Clinical Blood Transfusion Policy

National Blood Service, Ghana

CLINICAL BLOOD TRANSFUSION POLICY

Policy for the Prescribing, Collection, Storage and Administration of Blood and Blood Components for Patients in Hospitals

First Edition

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Foreword

The Health Services Rehabilitation Project III (HSRP III) of the Ministry of Health of Ghana aims at reducing inter-regional disparities in performance and quality of health care delivery by addressing priority areas identified in the MOH's Second Five Year Programme of Work (2002-2006).

One of the components of the HSRP III is the 'Support to the National Blood Transfusion Services'. This component aims to achieve well-organized, coordinated and improved blood services in Ghana through the modernization and restructuring of the National Blood Service. The overall objective is the institutionalizing of the collection of safe blood and blood components from regular voluntary non-remunerated blood donors, and ensuring adequate and appropriate processing by trained and competent professional staff at three Area Blood Centres, for distribution to hospitals in Ghana.

The targeted outcomes of the HSRPIII Component 2 are:

1. Appropriate organization and management of blood transfusion services nationwide
2. Securing requiring professional staff and collaborating with stakeholders
3. Construction and equipping of a National Blood Service (NBS) Headquarters and Southern Area Blood Centre in Accra, a Kumasi Blood Centre, and a Tamale Blood Centre. These Area Blood Centres will, at least initially, cover the country together with numerous blood banks in hospitals.
4. Appropriately resourced blood donor programmes in place
5. Appropriate use of safe blood and blood components

A number of Working Groups provided technical assistance services for the HSRPIII Component 2. The Technical Working Group on Safe Clinical Transfusion Practice (TWG 5) was tasked to formulate a National Clinical Blood Policy based on WHO guidelines, develop policy and procedures for Autologous Blood Transfusion, and develop a strategy and system for Emergency Blood Supply.

This document is patterned on the United Kingdom NHS Blood Transfusion Policies, with reference to the National Guidelines for the Clinical Use of Blood and Blood Products and teh Ghana National Blood Policy.

Introduction

It is well recognised that most errors in blood transfusion practices are operational rather than technical. Thus, errors in obtaining and labelling blood samples, requesting, storage, collection and administration of blood or blood components can lead to significant risk to patients.

Many 'wrong blood' episodes involve multiple errors at various stages of blood transfusion process. It is believed that such errors can be prevented if appropriate steps are taken to ensure that transfusion practices are performed to high standards of safety and effectiveness.

The procedures set out in this document, which must be considered in its entirety, constitute the NBS Ghana Clinical policy for transfusion of blood and blood components. These have been based on and are in line with the National Guidelines for the Clinical use of Blood and Blood Products (revised in 2009) and the National Blood Policy (2006).

The contents of this policy are broadly based on the National Guidelines for the Clinical use of Blood and Blood Products and covers the administration of blood and blood components and the management of transfused patients published in 2002 and revised in 2009. The guidelines reflect current professional opinion.

Glossary

CMV	Cytomegalovirus
DIC	Disseminated Intravascular Coagulation
DOB	Date of Birth
ECG	Electrocardiogram
FBC	Full Blood Count
FNHTR	Febrile Non Haemolytic Transfusion Reaction
GvHD	Graft Versus Host Disease
HB	Haemoglobin
HLA	Human Leukocyte Antigen
IV	Intravenous
IVIG	Intravenous Immunoglobulin
LFT	Liver Function Test
MSBOS	Maximum Surgical Blood Ordering Schedule
NBS	National Blood Service
NHIS	National Health Insurance Scheme
PTP	Post Transfusion Purpura
TRALI	Transfusion Related Acute Lung Injury

1 Requirements and Responsibilities

1.1 PURPOSE

The purpose of the policy is to detail best practice, to reduce the risk of transfusion errors and to assist practitioners with all aspects related to transfusion of blood and blood components/products.

This policy aims to provide a safe procedure from the requisition for blood component to collection, transportation and administration to patients. It covers guidelines for red cell, plasma, cryoprecipitate and platelet transfusions.

1.2 REQUIREMENTS

1.2.1 It is essential that all health care professionals and other staff responsible for, or involved in, any stage of the handling and administration of blood or blood components, are able to:

a. Identify and understand their role in the safe handling and administration of blood.

b. Complete that role safely.

1.2.2 The fate of all blood components/products must be traceable from donor to recipient and vice versa.

1.2.3 Data needed for full traceability from donor to recipient and recipient to donor shall be kept for at least five (5) years.

This requires patient medical records to be kept
for a minimum of five (5) years

1.2.4 It should be noted that the risk of transmitting viruses with the transfusion cannot be entirely excluded

.1.2.5 Consent should always be obtained from patients prior to a transfusion, following which the “Consent form for transfusion of

blood/blood products" is appropriately completed and signed by patient or otherwise guardian, if patient is under 18 years, and kept in the patient's hospital folder (refer Appendix 1 on page 30).

1.3 ACCOUNTABILITY AND RESPONSIBILITY

1.3.1 All staff involved in the transfusion process should be familiar with the National Blood Policy, the Clinical Blood Transfusion Policy and associated policies, as well as with their own professional responsibilities

1.3.2 Doctors

a. Doctors are accountable for the appropriate use of blood/blood components/products and alternatives to transfusion

b. Prescribers of blood transfusions are accountable for ensuring that:

- The correct patient for the correct blood/blood product is identified.
- The patient understands the need for a blood component or product
- The component, quantity, duration of transfusion and any special instructions are clearly prescribed.
- The blood request form is correctly completed with the patient's details
- The decision to transfuse and the clinical outcome are clearly documented in the patient's medical notes.
- They are aware of how to investigate and manage blood component/product transfusion reactions.

1.3.3 Qualified Nursing Staff

a. Qualified Nurses are accountable in following the National Blood Policy, the Clinical Blood Transfusion Policy and associated policies.

b. That they are up to date in the following mandatory training:

- Blood Transfusion
- Anaphylaxis
- Basic Life Support
- Infection Control

1.3.4 Managers / Matrons (Hospitals)

a. Managers / Matrons are responsible for ensuring that staff receive mandatory training on Blood Transfusion

b. They are to ensure that essential equipment is in place and in good working condition i.e. Blood fridge, Transit Cool Boxes, Emergency kit for transfusion reactions etc.

c. They are to ensure that an annual audit of blood transfusion practice and competency is carried out.

1.3.5 All staff authorised and trained to undertake venepuncture are accountable for:

- Correctly identifying the patient verbally
- Using the correct blood request form
- Ensuring that the patient's details on the wrist band (hospitals only) correctly match those on the blood request form. Wristbands should be checked using the patients Hospital Number and NHIS number where applicable
- Taking the correct blood samples using correct bottles.

2 Prescribing Blood or Blood Components

2.1 Prescribing blood and blood components/products is the sole responsibility of medical doctors and no other members of staff are authorised to prescribe blood.

2.2 Doctors are responsible for:

2.2.1 Prescribing blood component specifying:

- The type of blood component required.
- Volume or quantity to be transfused.
- Rate or duration of infusion.
- Special requirements such as gamma irradiated, HLA matched etc. These specifications must always be clearly stated both on the crossmatch request form and the blood prescription chart.
- Any medication required before or during transfusion.
- If a patient's clinical condition requires more frequent observations during transfusion than are routinely indicated on the prescription chart.

2.2.2 Explaining risks and benefits of proposed transfusion therapy to patients and obtaining their informed consent (details must be recorded in patient notes).

2.2.3 The investigation and management of adverse transfusion reactions and reporting all adverse events to the blood transfusion laboratory.

2.2.4 Authorising/completing the blood component request form, which must contain the following information:

- Patient's Surname.
- Patient's Forename(s) (initials not sufficient).
- Patient's Date of birth (if not known, age)

- Patient's Hospital number and NHIS number
- Patient's Sex
- Patient's Ward/location
- Time and date of request.
- Time and date the blood component is required.
- Relevant clinical details and precise indication for transfusion (unqualified terms such as 'anaemia' or 'low Hb' are not acceptable).
- When requesting red cells, the pre-transfusion Hb including the date of test should be given on the request form.
- The requests for platelets should indicate the patient's platelet count and the precise indication.
- Name and signature of doctor filling in the request form.
- Previous blood group, transfusion history and atypical antibodies (if known).
- Special requirements if any (e.g. gamma irradiated products, etc – details of indications for these requirements are given on the cross-match request form).

2.2.5 Discussion between the Transfusion Laboratory and clinical staff is essential during medical emergencies that may require the issue of blood products. Telephone requests for blood products should be made by a medical officer or during difficult circumstances by a delegated individual. The requestor must provide the same information as detailed above in 2.2.4. Laboratory personnel receiving verbal requests will record name of requestor and repeat all the details given to confirm accuracy.

2.2.6 Blood for elective surgical procedures should be requested in accordance with the Local / Regional Maximum Surgical Blood Ordering Schedules (MSBOS)

2.2.7 Fully cross-matched blood can usually be provided within 40 minutes. Red cells will normally be reserved for the patients for only 48 hours after the date requested unless special arrangements have been made with the laboratory.

2.2.8 Blood transfusions should only be administered when a qualified staff will be available to monitor patients to maintain patient safety

2.2.9 If patients are receiving long-term transfusion therapy for the same indication, the indication and explanation offered to patients need not be documented for each transfusion episode, but these must be fully documented for the initial episode.

3 Requirements for Taking Blood Transfusion Samples

3.1 Personnel to take Blood Samples

A blood sample for cross matching may be obtained by the following members of staff:

- Medical staff.
- Phlebotomists.
- Clinical staff that have been trained for this purpose, for example nurses, midwives and other health care professionals

3.2 Identification of the patient

3.2.1 All patients must be positively identified. Establish patient's full name and date of birth by asking, “what is your full name?” and “What is your date of birth?” and NOT questions such as “Are you Mr. .....?”

3.2.2 As much as possible in-patients should have an identification wristband at the time of taking “group and save” or “crossmatch” samples. The details present on the wrist band should contain NHIS number or the Hospital number

3.2.3 In case of patients unable to confirm their identity (e.g. confused or unconscious), two qualified trained members of staff (section 6.4) should check the unique patient NHIS number and/or Hospital number on the patient's wristband.

3.2.4 Only one patient should be bled at a time to minimize the risk of error.

3.2.5 Adults require 1 x 5ml Blood Transfusion sample for group and save / cross-match.

3.3 Labelling of patient's blood samples

3.3.1 The person taking the blood samples must label the sample tubes at the patient's bedside.

3.3.2 The following minimum patient identification details must be clearly written on the sample tubes:

- Surname.
- First Names (not initials).
- Date of birth or age.
- Hospital/NHIS number.
- Legible name/initials of the person taking the sample.
- If the patient details are unknown, the patient name should be referred to as 'unknown' and the emergency number; approximate age and sex must be recorded on the request form for patient identification.

3.3.3 Sample tubes must never be pre-labelled.

3.3.4 Sample details must be handwritten.

3.3.5 In relation to previous transfusion of cellular components (red cells, platelets) a fresh sample should be submitted with each repeat request for blood, at least 48 hours in advance of the next transfusion, where possible:

- In the absence of recent pregnancy or transfusion, samples may be taken up to 5 weeks prior to planned transfusion.
- In pregnancy, the sample used for cross-match should be taken within a maximum of 7 days prior to transfusion.

3.3.6 Samples that are not fully and correctly labelled as specified in section 3.3.2 will not be processed, and the requesting clinician or clinical team will be notified accordingly.

4 Ward Procedures prior to Collecting Blood from Blood Bank

4.1 Before requesting the collection of blood products, the following procedures / checks should be carried out:

- check details on prescription
- check verbal consent has been obtained (where appropriate)
- ensure all required equipment / items have been collected
- confirm blood products are ready for collection
- ensure pre-transfusion baseline observations have been recorded

N.B Pre-transfusion observations can be taken up to an hour prior to transfusion. If any observations are outside of the normal range then medical advice should be sought before blood unit(s) collected

4.2 Check patient identification (first name, surname, date of birth/age and identification number) from the following:

- patient verbal identification (full name and date of birth/age only)
- patient identification band
- Blood Transfusion Record

4.3 Identify an appropriately trained person to collect the blood units and confirm the following with the collector:

- which blood product(s) should be collected
- where the blood product(s) should be collected from
- the correct procedure for collection

4.4 Once the above checks have been completed, the person requesting the collection of blood product(s) must sign and record the date and time collection was requested on the Blood Transfusion Record. This documentation should then be taken by the collector and used to confirm patient identification at the Issue Fridge / Blood Bank.

5 Collection of Blood or Blood Components for Transfusion

5.1 Anyone collecting blood from the Blood Bank must be instructed in the correct procedure and have carried out the appropriate patient identification checks as outlined previously.

5.1.1 The following grades have been identified as appropriate, subject to training:

- Registered Nurse or Midwife
- Student Nurse
- Health Care Assistant
- Designated Emergency Department and Theatre Porters

5.1.2 The person responsible for collecting the blood (the collector) must have a personal identification tag and must bring a document identifying the patient with the following: patient identification number, full name and date of birth/age to the Blood Bank.

5.2 At the Blood Bank:

5.2.1 Check that details in the Blood bank register, match with the patient details:

- Patient Identification number
- Patient surname and first name
- Date of birth/age

5.2.2 The compatibility report form for each patient should accompany the unit for transfusion. Check expiry date on the blood pack. N.B the expiry date refers to the unit expiring at midnight of that date.

5.2.3 Only one unit of blood should be collected at a time. The only exceptions are for non-red cell components, or when the blood is to be transfused immediately and by special arrangement with the Transfusion Laboratory.

5.2.4 Check that the bag / unit number on the front of the blood bag matches the bag / unit number on the compatibility label on the blood bag. Visually inspect the unit for leaks, clots and discolouration

5.2.5 Check that all of the patient identification details on the compatibility label match the corresponding details in the blood bank register and on the patient's Request Form for Blood.

- Patient identification number
- Patient surname and first name
- Date of birth/age

5.2.6 If all the details are correct, sign the blood bank register and record date and time of removal from Blood Bank against the appropriate blood bag / unit number. If any discrepancies are found during any of the above checks, the staff of the Blood bank should be notified immediately.

5.3 Transport of Blood/Blood Components to Ward

5.3.1 Place the unit into a Blood Transit Bag / Cool Box. Return to the ward / department as soon as possible with the compatibility report form.

5.3.2 If any units are to be transported off site, the Blood Bank/Transfusion Laboratory staff must be informed beforehand to ensure that the blood is packaged appropriately, and to ensure traceability of each unit. The Blood Transfusion Laboratory staff will contact the receiving location to inform them of the pending arrival of blood products and to provide details of the units in transport.

5.3.3 If any units are received from another location during patient transfer, the Blood Transfusion Laboratory staff must be informed immediately of unit details for traceability purposes and where possible, the units should be taken immediately to the Blood Transfusion Laboratory to be 'booked'.

5.3.4 If any units have been transfused to a patient during transfer, the details of these units must also be given to the Blood Transfusion Laboratory staff as soon as possible for traceability purposes.

5.3.5 Any unused units should be returned to the Blood Transfusion Laboratory as soon as possible.

5.4 Receiving Blood/Blood Components on the Ward

5.4.1 The unit of blood must be delivered to the member of staff responsible for the patient's transfusion.

5.4.2 The collector and person receiving the blood (the receiver) should both ensure the patient identification details (Surname, First name, DOB/age, patient identification number) are identical on the following:

- the compatibility label on the blood unit
- the compatibility report form sent with the blood from the blood bank

5.4.3 The receiver must document receipt of the unit on the Blood Transfusion Record to include signature, date and time received.

6 Pre-Transfusion Procedures

6.1 Upon arrival in the clinical area, the blood unit(s) must be transfused straight away (and within 30 minutes of collection) or returned to the Blood Bank immediately

6.2 Night-time transfusions should only be given where clinically indicated. All routine transfusions should be given between the hours of 8am – 8pm.

6.3 All patients receiving a transfusion must have a patient identification band.

6.4 Before a unit of blood is transfused the following steps (6.5) must be taken by two personnel suitably trained in the administration of blood and blood products:

- Doctor
- Registered Nurse
- Registered Midwife
- Student nurses, should only act as a 3rd checker

N.B. During the checking process, it is vital that staff are not distracted or interrupted

6.5 Before starting the transfusion

6.5.1 The patient should be in a clinical area where resuscitation facilities are available and they can be readily observed. The following checks are required:

6.5.2 Check the Blood Transfusion Record to ensure the blood was correctly prescribed, a reason for transfusion was documented, and patient consent has been obtained. Also check previous transfusion history for any special blood/transfusion requirements and ensure pre-transfusion observations are documented.

6.5.3 Ensure the ABO, Rh D group and blood bag / unit number is identical on the following:

- the blood unit
- the compatibility label
- the compatibility report form (sent with the blood from the Blood Bank)
- the patient's ABO group only, if known

NB. Occasionally blood of a different group will be issued for a patient but this will be stated on the compatibility report form.

6.5.4 Check the details on the unit and compatibility report form match any requirements on prescription for special types of blood, e.g. gamma-irradiated, CMV-sero negative

6.5.5 Ensure the unit of blood is currently within expiry date and that there is no evidence of leaks, discoloration or clots. N.B the expiry date refers to the unit expiring at midnight of that date.

6.5.6 Blood component packs should be inspected for any leaks at the ports and seams and for the presence of clots and must not be used if any such defect is noticed.

6.5.7 The label on the unit should be checked for results of screening for transfusion transmissible infections (HIV, HBsAg, HCV, syphilis etc).

7 Administration of Blood or Blood Components

7.1 The following members of staff are authorized to administer the prescribed blood or blood components:

- Doctor
- Registered Nurse
- Registered Midwife

7.2 Immediately before setting up the transfusion, two qualified members of staff (see above) must take the following to the patient:

- The unit of blood component to be transfused with compatibility label on it.
- The Compatibility report form (cross-match report).
- The Blood request Form
- Patient's clinical case notes.
- The appropriate blood component giving set.

7.2.1 Patients who can communicate must be asked to state their surname, first name and date of birth.

7.2.2 Confirm that the details provided by the patient plus the patient identification number are the same on the patient identification band and on the compatibility label attached to the blood unit

IMPORTANT: It is essential that any patient having a blood transfusion has an identification wristband, or equivalent e.g. National Health Insurance Photo ID card with unique patient identifiers

7.2.3 Make absolutely sure that (i) Surname, (ii) Forenames, (iii) Date of birth/age and (iv) Unique patient identification number (e.g. NHIS and / or hospital number) is checked and found to be identical with:

- The patient's identification wristband or equivalent (see above).
- The Compatibility report form (cross-match report).
- The Compatibility label attached to the blood pack.
- Patient's clinical case notes.

7.2.4 If there are any discrepancies in any of the identification steps, the units must be returned to the Blood Transfusion Laboratory immediately and the laboratory staff contacted for assistance

7.2.5 The compatibility label on the blood pack must also be checked and found identical with the crossmatch report for the following details:

- The ABO and Rh blood group
- The Blood-pack / Batch Number.
- The Component type. e.g. Red cell concentrate, platelet concentrate, FFP
- Expiry date.
- Any special requirement such as gamma irradiation.

Such special requirements should also be checked on the blood prescription chart.

7.2.6 If the blood group of red cells units and the blood group of the patient are not identical, DO NOT START TRANSFUSION AND IMMEDIATELY CONTACT BLOOD TRANSFUSION LABORATORY FOR ADVICE.

7.2.7 Occasionally the blood groups of platelets may not be identical to the patient's blood group. This will be stated on the crossmatch report.

Units may be issued by the blood bank with the following stickers where products with alternative blood group are issued. If in doubt contact the Blood Transfusion Laboratory.

Blood group of component does not match patient's group. However it is safe to transfuse.

7.2.8 After ALL patient checks have been satisfied, BOTH qualified staff members must sign the crossmatch report, against the blood unit being given. In the event of any discrepancy, transfusion must not proceed and further advice obtained from the Hospital Blood Transfusion Laboratory.

7.2.9 It is absolutely essential that each of the two members of staff carrying out the patient checks is vigilant and one does not rely upon the other to be rigorous.

7.3 Starting the Transfusion

7.3.1 The person attaching the unit of blood component to the patient must also sign the Transfusion Monitoring Form and enter the start time and date.

7.3.2 Baseline vital signs i.e. PULSE, BLOOD PRESSURE, RESPIRATION AND TEMPERATURE must be checked just before setting up the transfusion.

7.3.3 The unit volume and start time should also be recorded on the IV fluid sheet in the appropriate place.

7.3.4 Immediately following commencement of transfusion, details of the blood unit (type of blood product, unit number, ABO and Rh group, volume, expiry date, crossmatch number) should be recorded in the patient's clinical notes.

7.3.5 If the unit is discarded before administration, or only partially administered, this should be documented in the clinical notes and on the Transfusion Monitoring Form (refer to Appendix 2).

7.3.6 The flow rate must be adjusted according to the prescription. The flow rate should be set using a drip rate formula. The transfusion of a unit of red cells should be completed within a 2-4 hour period.

7.3.7 The same patient check procedure is required for each subsequent unit of blood. The crossmatch report accompanies the blood units, and during the transfusion it must be secured in case notes.

7.4 After completion of the transfusion procedure, the Transfusion Monitoring Form (refer Appendix 2), the compatibility form and any additional observation chart, must be filed in patient's case notes as a permanent record.

7.5 The blood giving set must be changed after two units of the same blood/blood component or after 12 hours or if the filter is found to be blocked, whichever occurs first. Blood / blood components must not be transfused in the same blood giving set following the infusion of other intravenous fluids.

7.6 Electronic infusion pumps are not recommended for transfusion of blood as they may damage blood cells.

7.7 Always wear gloves and aprons when handling blood components.

7.8 IMPORTANT: Blood can only be warmed using appropriate blood warming equipment with built in thermostat and an audible alarm. Blood MUST never be exposed to temperatures of over 40ºC as this can cause severe transfusion reactions. Check with the blood transfusion laboratory, if in any doubt. Blood must never be warmed in hot water, microwaves or other heating equipment not specifically designed for this purpose. Failure to comply with this requirement is likely to result in severe red cell haemolysis with potentially lethal consequences.

7.9 Drugs must not be added to blood packs or infusion sets under any circumstances.

7.10 If the unit is returned unused to the blood bank, the compatibility label should not be removed.

8 Monitoring of Patient during Transfusion

8.1 The health care professionals responsible for the care and monitoring of transfused patients are defined under section 7.1.

8.2 Vital signs i.e. PULSE, BLOOD PRESSURE, RESPIRATION AND TEMPERATURE must be checked again 15 minutes and 60 minutes after the start of EACH PACK of blood or blood component (This information must be completed using the Transfusion Monitoring Form - see Appendix 2 on page 31).

8.3 The patient's observations should be recorded hourly until the completion of the blood transfusion unit, and also on completion.

8.4 The observations stated above are the minimum. More frequent observations may be necessary should the patient become unwell, or in other clinical situations e.g. unconscious or heavily sedated patients and patients with heart failure.

8.5 Most serious transfusion reactions tend to occur within the first 5-15 minutes of starting a new blood or blood component pack and the patient must therefore receive very close visual observation during this time.

9 Management and Investigation of Transfusion Reactions

A reaction to the transfusion of blood products may be mild, or severe and life threatening e.g. a haemolytic reaction due to ABO incompatibility, sepsis because of bacterially contaminated blood products. Adequate management depends on the likely nature of a transfusion reaction. It will be frequently necessary to seek specialist advice from senior haematology medical staff.

All reactions, errors and near misses MUST be reported to the blood transfusion laboratory/department and their advice and recommendations followed. See Appendix 3 on page 32 for the Reporting Form.

9.1 Haemolytic transfusion reaction

"Haemolytic transfusion reaction is one in which signs of increased red cell destruction are produced as a result of transfusion."

A distinction is made between an immediate reaction and one in which destruction begins only after there has been an immune response provoked by the transfusion.

9.2 Immediate haemolytic reaction

"This may be caused by the transfusion of incompatible red cells, bacterially contaminated or thermally damaged blood."

Incompatible red cells react with the patient's own anti-A or anti-B, activating complement, causing intravascular haemolysis and disseminated intravascular coagulation (DIC). Transfusion of ABO incompatible blood almost always arises from errors in labelling the sample or from inadequate pre transfusion bedside checks. If a unit is mistakenly transfused to a patient other than the one from whom the sample was received the chances of ABO incompatibility are about 1 in 3. The reaction is usually most severe when group

A red cells are given to a group O patient. In a conscious patient only a few millilitres, may be needed to cause a severe reaction within minutes of commencing transfusion. In an unconscious patient some of the symptoms will not be evident.

9.2.1 *Clinical features:*

- Fever, chills or rigor.
- Tachycardia.
- Hypotension and circulatory collapse.
- Severe pain at drip site.
- Pain in back or chest.
- Dyspnoea.
- Haemoglobinaemia.
- Acute oliguria, renal failure and collapse.
- Disseminated intravascular coagulation (DIC).

9.2.2 *Management*

- Stop the transfusion immediately.
- Remove the blood giving set and set up a normal saline drip with a new giving set
- Inform Physician who ordered the blood/ Physician-on-duty
- Resuscitate the patient.
- Return all blood packs and the drip set to the Blood Transfusion Laboratory together with a completely filled adverse reaction form.

9.3 Delayed haemolysis

The titre of an antibody in a recipient's plasma may be too low to be detected in the pre-transfusion tests. However, if incompatible red cells are transfused a secondary response may be provoked. A few days after transfusion there is a rapid increase in antibody with consequent destruction of transfused red cells.

9.3.1 *Clinical features:*

- Fever (not always present).
- Fall in haemoglobin level.
- Jaundice (often not before day 5 post-transfusion and can be as late as day 10).
- Haemoglobinuria (a mean of 8 days post-transfusion).

9.3.2 *Management*

Take samples for:

- FBC
- LFT
- Direct Antiglobulin Test (Coombs test).
- Antibody screening
- Inform Blood Transfusion Laboratory staff and discuss with senior haematology medical staff.

9.4 Febrile non-haemolytic transfusion reactions (FNHTR)

Mild febrile reactions are often caused by cytokines in blood components or patient antibodies to donor leucocyte antigens. These often occur towards the end of the transfusion and there are no clinical signs other than a rise in temperature and non-specific accompaniments of any pyrexia. FNHTRs will be seen less frequently if blood components are leucodepleted. FNHTRs are unpleasant but not life threatening.

9.4.1 Paracetamol is often all that is required.

However, it is important to remember that a mild febrile reaction may be the early stages of an acute haemolytic transfusion reaction caused by incompatible or bacterially contaminated blood. If a patient becomes unwell or hypotensive, transfusion must not be restarted and blood transfusion laboratory must be informed who will arrange the return of the blood component pack and additional blood samples from patient for necessary serological and microbiological investigations.

9.5 Allergic reactions

Caused by antibodies in the patient to infused plasma proteins or infusion of allergens, which react, with patient's IgE antibodies. More likely to occur with platelets and plasma than red cell concentrates.

9.5.1 *Clinical features* (within minutes of the transfusion):

- Urticaria.
- Itching.

9.5.2 Symptoms usually subside if the transfusion is slowed and antihistamine (e.g. chlorpheniramine 10mg i.v.) is given by slow injection. Hydrocortisone 100mg i.v. may also be used.

9.6 Anaphylaxis

This is a very rare but life-threatening complication. The onset is rapid and often dramatic. Immediate action is required. In some cases this is associated with antibodies against IgA in patients who have severe IgA deficiency. Antibodies to other plasma proteins may be implicated in other cases.

9.6.1 *Management*

- Discontinue transfusion and remove blood giving set.
- Follow your Hospital's Anaphylaxis Policy
- Inform Physician who ordered the blood/ Physician-on-duty
- Inform the Blood Transfusion Laboratory.
- Under no circumstances should transfusion be restarted.
- Return all blood packs and the drip set to the Blood Transfusion Laboratory, together with a completely filled adverse reaction form.

9.6.2 *Future transfusions*

Washed cellular blood components or selected blood components from IgA deficient donors may be needed for future transfusion.

9.7 Septic shock

Although this complication is extremely rare with a reported incidence of two cases per million blood components transfused, the mortality remains very high. This is caused by bacterial contamination of red cells or platelets.

9.7.1 *Clinical features:*

- Usually acute with rapid onset.
- Pyrexia.
- Hypotension.
- Tachycardia.
- Collapse.

9.7.2 *Management:*

- Discontinuation of transfusion
- Notify the doctor responsible for the patient/Physician-on-duty immediately
- Inform the Blood Transfusion Laboratory (Blood bank)
- Return all blood packs and the drip set to the Blood Transfusion Laboratory (blood bank), together with a completely filled adverse reaction form.

9.8 Transfusion related acute lung injury (TRALI)

This rare but life-threatening complication manifests as features of non-cardiogenic pulmonary oedema, either during or soon after transfusion.

The cause is usually donor plasma that contains antibodies to the patient's leucocytes and is a serious condition with a high mortality rate.

9.8.1 *Clinical features:*

- Chills.
- Fever.

- Non-productive cough.
- Breathlessness.
- Hypoxia.
- Interstitial shadowing on chest x-ray.

9.8.2 Management is that of acute respiratory distress syndrome:

- Stop transfusion.
- Immediately seek advice from senior haematology medical staff and Intensive Care Physician.

9.9 Transfusion-Associated Circulatory Overload (TACO)

Fluid overload can occur when correcting chronic anaemia in elderly patients or those with pre-existing cardiac disease.

9.9.1 *Clinical features:*

- Dyspnoea
- Tachycardia
- Hypotension

9.9.2 *Management:*

- Stop the transfusion.
- Give frusemide 40mg IV in the first instance.
- Arrange chest X-ray and ECG.

9.10 Late complications of transfusion

9.10.1 Iron overload

Transfusion dependent patients receiving red cells over a long period become overloaded with iron. Chelation therapy with desferrioxamine is used to minimise accumulation of iron.

9.10.2 Graft versus Host disease (GvHD)

This is a rare but often fatal complication of transfusion caused by T-lymphocytes. Immunodeficient patients e.g. recipients of an allogeneic bone marrow transplant, foetal intrauterine transfu-

sions, patients with Hodgkin's disease and patients undergoing specific chemotherapy such as fludarabine and cladribine, are at special risk for this disease. It has also occurred in immunologically normal patients after transfusion of a first or second degree relative's blood (from shared HLA haplotypes). It is prevented by gamma irradiation of cellular blood components given to patients at risk.

9.10.3 Post-transfusion Purpura (PTP)

PTP is a rare but potentially life threatening complication of red cell or platelet transfusion, most often seen in female patients. It is caused by platelet-specific alloantibodies. Typically 5-9 days after transfusion the patient develops an extremely low platelet count with bleeding. Refer to a Consultant Haematologist for treatment advice. High dose IVIG is the treatment of choice.

Plasma exchange may be required. If platelet transfusion is absolutely essential, platelets compatible with the patient's antibody should be used. Likewise any red cell transfusions should be from donors negative for the implicated platelet antigen.

9.10.4 Rare complications of transfusion

Some rare complications of transfusion, such as the transmission of viral infections may only be recognizable many days or weeks after the blood products have been given. Problems of this type should be reported to the blood transfusion laboratory so that adverse events are effectively followed up

In the event of a serious transfusion reaction, a completed Reporting Form (Appendix 3), the implicated blood component pack should be sent to the blood transfusion laboratory, with the giving set still attached to the blood component pack, and the cannula end of giving set sealed using an appropriate seal. The blood packs should be double bagged for transporting in a designated clinical waste bag and clearly labelled to identify the patient.

10 Routine Disposal of Used Packs and Blood Giving Sets

10.1 On completion of uncomplicated transfusion procedure, all used blood component packs must be placed in a designated polythene bag used for disposal of clinical waste and then sealed. The sealed bag must then be labelled with the patient name, the date of transfusion and the name of the nurse taking down the blood transfusion. This is to aid traceability.

10.2 These bags must then be retained and kept in a designated area on each ward/theatre for at least 24 hours. This will make it possible to investigate any adverse event that may have been attributed to blood transfusion. After 24 hours, the bag must be returned to the respective blood transfusion laboratory (hospital blood bank) for appropriate disposal.

10.3 The giving sets are disposed of into a sharps bin.

10.4 Partially transfused units that are no longer required must be sealed and returned to the respective blood transfusion laboratory (hospital blood bank) for appropriate disposal.

11 Inter-Hospital Transfer of Patients Being Transfused

11.1 If a patient has to be transferred from hospital to another while blood transfusion is in progress, a registered nurse or midwife, or a member of medical staff must remain with the patient until transfer is complete.

11.2 The registered nurse responsible for the patient must inform the technical staff the Hospital Blood Transfusion Laboratory giving full details of the transfer.

11.3 The transferring hospital should ensure that any remaining unused blood transfusion components are transported in an appropriate transit cool box in controlled storage conditions in line with guidance given by the Hospital Blood Transfusion Laboratory.

12 Emergency O-Negative Blood and Group-Specific Blood

12.1 Uncross-matched, O Rh 'D' Negative blood MUST ONLY be used when there is life threatening blood loss and the degree of urgency allows no time to wait for the arrival of group specific or cross-matched blood from the blood transfusion laboratory. This is predominantly for emergency ambulances and major incidents

12.2 Cross-matched or group specific blood must be used in preference to O Rh 'D' Negative blood whenever possible.

12.3 Blood transfusion laboratory must be immediately informed of the degree of urgency and anticipated blood component requirement.

12.4 Patient must immediately be fitted with a wristband with all patient identity details, or if the patient is unidentified, then the unique identity number and gender must be used.

12.5 Group specific blood can normally be made available for collection from the Hospital blood transfusion laboratory in 10 minutes of receiving patient's blood sample. Cross-matched blood can be made available for collection in 35-40 minutes of the receipt of samples; unless atypical antibodies are detected when further laboratory tests will be necessary.

12.6 Units of uncross-matched, O Rh 'D'Negative and O Rh 'D'Positive blood are available for use in extreme emergency.

Appendix 1

NBS/CLIN/405/2

Consent Form
for Transfusion of Blood/Blood Product

Health Facility

Dr .....

has explained to me that I need* / my ward needs* a transfusion of blood or blood components in view of my* / his* / her* medical condition.

*(*delete as appropriate)*

I understand the benefits and possible risks. These risks include, but are not limited to, allergic reactions, fever, blood incompatibility, or very rarely, death. I understand there is also risk of exposure to HIV or hepatitis, but that the risk is very remote. I understand that these risks exist in spite of the blood being carefully tested. No guarantees have been made to me about the outcome of the transfusion. I understand that alternatives, including the choice of not being transfused, are much slower acting than the direct transfusion of blood or blood components, and are not recommended in my present condition.

Therefore

- ☐ YES, I give my informed and voluntary CONSENT to receiving the transfusion. This consent remains valid for all transfusions I may require during this admission.
- ☐ NO, I REFUSE to consent to the transfusion. I understand that the risks associated with this refusal include permanent injury and possible death. I accept full responsibility for those risks.

.....

(Name of patient, otherwise name of guardian if under 18 years)

.....	.....	.....
Signature of Patient/Legal Guardian	Witness	Date

Article 28 of the Constitution of the Republic of Ghana stipulates that
"No person shall deny a child medical treatment by reason of religious or other beliefs."
This is reinforced by the Children's Act, 1988 (Act 560).

Appendix 2

NBS/CLIN/404/2

Blood Transfusion Monitoring Form

Health Facility

Surname: _____ First Name: _____

DOB/Age: _____ Sex: _____ Ward: _____

Hospital Number: _____ NHIS: _____

Blood competent transfused:

☐ Whole Blood ☐ CRC ☐ FFP ☐ Cryoprecipitate ☐ Platelets

Time STARTED_____ Time COMPLETED _____

	START	FINISH
BP		
Temp		
Pulse		
Resp Rate		

	15 min	30 min	1 hour	2 hour
Pulse				
Resp Rate				

Was the whole unit transfused uneventfully? ☐ Yes ☐ No

If No, tick reasons for discontinuing transfusion:

☐ Challenges with venous access ☐ Patient reacted to transfusion

☐ Other reason (Please state) _____

In the event of a transfusion reaction, please complete a transfusion reaction form and return all blood units, required specimens and the completed form to the Blood Bank for investigation.

Appendix 3

NBS/CLIN/402/2

Transfusion Reaction Reporting Form

Please complete ALL sections of this form fully.
If *Not Applicable*, write N/A in the relevant section.

NBS Use Only # _____
☐ Pending ☐Completed ☐DNP

PATIENT IDENTIFICATION			
Surname:		First Name:	
Hospital:		Ward:	Hospital #
Age:	☐ Male ☐ Female	Patient's Blood Group:	
TRANSFUSION INFORMATION			
Diagnosis and Indication for Transfusion:			Pre-Transfusion Hb: g/dL
Blood Product: ☐ Whole Blood ☐ Packed Red Cells ☐ FFP ☐ Platelet Concentrate			
Unit Number:	Blood Group of Unit:	Volume transfused:	ml
Date Transfusion started:		Time Transfusion started:	
Date Reaction observed:		Time Reaction observed:	
Unit Numbers transfused before reaction:			
Any Previous Transfusion? ☐ Yes ☐ No		Any Previous Reaction? ☐ Yes ☐ No	

SYMPTOMS (tick as many apply)		
☐ Itching	☐ Dyspnoea	☐ Back/flank pain
☐ Chills/Rigors	☐ Chest pain / Tight chest	☐ Oliguria
☐ Fever _____ °C	☐ Anxiety	☐ Dark urine
☐ Nausea	☐ Restlessness	☐ Unexplained bleeding
☐ Rash	☐ Palpitations (pulse = _____ bpm)	☐ Other _____
☐ Urticaria	☐ Hypotension (BP = _____ mmHg)	☐ Other _____

MANAGEMENT	
Outcome:	☐ Complete Recovery ☐ Recovered with Complication ☐ Death
Specimens accompanying this form:	☐ 2ml patient's blood sample (opposite arm) in EDTA tube ☐ 5ml patient's blood sample (opposite arm) in plain tube ☐ 20ml urine (if applicable) ☐ All blood bags and unused units with attached giving set
Reporting Physician:	Date:
Contact Number:	

Please return this form with samples and blood bags to Hospital Blood Bank as soon as possible


NATIONAL BLOOD SERVICE GHANA