HEALTH HOLDING

HAFER ALBATIN HEALTH CLUSTER MATERNITY AND CHILDREN HOSPITAL

Department:	Laboratory and Blood Bank		
Document:	Multidisciplinary Policy and Procedure		
Title:	Administration of Blood Products		
Applies To:	Blood Bank and Medical Staffs (Physicians and Nurses) Involved in Transfusion Process		
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1. PURPOSE:

1.1 To provide comprehensive and standardize guidelines related to administration of blood and blood components to ensure safety and efficiency of blood transfusion practice . In other words To ensure "the right blood to the right patient at the right time"

2. DEFINITONS:

2.1 **Blood transfusion** - is the infusion of whole blood or its component into the patient circulation.
2.2 **Blood components** -include packed red blood cells, platelets, fresh frozen plasma, and cryoprecipitate.
2.3 **Hemovigilance** may be defined as the collection of information on the complications of transfusion, analysis of these data, and subsequent data-driven improvements in transfusion practices.

3. POLICY:

3.1 Blood transfusions are an essential support to many medical treatments and stringent policies and procedures, guiding the administration of blood transfusions, must be followed to ensure that the correct blood is always given and that any adverse reactions are dealt with promptly and efficiently.
3.2 Several measures before, during and after blood component transfusion must be undertaken to prevent recipient's reactions or adverse events.
3.3 In some cases, reactions or adverse events cannot be prevented, but close monitoring and early intervention can make a critical difference in the patient's recovery.
3.4 Blood transfusions must be prescribed and administered under medical direction. Only physicians order blood and in accordance with a policy clarifying when blood and blood products may be ordered.
3.5 Recipient Consent is a must before blood transfusion, but in emergency, the blood component may be administered without consent.
3.6 The physician obtain **informed consent** for transfusion of blood and blood products. Elements of patient consent include:
- 3.6.1 Description of the transfusion process.
- 3.6.2 Identification of the risks and benefits of the transfusion.
- 3.6.3 Identification of alternatives including the consequences of refusing the treatment.
- 3.6.4 Giving the opportunity to ask questions.
- 3.6.5 Giving the right to accept or refuse the transfusion.

3.7 Patient's history taking and education should be started before blood transfusion.
3.8 The physician responsible for blood transfusion order must be aware of turnaround time (TAT) for each order.
3.9 Pre-transfusion medications and equipment especially the emergency ones must be available and approved for transfusion of blood components.
3.10 The issue of whole blood or blood components must ensure:
- 3.10.1 Accurate identification of the intended recipient and the required blood components.
- 3.10.2 The integrity of the donor unit identification label and the recipient identification.

compatible.

3.10.4 Proper documentation of the release event.

3.10.5 That the blood components meet the specified requirements before issue.

3.11 Usually, except in the case of an emergency (or large-volume transfusion) and release to outside facility, blood bank allows the issue of only one unit of blood at a time.

3.11.1 More than one blood unit can be released during surgery when the other unit is sure to be transfused.

3.11.2 Several units of platelets and fresh frozen plasma may be issued at a time.

3.12 Issue of multiple components for multiple patients at any one time is also not allowed, except the release to outside facility.

3.13 Blood and blood products will be issued to physicians and nurses/ departmental technician.

3.14 The blood bank may receive back (from MCH departments and governmental hospitals) into the blood component inventory those units that meet acceptance specifications.

3.15 Corrective action is taken when nonconforming blood and blood components are released.

3.16 There must be positive identification of the recipient using, at least, two independent identifiers and by two staff members prior to blood drawing for cross match and prior to the administration of blood or blood components.

3.17 Before transfusion, two health care providers must be sure that the blood component meets the specified requirements.

3.18 Blood is transfused according to accepted transfusion practices following the national and international standards as applicable. American Association of Blood Banks (AABB) rules and guidelines are generally followed.

3.19 Component must be administered through special blood infusion set or leukocyte-reduction filter if it is indicated.

3.20 The transfusionist must be aware about the compatible IV solutions which can be administered simultaneously with blood components through the same tubing.

3.21 Before transfusion, two determinations of the recipient's ABO group must be made on two specimens collected during the current admission.

3.22 The infusion should start slowly, then the flow rate should be adjusted according to the volume that the patient's circulatory system can tolerate.

3.23 Transfusion must be completed within < 4 hours.

3.24 Patients receiving blood are closely monitored. The transfusionist should monitor the patient throughout and after the blood transfusion.

3.25 In dire emergencies, blood components may be released before completion of compatibility testing and/or infectious disease testing (NAT and/or Serological testing). Consent of the patient, or next of kin, for transfusion without (NAT and/or Serological testing) must be taken, when applicable.

3.26 All personnel who contribute to this event should be provided with training in their duties regarding what actions they can take to provide the safest transfusion event for the patient.

3.27 Documentation of the transfusion event should be made in the patient's medical record.

3.28 The blood utilization committee members should periodically audit the blood administration process to identify non-conformances, to analyse their causes, and to address actions to prevent them in the future.

3.29 All personnel who contribute to this event should follow the policies and procedures.

4. PROCEDURE:

4.1 INTRODUCTION:

4.1.1 Appropriate blood transfusion is an essential support to many medical treatments and is lifesaving. Problems with the safety of blood transfusion are highlighted through the Serious Hazards of Transfusion (SHOT) hemovigilance scheme in some countries. This scheme has shown that avoidable, serious hazards of blood transfusion continue to occur in health care institutions. The most common being giving the wrong blood to patients. There are many risks to the patient and these include acute haemolytic reactions and transfusion transmitted infections.

4.1.2 Blood transfusion has been associated with poor outcomes in a dose-dependent manner in trauma patients ,after major surgery and in an intensive care unit. Stringent procedures must be followed to ensure that the correct blood is always given and that any adverse reactions are dealt with promptly and efficiently .

4.1.3 Blood transfusion can be life-saving and provides great clinical benefit to many patients but it is not without risks. Acute transfusion reactions can be associated with significant morbidity and rarely with mortality .

4.1.4 Prompt recognition and management is essential .

4.1.5 All suspected transfusion reactions should be reported immediately to the hospital blood bank .

4.2 PRESCRIPTION OF BLOOD/BLOOD COMPONENTS:

4.2.1 Blood transfusions must be prescribed and administered under medical direction. Only physicians order blood/blood products.

4.2.2 Refer to **"Ordering Of Blood/Blood Products And Tests"** (LB-MPP-236) and **"Selection Of Blood/Blood Product For Transfusion"** (LB-MPP-237) policies.

4.3 PREDISPENSING EVENTS AND CONSIDERATIONS:

4.3.1 Recipient Consent:

4.3.1.1 Informed consent for the administration of blood and blood components must be obtained from the recipient or substitute decision maker before the first blood administration of each admission and is valid for the total period of care episode regardless of the number of transfusions. It may be included in the general consent at the time of admission.

4.3.1.2 At a minimum, elements of consent shall include all of the following:

4.3.1.2.1 A description of the transfusion process, risks, benefits, and treatment alternatives (including no treatment) and the consequences of refusing the treatment.

4.3.1.2.2 The opportunity to ask questions.

4.3.1.2.3 The right to accept or refuse transfusion.

4.3.1.3 The consent shall be documented on the specific **consent form** "Consent For Blood/Blood Components Transfusion (GDOH-COR-CBCT-357)" and any discussed information on the progress notes.

4.3.1.4 If the patient is unable to give consent, a legally authorized representative or surrogate may provide consent.

4.3.1.5 If no one is available to give consent and the need for transfusion is considered to be a medical emergency, the component may be administered without consent.

4.3.1.6 In dire emergencies, blood components may be released before completion of compatibility testing or infectious disease testing. Get consent of the patient or next of kin, when applicable

4.3.1.6.1 Refer to **"The Emergency Release Of Incompletely Tested Blood And Blood Components"** chapter (LB-MPP-238).

4.3.2 Patient's Education and History:

4.3.2.1 The physician or nurse starting the transfusion should go over with the patient the symptoms that are suggestive of a reaction.

4.3.2.2 The physician who orders for blood transfusion has to take proper history from the patient for their previous transfusion reaction, if any occurred. The physician must record all results pertaining to his/her patient's previous positive Ab. screen and also date of previous transfusion, on the blood transfusion request.

4.3.2.3 The medical team should determine whether the patient needs medication before the transfusion or whether special processing of the component is indicated to mitigate the risk of an adverse reaction.

4.3.3 Medical Order: Only physicians order blood or blood components and in accordance with a policy clarifying when blood and blood products may be ordered. Refer to **"Ordering Of Blood/Blood Products And Tests"** chapter (LB-MPP-236).

4.3.4 Laboratory Testing:

4.3.4.1 The time interval from sample receipt to the availability of the requested component can vary greatly, depending on a number of factors. For example: availability is highly dependent on the inventory of components maintained by the blood bank. Some components may need to be ordered from an outside provider.

4.3.4.2 If the patient has developed an antibody to a red cell antigen, the blood bank may require additional time to identify the specificity of the antibody and find compatible units.

4.3.4.3 Some components require thawing, relabelling, or other preparation before release.

4.3.4.4 Components that require thawing have a shortened shelf life once thawed (4-24 hours), and transfusionists need to be aware of the shortened period within which the unit must be infused.

4.3.4.5 Communication between the blood bank staff and the transfusing clinic or unit is needed to predict the availability of components for administration.

4.3.5 Pre-transfusion Medications:

4.3.5.1 If a medication has been ordered before the infusion, it should be administered in advance of the component's arrival to the transfusion unit.

4.3.5.2 Some individual providers routinely use antipyretics in a prophylactic manner, whereas others wait until the patient has experienced at least one febrile transfusion reaction. Others believe prophylactic use may mask the elevated temperature that results from a transfusion reaction, thus hiding a clinically relevant event, although evidence for this is limited.

4.3.5.3 Meperidine or corticosteroids are occasionally ordered for patients who have experienced severe rigors during a transfusion reaction. If the premedication is given orally, the transfusionist should wait 30 to 60 minutes before initiating the transfusion. If the premedication is given intravenously, a 10- minute wait before transfusion is adequate.

4.3.6 Venous Access:

4.3.6.1 Acceptable intravenous catheter sizes for use in transfusing cellular blood components *range* from 22 to 14 gauge.

4.3.6.2 A 20- to 18-gauge intravenous catheter is suitable for the general adult population and provides adequate flow rates without excessive discomfort to the patient.

4.3.6.3 In patients with small veins or in need of rapid flow rates, the catheter size should be adjusted accordingly.

4.3.6.4 In transfusing an infant or a toddler, a 24- to 22-gauge intravenous catheter may be suitable but will requires infusion through a syringe.

4.3.6.5 With the use of smaller-size catheters, blood dilution and a pump are helpful to administer the unit to prevent slow flow rates that lead to clogging of the intravenous catheter.

4.3.7 Equipment:

4.3.7.1 Blood Warmers:

4.3.7.1.1 Warmers are rarely needed during routine transfusion situations.

4.3.7.1.2 Indications:

4.3.7.1.2.1 When rapid transfusion of components is required, especially in trauma or surgery settings, because the infusion of cold components can cause hypothermia and cardiac complications, increasing morbidity and mortality for the patient.

4.3.7.1.2.2 Neonates, where hypothermia can cause serious adverse effects in the infant.

4.3.7.1.2.3 Patients with cold agglutinin syndrome require the use of blood warmers to avoid infusion of cold red cells, which can increase the immune destruction of the cells by the cold agglutinin.

4.3.7.1.3 Warming devices shall be equipped with a temperature sensing device and a warning system to detect malfunctions and prevent hemolysis.

4.3.7.1.4 Warming devices should be validated. Maintenance and testing of alarms should be performed according to the manufacturer's suggestion. Temperature of warming device must be recorded daily by the departmental nurse as blood must not be warmed above 42 °C.

4.3.7.1.5 NOTES: Blood should not be warmed by placing it in a microwave, on a heat source, in hot water, or by using other devices not specifically approved by the FDA for blood warming.

4.3.7.2 Infusion Systems:

4.3.7.2.1 The manufacturer of the pump should be consulted to determine if the pump is approved for infusion of blood components.

4.3.7.3 Pressure Devices:

4.3.7.3.1 The application of an external pressure device to the blood bag to expedite the transfusion of RBCs causes minimal damage to the red cells and is a safe practice in the majority of patients.

4.3.7.3.2 However, the use of pressure devices has been reported to provide only a small increment in component flow rates.

4.3.7.3.3 When rapid infusion is desired, an increase in cannula size typically provides better results.

4.3.7.3.4 Note: The head nurse or her deputy must follow the preventive maintenance done by the responsible company for every machine.

4.3.7.4 Availability of Emergency Equipment:

4.3.7.4.1 The transfusionist should know how to obtain and administer emergency interventions.

4.3.7.4.2 Items must be prepared or available for emergency use during a transfusion by the head nurse or her deputy. They include the following:

4.3.7.4.2.1 Medications to treat an allergic reaction, ranging from antihistamines for mild reactions to epinephrine for severe reactions.

4.3.7.4.2.2 0.9% sodium chloride intravenous (IV) solution and administration set to keep an IV line open.

4.3.7.4.2.3 Ventilatory assistance and an oxygen source.

4.3.7.4.2.4 A mechanism to activate emergency resuscitation measures in the event of a severe reaction.

4.3.7.5 Baseline Vital Signs:

4.3.7.5.1 The patient's vital signs should be taken before the initiation of the transfusion (by the nurse) as a baseline for subsequent comparison.

4.4 ISSUE AND DELIVERY OF COMPONENTS TO THE PATIENT AREA: Refer to **"The Issue Of Blood And Blood Components"** chapter (LB-MPP-242).

4.4.1 Blood and blood products will be issued to physicians and nurses/ departmental technician who have presented proper identification to blood bank technician/ specialist.

4.4.2 Only compatible and completely tested blood and blood components can be released

4.4.3 Blood bank technician/ specialist checks the cross match register and blood transfusion request and gets the component unit from the storage machine.

4.4.4 The unit should be inspected for (by the person issuing the blood and the person to whom the blood was issued):

4.4.4.1 Expiry (or collection) date.

4.4.4.2 The integrity of the bag - check for leaks.

4.4.4.3 Evidence of unusual discoloration (segments appearing lighter or darker in color

than the primary bag contents, purple color to the red cells or cloudiness), gross lipaemia.

4.4.4.4 The presence of large clots, white particulate matter in the blood bag.

4.4.4.5 Grossly visible aggregates in platelet concentrate.

4.4.5 **Transfusion Recipient/ Blood bag Identification:** For each unit of blood or component, both the person issuing the blood and the person to whom the blood was issued must confirm that the identifying information on the "BLOOD & BLOOD PRODUCTS REQUEST & RELEASE FORM" (GDOH-LAB-BBPR-319), the cross match register and blood bag are all in agreement and must include:

4.4.5.1 Two independent patient identifiers, one of which is usually the patient's name and the other is file number (ID).

4.4.5.2 The recipient's ABO group and Rh type.

4.4.5.3 Donor's ABO group and, if required, Rh type. The donor's ABO/Rh must be identical with the recipient's, or compatible.

4.4.5.4 The blood component unit number.

4.4.5.5 The interpretation of cross match tests (if performed).

4.4.5.6 Type, quantity and expiration (or collection) date of the blood component.

4.4.5.7 Transfusion transmitted disease (TTD) negative result label.

4.4.5.8 Technician signature must appear on the "BLOOD & BLOOD PRODUCTS REQUEST & RELEASE FORM" issued with the unit of blood component.

4.4.5.9 The date and time of issue.

4.4.5.10 Special transfusion requirements (e.g. leukocyte-filtered, washed, or antigen negative component).

4.4.5.11 Blood product for transfusion label: is attached to the bag to be transfused indicating: The intended recipient's two independent identifiers, Bag number, Interpretation of compatibility tests, if performed, Quantity of the product and TTD negative result

4.4.6 If all checks are correct, the unit may be issued.

4.4.7 Any and all discrepancies must be resolved before issue.

4.4.8 The person issuing the blood, the person to whom the blood was issued, and the destination of the unit must be identified. Both the person issuing the blood and the person to whom the blood was issued must sign in the "BLOOD & BLOOD PRODUCTS REQUEST & RELEASE FORM" and Issue of cross matched blood form. In addition, the person to whom the blood was issued must sign in the cross match register.

4.4.9 The person to whom the blood was issued must get a paper of "BLOOD & BLOOD PRODUCTS REQUEST & RELEASE FORM" and place the unit in a protective container to contain any spillage if the bag breaks.

4.4.10 The person issuing the blood attaches the 'issue of cross matched blood' form to the copy of the "BLOOD & BLOOD PRODUCTS REQUEST & RELEASE FORM" and keeps all documents in their specified files.

4.4.11 **Delay in Starting Transfusion:**

4.4.11.1 The unit should be returned to the blood bank (by nurse or departmental technician) for proper storage.

4.4.11.2 The time, that RBCs unit can be out of the controlled storage environment before it is considered unsuitable for reissue, is usually 30 minutes.

4.4.11.3 If a refrigerated component rises above 10 °C, the unit must be infused within 4 hours of the time it was issued from the blood bank, or it must be discarded. Blood bags should be returned to the blood bank for disposal with the time of return documented. OVR is made by supervisor of blood bank technicians.

4.4.11.4 Components should never be stored or held in a patient care unit unless there is a controlled, monitored environment for components.

4.4.11.5 The transfusion of FFP and platelet concentrate should commence as soon as possible to preserve the maximum activity of platelets or coagulation factors.

4.4.12 **Return of Blood Components and Reissue:**

4.4.12.1 The blood bank may receive back into the blood component inventory those units that meet acceptance specifications. These conditions include the following:

4.4.12.1.1 The primary container has not been entered.

4.4.12.1.2 The appropriate temperature has been maintained and the component has been returned within a prescribed time frame from issue.

4.4.12.1.3 at least one sealed segment remains integrally attached to the container of RBCs.

4.4.12.1.4 Visual inspection of the component.

4.4.12.2 Platelets returned to the blood bank greater than 30 minutes from issue may be placed back into inventory following a visual inspection of the component. The platelet bag can be held in front of a light source and gently squeezed to check the "swirling" appearance of the platelets. If "swirling" is evident and/or there is no visible clumping of the platelets, they may be returned into inventory. The platelet component should be agitated for at least 10 minutes before reissue.

4.4.12.3 The cause of returning should be written on the Issue of cross matched blood form by the clinician to be accepted by blood bank

4.4.12.4 Documentation of all acceptable or unacceptable conditions must be carried out by blood bank technician or specialist who receives the returned unit. Use "Returned blood component units form".

4.4.12.5 Depending on the criterion not met, the component discarded in a biohazard container. If the component is accepted, it may be returned to the general blood inventory and reissued.

4.4.13 **BLOOD RELEASE IN AN EMERGENCY:**

4.4.13.1 Refer to the "**THE EMERGENCY RELEASE OF INCOMPLETELY TESTED BLOOD AND BLOOD COMPONENTS**" chapter (LB-MPP-238).

4.4.14 **RELEASED NONCONFORMING BLOOD AND BLOOD COMPONENTS:**

4.4.14.1 Blood and blood components, that are determined after release not to conform to specified requirements, shall be evaluated to determine the effect of the nonconformance on the quality of the product.

4.4.14.2 Corrective action taken.

4.4.14.3 Immediately call the ward, treating doctor or the hospital about the case and the nonconformance.

4.4.14.4 Try for retrieval of the unit.

4.4.14.5 If transfusion was started, transfusion must be stopped and the bag is returned to blood bank.

4.4.14.6 OVR shall be written.

4.4.14.7 Maintain records of the nature of non-conformances and subsequent actions.

4.5 PREADMINISTRATION EVENTS AND CONSIDERATIONS:

4.5.1 Identification of the Recipient and Correct Component:

4.5.1.1 Once the unit is received, the transfusionist should take it to the patient's bedside. There must be positive identification of the recipient using at least two independent identifiers (like name and ID) and by two staff members.

4.5.1.2 Check the following with another health-care provider (commonly the treating doctor with the head nurse):

4.5.1.2.1 Appearance of the unit: Units should be returned if there is discoloration, foaming, or bubbling of the component; abnormal cloudiness; presence of clots; or loss of integrity of the bag.

4.5.1.2.2 Identification of the patient and unit: The patient's name and identification number as well as unit number must match those in blood transfusion request.

4.5.1.2.3 Medical order: The transfusionist should verify that the component is the one requested on the medical order and that any special processing was performed.

4.5.1.2.4 Before transfusion, the treating doctor has to compare the patient's previous with the current blood group results and the blood group recorded on the blood transfusion request and in case of discrepancy; he (she) has not to transfuse the blood component except after discrepancy resolution.

4.5.1.2.5 Blood type: The patient's blood type should be compatible with the unit.

4.5.1.2.6 Expiration date.

4.5.1.2.7 TTD negative result label or stamp.

4.5.1.3 The transfusion should be withheld if any discrepancy or abnormality is found.

4.5.1.4 Regular training of the transfusionist is better to be done periodically.

4.5.2 Infusion Sets:

4.5.2.1 Components must be administered through special IV tubing with a filter designed to remove blood clots and particles potentially harmful to the patient.

4.5.2.2 Standard blood administration tubing has a 170- to 260-micron filter.

4.5.2.3 The tubing can be rinsed or primed with either 0.9% sodium chloride or the component itself (The manufacturer's instructions should be reviewed for proper use).

4.5.2.4 The IV setup should have a mechanism that allows bypass the blood IV administration tubing to start 0.9% sodium chloride in the event of a reaction. A suggested mechanism is to have a "Y" port or three-way stopcock close to the infusion site that would allow the administration of 0.9% sodium chloride.

4.5.3 Leukocyte-Reduction Filters:

4.5.3.1 Leukocyte-reduction filters are expected to reduce the number of leukocytes in red cell and platelet units to less than 5×10^6 cells.

4.5.3.2 Filters designed for red cells or platelets may not be used interchangeably. The manufacturer's instructions should be followed for priming and administering blood components through the filter.

4.5.3.3 Leukocyte removal may be ineffective or an air lock may develop, preventing passage of the component through the filter.

4.5.3.4 Leukocyte filters should never be used to administer granulocyte or mononuclear cell concentrates.

4.5.3.5 use of bedside leukocyte-reduction filters has been associated in some individuals with dramatic hypotension, often in the absence of other symptoms. This happens more frequently with patients taking angiotensin-converting enzyme (ACE) inhibitors. If a precipitous drop in blood pressure is noted, the transfusion should be stopped immediately.

4.5.4 Compatible IV Solutions:

4.5.4.1 No medications or solutions other than 0.9% sodium chloride injection should be administered simultaneously with blood components through the same tubing.

4.5.4.2 Solutions containing dextrose alone may cause red cells to swell and lyse.

4.5.4.3 Lactated Ringer's solution or other solutions containing high levels of calcium may overcome the buffering capacity of the citrate anticoagulant in the blood preservative solution and cause clotting of the component.

4.5.4.4 Acceptable solutions include ABO- compatible plasma, 5% albumin, or plasma protein fraction.

4.6 BLOOD TRANSFUSION ADMINISTRATION:

4.6.1 Starting the Transfusion:

4.6.1.1 Transfusions shall be prescribed and administered under medical direction.

4.6.1.2 The blood administration tubing should be filled with either 0.9% sodium chloride or with the contents of the blood component.

4.6.1.3 If any solution/medication other than 0.9% sodium chloride is infused before component administration, the tubing should be flushed with 0.9% sodium chloride before the blood infusion.

4.6.1.4 The infusion should start slowly at approximately 2 ml per minute for the first 15 minutes while the transfusionist remains near the patient.

4.6.1.5 Severe reactions may occur with as little as 10 ml transfused.

4.6.1.6 Potentially life- threatening reactions most commonly occur within 10 to 15 minutes of the start of a transfusion.

4.6.1.7 If there is no sign of a reaction after the first 15 minutes, the flow rate can be increased to the designated infusion rate.

4.6.1.8 The flow rate should be adjusted according to the volume that the patient's circulatory system can tolerate.

4.6.1.9 Transfusion must be completed in <4 hours.

4.6.2 Suggested Infusion Rate of Components in Nonemergency Settings:

4.6.2.1 RBC (Infusion duration should not exceed 4 hours):

4.6.2.1.1 In first 15 minutes: 1-2 ml/min (60-120 mL/hour)

4.6.2.1.2 After 15 Minutes: ≈4 ml/minute (240 mL/hour)

4.6.2.1.3 For patients at risk of fluid overload, may adjust flow rate to as low as 1 mL/kg/hour.

4.6.2.2 FFP:

4.6.2.2.1 In first 15 minutes: 2-5 ml/min (120-300 mL/hour)

4.6.2.2.2 After 15 Minutes: As rapidly as tolerated (≈300 ml/hour).

4.6.2.3 Platelets:

4.6.2.3.1 In first 15 minutes: 2-5 ml/min (120-300 mL/hour)

4.6.2.3.2 After 15 Minutes: 300 ml/hour or as tolerated

4.6.2.4 Cryoprecipitated AHF (anti hemophilic factors): As rapidly as tolerated.

4.6.3 Monitoring the Transfusion:

4.6.3.1 The transfusionist should continue to monitor the patient throughout the infusion and check the IV site and flow rate. The patient should be closely observed for the first 5-15 min after the start of each unit of blood or blood component (to detect any adverse events such as rash, wheezing etc.), then every 15 min for the next 30 minutes, every 30 min. for the next 1 hour and hourly till the end of transfusion.

4.6.3.2 If the IV rate has slowed down, the transfusionist should take one or more of the following actions:

4.6.3.2.1 Check to make sure that the IV site is patent and there is no swelling at the IV site.

4.6.3.2.2 Attempt to administer the component through an infusion pump.

4.6.3.2.3 Raise or elevate the unit.

4.6.3.2.4 Examine the filter for air, excessive debris, or clots.

4.6.3.2.5 Consider the addition of 0.9% sodium chloride as a diluent if the unit is too viscous.

4.6.3.3 Frequent monitoring of vital signs during the infusion will help alert the transfusionist to a possible transfusion reaction.

4.6.3.4 It is suggested that vital signs be taken every **5 minutes** for the 1st 15 minutes, every **15 minutes** for the next 30 minutes, every **30 minutes** for the next 1 hour and every **hour** thereafter

4.6.3.4.1 There is little evidence to support a best practice related to the frequency of vital-sign monitoring other than at baseline, soon after the start of the transfusion, and after transfusion.

4.6.3.5 Vital signs should be taken at once if there is a suspected transfusion reaction.

4.6.3.6 The bag label or other unit identifiers should never be removed during the transfusion.

4.6.3.7 The transfusionist should be knowledgeable about signs and symptoms indicative of an adverse reaction and able to act quickly.

4.6.3.8 If a transfusion reaction is suspected, the transfusion should be stopped and 0.9% sodium chloride administered.

4.6.3.9 The 0.9% sodium chloride should be infused near the IV insertion site to avoid flushing the tubing with the residual component.

4.6.3.10 The unit identification should be rechecked.

4.6.3.11 The transfusionist should notify the patient's care provider of any suspected transfusion reaction and obtain emergency medication orders as needed for the suspected reaction.

4.6.3.12 Refer to "**Adverse Reactions To Transfusion**" chapter (LB-MPP-244).

4.6.4 Completing the Transfusion:

4.6.4.1 At the completion of the transfusion event, the patient's vital signs are obtained.

4.6.4.2 The bag and tubing are discarded in a biohazard container if the transfusion was uneventful.

4.6.4.3 Because patients can experience delayed transfusion reactions, the nurse should continue to monitor vital signs periodically for 4-6 hours after the end of the transfusion to detect febrile or pulmonary reactions that may be associated with blood administration.

4.6.4.4 If the patient is not under direct medical supervision after the transfusion event, the physician should instruct the patient about signs and symptoms of delayed transfusion reaction to be aware of and report, and they should ensure that the patient has a phone number to call or a person to contact if a delayed reaction occurs.

4.6.4.5 Documentation of the transfusion event should be made in the patient's medical record. The following documentation is required:

4.6.4.5.1 Medical order for transfusion.

4.6.4.5.2 Documentation of recipient consent.

4.6.4.5.3 Name or type of component.

4.6.4.5.4 Donor unit identification number.

4.6.4.5.5 Date and time of transfusion.

4.6.4.5.6 Pre- and post-transfusion vital signs.

4.6.4.5.7 Volume transfused.

4.6.4.5.8 Identification of the transfusionists (nurse and physician).

4.6.4.5.9 Any adverse events possibly related to the transfusion.

4.6.4.6 If another unit needs to be transfused, manufacturer's recommendations should be consulted to determine if the same blood administration tubing may be used for subsequent units.

4.7 OPERATING ROOM AND TRAUMA: RAPID INFUSIONS Considerations.

4.7.1 If components need to be administered rapidly, the use of pressure infusion, large-bore administration tubing, and 8-Fr intravenous catheters can decrease the infusion time without inducing hemolysis.

4.7.2 Specific tubing sets are designed for rapid blood administration with appropriate filters.

4.7.3 Flow rates as fast as 10 to 25 mL/second (600-1500 mL/minute) have been reported with this tubing. At such rapid infusion rates, steps should be taken to avoid hypothermia.

4.7.4 When multiple units are infused through the same tubing, the flow rate may decrease appreciably.

4.7.5 Hypocalcemia and Transfusion-associated hyperkalemic cardiac arrest have been reported with rapid administration of RBCs.

4.7.5.1 Hypocalcemia is usually transient and dependent on the amount and rate of citrate infused. Calcium replacement may be based on the patient's ionized serum calcium level and the rate of citrate administration.

4.7.6 If components are urgently needed and a delay in transfusion could be detrimental to the patient, refer to "**The Emergency Release Of Incompletely Tested Blood And Blood Components**" chapter (LB-MPP-238).

4.8 NURSES ROLE IN BLOOD TRANSFUSION (Stepwise procedure considering the previous general rules):

4.8.1 Before Transfusion (Obtaining blood for typing & cross matching):

4.8.1.1 Check the doctors prescribed order.

4.8.1.2 Ensure that the patient's data required in the "**Blood & Blood Products Request & Release Form**" is properly and legibly filled by the prescribing doctor without any correction.

4.8.1.3 Wash your hands 40-60 seconds.

4.8.1.4 Assemble the equipment needed on the procedure trolley/tray and take to patients' room.

4.8.1.5 Two registered nurses should verify the four names by asking the patient's name/significant others, check the ID band and ensure that it coincides the "Blood & Blood Products Request & Release Form ".

4.8.1.6 Consent should be secured by the prescribing physician, witnessed by the assigned nurse and patient's identification must be verified by two nurses prior to extraction of blood samples for cross matching. Explain the procedure and provide the privacy to get the patient cooperation.

4.8.1.7 Select the appropriate site for blood extraction.

4.8.1.8 Put the drape underneath the site.

4.8.1.9 Put on clean gloves to prevent blood borne pathogens contamination.

4.8.1.10 Apply tourniquets 5-10 cm from the site of insertion then instruct the patient to open and close the fist of his/her hands.

4.8.1.11 Observe aseptic technique, insert an IV line with G18 or 16 cannula and extract 4 ml of blood for typing and cross matching before connecting to 3-way IV connector. Secure the site with transparent adhesive tape.

4.8.1.12 Transfer the blood obtained to vacutainer violet tube (EDTA tube) labelled clearly and legibly with the patient identification and the RN nurse signature. In order to avoid hemolysis, use adapter and needle for vacutainer tubes. If a syringe is used, do not apply pressure on transferring blood to the tube.

4.8.1.13 Dispose syringe with needle to sharp receptacle without recapping.

4.8.1.14 Dispose equipment used to medical waste bag.

4.8.1.15 Remove and dispose gloves to medical waste bag (biohazardous bag).

4.8.1.16 Wash your hands.

4.8.1.17 Attach the tube with blood to the "Transfusion Request Form" using plaster and put blood specimen with request into the container.

4.8.1.18 Send the sample and request immediately to blood bank using the available facilities.

4.8.1.19 If blood is for urgent use, or if FFP, Platelets, or Cryoprecipitate are requested, call the blood bank for follow up.

4.8.1.20 Follow the guidelines regarding "Issue and Delivery of Components to the Patient Area" as mentioned in (4.4) considering the following

4.8.1.20.1 Check the blood brought from the Blood Bank with the following:

4.8.1.20.1.1 Patient's four names, ward, medical record number.

4.8.1.20.1.2 Type of blood requested.

4.8.1.20.1.3 Number of units or quantity received.

4.8.1.20.1.4 Blood typing and cross matching.

4.8.1.20.1.5 Blood bag number.

4.8.1.20.1.6 Expiration date.

4.8.1.20.1.7 Transfusion request.

4.8.1.20.2 If blood and data are correct, sign the " the cross match register ", or the designated register, and "issue of cross matched blood form".

4.8.1.21 Upon ward reception of blood:

4.8.1.21.1 Place the blood in the refrigerator at 2-6°C if not to be transfused urgently.

4.8.1.21.2 If the blood Is to be transfused urgently keep at room temperature for not more than 30 minutes.

4.8.1.21.3 Inform the prescribing/on-call doctor to check the blood to be

transfused.

4.8.1.22 Ensure that the "Blood Transfusion Checklist Form" and "Confirmation Note" are accomplished by the prescribing/on call doctor in each specialty.

4.8.2 The transfusion process:

4.8.2.1 Check vital signs as baseline.

4.8.2.2 Recheck available blood before initiating transfusion (data written on the bag should coincide with the patient's "Blood & Blood Products Request & Release Form" and with the "Doctors Confirmation Documentation").

4.8.2.3 Wash your hands 40-60 seconds.

4.8.2.4 Collect equipment needed for transfusion on a trolley and take to patient's room.

4.8.2.5 Verify three times by asking the patient's name/significant others, check the ID band and ensure that it coincides with the " Blood & Blood Products Request & Release Form" together with the prescribing/on-call doctor.

4.8.2.6 Explain the procedure and provide privacy to the patient.

4.8.2.7 Position the patient comfortably.

4.8.2.8 Put on clean gloves.

4.8.2.9 Open blood transfusion set, and insert the tip of the chamber to the blood bag. Observe aseptic technique throughout the procedure.

4.8.2.10 Close the regulator of the set to prevent air entry.

4.8.2.11 Hang blood bag to the IV stand, then open the regulator, fill the chamber ¾ full then let the blood flow up to the tip of the tubing.

4.8.2.12 Put the drape underneath the IV site to prevent soiling of the linens.

4.8.2.13 Cleanse the 3-way IV connector with alcohol swab then remove the cover and place on procedure tray.

4.8.2.14 Remove the transfusion set tip cover, and then connect the tip of the three way connector to the transfusion set.

4.8.2.15 Open the transfusion regulator (check the arrow of the connector to make sure the line is open).

4.8.2.16 Regulate the rate at 1-2 ml/min for at least 15 minutes (observe signs of transfusion reactions and instruct patient to press the bell if it occurs later). Educate the patient/significant others on the clinical manifestation that must be reported immediately.

4.8.2.17 Remove disposable equipment used and dispose to medical waste including gloves.

4.8.2.18 Regulate the rate as prescribed.

4.8.2.19 Fill up the data required on the IV tag then attach to the blood bag (Ensure the data in the IV tag such as name of patient, ward and bed number, age, hospital number, blood typing, blood number, volume infused, date and time started and nurse's signature are accomplished).

4.8.2.20 Tag procedure trolley to treatment room and return unused equipment to its proper place.

4.8.2.21 Wash procedure tray with chlorhexidine soap (or the disinfectant availabe), keep dry.

4.8.2.22 Wash your hands 30 seconds.

4.8.2.23 Check the patient with ongoing transfusion, assess and monitor for any signs of transfusion reaction.

5. MATERIALS AND EQUIPMENT:

5.1 **Records And Forms:**

5.1.1 Blood & Blood Products Request & Release Form (GDOH-LAB-BBPR-319)

5.1.2 Issue of cross matched blood form.

5.1.3 Blood product for transfusion label.

5.14 Returned blood component units form and file.

5.1.5 Cross match register.
5.1.6 Non-conformance register.
5.1.7 Consent For Blood/Blood Components Transfusion (GDOH-COR-CBCT-357)
5.1.8 Blood transfusion reactions form (GDOH-LAB-BTR-325).
5.1.9 Adverse reaction investigation form.
5.1.10 Consent for blood transfusion without "ELISA &/or NAT"testing.
5.1.11 Blood Transfusion Checklist Form.

5.2 **Equipment**: As mentioned in the procedure.

6. RESPONSIBILITIES:

6.1 Physician:

6.1.1 Solely responsible for deciding the need and prescribing blood components .
6.1.2 He / She must state product type, amount. flow rate and date and time to be given .
6.1.3 Ensuring adequate documentation of blood transfusion in the medical records.
6.1.4 Explaining the risks and benefits of blood transfusion to the patient and obtaining consent .

6.2 Nurses:

6.2.1 Refer to "NURSES ROLE IN BLOOD TRANSFUSION" section (4.8).

6.3 Blood Bank Staff:

6.3.1 Ensuring that the labeling of request forms and blood samples comply with the hospital guidelines .
6.3.2 Blood grouping and compatibility testing .
6.3.3 Checking whether there are any special requirements whenever blood or blood components are requested.
6.3.4 Ensuring that blood and blood components are properly labelled, and the identification details of the patient and the blood to be transfused are the same.
6.3.5 The investigation and reporting of transfusion reaction or other incident related to transfusion .

6.4 Blood Bank Physician:

6.4.1 To monitor the blood/blood component utilization .

6.5 The Blood Utilization Committee (BUC):

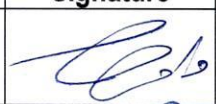
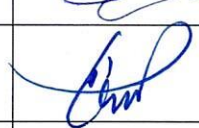
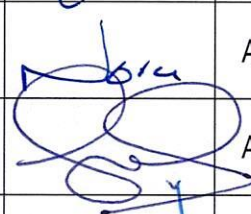
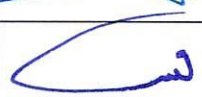
6.5.1 To review mechanisms that ensures adequate supplies of blood and blood products, and to make recommendation for any necessary improvements.
6.5.2 To review all confirmed blood transfusion reactions and to evaluate the cause and possible preventive measures that should have been taken.
6.5.3 To review the usage report of all blood components and ordering practices of blood products.
6.5.4 To approve, review and monitor implementation of policies and procedures relating to the distribution, handling, storing, use and administration of blood components in the hospital that includes but is not limited to:
6.5.4.1 Taking blood samples from patients for type and cross matching
6.5.4.2 Taking blood from donors and processing it
6.5.4.3 Handling of blood outside the laboratory.
6.5.4.4 Use of blood warmers and infusion devices.
6.5.4.5 Venous access
6.5.4.6 Addition of fluids and drugs other than 0.9% NaCL.
6.5.4.7 Bedside Identification of the blood product and the intended recipient.
6.5.4.8 Monitoring of patient during and after blood administration.
6.5.5 To ensures the optimal use of blood and blood products by establishing indications/triggers for the transfusion of blood, blood components and blood derivatives.
6.5.6 To monitor and review clinical indicators for transfusion services.
6.5.6.1 Blood units returned unused.
6.5.6.2 Surgical cancellation due to unavailability of blood.
6.5.7 To monitor the Blood Bank's performance and review all the procedures used for collecting, testing and storing blood and blood products.

7.1 Consent For Blood/Blood Components Transfusion (GDOH-COR-CBCT-357)
7.2 Blood transfusion reactions form (GDOH-LAB-BTR-325)
7.3 Adverse reaction investigation form.

8. REFERENCES:

8.1 The Unified Practical Procedure Manual For Blood Banks In The Arab Countries, 1434-2013.
8.2 The Standard Policy For Blood Banks In The Kingdom Of Saudi Arabia, 1st edition, 1435-2014
8.3 National Standards For Clinical laboratories and Blood Banks, 1st edition, 2015.
8.4 Saudi Central Board For Accreditation Of Health Care Institutions; Third edition, 2015.
8.5 AABB Technical manual, 18th edition, 2014.
8.6 AABB Standards for Blood Banks and Transfusion Services, 30th edition, 2016.
8.7 Mollison's Blood Transfusion in Clinical Medicine; 12th edition, 2014.
8.8 Modern Blood Banking & Transfusion Practices, 6th edition, 2012.

9. APPROVALS:

	Name	Title	Signature	Date
Prepared by:	Dr. Mohamed Amer	Blood Bank Physician		August 06, 2024
Reviewed by:	Dr. Kawther M. Abdou	Consultant & Lab. Medical Director		August 08, 2024
Reviewed by:	Ms. Noora Melfi Alanizi	Laboratory & Blood Bank Director		August 11, 2024
Reviewed by:	Mr. Abdulelah Ayed Al Mutairi	QM&PS Director		August 12, 2024
Reviewed by:	Dr. Tamer Mohamed Naguib	Medical Director		August 13, 2024
Approved by:	Mr. Fahad Hazam Alshammari	Hospital Director		August 20, 2024