6. Attachments**:

Attachment 1: How to Charge for a Pediatric Filter

Attachment 2: How to Credit a Charge for a Pediatric Filter

Attachment: ISBT Label examples

Attachment: Codabar Label examples

Attachment: Type and Screen Neonate Flowsheet

Attachment: SCC-Component Prep Quick Reference Guide

 **7. Revised/Reviewed Dates and Signatures:**

 Refer to archive history/Title21.



