

5 Ordering and administration of blood

Procedures for the administration of blood may vary in different hospitals but safety is always the primary concern. As monitoring of the patient during transfusion is usually a nursing responsibility, accurate and thorough guidelines should be available for all nurses.

In order to ensure the safety of transfusion, these guidelines should include:

- i. Correct identification and verification of the patient and the blood unit.
- ii. Correct aseptic technique.
- iii. Careful observation of the patient during transfusion.
- iv. Special precautions.

1 IDENTIFICATION AND VERIFICATION

The safe transfusion of blood products starts with the positive identification of the patient at the time of drawing a blood sample for compatibility testing. Identification is carried out by questioning the conscious patient or suitable responsible person and by matching the name and hospital registration number on the unit with the patient's records and name band. After being filled with blood, the sample should be clearly labelled at the patient's bedside, with full names, date of birth, hospital number, date of sample and ward name or number. In the under age or unconscious patient the medical staff may assume the responsibility for identification.

The clinician should complete a requisition form outlining all the above information plus details of previous medical, obstetric, and transfusion history, the diagnosis, reason for transfusion, number and type of component required, and the date and time when the blood or blood components should be available. This information will assist the blood bank staff in identifying the recipient and in finding the compatible units. The blood bank will return all incomplete or illegible forms, and samples. The reason for this is that the Transfusion Service cannot accept any legal responsibility if they are not supplied with the appropriate information as outlined above. Laboratory tests are carried out on the sample to determine the ABO and Rh status of the patient, to detect blood group antibodies and to test for serological compatibility with the available donor.

a) The Unit

Prior to commencing the transfusion, the blood unit is preferably verified by a medical practitioner and a registered nurse or by two registered nurses. However, staffing and other requirements do not always make this practicable; nevertheless, special care must be exercised in identification procedures. It should always be assumed that one has the wrong patient or the wrong unit, until all identification has been specifically checked. The following guidelines should be adhered to:

- i. All identification is carried out at the patient's side.
- ii. All information is read aloud by both people checking the blood.
- iii. The recipient's name and identification number on the unit must be identical to that on the hospital record (folder).
- iv. The identification number on the unit must correlate with the unit identification number on the requisition form and/or label.
- v. The donor's ABO and Rh groups must be recorded on the blood unit (and the transfusion requisition).
- vi. Verification of compatibility between the donor and the recipient must be made.
- vii. If possible the patient's ABO and Rh groups should be confirmed from previous transfusion information.
- viii. The date and time of expiry of the unit must be checked. On no account must expired blood be transfused.
- ix. The blood component and the container must be visually examined for abnormalities. The hermetic seal of the container must be intact and show no evidence of being pierced after the container was filled.

b) The patient

Asking for his/her full name, birth date and other relevant details identifies the patient. The questions should be phrased so that the patient gives a specific answer and not just "yes" or "no". For example "What are your full names?" and not "Are you Mr J Smith?" The patient information must correlate with that on the blood unit (and requisition form).

Extra care must be taken in identifying the unconscious, anaesthetised or unidentified patient by checking identity bands, written records and requisition forms. ONLY if all identification is in order may the transfusion be initiated.

2 ASEPTIC TECHNIQUE

Blood is usually transfused through a large needle or cannula, the size of which is selected according to the calibre of the patient's veins. Almost any peripheral vein is suitable for transfusion; however, those in the forearm are best, as the patient's movement will not be restricted. Meticulous skin care and aseptic technique cannot be overemphasised in transfusion therapy as blood acts as an ideal culture medium for bacterial growth. The proposed site for venepuncture should be cleaned with the recommended hospital antiseptic working from clean to dirty area. Ideally, gloves and a sterile field should be used to position the cannulae for transfusion, but most especially in the immunocompromised and long-term transfusion patients. The site should never be re-palpated after cleansing.

During transfusion the transfusion site should be visible through a transparent dressing so that any inflammation or infiltration may be seen immediately. The transfusion should be repositioned if inflammation is observed.

3 MONITORING THE PATIENT

One of the major roles of the nurse, in transfusion therapy, is monitoring of the patient. The accurate and quick interpretation of adverse effects could prevent a fatal reaction occurring.

The unit number, date of transfusion, and the starting and finishing time of each unit transfused should be recorded in the patient's folder. Some services require additional signatures on accompanying forms. All this information should be permanently retained in the patient's folder.

Baseline observations of vital signs should be recorded prior to commencing the transfusion. The patient is then observed closely for the first 30 minutes of the transfusion, to observe any untoward reaction, and to ensure that the desired rate of transfusion is maintained. In cases of major blood loss, ideally the CVP, pulse, BP, respiratory rate and urinary output should be monitored every 15 minutes throughout the transfusion. In less acute cases the recipient's vital signs should be checked every half hour after the initial 30-minute observation. Patients at risk for circulatory overload should be observed for 12-24 hours after transfusion.

In the event of any untoward sign or symptom occurring, the transfusion must be stopped immediately, the drip set changed, and the vein kept open with a transfusion of normal saline.

All empty blood units should be returned to blood bank. In any event, they must be retained for 48 hours following transfusion, at a temperature of 1-6 °C.

4 SPECIAL PRECAUTIONS

a) Rate of transfusion

The rate of the transfusion depends on the clinical condition of the patient. A patient in acute shock from massive blood loss will require rapid transfu-

sion whereas a patient with chronic anaemia should not exceed 2 ml per minute. A relatively slow drip of 5 ml per minute is recommended for the first 30 minutes and if there is no sign of untoward reaction the rate can then be increased. Blood transfusions must be completed within 6 hours of entry of the pack. Blood components that are not used immediately should be stored at the temperature specified by the blood bank. Blood components that are no longer required for a specific patient must be returned to the blood bank for correct storage (if still contained in the original packaging and no seals are broken) or disposal.

b) Filters

Red blood cells, whole blood, cryoprecipitate, FFP and WPBTS VIAHF (Factor VIII concentrate) are administered through a standard blood recipient set, or Y-type giving set. These sets have 170 μm mesh filters to prevent the transfusion of clots or coagulation debris.

A platelet giving set should preferably be used with platelets although the standard 170 μm filter administration giving set may also be used in an emergency. The latter results in greater loss of the available platelets due to larger surface area for adhesion.

The filter should be covered with blood to ensure that the full filtering area is used.

The administration set should be changed:

- i. When there is a transfusion reaction, in order to prevent potentially harmful blood entering the patient's system.
- ii. Between red cells and other blood products, and between red cell transfusions of different ABO groups.
- iii. Before infusing other fluids, e.g. Dextran, Ringers lactate.
- iv. Every 12-24 hours in patients requiring long term transfusion.

c) Temperature of the blood

If cold blood is administered at a slow rate it does not appear to affect the circulatory system. However, in cases where rapid transfusion is necessary, complications such as cardiac arrhythmia can be avoided by warming the blood to not more than 37 °C. Overheating of the blood can cause extensive haemolysis with resultant severe transfusion reaction and possible death. Blood should be warmed with a blood warmer specifically designed for that purpose. This apparatus should be equipped with a visible temperature-monitoring device and should have an audible alarm. The practice of warming blood in a sink of warm water is ineffectual, as only the outer red cell layers are warmed, and hazardous as the ports may become contaminated. Further, overheating may occur with devastating haemolysis. Blood warming is not routinely indicated and

refrigerated blood may be transfused without harm over several hours.

Indications for warming are:

- i. Massive transfusion of more than 50 ml/kg/h.
- ii. Infants transfused at greater than 15 ml/kg/h.
- iii. Neonates receiving exchange transfusion or large volume transfusion.
- iv. Patients with high titre cold haemagglutinins reactive in vitro at temperatures above 30 °C.

d) Additives

With the exception of sterile normal saline, no medications or other fluid should be added to the blood or blood products before or during a transfusion because:

- i. Bacterial contamination is a real hazard whenever any unit of blood is entered.
- ii. A reaction could occur between the drug and the anticoagulant or nutrient fluid in the blood, e.g. Dextrose solutions might cause lysis or aggregation of the red cells in the transfusion set.
- iii. Because blood may be administered slowly, therapeutic levels of a drug may not be achieved.
- iv. If it is difficult to infuse medication through an alternative access site then a Y piece may be inserted near the junction of the insertion of the IV transfusion cannula.