THE RIGHT BLOOD FOR THE RIGHT PATIENT - USE OF BLOOD/ BLOOD PRODUCTS IN HOSPITALS

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The elimination of transfusion errors related to patient identification is a prime responsibility of hospitals. Such adverse events include the administration of mismatched units; events related to blood component collection; blood products dispensed, distributed, or administered; or wrong patients transfused. Recipient identification at blood collection and administration are essential to the safety of the total blood transfusion process. The safe transfusion of blood components is a complex process involving many departments, multiple staff, and several steps. (1)

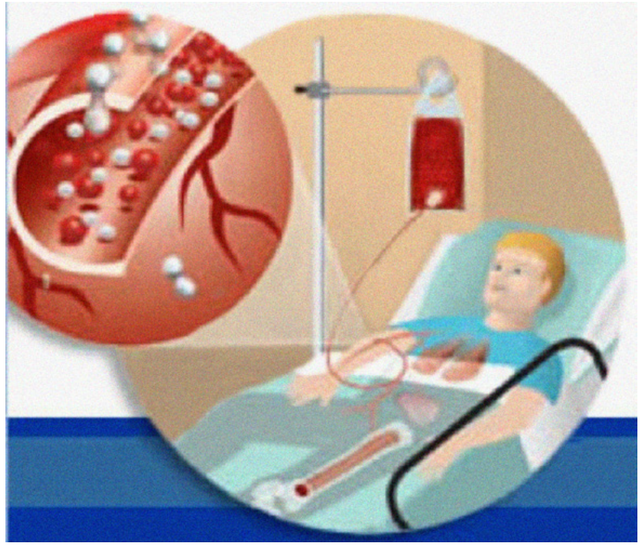
Introduction

Administration of blood or blood products may become a necessity when the indication for their use is identified. The use of blood in hospitals is a treatment modality that carries with it an element of acute or late adverse effect. Hospital staff should exercise utmost care when administering blood to their patients. Hospital officials should ensure that the concerned staff who are involved in this process are competent to do so. This competency should be updated through periodic training and testing. Also hospital officials should continue to evaluate the blood administration process to eliminate problematic steps and reduce the human intervention whenever possible, by introducing information technology in the verification process such as barcodes.

Patient death or disability associated with incompatible blood is one of the hospital-acquired adverse events that occur in about 1 of 10,000 transfused units. According to the Agency for Healthcare Research and Quality's (AHRQ) report - Statistics on Hospital-Based Care in the U.S., 2007 - two-thirds of these errors are associated with incorrect blood recipient identification at the patient's bedside.

Definition of Blood Transfusion

Blood transfusion is the process of receiving blood products into one's circulation intravenously. Transfusions are used in a variety of medical conditions to replace lost components of the blood. Modern medical practice commonly uses only components of the blood, such as red blood cells, white blood cells, plasma, clotting factors, and platelets.(2)



The World Health Organization (WHO) monitors key quantitative blood safety indicators to assess the global situation on blood safety, monitor trends and progress, and identify priority countries for support. In 2007, a fact sheet issued by the WHO's program on Blood Transfusion Safety indicating that millions of patients needing transfusion around the world do not have timely access to safe blood.(3)

Indications for Blood Transfusion

The treating physician identifies the need for transfusion of whole blood based on any of the following clinical indications:

- Anemia
- Major surgical operations
- Accidents resulting in considerable blood loss
- Cancer patients requiring therapy
- Women in childbirth and newborn babies in certain cases
- Patients of hereditary disorders like Hemophilia and Thalassaemia
- Severe burns.

Transfusion of whole blood is a well-recognized life saver during and after major surgery and where there is massive loss of blood in an accident or in childbirth. There are, however, various conditions which do not need whole blood replacement. For example, chronic anemic condition requires transfusion of only the red cells of blood. Separation of red cells from plasma can be achieved either by allowing the container in which the blood is collected to stand for few hours during which the red cells will separate themselves from the plasma by gravity, or by spinning the container in a centrifuge.

Autologous Blood

Persons who require surgery, but are otherwise in good health and are able to donate blood safely may reasonably donate blood for themselves prior to surgery. It is generally possible for a patient to donate 2 to 6 units of blood in this way within a period of 4-6 weeks. A slight fall in hemoglobin level is acceptable. Autologous donation has become well established practice in preparation for certain orthopedic procedures that are likely to require blood transfusion.

Training and Competency Assessment

To become eligible to order and administer blood/ blood products, the medical and nursing staff undergo extensive training and competency testing. Healthcare personnel who participate in the administration of blood components must be trained in transfusion procedures and in recognition and management of adverse reactions. The bedside identification is to be performed by a qualified individual such as a physician and registered nurse, two registered nurses, or by a registered nurse and a licensed practical nurse.

Informed Consent

Informed consent for blood transfusion is a process in which the patient is informed of the medical indications for the transfusion, the possible risks, the possible benefits, the alternatives, and the possible consequences of not receiving the transfusion.

Informed consent should be obtained by the physician who explains the risks of transfusion (including adverse symptoms and alternatives to the blood transfusion), benefits, possible alternatives, and possible results of non-transfusion. Informed consent should be obtained sufficiently in advance of the transfusion that the patient can truly understand what is said and have sufficient time to make a choice. Informed consent should be documented in the medical record. A single informed consent may cover many transfusions if they are part of a single course of treatment.

In emergency situations the physician ordering the transfusion must make a reasonable judgment that the patient would accept the transfusion. Transfusion should not be delayed in a life-threatening situation if it is likely that the patient would agree to transfusion. After the event, the circumstances of the transfusion decision should be documented in the patient's medical record.

A Physician Order

Blood transfusion in hospitals should always be initiated by a medical staff member with a written order in the patient's medical record including the following points:

1. Date and time the order is written
2. Type of the blood product required
3. The amount of the blood product: For pediatric patients the volume must be specified. For adult patients the number of units must be specified
4. Time frame in which to transfuse the blood/blood product
5. Any special instructions (irradiated, leukocyte-filtered, washed, Cytomegalovirus (CMV) -negative)
6. Signature of the medical staff member
7. An order for intravenous (IV) line with 0.9% saline solution for patency.

Preparation and Issuance

The blood bank staff should perform the compatibility testing and proceed to prepare the blood/blood products in accordance with their internal policies and procedures. Blood bank staff should prepare the transfusion record and include the following information:

1. Patient's triple name and patient hospital number
2. Blood/blood product unit number
3. Blood group and Rh type of the patient and blood unit
4. Volume and component
5. Any special instructions (irradiated, filtered, washed, CMV-safe)
6. Name of blood bank staff and date of preparation
7. The signature or initials of blood bank

Intravenous Solutions

Only isotonic saline (0.9%) is recommended for use with blood components. Other isotonic electrolyte solutions that have been approved by the FDA for this purpose may be used. Other commonly used intravenous solutions will cause varying degrees of difficulty when mixed with red cells. For example, 5% dextrose in water will hemolyze red cells. Intravenous solutions containing calcium, such as Lactated Ringer's solution, can cause clots to form in blood. Prior to blood transfusion, completely flush incompatible intravenous solutions and drugs from the blood administration set with isotonic saline.

The Transfusion Process

Step 1

- The staff eligible to administer the blood/blood product visually checks it for any abnormalities such as clots, leakage, odd color, punctures, etc. If any of the above is observed, the staff should not proceed with the transfusion process and should return the blood unit to the blood bank.

Step 2

- The staff matches the information on the blood/blood product against those on the transfusion record issued by the blood bank to ensure compatibility.

Step 3

- The staff performs patient identification at bedside using the two patient identifiers (triple name and patient hospital number) by matching the information on the identification bracelet with the information recorded on the transfusion record. If the identification bracelet is not available, the staff should perform positive patient identification. In case of a documentation error or a discrepancy in identification, the staff should clarify the discrepancy and achieve positive identification. In case of any doubt, the staff should return the blood/blood product immediately to the blood bank.

Step 4

- The staff records the vital signs (temperature, blood pressure, respirations and pulse) before initiating the transfusion and after 15 minutes. The staff monitors the patient closely during the first 5 minutes for early identification of transfusion reaction. The staff should also record the patient's temperature every 30 minutes during transfusion, at the end of the transfusion and one hour post transfusion.

Step 5

- The staff should record his/her name, date, time, and signature on the transfusion record. The same identification procedure should be repeated independently by the "witness" at the bedside and recorded on the transfusion record. The transfusion record should be filed in the patient's medical record.

Use of Barcodes in the Verification Process

The Food and Drug Administration (FDA) encourages the use of barcodes to match the information on the blood unit with that on the patient's bracelet as an effective and safe method of verification.

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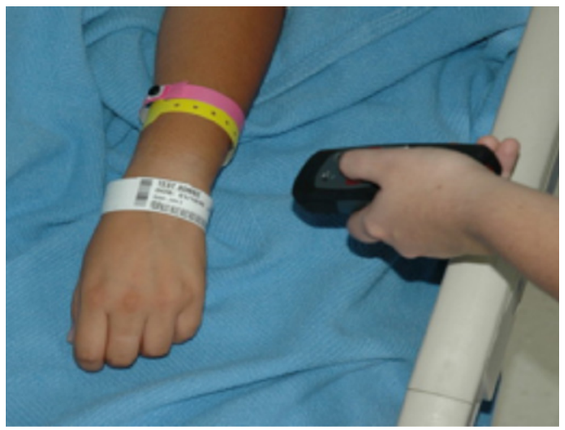


Transfusion Reaction

The staff eligible to administer the blood/blood product should monitor the patient for possible reaction. In case a reaction is identified or suspected, the staff should immediately stop the transfusion and report the case to the physician. The signs and symptoms of a transfusion reaction may include:

- Fever and chills
- Pain at the infusion site, chest, abdomen or flanks
- Acute blood pressure changes
- Respiratory distress
- Skin changes
- Nausea and vomiting

Responsibilities of the Hospital Leadership

The hospital leadership should ensure that the blood transfusion process is monitored by selecting and monitoring specific indicators such as:

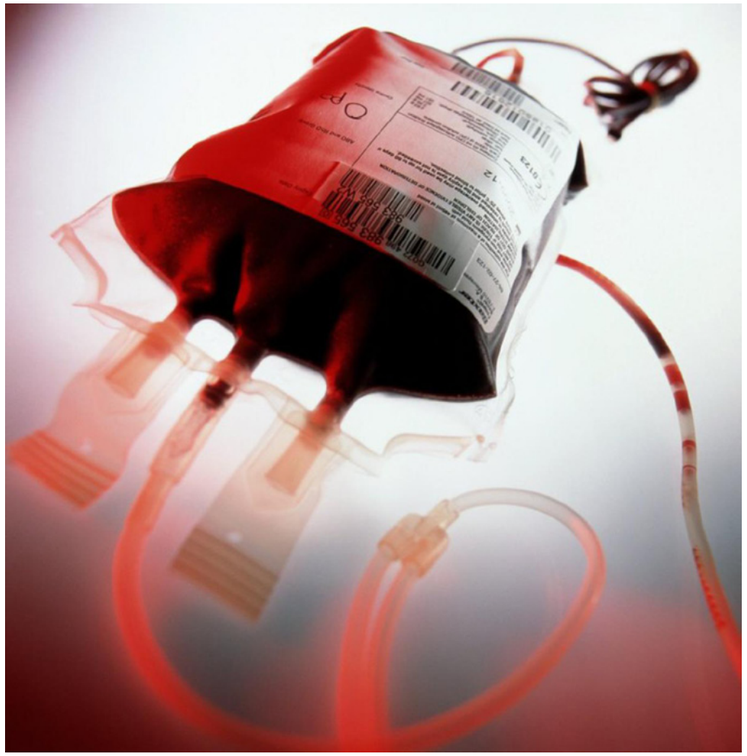
- Indication for the use of blood
- Cross matched to Transfused (CT) blood ratio
- Compliance with the informed consent process
- Blood transfusion reactions – Hemolytic and non-hemolytic

Risks of Blood Transfusion

A hemolytic transfusion reaction is considered a sentinel event that requires the formation of a special task-force to conduct root cause analysis and prepare an action plan to prevent similar events from happening in the future. (4)
If a transfusion reaction is suspected, the staff should

- Stop the transfusion
- Maintain the infusion line
- Send the blood/blood product unit to the blood bank
- Report the event by using the appropriate reporting form
- Document the event in the patient's medical record

Ethics of Blood Transfusion



We should respect the wishes of the patient and family and their religious beliefs. Some groups do not accept the receipt of blood. In such situations, the physician and the healthcare team should take note of this and plan for possible alternatives.

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