Blood Product Administration (Blood Transfusion)

**Purpose:** Blood products including whole blood or packed red blood cells, plasma, or platelets may be administered to a patient via the venous circulation, depending on their needs. Red blood cells may be administered to treat hemorrhage, symptomatic anemia, or sickle cell crisis, and will improve oxygen delivery to the tissues. Fresh frozen plasma can help reverse the effect of anticoagulants. Platelets transfusions may prevent bleeding with thrombocytopenia. Compatibility must be checked by two qualified personnel before a blood product is administered to prevent a life threatening transfusion reaction.

Most blood products are frozen and require time to thaw in the lab. Prior to thawing, the lab performs blood typing and compatibility testing - including antibody screening (ABO Rh and cross match). Blood bank personnel use special equipment to prepare the blood for transfusion only after orders are received to transfuse. Once thawed, blood products must be hung within 30 minutes after obtaining the unit from blood bank; otherwise it is to be returned to the lab to avoid spoiling. Typically, one unit is dispensed at a time except in cases where rapid replacement is needed for gross hemorrhage or in the OR).

**Note:** When emergent transfusion is required, the blood bank needs notification as early as possible in order to prepare Type O-Negative blood. In these cases, cross matching is not always done, but blood banks have special procedures for these situations.

**Blood Warmers:** Even after thawing, blood arrives from the lab cold. Blood warming devices aid in preventing hypothermia by warming blood as it is being administered to the patient. Although a warmer is not required for routine transfusions, they are preferred when time permits because they enhance patient comfort and tolerance. Special tubing is usually required. Blood warmers are typically used in intensive care, operating rooms, post anesthesia care, and emergency departments, where larger amounts of blood are often administered. Once blood is warmed it can never be returned to the blood bank.

**NEVER warm blood in hot water or a microwave.**

**Nursing Considerations**

**Assessment:**

Check the provider order for type of blood product to be administered.
Check if the patient is wearing a blood ID bracelet. It is usually applied to the wrist. The patient MUST have a blood ID bracelet. A phlebotomist applies the bracelet when blood is drawn for the purpose of screening. Most facilities have strict policies that guide the use of blood ID bracelets.
Ensure that a recent type and cross-match is available for review. The patient’s blood must be ABO-typed and crossMatched for compatibility.
Evaluate the patient’s labs, including the CBC.
Ask if patient has received a transfusion or organ or tissue transplant in the past and whether they had any reaction. Note the type of reaction. Check if the patient requires irradiated blood products due to immunosuppression.
Send the order for the blood product to the blood bank immediately. Call the blood bank to confirm.
Assess IV access site for patency; catheter will ideally be size 18 gauge or larger. While it is safe to administer some products through 20 gauge catheters, hospital policy will govern what is acceptable.
Assess heart and lung sounds and recent urinary output. Baseline vitals including temperature and respirations will be taken just prior to administration of blood product and every 15-30 minutes during administration, therefore, it is advisable to dedicate equipment for serial measurements at the bedside.

Contraindications:

Patients at risk for graft vs host disease or with immunocompromised conditions may require irradiated blood components.
Platelet infusions are contraindicated as a prophylactic measure in most cases of HIT and TTP: Heparin-induced thrombocytopenia (HIT) and thrombotic thrombocytopenic purpura (TTP) are disorders in which thrombocytopenia leads to a risk of bleeding due to platelet consumption and activation. Platelet transfusions may help in cases where there is active or anticipated bleeding due to an invasive procedure, and platelet transfusion should not be withheld in these case. However, platelet transfusions may cause an increased risk of arterial thrombosis in patients with TTP or HIT due to the same pathophysiology causing the initial thrombocytopenia.
Members of some faith such as Jehovah’s Witnesses may refuse blood products, but individual patients make their own decisions. Some may allow albumin or immunoglobulin but will not accept whole blood products. Informed consent must be obtained and documented.
Risks:

There is a risk of transmission of blood borne pathogens such as Hepatitis B, Hepatitis C, HIV and others from donated blood. All donated blood products are carefully screened for these diseases, but a very small risk remains.
Transfusion reactions occur when blood is mismatched according to blood type, but can occur due to undetected incompatibilities, regardless of proper screening procedures. Common signs of reactions include fever, hives or rash, and breathing problems. Fever and chills are the earliest and most common complaint. This can be quite pronounced, inducing rigors in minutes, often resembling anaphylaxis. The patient may turn bright red with body-wide flushing. Note: Reactions may begin at any time during transfusions, however, most reactions occur within the first few minutes of administration.

**Patient Teaching:**

Instruct patient to report any sensation of flushing, itching, shortness of breath, or back/flank pain immediately, as these may be signs of a transfusion reaction.

Procedure

**Supplies:**

0.9% normal saline, 250 mL bag 
blood administration set with in-line filter and a Y set for saline administration 
IV pole 
clean gloves 
blood product 
IV pump (most facilities) 
blood warmer, if indicated

**Steps:**
ALWAYS ensure patency of IV line prior to obtaining blood from the lab. Obtain blood product from the blood bank promptly. Visually inspect the blood for clots, sediment, or bubbles. Confirm the patient’s ID with two identifiers and ensure that the consent is signed, if required by your facility. Perform hand hygiene and put on clean gloves. Obtain baseline vital signs. Pre-existing fever should be reported to the provider prior to proceeding with transfusion. Two RNs (one of whom will administer the blood product, though this policy may vary) must confirm the following on the blood unit, lab paperwork, and the blood ID band at the bedside: blood unit ID number, blood ABO and Rh type, unit expiration date, unit unique identifier (a code), and patient’s name and DOB confirmed with the ID band. Close ALL clamps on Y set tubing. Hang 0.9 % NS. Note: Only isotonic electrolyte solutions are approved from blood administration. Dextrose will hemolyze RBCs and the calcium in Lactated Ringers will cause clotting. Prime Up: Spike the normal saline with one short end of the Y tubing and open the clamps on both of the shorter Y ends set to prime them. The descending tubing clamp remains closed. Prime Down: With NS clamp still open, now close the clamp on the other short end of the Y set and open main (descending tubing) clamp to prime the rest of tubing with NS. Close all clamps. Gently agitate blood bag (suspends the blood cells). Pull back the tabs on blood bag ports to expose them. Prime Blood: Main tubing and NS Y arm clamps remain closed. Spike the blood bag with the free short end of the Y tubing and open the corresponding clamp to allow blood to flow down and prime the filter with blood. Note: The filter is housed in a large round or cylindrical drip chamber that lies below the Y set connection. It is necessary to allow blood into this drip chamber until the filter is completely submerged in the blood. It is best to allow a little air to remain at the very top of the drip chamber to allow you to observe the drip rate. Load tubing into the infusion pump, if used. Prep injection port per facility policy, and connect the tubing to patient. Open main clamp and begin infusion via pump or gravity. Begin the transfusion slowly, rate of 2 mL/minute for the first 15 minutes (100 mL/hour). In most cases, the rate should not exceed 2-4 mL/kg/hr. Stay with the patient for the first 15 minutes and assess vital signs at 15 minutes and again at 30 minutes. Follow institutional guidelines for monitoring vital signs for the remainder of the transfusion. Most severe reactions occur in the first 15 minutes or 50 mL of the transfusion. Watch for pain near the insertion site, backache, fever, chills, itching, hives, dyspnea, or unusual complaints from the patient. Administer blood at prescribed rate but continue to monitor for signs of hemolytic reaction or fluid overload. A rise of 1 degree C (2 degrees F) warrants reporting to the provider. From the time a unit of blood is spiked, the infusion should take a maximum of four hours. Each unit of plasma or platelets should be administered over 30-60 minutes. In addition, the tubing/administration set should be changed with each unit of blood, or at the end of 4 hours. This reduces the risk for bacterial contamination. Once complete, all transfusion-related items should be discarded in a biohazard waste receptacle according to facility policy.
If a reaction is suspected, stop the blood immediately, replace the tubing, and run 0.9% normal saline. Report this to the health care provider and the blood bank immediately. The entire unit with tubing still connected if often retrieved by the blood bank.