

Blood and Blood Product Transfusions

Clients can receive transfusions of whole blood or components of whole blood for replacement due to blood loss or blood disease.

Blood components include packed RBCs, fresh frozen plasma, albumin, clotting factors, cryoprecipitate, and platelets.

TRANSFUSION TYPES

Standard donation: Transfusion from compatible donor blood.

Autologous transfusions: The client's blood is collected in anticipation of future transfusions (elective surgery). This blood is designated for and used only by the client. Clients can donate up to 6 weeks prior to the scheduled surgery. If the client's hemoglobin and hematocrit remain stable, donation can occur weekly to arrive at the desired amount of blood for the anticipated transfusion.

Intraoperative blood salvage: Blood loss during some surgeries (trauma-related, liver transplantation) is recycled through a device that filters blood into a transfusion bag for transfusion intraoperatively or postoperatively. Reinfusion must occur within 6 hr of salvaged blood collection.

INDICATIONS

POTENTIAL DIAGNOSES

Excessive blood loss: packed RBCs

Anemia (Hgb less than 6, or 6 to 10 g/dL, depending on findings): packed RBCs

Kidney failure: packed RBCs

Coagulation factor deficiencies such as hemophilia: fresh frozen plasma

Thrombocytopenia/platelet dysfunction (platelets less than 20,000 or less than 50,000 and actively bleeding): platelets

Hemophilia A: cryoprecipitate

Burns, hypoproteinemia: albumin

CONSIDERATIONS

PREPROCEDURE

- Incompatibility is a major concern when administering blood or blood products. Preventing incompatibility requires strict adherence to blood transfusion protocols.
- Blood is typed based on the presence of antigens.

40.1 Blood type compatibility

BLOOD TYPE	ANTIGEN	ANTIBODIES AGAINST	COMPATIBLE WITH
A	A	B	A, O
B	B	A	B, O
AB	AB	None	A, B, AB, O
O	None	A, B	O

- Another consideration is the Rh factor. Clients who are Rh-negative are born without the Rh antigen in their RBCs. As a result, they do not develop antibodies unless sensitization occurs. Once this occurs, any transfusion with Rh-positive blood will cause a reaction.

NURSING ACTIONS

- Explain the procedure to the client.
- Assess vital signs and the client's temperature prior to transfusion.
- Remain with the client during the initial 15 to 30 min of the transfusion. Most severe reactions occur within this time frame.
- Assess laboratory values (e.g., platelet count less than 20,000 and hemoglobin less than 6 g/dL).
- Verify the prescription for a specific blood product.
- Obtain consent for procedure if required.
- Obtain blood samples for compatibility determination, such as type and cross-match.
- Assess for a history of blood-transfusion reactions.
- Initiate large-bore IV access. An 18- or 20-gauge needle is standard for administering blood products.
- Obtain blood products from the blood bank. Inspect the blood for discoloration, excessive bubbles, or cloudiness.
- Prior to transfusion, two RNs must identify the correct blood product and client by looking at the hospital identification number (noted on the blood product) and the number identified on the client's identification band to make sure the numbers match.
- The nurse completing the blood product verification must be one of the nurses who administers the blood product.
- Prime the blood administration set with 0.9% sodium chloride only. Never add medications to blood products. Y-tubing with a filter is used to transfuse blood.
- Begin the transfusion, and use a blood warmer if indicated. Initiate the transfusion within 30 min of obtaining the blood product to reduce the risk of bacterial growth.
- **OLDER ADULT CLIENTS** ☺
 - No larger than a 19-gauge needle is used.
 - Assess kidney function, fluid status, and circulation prior to blood product administration. Older adult clients are at an increased risk for fluid overload.
 - Use blood products that are less than 1 week old.

CLIENT EDUCATION: Explain the reason for the blood transfusion.

INTRAPROCEDURE

NURSING ACTIONS

- Remain with the client for the first 15 to 30 min of the infusion (reactions occur most often during the first 15 min) and monitor vital signs and rate of infusion per facility policy. 
- **OLDER ADULT CLIENTS:** Assess vital signs every 15 min throughout the transfusion because changes in pulse, blood pressure, and respiratory rate can indicate fluid overload, or can be the sole indicators of a transfusion reaction. Older adult clients who have cardiac or renal dysfunction are at an increased risk for heart failure and fluid-volume excess when receiving a blood transfusion. Administer the blood transfusion over 2 to 4 hr for older adult clients. Withhold administration of other IV fluids during blood product administration to prevent fluid overload. 
- Notify the provider immediately if indications of a reaction occur.

POSTPROCEDURE

NURSING ACTIONS

- Obtain vital signs upon completion of the transfusion.
- Dispose of the blood-administration set according to facility policy.
- Complete paperwork, and file in the appropriate places.
- Document the client's response.

COMPLICATIONS

Acute hemolytic

ONSET: Immediate or can manifest during subsequent transfusions

FINDINGS

- Results from a transfusion of blood products that are incompatible with the client's blood type or Rh factor. Can occur following the transfusion of as few as 10 mL of a blood product.
- Can be mild or life-threatening, resulting in disseminated intravascular coagulation (DIC) or circulatory collapse.
- Findings include chills, fever, low-back pain, tachycardia, flushing, hypotension, chest tightening or pain, tachypnea, nausea, anxiety, hemoglobinuria, and an impending sense of doom.

NURSING ACTIONS

- Stop the transfusion.
- Remove the blood tubing from the IV access. Avoid infusing further blood products into the circulatory system.
- Initiate an infusion of 0.9% sodium chloride using new tubing.
- Monitor vital signs and fluid status.
- Send the blood bag and administration set to the lab for testing.

Febrile

ONSET: Commonly occurs within 2 hr of starting the transfusion

FINDINGS

- Results from the development of anti-WBC antibodies. Can be seen when the client has received multiple transfusions.
- Findings include chills, increase of 1° F (0.5° C) or greater from the pretransfusion temperature, hypotension, and tachycardia.

NURSING ACTIONS

- Use WBC filter for administration to prevent the reaction from occurring.
- Stop the transfusion and administer antipyretics.
- Initiate an infusion of 0.9% sodium chloride using new tubing.

Allergic

ONSET: During or up to 24 hr after transfusion

FINDINGS

- Results from a sensitivity reaction to a component of the transfused blood products.
- Findings are usually mild and include itching, urticaria, and flushing.
- The client can develop an anaphylactic transfusion reaction resulting in bronchospasm, laryngeal edema, and shock.

MILD REACTION NURSING ACTIONS

- Stop the transfusion.
- Initiate an infusion of 0.9% sodium chloride using new tubing.
- Administer an antihistamine, such as diphenhydramine.
- If the provider prescribes to restart the transfusion, do so slowly.

ANAPHYLACTIC REACTION NURSING ACTIONS

- Stop the transfusion.
- Administer epinephrine, oxygen, or CPR if indicated.
- Remove the blood tubing from the client's IV access.
- Initiate an infusion of 0.9% sodium chloride using new tubing.

Bacterial

ONSET: During or up to several hours after transfusion

FINDINGS

- Results from a transfusion of contaminated blood products.
- Findings include wheezing, dyspnea, chest tightness, cyanosis, hypotension, and shock.

NURSING ACTIONS

- Stop the transfusion.
- Administer antibiotics and an IV infusion of 0.9% sodium chloride using new tubing.
- Send a blood culture specimen to the lab for analysis.

Circulatory overload

ONSET: Can occur any time during the transfusion

FINDINGS

- Results from a transfusion rate that is too rapid for the client. Older adult clients or those who have a preexisting increased circulatory volume are at an increased risk.
- Findings include crackles, dyspnea, cough, anxiety, jugular vein distention, and tachycardia. Manifestations can progress to pulmonary edema.

NURSING ACTIONS

- Slow or stop the transfusion depending on the severity of manifestations.
- Position the client upright with feet lower than the level of the heart.
- Administer oxygen, diuretics, and morphine as prescribed.

PRACTICE Active Learning Scenario

A nurse is caring for a client who is receiving a blood transfusion. What nursing actions should the nurse anticipate if a transfusion reaction is suspected? Use the ATI Active Learning Template: Nursing Skill to complete this item.

INDICATIONS

- Describe the four types of reactions and the time of onset.
- Describe three medications that can be administered and for which reaction.

POTENTIAL COMPLICATIONS: Describe two nursing actions for each type of reaction.

Application Exercises

1. A nurse is preparing to administer packed RBCs to a client who has a Hgb of 8 g/dL. Which of the following actions should the nurse plan to take during the first 15 min of the transfusion?
 - A. Obtain consent from the client for the transfusion.
 - B. Assess for an acute hemolytic reaction.
 - C. Explain the transfusion procedure to the client.
 - D. Obtain blood culture specimens to send to the lab.
2. A nurse is caring for a client who is receiving a blood transfusion. Which of the following actions should the nurse expect if an allergic transfusion reaction is suspected? (Select all that apply.)
 - A. Stop the transfusion.
 - B. Monitor for hypertension.
 - C. Maintain an IV infusion with 0.9% sodium chloride.
 - D. Position the client in an upright position with the feet lower than the heart.
 - E. Administer diphenhydramine.
3. A nurse is monitoring a client who began receiving a unit of packed RBCs 10 min ago. Which of the following findings should the nurse identify as an indication of a febrile transfusion reaction? (Select all that apply.)
 - A. Temperature change from 37° C (98.6° F) pretransfusion to 37.2° C (99.0° F)
 - B. Current blood pressure 178/90 mm Hg
 - C. Heart rate change from 88/min pretransfusion to 120/min
 - D. Client report of itching
 - E. Client appears flushed
4. A nurse is providing preoperative teaching for a client who requests autologous donation in preparation for a scheduled orthopedic surgical procedure. Which of the following statements should the nurse include in the teaching?
 - A. "You should make an appointment to donate blood 8 weeks prior to the surgery."
 - B. "If you need an autologous transfusion, the blood your brother donates can be used."
 - C. "You can donate blood each week if your hemoglobin is stable."
 - D. "Any unused blood that is donated can be used for other clients."
5. A nurse preceptor is observing a newly licensed nurse on the unit who is preparing to administer a blood transfusion to an older adult client. Which of the following actions by the newly licensed nurse indicates an understanding of the procedure?
 - A. Inserts an 18-gauge IV catheter in the client
 - B. Verifies blood compatibility and expiration date of the blood with an assistive personnel (AP)
 - C. Administers dextrose 5% in 0.9% sodium chloride IV with the transfusion
 - D. Obtains vital signs every 15 min throughout the procedure.

Application Exercises Key

1. A. The nurse should obtain consent from the client for the transfusion prior to initiating the transfusion.
 B. **CORRECT:** The nurse should assess for an acute hemolytic reaction during the first 15 min of the transfusion. This form of a reaction can occur following the transfusion of as little as 10 mL of blood product.
 C. The nurse should explain the transfusion procedure to the client prior to initiating the transfusion.
 D. The nurse should obtain blood culture specimens from the client if a bacterial reaction is suspected.
 NCLEX® Connection: Pharmacological and Parenteral Therapies, Blood and Blood Products
2. A. **CORRECT:** The nurse should immediately stop the infusion if an allergic transfusion reaction is suspected.
 B. The nurse should monitor for hypotension if an allergic transfusion reaction is suspected due to the risk for shock.
 C. **CORRECT:** The nurse should administer 0.9% sodium chloride solution through new IV tubing if an allergic transfusion reaction is suspected.
 D. The nurse should position the client in an upright position with the feet lower than the level of the heart if a circulatory overload is suspected.
 E. **CORRECT:** The nurse should administer an antihistamine, such as diphenhydramine, if an allergic transfusion reaction is suspected.
 NCLEX® Connection: Pharmacological and Parenteral Therapies, Blood and Blood Products
3. A. A temperature increase of 1° F (0.5° C) is an indication of a febrile transfusion reaction.
 B. Hypotension is an indication of a febrile transfusion reaction.
 C. **CORRECT:** Tachycardia is an indication of a febrile transfusion reaction.
 D. The client's report of itching is an indication of an allergic transfusion reaction.
 E. **CORRECT:** A flushed appearance of the client can indicate a febrile transfusion reaction.
 NCLEX® Connection: Pharmacological and Parenteral Therapies, Blood and Blood Products
4. A. The client should donate blood for an autologous transfusion no sooner than 6 weeks prior to surgery.
 B. An autologous donation refers to the client's donation of blood for his own personal use.
 C. **CORRECT:** Beginning 6 weeks prior to surgery, the client can donate blood each week for autologous transfusion if his Hgb and Hct remain stable.
 D. An autologous donation is for use only by the client.
 NCLEX® Connection: Reduction of Risk Potential, Therapeutic Procedures
5. A. The nurse should use no larger than a 19-gauge needle in the older adult client.
 B. The nurse should verify the client's identity and blood compatibility, and expiration date of the blood with another nurse. This task is beyond the scope of practice for an assistive personnel.
 C. The nurse should administer blood products with 0.9% sodium chloride. IV solutions containing dextrose cannot be used.
 D. **CORRECT:** The nurse should check the older adult client's vital signs every 15 min throughout the transfusion to allow for early detection of fluid overload or other transfusion reaction.
 NCLEX® Connection: Pharmacological and Parenteral Therapies, Blood and Blood Products

PRACTICE Answer

Using the ATI Active Learning Template: Nursing Skill

INDICATIONS

Types of reactions and onset

- Acute hemolytic: immediate or during subsequent transfusions
- Febrile: within 2 hr of starting the transfusion
- Allergic: during or up to 24 hr after transfusion
- Bacterial: during or up to several hours after the transfusion
- Circulatory overload: any time during the transfusion

Medications

- Antipyretics (acetaminophen): febrile
- Antihistamines (diphenhydramine): mild allergic
- Antihistamines, corticosteroids, vasopressors, epinephrine: anaphylactic
- Antibiotics: bacterial
- Diuretics, morphine: circulatory overload

POTENTIAL COMPLICATIONS

Acute hemolytic

- Stop the transfusion.
- Remove the blood tubing.
- Initiate an infusion of 0.9% sodium chloride.
- Monitor vital signs and fluid status.
- Send the blood bag and administration set to the lab for testing.

Febrile

- Use a WBC filter to help prevent a febrile reaction.
- Stop the transfusion.
- Administer antipyretics.
- Initiate an infusion of 0.9% sodium chloride.

Mild allergic reaction

- Stop the transfusion.
- Initiate an infusion of 0.9% sodium chloride.
- Administer an antihistamine.
- If prescribed, restart the transfusion slowly to continue.

Anaphylactic reaction

- Stop the transfusion.
- Administer epinephrine and oxygen.
- Administer CPR if indicated.
- Remove the blood tubing from the client's IV access.
- Initiate an infusion of 0.9% sodium chloride.

Circulatory overload

- Slow or stop the transfusion depending on the severity.
- Position the client upright with feet lower than the level of the heart.
- Administer oxygen, diuretics, and morphine.

Bacterial

- Stop the transfusion.
- Administer antibiotics as prescribed.
- Initiate an infusion of 0.9% sodium chloride.
- Obtain blood samples for culture.

NCLEX® Connection: Physiological Adaptation, Unexpected Response to Therapies