Blood Component and Blood Product Administration Policy

TABLE OF CONTENTS

Policy	Page 2
Definitions	Page 2
Guidelines	Page 4
Pre-Transfusion Preparation	Page 4
Prior to Retrieving Blood Component/Product	Page 5
Retrieving Blood Components and Blood Products from the TML	Page 6
Assignment/Issue Cards	Page 7
Computer Downtime procedure	Page 7
Receipt of Blood Components/Products	Page 7
Confirming Patient and Blood Component/Product Information	Page 8
Visual Inspection of Blood Components/Products	Page 8
Administration of Blood Components and Blood Products	Page 9
Administration Sets and Filters	Page 10
Observation and Monitoring	Page 10
Documentation	Page 11
Assignment/Transfusion Cards	Page 11
Patient Handover during a Transfusion	Page 12
Emergency Issuing	Page 12
Transfusion Reactions	Page 13
Procedure	Page 14
References	Page 15
Appendixes	Page 16
Appendix A: ABO/Rh Compatibility Table	Page 16
Appendix B: Adverse Transfusion Reaction – SIGNS AND SYMPTOMS	Page 17
Appendix C: Transfusion Reaction Algorithm	Page 18

Policy

1. This policy was developed collaboratively by Transfusion Medicine and the Nursing Department. Transfusion Medicine is responsible for blood component and blood product administration updates and the Nursing Department for operational implementation.
2. Labrador-Grenfell Health (LGH) will support best practice for the administration of blood components and blood products consistent with current Canadian Standards Association, (CSA) Standard Z902. Guiding principles will be adapted from Canadian Society of Transfusion Medicine (CSTM) standards, Newfoundland and Labrador (NL) Provincial Blood Coordinating Program Policies, and the American Association of Blood Banks (AABB) standards.
3. Informed patient consent to treatment with a blood component or blood product requires documentation in the patient's permanent health record. A substitute decision maker may consent on behalf of the patient.
4. Blood components/products will be issued from the Transfusion Medicine Laboratory (TML) and administered to the patient based on written orders from the treating physician, and in accordance with the protocols within this policy. In this document the Transfusion Medicine Laboratory will be referred to as (TML).
5. Positive patient identification (PPI) is **mandatory** prior to administration of a blood component/product. In an emergency situation, where life is threatened and positive identification is unattainable, the responsibility falls to the treating physician to sign the Release of Emergency Blood form, which will be provided by the TML.
6. Nursing/Transfusionists are responsible to complete education annually or more frequently (if required) to ensure continued competence in blood component/product administration.

Definitions

Adverse Transfusion Reaction: Adverse transfusion reaction is identified as an undesirable and unintended response to the administration of blood components/products that are considered to be definitely, probably, or possibly related to these products.

Blood Component: A therapeutic component of blood intended for transfusion. Blood components are defined as: red blood cells (RBCs), platelets, plasma, and cryoprecipitate.

Blood Product: Any therapeutic product derived from human blood or plasma, and produced by a manufacturing process. Some common blood products include intravenous immunoglobulin (IVIG), Rh immunoglobulin, albumin, and factor concentrates.

Clerical Discrepancy: A clerical discrepancy exists when there is less than 100% consistency in the information on the blood component or blood product, blood transfusion card, and the patient's identification band.

Close Observation: Being in near proximity and able to render care immediately if necessary.

Positive Patient Identification (PPI): A minimum of two unique identifiers are verified/checked as part of the patient's identity upon admission, transfer and prior to administration of care. Unique identifiers include: **patient's full name, unit number or health card number, date of birth (if unit number or health card number not available)**. See CL-7-040 Client Identification for more details on how to accurately identify LGH patients prior to providing care and service.

Substitute Decision Maker: The person who will give consent on behalf of the patient if the patient does not have the capacity to consent. See A-1-50 CONSENT for more details on obtaining and verifying informed consent from the client or authorized person.

Transfusionist: A health care professional who is qualified to transfuse blood components/blood products.

Transfusion card: Attached to all blood components/products issued by TML. This form is to remain on all products for the duration of the transfusion. All areas of the form will be filled out by the individual who administered the product (transfusionist).

Transfusion Medicine Laboratory (**TML**): Commonly referred to as Transfusion Medicine Department or Blood Bank.

Uncrossmatched Blood: Blood that has not undergone pre-transfusion testing. This may be requested by the treating physician in life-threatening situations.

Guidelines

1. Blood components/products to be transported to a patient care area will be ordered in Meditech. During computer downtime, a laboratory paper requisition will be completed and brought to the TML prior to issuing any blood components/products.
2. Only one unit at a time will be issued per patient.
3. All blood components/products will be transported to the patient care area in a clear plastic bag, provided by the TML.
4. Blood components/products will be transported to the patient care area immediately upon retrieval from the TML.
5. Infusion must begin immediately upon delivery of components/products to patient care area, and within **60 minutes** of removal from TML designated storage area.
6. **DO NOT** store blood components/products in refrigerators in the patient care area, as the temperature is not appropriately monitored for blood components/products.
7. Return components/products to TML **immediately** if transfusion cannot be started.
8. ALL non-transfused blood components/products **will** be returned to TML in order to properly update the patient transfusion history.

Pre-Transfusion Preparation

1. Initiate the Transfusion Checklist.
2. Review physician's orders, including indication, blood component/product required, amount, rate of infusion, as well as other specific instructions such as pre/post medication orders.
3. Review applicable bloodwork (CBC, INR, etc.) and confirm indication. Ensure that any required laboratory testing is completed (Type&Screen, Crossmatch, etc.).
4. Confirm informed consent for transfusion is signed by patient and on chart.
5. Enter blood component/product order in Meditech; include any required modifications or special instructions (Irradiated, CMV negative, etc.). Check patient history to determine if patient was pregnant and/or transfused within the last three (3) months, and document in the patient Order Entry field.

Prior to Retrieving Blood Component/Product

1. Confirm blood component/product is ready for pickup in Meditech.
    - From the Nursing main menu, go to **"Print BBK View Available Products by Patient"** and search the patient by their MCP or unit number to generate a report.
    - RBC's available for the patient will say "**XMC"** (crossmatch compatible) under the **Status** column, all other available blood components/products will say **"ASN"** (assigned).

    Note: This report provides the required documentation (at least two unique identifiers, location, and the blood product requested) for the TML to issue any blood components/products. If you do not already have a hardcopy of the report, print this to bring with you to pick up the blood.
2. Equipment required readily available at bedside including IV pump/pole, and any additional equipment if ordered (i.e. blood warmer, rapid infuser, etc.).
3. Patient teaching completed including signs and symptoms of an adverse transfusion reaction. Ensure patient's questions and/or concerns regarding the purpose and process of transfusion have been addressed.
3. Check patient identification band (if band is inaccessible or removed, a procedure must be in place to ensure unequivocal identity of the patient before the transfusion is started).
4. Intravenous (IV) access established and patent.
5. Administration set and filter flushed with a compatible solution. 0.9% normal saline solution is recommended when there is direct contact between IV solution and blood component/product.
6. **Note the following:**
    - IVIG products are **only** compatible with D5W.
    - Do not infuse an IV medication directly with blood components/products. If there is no alternative IV access, use or attach a Y extension set. Administer medication through alternate limb of Y set. Clear line with 0.9% normal saline (or D5W when appropriate) prior to/post medication administration;
    - When medically necessary, a blood component/product can be transfused via an existing intravenous line. Clear the line with an appropriate solution pre/post transfusion.

7. Assess baseline vital signs (must be completed **within 30 minutes** of starting transfusion).
8. Administer pre-medication(s) if indicated/ordered.

Retrieving Blood Components and Blood Products from the TML

Note: Persons retrieving blood components/products will:

- Be a staff member of LGH and complete transporting blood components/products internally education;
- Bring a hardcopy identifying the patient, location, and the blood component/product they are collecting;
- Provide appropriate staff identification (ID).

1. Locate the requested blood component/product in the designated temperature storage location in the TML. There will be an attached **Assignment/Transfusion Card** with the component or product indicating patient name, location and the type of blood component/product. Ensure the transfusion card matches the hardcopy report.
2. Sign out the blood component/product from the TML by locating and filling out the matching **Assignment/Issue Card** located in the **Blood/Blood Products Sign-out Binder**.
3. Perform a visual inspection of the blood component/product and document on the **Assignment/Issue Card**.
4. Check the expiry date of the blood component/product and the date/time indicated on the **"DO NOT TRANSFUSE AFTER"** stamp, which is located on the Assignment Issue and Transfusion Cards.
5. If present, a laboratory technologist will assist in confirming the blood product requested, patient identifiers, ABO/Rh compatibility, and ensure that the unit or lot number on the blood component/product matches the number on the labels.
6. Once completed, the individual retrieving the product will print their mnemonic in the **"Taken By"** area and the lab technologist will print their mnemonic in the **"Verified By"** area on the **Assignment/Issue Card**.
7. If pickup is after hours, and there is no technologist available to assist in the issuing process, a second, qualified individual will accompany the person picking up the blood component/product and print their mnemonic in the **"Verified by"** area on the **Assignment/Issue Card**.
8. Insert blood component/product into a clear plastic bag prior to leaving the TML.

Assignment/Issue Cards

The following information will appear on the **Assignment/Issue card**:

- Patient's full name and demographics (unit #, HCN, location, age, sex, DOB);
- Type of blood component/product;
- Patient blood type;
- Product blood type (if applicable);
- Unique product/donor number;
- Visual inspection performed at retrieval (to be completed by individual picking up blood component/product);
- Section for "Date/Time removed";
- Section for "Taken by" and "Verified by";
- Section for "Date/Time Returned" and "Returned by" (to be filled out if blood component/product was returned to the laboratory unused).

Computer Downtime Procedure

1. Blood components/products will be issued by the laboratory following presentation of a completed laboratory paper requisition. The requisition must clearly indicate:
   - Patient's full name and DOB;
   - A second unique identifier (E.g. MCP, chart#);
   - Type of blood product(s) requested;
   - Quantity/volume required;
   - Date and time product required;
   - Patient's location.
2. After required testing is completed and the blood component/product is ready for pick-up, the laboratory will telephone the patient's attending nurse to notify them.
3. Assignment/Issue and Transfusion cards are manually completed by the TML, and the same process will be followed for picking up the blood component/product.

Receipt of Blood Components/Products

The person who transports the blood component/product will hand off the product to the patient's nurse in the specific Patient Care Area. There must be an acknowledgement that the product has been received.

Confirming Patient and Blood Component/Product Information

1. The nurse/transfusionist who starts the transfusion must check ALL blood components/products with a **second qualified person**.
2. The check will be completed at the patient's bedside.
   Note: The highest risk during transfusion is administering the wrong blood to the wrong patient. Therefore, **two** persons **will** check identification in the presence of the patient.
3. The following will be checked:
   a. Physician's orders including blood product type and dose.
   b. Patient's full name and at least one unique identifier on:
      - Transfusion card attached to blood component/product ;
      - Patient's chart;
      - Patient identification band.

   Note: These **will** be identical. If possible, the patient should also participate by stating name and DOB.
   c. ABO Blood Group and Rh (if applicable) of both the patient and the unit on the:
      - Transfusion card attached to the blood;
      - Canadian Blood Services (CBS) Blood Product label.

   Note: If **not** identical, refer to **Appendix A: ABO / Rh Compatibility Table.** Any unresolved discrepancies must be brought to the attention of the TML staff. (Exception: blood products such as albumin and IVIG do not have blood groups).
   d. Unit/Lot number **will** be identical on the following:
      - Transfusion card attached to blood component/product;
      - CBS label/Blood product label.

Visual Inspection of Blood Components/Products

1. Inspect for abnormal appearance such as unusual color, clots or turbidity.
2. Inspect to ensure the port and seal is intact on the vial or bottle.
3. Products in a glass bottle must be inspected for particulate matter before infusion. Do not use if any particulates are seen in the product and return product to the TML.
4. Any concerns should be reported to the TML immediately.

Administration of Blood Components and Blood Products

1. If it is greater than 30 minutes from when baseline vitals were completed, repeat vitals prior to starting transfusion.
2. Start transfusion **within 60 minutes** of removal of blood component/product from temperature controlled storage.
3. If a delay is going to occur, return product promptly to the TML. Sign the blood component/product back into the **blood/blood product sign-out binder,** by filling out the **"Returned by"** section.
   - When returning unused blood component/product:
     - Give the blood component/product to a technologist present in the TML
     - If there is no technologist available, place the unused blood component/product into the **quarantine basket** in the appropriate storage area (Blood bank refrigerator/Room temperature incubator).

   Note: Blood Components and Blood Products that have been outside of the temperature-controlled environment for more than 60 minutes will be discarded (by the TML) and a blood wastage report completed by the TML technologist.
4. Gently agitate blood components to mix thoroughly.
5. Infuse RBC's through an 18 gauge cannula or larger, to promote optimum flow, and prevent hemolysis. A 22 to 24 gauge cannula may be used for children, with decreased infusion rates.
6. Under special circumstances warmed blood may be required by order of the physician. The warming unit must be CSA approved, and maintained as per manufacturers' criteria. Refer to Fluid/Blood Warmer Policy for more information.
7. Infusion rates, amount to be infused, product, and physician's order depend on clinical condition of patient. Each product **will** be administered **within four (4) hours of removal from storage**.
8. When infusing blood components/products that require an infusion pump, the Infusion Pump Policy will be followed.
9. Transfuse slowly, 50 mL/hr for the first 15 min, where applicable.
10. For IVIG refer to Intravenous Immune Globulin infusion rates, and for increment suggestions.

Administration Sets and Filters

1. 170 to 260 micron filters will be used for blood components- RBCs, plasma, platelets, and cryoprecipitate. For other products, check the applicable Blood Component/Product Clinical Practice Guideline for appropriate filters (or package insert if CPG not available).
2. If pressure bag is used, pressure should not exceed 300 mmHg.
3. Flush the line with 0.9% sodium chloride solution (or D5W when appropriate) following the transfusion to ensure remaining product is transfused.
4. Change sets and filters as follows:
    - If more than 60 minutes has elapsed before another transfusion is initiated;
    - For a continuous infusion in which products are changed every 4 hours, change tubing at the same time, as product left in tubing will exceed the 4 hour expiry time;
    - After four consecutive units is transfused (as long as the 4 hour period is not exceeded);
    - If blood is not infusing at the desired rate and the administration set becomes occluded;
    - Recommended between the administrations of different blood components/products. A new administration set **will** be used for **platelet** transfusions.

Observation and Monitoring

1. Vital signs include temperature, heart rate, respiration rate, blood pressure, and oxygen saturations. Assess lung sounds on patients at risk for circulatory overload (i.e. elderly, pediatric, cardiovascular disease).
2. Explain monitoring that is required during procedure to patient or substitute decision maker if applicable.
3. Remain with the patient for close observation, especially during the first 15 minutes of transfusion.
4. Assess patient and record vital signs, at a **minimum**, as follows:
    - Within 30 minutes prior to starting transfusion;
    - After the first fifteen (15) minutes of transfusion;
    - Every hour during transfusion;

- Following completion of transfusion;
- If a transfusion reaction is suspected;
- More frequently as indicated by the clinical situation, or as ordered by physician;
- Repeat for every subsequent unit.

5. If the transfusion is less than sixty (60) minutes (i.e. WinRho) vital signs will be completed within 30 minutes prior to transfusion, on completion, and as required by clinical condition.
6. Monitor patient and vital signs as described in step 4, when more than one of the same product is given with different **lot** or **product number**.
    - For IVIG, refer to Intravenous Immune Globulin infusion rates
7. In an ambulatory setting,
    - For blood products given intramuscularly (IM), maintain close observation for possible transfusion reactions at least 30 minutes (and dependent on patient condition);
    - Educate patient on the signs and symptoms of a possible adverse reaction;
    - Provide the patient with instructions on what to do if they experience signs or symptoms of a possible adverse reaction.

Documentation

Observations, assessments, education, notification to the physician, intake and output, and vital signs will be documented on the appropriate forms within the permanent health record. This will also include how the patient tolerates the transfusion, and the presence or absence of a suspected transfusion reaction.

Assignment/Transfusion Cards

1. The following information will appear on the **Assignment/Transfusion card** attached to the blood component/product:
    - Patient's full name and demographics (unit #, HCN, location, age, sex, DOB);
    - Type of blood component/product;
    - Patient blood type;
    - Product blood type (if applicable);
    - Unique product/donor number;
    - Section to check off that Visual inspection was performed at patient bedside;

- Section for Mnemonic of person administering the transfusion, and Mnemonic of second person verifying the information during the pre-transfusion check;
- Section for date/time transfusion began;
- Section for date/time transfusion ended;
- Section for volume transfused
- Section to note any type of reaction.
- Section to document the use and temperature of a blood warmer.

Note: This card has two identical copies that will be completely filled out. One copy goes on the patient chart and the second copy must be returned to the laboratory with the empty blood component/product and placed in the **"Transfused Blood Products"** basket. Before returning to the TML, insert the empty blood component/product into a biohazard bag and the completed Transfusion card in the front pocket of the biohazard bag.

Patient Handover during a Transfusion

When transferring a patient during a transfusion, the nurse giving report and the nurse receiving report will both recheck the transfusion order, consent form, and identifying information in the presence of patient. The nurse who is now responsible for care will sign the Transfusion Card as well.

Emergency Issuing

1. If required, refer to the Massive Hemorrhage Protocol.
2. Exceptions to policies may be made during emergency situations where life is threatened. Documentation will be completed as soon as possible when the patient is stabilized.
3. When positive identification is unavailable, (i.e. during an emergency situation), O negative RBCs and AB plasma will be issued. A type and screen, and crossmatch will be drawn prior to transfusion, if possible.
4. O positive RBCs may be given to males and females greater than fifty (>50) years of age in a blood shortage situation.
5. Treating physician will sign the Emergency Release of Blood form (provided by the TML). If the physician's signature is not obtained due to urgency of situation, it will be obtained as soon as possible after patient is stabilized.
6. Ultimately, responsibility of identification, and issuing of emergency blood is with the treating physician.

7. As soon as the patient's blood type is available from pre-transfusion specimen testing, the patient will be switched to group-specific or group compatible red blood cells and plasma.

Transfusion Reactions

Note: Refer to Appendix B, Adverse Transfusion Reaction – SIGNS AND SYMPTOMS.

1. An adverse transfusion reaction refers to any unfavorable response to infusion of blood components/products. A transfusion reaction may be immediate, during transfusion, within 24 hours, or delayed for days to months, following transfusion.
2. Serious transfusion reactions tend to occur within the first 15 minutes.
3. When blood components and blood products are administered in an ambulatory setting, or when patients are discharged less than 24 hours after a transfusion, education regarding transfusion reactions will be provided prior to discharge.
4. Instructions will be given to go to the Emergency Department if a reaction occurs outside the healthcare facility.
5. Symptoms of a transfusion reaction may include one or more of the following:
    - Change in vital signs- temperature, blood pressure, pulse, or respirations;
    - Temperature rise of one degree or more, and greater than or equal to 38 degrees Celsius;
    - Urticaria, itching, erythema;
    - Anaphylaxis-upper respiratory distress, dyspnea;
    - Pain (abdominal cramps, generalized, back, flank, chest, or at the insertion site);
    - Headache;
    - Nausea, vomiting;
    - Chills, rigors;
    - Generalized bleeding;
    - Oliguria, anuria, or hematuria;
    - Peripheral edema;
    - Cardiac dysrhythmias.

Transfusion Reaction Procedure

Note: Refer to Appendix C, Adverse Transfusion Reaction Algorithm.

1. **If the patient experiences any signs and symptoms as listed above stop the transfusion immediately.**
2. Maintain IV access with 0.9% Sodium chloride or D5W for IVIG infusions.
3. Contact physician for medical assessment.
4. Assess vital signs every 15 minutes until stable.
5. Confirm positive patient identification on all labels, tags, forms, blood orders and identification band to rule out clerical discrepancy.
6. Refer to "Adverse Transfusion Reaction Algorithm" after conferring with physician.
7. If blood specimens are required as per algorithm, order a Transfusion Reaction Investigation.
8. Notify the TML.
9. Fill out the Transfusion Incident Adverse Reaction form.
10. Transfusion may be restarted for minor reactions (see algorithm) as per physician's order.
11. Return blood component or blood product and administration set, completed transfusion card, and adverse reaction form to the TML.
12. Additional testing may be ordered, per physician's request.

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Appendices

Appendix A: ABO/Rh Compatibility Table

Patient's Group	Packed Cells[1]	Plasma[2]	Platelets[3] (listed in order of preference)	Cryoprecipitate[2]
O Pos	O+, O-	All groups	O, B, A, AB	Any group is safe to transfuse.
O Neg	O-			
A Pos	A+, A-, O+, O-	A, AB	A, AB, B*, O*	
A Neg	A-, O-			
B Pos	B+, B-, O+, O-	B, AB	B, AB, A*, O*	
B Neg	B-, O-			
AB Pos	All groups	Only AB	AB, B*, A*, O*	
AB Neg	AB-, B-, A-, O-			
UNKNOWN	O+ All males, Females>50yrs O- Females<50yrs	Only AB	Any group	

Rh Comments

1 Rh Positive red cells may be given to Rh Negative patient when Rh negative red cells are of diminished supply

2 Rh is not taken into consideration when transfusing plasma or cryoprecipitate

3 If Rh Positive platelets are issued to an Rh Negative patient, RhIg is recommended. One vial of 300 µg (1500 IU) RhIg is required to counteract the immunizing effects of approximately 15-17 mL of Rh positive red cells.

Platelet Comments

ABO identical platelets are preferred, but frequent platelet shortages limit availability. If ABO identical platelets cannot be issued, order of preference for non-identical is listed for each blood group.

* The plasma in these platelets is ABO incompatible with patient's group. In the instance a patient receives platelets that are not ABO identical and the platelet contains a high titre anti-A or Anti-B the patient may become sensitized and hemolysis may occur with large volume transfusion (more than one adult dose per 24 hour period).

Appendix B: Adverse Transfusion Reaction – SIGNS AND SYMPTOMS

Type of Reaction	Suspected Transfusion Reaction Signs & Symptoms	Timing of Symptoms	Actions & Suggested Treatment / Investigations
ACUTE (< 24 hours)			
Minor Allergic Reaction	Intensely pruritic localized/or widespread urticaria less than 2/3 of the body; generalized erythema or flushing	During transfusion up to 2-3 hours from start	Consult with Physician–diphenhydramine hydrochloride 25-50 mg PO/IM or IV; proceed with **CAUTION**
Anaphylactic	Angioedema–localized non-pitting deep edema; upper airway obstruction–laryngeal edema, hoarseness, stridor, 'lump in the throat;' lower airway obstruction –bronchospasm, wheeze, chest tightness, dyspnea, cyanosis; profound hypotension	1-45 minutes after start of infusion; majority within 5 minutes	Epinephrine 0.3 - 0.5mg S/C or IV (up to 3 doses); fluid bolus; vasopressors if intractable hypotension; **DO NOT RESTART TRANSFUSION**
Hypotension	Abrupt onset of clinically significant hypotension–facial flushing with or without mild respiratory symptoms	Within 5 minutes after start of infusion	Supportive therapy; **DO NOT RESTART TRANSFUSION**
Febrile Non-Hemolytic	Cold sensation, rigors, nausea, vomiting with/without temperature greater than 1°C above baseline.	Usually within 30 minutes after start of infusion; up to one (1) hour after completed	Consult with Physician–Acetaminophen 325-500 mg PO; proceed with **CAUTION**
Acute Hemolytic (AHTR)	Temperature ≥ 39°C, hypotension, tachycardia, rigors/chills, anxiety, dyspnea, anemia, hyperbilirubinemia, hemoglobinuria/oliguria, bleeding at IV site, nausea/vomiting, DIC, pain –back/chest/head/flank/abdomen/groin/IV site	Usually within first 15 minutes; up to 24 hours following transfusion.	Usually within first 15 minutes; up to 24 hours following transfusion. Serologic testing: group and screen, cross-match, DAT, LDH, BUN, creatinine, TB; IV Fluids **DO NOT RESTART TRANSFUSION**
TACO	Dyspnea, orthopnea, cyanosis, hypoxemia, tachycardia, hypertension, pulmonary/pedal edema, elevated JVP	Within 1-2, up to 6 hours following start of transfusion	Oxygen, diuretics, elevate head of bed, chest x-ray **DO NOT RESTART TRANSFUSION**
Transfusion Related Acute Lung Injury (TRALI)	Acute respiratory distress, dyspnea, cyanosis, severe hypoxemia, severe bilateral pulmonary edema, bilateral infiltrates on chest x-ray, hypotension unresponsive to fluid bolus	Within 1-2 hours during transfusion or within 6 hours post-transfusion	Oxygen, chest x-ray, intubation and ventilation, vasopressors **DO NOT RESTART TRANSFUSION**
Bacterial Contamination	Temperature ≥ 38.5°C, chills, hypotension, shock, nausea/vomiting, tachycardia, hypotension	During or within 4 hours of transfusion	Treatment of shock, DIC, renal failure, product and recipient cultures, antibiotics–broad spectrum initially; anti-pseudomonas if red cells implicated **DO NOT RESTART TRANSFUSION**
DELAYED (> 24 hours)			
Delayed Hemolytic	Weakness, unexplained fall in post-transfusion hemoglobin, elevated serum bilirubin	Within 3-7 days post-transfusion and up to 21 days post-transfusion	Provide antigen negative blood products for subsequent transfusions
Transfusion Associated Graft Versus Host Disease	Fever, erythematous cutaneous pruritic rash which progresses to generalized erythroderma, watery/bloody diarrhea, pancytopenia, liver dysfunction, anorexia, nausea/vomiting	Within 2-50 days of transfusion (usually 1-2 weeks)	Largely ineffective–Immunosuppressive therapy, cyclosporine/OKT3, cyclophosphamide/antithymocyte, T cell monoclonal antibodies, HPC transplants, irradiated components. Mortality is greater than 90%
Post Transfusion Purpura	Purpura, bleeding, platelet count less than $10X10^9/L$	1-24 days post transfusion	IVIG

Appendix C: Adverse Transfusion Reaction Algorithm