1.0 INTRODUCTION

The purpose of having this user manual is to serve as a part of Transfusion Practice Guidelines for clinicians, paramedic as well as laboratory personnel to improve the quality of blood transfusion practice in this hospital.

It is important for all clinicians to be discriminating and judicious in ordering blood and blood product. Blood transfusion can be dangerous as any unit of blood or blood product given carries a potential risk of:

i. Transfusion transmitted disease e.g. HIV, Hepatitis B, Hepatitis C, CMV etc.

ii. Immunization and development of antibodies to red blood cells (RBC), white blood cells (WBC) and platelets.

iii. Blood transfusion reaction e.g. immune haemolytic transfusion reaction, urticaria, anaphylactic reaction etc, some of which can be potentially fatal.

The Crossmatching Laboratory provides a 24 hours service for request of blood and blood products. However, only emergency request will be entertained after normal working hours (8.00 am to 5.00 pm).

2.0 REQUEST FOR BLOOD

2.1 Request Forms

2.1.1 All requests for blood or blood product must be made in duplicate using the Borang Permohonan Transfusi Darah (PPDK-5 form) and duly signed and stamped by the doctor. It is essential to provide the patients full name and full New NRIC number. For foreigners, passport number is acceptable. If new NRIC number or passport number is not available, hospital registration number unique to the particular patient should be use. The PPDK-5 forms must be handwritten.

Other information such as sex, reason for transfusion, blood group (if known), previous transfusion reaction should also be filled up especially for maternity cases where ABO grouping, Rh typing & Hb investigating have already been done during Antenatal Check-up. This will minimize the fatal errors.
2.1.2 Request for other test must be made in the PER PAT 301 form.

2.1.3 Forms that are inadequately filled up will be rejected.

2.2 Blood Sample

2.2.1 Patient identification and blood sampling

The process of taking and labelling of blood samples must be done in one process at the bedside, one patient at one time. Freshly drawn blood sample (<48 hours) is preferable and to be sent with each blood request.

The patient should be correctly identified by positive identification by asking the patient to state his/her full name. The information must be checked against the case notes. Unconscious patient must be identified by the information given on the identity band, such as wristband or by asking his/her relatives or second member of staff.

2.2.2 Labelling of sample.

(a) The person who takes the blood and the person who labels the blood sample must be the same person.

(b) The sample must be labelled clearly and accurately at patient’s bedside immediately after blood taking. Use only hand written label and never use pre printed label. The label should include the patient’s full name, identity card (IC) number or passport number or current hospital registration number.

(c) Never label 2 or more patient’s samples at the same time.

2.2.3 Filling of blood request form

Blood request form should be filled and signed by doctor’s only. The name should be stamped or written clearly in block letters. It should be filled completely or it will be rejected.
2.2.4 Volume of blood to be collected

Samples should be sent to the Blood Bank in a biohazard-labelled plastic bag during office hours at least 24 hours before the blood is required.

(a) Sample from adult and children above 4 months of age.
- 4 ml blood sample in EDTA tube accompanied by one request form.
- If the patient requires repeated transfusions during the current admission, a new blood sample is needed for each request.

(b) Sample from infant less than 4 months of age.
- Infant's blood sample should be accompanied by a sample of the mother’s blood.
- 2.5 ml blood sample in EDTA tube from infant and 4 ml blood sample in EDTA tube from mother.
- Both samples are to be sent to Blood Bank using one request form.

3.0 TEST FOR BLOOD REQUEST

3.1 Group, Screen & Hold (GSH)

3.1.1 The ward doctors are advised to refer to the Maximum Surgical Blood Order Schedule (MSBOS). Group, Screen and Hold (GSH) can be requested by sending 4 ml of blood sample to the Blood Bank, completing the PPDK-5 form and ticking the appropriate box in the form.

3.1.2 GSH is a test where patient’s blood sample will be typed for ABO and Rh grouping and screened for unexpected antibody. Screening for unexpected antibody is done by performing and indirect antiglobulin test (IAT), also known as indirect Coomb’s test. If the patient does not have any clinically significant antibody, “ANTIBODY SCREENING: NEGATIVE” will be stamped on the form. The serum/plasma is retained for 48 hours in the blood bank in the event that cross-matched blood is required within this period.

3.1.3 If blood is required following a GSH, cross-matched blood should be available for issue within 20 minutes. To convert GSH to GXM, the ward doctor should send the duplicate
copy of PPDK-5 request form with a request note attach at the back of form. If unexpected antibodies detected, the laboratory will proceed with procedure to identify the particular antibody and attempt to supply compatible blood for patient. The ward doctor will be informed.

3.1.4 In the rare event that the blood is required urgently, the doctor should call the blood bank immediately and give patient particular. The duplicate copy of request form with a note URGENT CROSS MATCH should be sent to blood bank. A saline cross match (immediate Spin) will be performed and blood will be available within 15 minutes. A full cross matching procedure will be carried out after the blood issued.

3.2 Grouping & Cross matching (GXM)

3.2.1 GXM for elective surgery

The request must reach Blood Bank at least 24 hours before the operation. In the case of rare blood group such as Rh negative, initial verbal request must be made at least 1 week before the surgery.

3.2.2 GXM for non-urgent transfusion.

Request for non-urgent cases e.g. thalassaemias, leukemia, anemia etc. should be sent during normal working hours (8.00 am to 5.00 pm). This is to ensure that the sole Medical Laboratory Technologist (MLT) on call after office hours will not be overwhelmed with non-urgent requests and can attend promptly and properly to urgent request.

3.2.3 Emergency Transfusion

3.2.3.1 If blood is required urgently, the appropriate box on the request form should be ticked and the ward doctor who makes the request should inform the MLT working in the Blood Bank by telephone (Ext. 164)
3.2.3.2 (a) Emergency Saline Group & Cross Match

If the blood needed urgently, approximately 15 – 20 minutes from the time sample reach the Blood Bank, Grouping & Saline cross matching at room temperature (Immediate Spin) can be performed.

However, compatibility is not guaranteed, as it cannot detect unexpected antibodies. The full cross match will be carried out after the blood is issued and if there is any incompatibility detected, the requesting doctor will be informed.

(b) “Safe O”

In Malaysia, where Rh D negative is uncommon, Group O Rh D positive packed cells are used as Safe O.

In life threatening situations, clinicians can make the decision to transfuse Safe O blood for resuscitation. Decisions to transfuse un-crossmatched Group O Rh D positive packed cells only be made after the clinician has fully assessed the patient’s condition. The decision should not be made in haste. The requesting doctor must state the reasons for such a decision on the request form and sign it.

3.2.4 Reservation of Cross matching Blood

Blood cross-matched will only be kept in reserve for maximum of 24 hours. After 24 hours, the blood will be released automatically without informing the ward, unless the doctor inform for further reservation.

4.0 REQUEST FOR BLOOD PRODUCT OTHER THAN RED CELLS

Several types of blood component are available in the blood bank.

a. Request for blood component other than red cells must be sent with blood sample and request form.
b. However, if a patient had received a transfusion of blood within the previous 3 months in the same hospital and the procedure was without any complications, a new blood sample need NOT accompany requests for more blood components other than red cells. However, a copy or carbon copy of the old request form should be attached to the new request form.

4.1 Platelet Concentrate

Limited units of screened platelet concentrate are available daily for emergency usage. Since platelet concentrates have a shelf life of 5 days and screening takes at least 24 hours, the notice of requirement must be given early so that, production can be stepped up accordingly.

4.2 Fresh Frozen Plasma (FFP) & Cryoprecipitate

These are to be transfused within 30 minutes of thawing. Therefore, the fresh frozen plasma (FFP) and cryoprecipitate should only be collected just before use.

Note: FFP HAS NO ROLE AS A VOLUME EXPANDER OR SOURCE OF PLASMA.

5.0 TRANSPORTATION

5.1 Blood, Fresh Frozen Plasma and Cryoprecipitate

These products must be transported in clean, well-insulated container with icepack inside. However, PACKED CELLS/WHOLE BLOOD MUST NOT BE IN DIRECT CONTACT WITH ICE PACKS TO AVOID HAEMOLYSIS.

5.2 Platelets.

Platelet must be stored at 22 ± 2°C. Container for transportation of platelets must not contain any ice. However, for long distance transportation of platelets in hot and humid conditions or in a non-air-conditioned transport, an ice pack may be put at the bottom of the container in order to sustain an ambient temperature for the viability of the platelets. The platelet must never come into contact with the ice pack and kept as far away as possible with a gap of air space in between them.
6.0 ADMINISTERING BLOOD

Please refer to

a. Guidelines for the Rational Use of Blood and Blood products by Pusat Darah Negara

b. Transfusion Practice Guidelines For Clinical and Laboratory Personnel by Pusat Darah Negara.

7.0 TRANSFUSION REACTION

In the event of transfusion reaction, a doctor should take relevant blood samples and fill certain forms.

(a) Blood samples:

<table>
<thead>
<tr>
<th>Test</th>
<th>Tube</th>
<th>Amount</th>
<th>Necessity</th>
</tr>
</thead>
<tbody>
<tr>
<td>To repeat -grouping &amp; Rh typing Antibody detection Coomb’s test</td>
<td>EDTA (GXM 4 ml tube)</td>
<td>8 ml (2 x 4ml)</td>
<td>Mandatory for all cases</td>
</tr>
<tr>
<td>Full Blood Count</td>
<td>EDTA (2 ml tube)</td>
<td>2 ml</td>
<td></td>
</tr>
<tr>
<td>Full Blood Picture</td>
<td>EDTA (2 ml tube)</td>
<td>2 ml</td>
<td></td>
</tr>
<tr>
<td>PT/aPTT</td>
<td>Citrated tube</td>
<td>1.8 ml</td>
<td>If hemolysis is suspected</td>
</tr>
<tr>
<td>Renal profile Liver Function Test</td>
<td>Plain tube with gel</td>
<td>3 ml</td>
<td></td>
</tr>
</tbody>
</table>

(b) Urine sample:

<table>
<thead>
<tr>
<th>Test</th>
<th>Container</th>
<th>Amount</th>
<th>Necessity</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEME (for urine Hb)</td>
<td>Universal urine container</td>
<td>15 – 20 ml</td>
<td>If hemolysis is suspected</td>
</tr>
</tbody>
</table>

Samples are to be sent:

a. Immediately after transfusion reaction, and
b. After 24 hours of transfusion reaction
The request form should be written as follow;

a. Post Transfusion Reaction I or Immediate Sample Of Transfusion Reaction
b. Post Transfusion Reaction II or After 24 hours Sample Of Transfusion Reaction

Transfusion Reaction forms to be filled;

a. Borang Laporan Reaksi Kepada Darah Atau Plasma (Appendix 15)
b. Borang Reporting Format For Adverse Transfusion Event (Appendix 17)

Send the completely filled forms to Blood Bank.

8.0 BLOOD DONORS AND BLOOD REPLACEMENT

8.1 All blood collected by Blood Bank Hospital Seberang Jaya is only from voluntary donors and NO CHARGE is made for the blood used by any patient. All donated blood are screened for HIV, Hepatitis C virus, Hepatitis B virus and Syphilis. Any charges occurred is solely for tests (Screening, grouping and cross matching). This fact must be stressed to the patients.

8.2 Replacement donors are not accepted. Blood and blood products are provided free of charged to the patients, whether they are from Government Hospital or Private Hospital. Nevertheless, the private hospital is required to pay a minimal charge to cover the cost incurred for the blood bag, serology screening, blood grouping and cross matching. In any circumstances of massive blood transfusion or when blood transfusion is anticipated, the patient’s family and friends should be encouraged to donate by the attending doctor.

9.0 OTHER INVESTIGATION

Blood Bank also provides other related investigation besides the main activity of Group & Cross matching blood. Please refer to Table 2 on page 27 for further information. All these investigation are available upon request on daily basis.
10.0 COMMUNICATION

If there are any problems or matter requiring clarification please contact:

i. Head of Unit
   Dr Khairulnisa Bt A. Manap
   Pakar Transfusi Darah (UD54) Ext. 420

ii. Medical Officer
    Dr. Nor Idayu Bt Ibrahim
    Medical Officer In Charge Ext. 420

iii. Senior MLT
     En. Ramli Razak/Pn Sharifah Syed Mohamad
     Ext. 163/164

11.0 DONOR PROCUREMENT

Our blood donation centre is open on every working days from 8 am to 5 pm. On weekdays, weekends and on public holidays, there will be mobile blood donation campaign/s carried out according to schedule. For any enquiry regarding blood donation and mobile blood donation campaign organization, please contact 04- 3827333 ext. 602.
<table>
<thead>
<tr>
<th>NO</th>
<th>BLOOD COMPONENT</th>
<th>CONTENT</th>
<th>VOLUME</th>
<th>STORAGE</th>
<th>USES</th>
</tr>
</thead>
</table>
| 1. | Cryoprecipitate    | Factor VIII, Fibringen (each bag contain about 100 units of Factor VIII activity and about 250 mg Fibrinogen) | 30 – 50 ml | Below -25ºC   | 1. Hypofibrinogenaemia or Dysfibrinogenaemia  
2. To replace fibrinogen in DIC  
(Std. dose: 6 bags transfuse over 10 – 20 min. Children: 1 unit/5 Kg) |
| 2. | Fresh Frozen Plasma| All coagulation factors                                                 | 150 – 200ml | Below -25ºC, 2 yr | 1. Deficiency of multiple clotting factors  
e.g.:  
a) DIC  
b) Liver disease  
c) Septicaemia  
d) Massive transfusion  
2. Replacement of single factor deficiency where specific or combined factor concentrate is not available.  
3. For reversal of wafarin effect. |
| 3. | Whole Blood        | RBC and Plasma                                                          | 300 – 450 ml | 2-4ºC, 4 – 6 weeks | 1. Acute haemorrhage  
2. Exchange transfusion |
| 4. | Red Cell Concentrate| Packed RBC with/ without added nutrient solution                        | 200 - 350 ml RBC | 2-4ºC, 4 – 6 weeks | RBC replacement for anaemia or bleeding |
| 5. | Platelet           | Platelets                                                              | 50 – 70 ml   | Room temp. (20-24ºC) on agitation 5 days | Thrombocytopenia or platelet dysfunction (not in TTP)  
Std. dose: 4 – 6 donors units within 1 hour. Children: 1 unit/10 Kg |
<table>
<thead>
<tr>
<th>NO</th>
<th>TEST</th>
<th>SPECIMEN</th>
<th>FREQUENCY</th>
<th>FORM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>ABO – Rh Grouping</td>
<td>2 ml blood in EDTA tube</td>
<td>Daily</td>
<td>PER – PAT 301</td>
</tr>
<tr>
<td>2.</td>
<td>GSH / GXM</td>
<td>4 ml blood in EDTA tube</td>
<td>Daily</td>
<td>PDDK 5</td>
</tr>
<tr>
<td>3.</td>
<td>Cold Agglutinin Test</td>
<td>2 x 4 ml blood in EDTA tube</td>
<td>Office hour</td>
<td>PER – PAT 301</td>
</tr>
<tr>
<td>4.</td>
<td>Coomb’s Test (Direct and Indirect)</td>
<td>4 ml blood in EDTA tube (adult)</td>
<td>Daily</td>
<td>PER – PAT 301</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 ml blood in EDTA tube (baby)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Investigation of Blood Transfusion Reaction</td>
<td>As instruction no. 7</td>
<td>Daily</td>
<td>Borang Appendix 15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Borang Appendix 17</td>
</tr>
<tr>
<td>6.</td>
<td>Rh Antibody Titre</td>
<td>4 ml blood in EDTA tube</td>
<td>Office hour</td>
<td>PER – PAT 301</td>
</tr>
<tr>
<td>7.</td>
<td>Rh Genotyping</td>
<td>4 ml blood in EDTA tube</td>
<td>Daily</td>
<td>PER – PAT 301</td>
</tr>
<tr>
<td>8.</td>
<td>Antibody Identification</td>
<td>2 x 4 ml blood in EDTA tube</td>
<td>Office hour</td>
<td>PER- PAT 301</td>
</tr>
<tr>
<td>9.</td>
<td>RBC phenotyping (Minor Blood Group)</td>
<td>4 ml blood in EDTA tube</td>
<td>Office hour</td>
<td>PER – PAT 301</td>
</tr>
</tbody>
</table>