SUNY DOWNSTATE MEDICAL CENTER
DEPARTMENT OF PATHOLOGY
POLICY AND PROCEDURE

☒ UNIVERSITY HOSPITAL OF BROOKLYN ☒ BAY RIDGE

Subject: HOW TO ADMINISTER A BLOOD TRANSFUSION

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I. PURPOSE

1. To restore circulatory blood volume.
2. To replace clotting factors.
3. To improve oxygen carrying capacity.

II. POLICY

It is the policy of SUNY Downstate to ensure the proper administration of blood in order to foster patient safety.

III. DEFINITION(s)

None

IV. RESPONSIBILITY

Physicians, Nursing, Clinical Labs staff

V. PROCEDURE/GUIDELINES

Equipment

1. Blood administration set with 170-micron filter (Y type)
2. Normal saline infusion.
3. Blood/Blood products as ordered.
4. Alcohol and betadine solution, tourniquet, tape, blue pads.

Optional Equipment

1. 40-micro aggregate filter
2. Pall leukocyte removal filter for blood
3. IV infusion pump and tubing #2477

PREPARATORY PHASE	KEY POINTS
1. Check physician's order for blood transfusion.	1. There must be a written order for the transfusion of blood product in the patient's record. Also there must be some indication of physician-patient discussion of risks and benefits of transfusion, and/or the SD002N form, *Documentation of Patient Notification by the Transfusing Physician Regarding Transfusion of Blood Components/Products; Transfusion Notification/Consent/Refusal Form.* The form must be filled before the first elective transfusion episode for each indication for transfusion. As the indication changes, a new consent form must be filled out. All outpatients must fill out a new consent form on

each day of transfusion.

NOTE: IDEALLY ELECTIVE TRANSFUSIONS SHOULD BE ORDERED FOR ADMINISTRATION BETWEEN 9:00 AM-9:00 PM TO ENSURE OPTIMAL PATIENT SAFETY.

2. Check patient's chart - make sure that the blood has been typed and crossmatched.

2a. Typing is done to establish the blood group (A, B, AB, or O) and Rh factor; a cross-match is done to establish the compatibility between the patient's blood and blood donor.

2b. You may call the Blood Bank at extension 4630 to confirm. [**See Attachment #1 =** Request for Blood Components (Type and Cross-match)] or view the order in Cerner.

3. Use a request for "Blood Release Card" from the nursing station to obtain blood from the Blood Bank. While at the Blood Bank with the technologist, check the **Request for Blood Release Card** against the top sheet of the **Transfusion Tag** and the Blood Bank Pick-up Book. Also check the donor number on the **Transfusion Tag** against the donor number on the blood product. The third white copy of the **Transfusion Tag** is kept by the Blood Bank technologist. **All information concerning the patient must match that on Blood Bank records before any blood products can be released. The Blood Bank may issue a form entitled <u>Blood Product Administration Checklist</u> for each blood product issued. This form is to be reviewed at the side of the patient, prior to a blood transfusion.**

3. A responsible designated employee may obtain the blood from the Blood Bank, but an M.D. or R.N. must sign and check the blood release slip. (**See Attachment #2** = Request for Blood Release Form).

4. Give the blood product within 20 minutes after taking it from the Blood Bank, or return it immediately to Blood Bank. If it appears that a unit of blood will require more than four hours to infuse, request that the Blood Bank divide the unit into smaller aliquots.

4. Storage at 1 – 6º C (for red cells and thawed frozen plasma) or 32.8 – 42º C (if a blood warmer is used for red cells or thawed frozen plasma) should be maintained until just before administration. **(Monitored refrigerator capability exists only in the Blood Bank and Operating Room). The blood must be returned to the Blood Bank within 30 minutes of issue from the Blood Bank to be accepted back into its inventory for future use.** Blood returned outside this time period is wasted. Prolonged periods at room temperature increase the risk of bacterial contamination. Transfusion should be as rapid as tolerated and must not exceed four hours.

5. In elderly patients or those with CARDIAC DYSFUNCTION or any patient with a need for smaller volume infusion, red blood cells should be infused over longer periods of time. Request that Blood Bank divide the unit into smaller aliquots.

5. Too rapid administration of blood may overload the circulatory system and precipitate congestive heart failure.

6. Inspect the blood product for gas bubbles, any abnormal color, cloudiness or clotting.

6. Gas bubbles may indicate growth, abnormal color or clotting may warn of hemolysis.

PERFORMANCE PHASE

KEY POINTS

1. Check the physician's orders.

2. Check for agreement of ABO/Rh on the **Transfusion Tag** with that in patient record, if previously tested for group/type. Patient record includes charted and computerized records.

3. At the **TRANSFUSION SITE** (at the side of the patient), ask the patient to recite his/her full name and check the stated patient name against the ID band. Explain procedure to the patient.

NOTE: IN AREAS WHERE AN I.D. BAND MIGHT NOT BE REQUIRED, REFER TO THE UNIT MANUAL FOR THE PROCEDURE I.D. CHECK. IF IDENTIFICATION IS NOT SUBSTANTIATED DO NOT HANG BLOOD.

3. Meticulous attention to detail is essential to avoid giving the wrong blood product to the wrong patient, which may cause a fatal hemolytic reaction. **The checks of patient and unit identification and information must be done by two licensed professionals from the following categories:**

- **Physician**
- **Physician Assistant**
- **Registered Nurse**
- **Nurse Practitioner**
- **Board Certified Cardiovascular Perfusionist**

4. Take patient's vital signs prior to blood administration.

4. Base-line temperature, pulse, respiration and blood pressure measurements are used for later comparison. If patient has a fever with temperature greater than 101ºF/38ºC, return blood to Blood Bank immediately and notify the physician immediately. Return blood to Blood Bank if blood cannot be administered **within 30 minutes** of issue.

At the **TRANSFUSION SITE** (at the side of the patient)–check blood against the first white form (This is the **Transfusion Tag** attached to the blood bag. **See Attachment #3).**

- Check the patient's name and medical record number on the Transfusion Tag against those on the ID band by reading information **ALOUD**.
- The donor I.D. number, ABO/Rh and product expiration date must be identically recorded on the label of the blood bag and the **Transfusion**

- In the event a blood warmer is used, record all the required information, on the **Blood/Fluid Warmer Temperature Sheet** (**See Attachment #4)**

Both persons performing these checks must then sign the **Transfusion Tag** attached to the blood.

Tag and be so noted by the **two** persons checking it. The checks should be made by reading the information **ALOUD.**

- Fill in all necessary and appropriate documentation on the **Transfusion Tag** that is attached to the unit throughout the transfusion.

NOTE: IF BLOOD PRODUCT REQUIRES WARMING PRIOR TO INFUSION, ONLY BLOOD WARMERS APPROVED AND MAINTAINED BY SCIENTIFIC AND MEDICAL INSTRUMENTATION CENTER (S.M.I.C.) MAY BE UTILIZED. ANY OTHER METHOD MAY PRECIPITATE HEMOLYSIS. SEE ATTACHMENT #4 – BLOOD PRODUCT ADMINISTRATION CHECKLIST FOR ADDITIONAL PRACTICE POINTS.

NOTE: ALL BLOOD PRODUCTS MUST BE INFUSED THROUGH AT LEAST A 170 – MICRON FILTER SUCH AS THE ONE IN THE STANDARD BAXTER Y TUBING SET #2C8720.

NOTE: IN ELECTIVE, NONEMERGENT SITUATIONS, TRANSFUSE ONE PRODUCT AT A TIME.

PERFORMANCE PHASE	KEY POINTS
4. Prepare to hang the saline solution and the blood product. • This procedure requires universal precautions. • Prime the tubing with only normal saline. • Connect I.V. lines directly to cannula. • Hang saline and blood about a meter (3-4 feet) above the level of the patient's head.	4. **Do not piggyback blood products.** a. Use Y type blood solution administration set or primary blood administration set. Blood may also be infused via the IV infusion pump with infusion set#2477 available from Central Sterile. b. Blood products are not compatible and should not be infused into the same site with any medication or solution other than normal saline. c. All dextrose solutions are either hyper- or hypotonic and will damage red cells. Even Ringer's Lactate will precipitate clotting. No medications can be added directly to blood products.
5. Use 18-20 gauge cannula for adults a. Pediatrics 18-24 gauge b. Neonates 24 gauge	5. See venipuncture procedure.
6. **a. Adults** Allow 50 mls of saline to infuse initially unless otherwise contraindicated. **b**. **Pediatrics** May require smaller volume infusion of	6. Normal saline is used because it is isotonic, and it will not cause hemolysis. Flushing the tubing removes any other solution which may cause hemolysis.

normal saline (e.g. 3-20 mls for infants or cardiac patients).

c. <u>Neonatal</u>
Flush I.V. site with 1 ml of normal saline prior to transfusion.

7. Discontinue the saline and start the blood product.

7. If Y tubing is not used, remove the saline and replace with blood.

8. Allow the blood product to run through transfusion set. Avoid covering the entire surface of the filter with blood. See special instructions pertaining to filter, on the package. Use special filters, if dispensed by the Blood Bank with the product.

8. A filter is located between the container and the flow indicator to screen out particles that can embolize. Precipitation of platelets, leukocytes and fibrin may clog the administration set.

9. Adjust the blood to rate of flow that the physician has ordered. **(Maximum infusion time: 4 hours).** All units hung before their expiration, can be infused at the ordered rate of flow up to 4 hours.

9. The rate of flow is determined by the height of the blood, the drop factor of the infusion set and the size of the I.V. cannula (Gauge 18 or larger when possible for adults) and the drip regulator clamp.

10a. **<u>Adult and Pediatric</u>**
Stay with the patient for at least 15 minutes after the start of the transfusion. Re-assess and document the patient's vital signs 15 minutes after the start of the transfusion and at the end of transfusion. **The person administering the blood and another competent adult shall be immediately available at all times during a blood transfusion and for 30 minutes afterwards.**

10a. **<u>Adult</u>**
Symptoms of an untoward reaction are usually manifested during the infusion of the initial **50-100** mls **of blood. The first 50 mls of blood should be infused in over 30 minutes.**

10b. **<u>Neonatal</u>**
Vital signs and blood pressure will be monitored and documented on the nursing flowsheet prior to and 15 minutes after the start of transfusion and every 30 minutes during transfusion. Continue to monitor vital signs for 30 minutes post transfusion once and then as per protocol.

10b. **<u>Neonatal and Pediatric</u>**
Symptoms of untoward reaction may manifest in less than 50 mls of initially infusing blood, according to the infant's or child's age or size.

11. An INCIDENT REPORT is to be initiated if a patient experiences a blood transfusion reaction, in addition to the **Blood Transfusion Reaction Section of the** Tr**ansfusion Tag,** attached to the blood bag.

11. An early change in the condition of the patient may signal the onset of a transfusion complication. Most reactions occur within the first 15 minutes.

12. Stop blood transfusion and notify the

Blood Bank of **ANY** reaction. Notify the physician if patient develops any of the following reactions:

a. **Hemolytic reaction:**
Symptoms: Rapid onset of symptoms, chills, fever, dyspnea and/or cyanosis, headache, backache, chest pain, hematuria, oliguria, tachycardia, hypotension, hemoglobinuria, bleeding, tachypnea, nausea or vomiting, vascular collapse, acute renal failure or even cardiac arrest.

a. Hemolytic reactions are the most dangerous reactions and are most commonly due to **mismatched blood or patient misidentification.**

b. **Bacterial (septic) reaction** due to blood transfusion:
Symptoms: Rapid onset, chills, fever, flushing, malaise, headache, red shock (skin warm, dry and pink due to peripheral vasodilation), lumbar pain, hematemesis, diarrhea, nausea or vomiting.

b. Bacterial reactions are caused by the contamination of blood products with microorganisms. **Red shock is most obvious on patients with fair skin. In dark skinned patients, observe for red shock on palms of hands, eyes, soles of feet and fingernail beds.**

c. **Mild allergic reaction:**
Symptoms: Itching, urticaria, hives / spetechiae and mild edema. Should symptoms progress to severe allergic reaction (or present as) bronchial wheezing leading to bronchospasm and severe dyspnea, the blood should be stopped, the Blood Bank and physician notified.

c. **The physician may decide to treat an allergic reaction with Benadryl or steroids, but the transfusion must be terminated and the reaction worked up as for all other reactions.**

d. **Severe allergic reaction (anaphylaxis):**
Symptoms: Hypotension, respiratory wheezing, distress or failure, nausea or vomiting, loss of bowel and/or bladder function with or without the symptoms/signs in Mild Allergic Reaction above.

d. The physician may decide to treat anaphylaxis with epinephrine, vasopressors, bronchodilators and ventilatory support.

e. **Febrile, non-hemolytic reaction (most common):**
Symptoms: Sudden chills and fever greater than 1ºC / 2ºF rise, headache, flushing, anxiety and muscle pain.

e. The Physician may decide to treat a febrile reaction with acetaminophen, e.g. Tylenol, but the transfusion must be terminated and the reaction worked up as for all other reactions. BENADRYL SHOULD NOT BE USED TO TREAT FEBRILE REACTIONS. IT IS NOT AN ANTI-PYRETIC.

f. **Circulatory overload reaction:**
Symptoms: Tachycardia, dyspnea, coughing frothy pink tinged sputum, edema, elevated jugular venous pressure.

f. Monitor central venous pressure through a separate infusion line for patients with circulatory overload problems.

g. **Transfusion related acute lung injury**

g. The physician may decide to treat TRALI with

(TRALI):
Symptoms: Dyspnea, coughing, fever, hypotension, normal jugular venous pressure, bilateral "butterfly" infiltrates on chest x-ray, within 2 to 6 hours post transfusion.

h. **Delayed Reactions:**
Symptoms: Notify the physician if the patient develops any of the following after transfusion:
- Hemolytic: Post-transfusion anemia
- Transfusion infection: e.g., Jaundice, laboratory tests positive for infectious disease markers.

steroids and ventilatory support.

13. After any type of blood transfusion reaction:
    a. Using aseptic technique, change I.V. tubing and keep I.V. line open with normal saline.
    b. Re-check identification labels.
    c. Treat symptoms as per physician orders.
    d. Send the first voided specimen for complete urinalysis including microscopic examination, (RBC – hemolysis), to the urinalysis lab.
    e. A "Transfusion Reaction Workup" must be ordered in Cerner. Fill in the required information and submit the order. Send blood bag with a post-reaction specimen of a pink top tube and Transfusion Tag yellow copy (after completion), to the Blood Bank.
    f. Send serum bilirubin after 5-7 hours.
    g. Watch the patient carefully. Monitor the vital signs at least **every 15 minutes** or more frequently as indicated, until the patient is stable.

13. In areas where nurses are not able to draw blood, the physician must draw one pink top tube of blood for post-reaction specimens and send to the Blood Bank with the completed form mentioned in Performance phase #11.

14. Using aseptic technique, change the administration set whenever clots appear on the filter or after every four hours.

14. The filters become increasingly clogged with fibrin and debris and impede the flow.

15. After unit is absorbed, the tubing and blood bag are discarded in the regulated medical waste container (red bag) located in the soiled utility room and **the Transfusion**

15. The nurse may delegate the clerk to send the copy of the form to the Blood Bank and insert the original form in the patient's chart but he/she is responsible for ensuring that it is carried out.

Tag is completed and signed by the nurse discontinuing the transfusion. The yellow copy is then sent to the Blood Bank in the approved plastic bag, the white copy is then inserted into the patient's chart.

16. Wash hands.

17. **Documentation:**

    a. The volume administered must be charted on the Intake and Output sheet (or Critical care Flow Sheet).
    b. The type of blood product and the patient's response should be charted in the progress note.
    c. Any lab work sent should be documented in Cerner and in the progress note.
    d. Patient education must be noted on the education record.
    e. Vital signs before, during and after blood transfusions must be charted on the flow sheet.

18. A completed form **Instructions for Outpatient Transfusion Recipients (Attachment #5)** is to be reviewed with patients being discharged from outpatient areas. A copy of the signed form is given to the patient and the chart copy is maintained in the patient's medical record.

Nursing Alert:

Transfusion therapy (whether of whole blood or blood components) entails a number of calculated risks. Some of these potential complications cannot be prevented with absolute certainty.

NOTE: In the event that a patient's blood type is needed, that information will be found on the **Transfusion Tag once the blood has been administered.** The blood type can be found in Cerner. The Blood Bank may be called also for this information at extension 4630.

VI. ATTACHMENTS :

PROTOCOL FOR THE LEUKOCYTE REMOVAL FILTERS

1. There is a leukocyte removal filter for red blood cell transfusions: the EZ Prime (RCEZ1T) for single unit transfusions.

2. The filter will remove over 99% of leukocytes.

3. The EZ Prime (RCEZ1T) filters are to be used for single red blood cell transfusions. Due to the importance of priming and virtually eliminating any air bubbles in the filter, only the EZ Prime (RCEZ1T) filter will be used. Each additional RBC transfusion will require a new set and filter. Indications and dispensing above filters will be done only after consultation with the Blood Bank Medical Director; Physician Designate; Blood Bank Supervisor, or if so indicated, in the Patient History File.

4. Instructions for the use of the filter are included in the package containing the filter.