1. INTRODUCTION:

1.1 Administration of blood and blood products has the potential to be a hazardous procedure. The purpose of this document is to provide a systematic, safe and consistent evidence based approach to the appropriate use of blood products in the retrieval environment.

1.2 Transfusion reactions are usually broadly grouped into those that result from: ABO/Rhesus incompatibility, bacterial contamination and violation of the “cold chain” of storage, diseases related to immune reaction to micro-aggregates and finally issues around volume overload or cyclic hyper-resuscitation in the setting of massive transfusion and failing surgical haemostasis.

1.3 There are already several NSW Health policy directives that regulate the use of blood products:

   1.3.2 PD2005/261 Management of fresh blood components that is intimately linked to the NSW Health Guideline for the management of Fresh Blood components.

1.4 The most preventable risk is receiving the wrong blood type resulting from the mis-identification of the patient or from a failure to comply with the above policy directives. These risks are minimised by clear adherence related to near-patient and point-of-care activities.

1.5 During administration of any blood product, the patient requires monitoring for any adverse reaction. Transfusion reactions should be managed appropriately and reported to the blood dispensing agency as appropriate.
2. OBJECTIVE:

2.1 The objective of this document is to define the blood products used by the Retrieval Service.

2.2 To define the accepted standard of blood product handling by the Retrieval Service.

2.3 To define the accepted standard of documentation of the use of blood products by the Retrieval Service.

3. SCOPE:

3.1 Medical officers, nurses and paramedics working for the Retrieval Service.

3.2 Only Group O Red Blood Cells (RBC) are used by the Retrieval Service blood transfusion policy in the pre-hospital setting. During inter-facility transfer the patient may receive either Group O RBC’s, or cross matched RBC’s and other blood products provided by the referring site.

3.3 The law does not require consent or provision of information, including warnings about material risks to be documented in writing. That said, best practice indicates that written consent should be obtained, as it will provide support for the thinking of the clinician in any further legal challenge. Furthermore, NSW Health policy states that written consent should always be sought from the patient prior to any blood transfusion. All reasonable attempts should be taken to explain and obtain consent for any transfusion of blood or blood products.

3.4 A patient may consent to blood transfusion without writing. It may be “expressed” either orally or in writing, or it can be implied from a patients conduct, for example the patient may hold out their arm for the transfusion.

3.4 Consent will not be obtainable for critically ill or unconscious patients. In such circumstances, consent is not required to proceed with the transfusion of blood products. This complies with NSW Health policy guidelines because:

3.4.1 In an emergency situation the patient is unable to give consent and treatment is required immediately to:

• Save the patient’s life.
• To prevent significant injury or disability.
• To prevent the patient from suffering or continuing to suffer.
3.4.2 In situations where the patient lacks the competence to give consent due to one of the following reasons:

- Temporary incapacity (e.g. unconsciousness or delirium).
- Mental illness (Mental Health Act provision for care).
- Intellectual impairment, dementia, or brain injury.

3.5 Paediatric blood transfusion and the guiding principle of the duty of care. Pursuant to section 174 of the Children and Young Persons (Care and Protection) Act 1998, a medical practitioner may carry out any medical procedure on a child (a child under the age of 16) or a young person (a person aged 16 or 17), without the consent of the child or young person, or a parent of the child or young person, if the medical practitioner is of the opinion that the treatment or procedure is necessary, as a matter of urgency, to carry out the treatment on the child or young person in order to save his or her life or prevent serious damage to his or her health. Generally, the guiding principle is that emergency medical treatment and medical first aid (including any procedure, operation, or examination) may be provided without the consent of the minor or parent or guardian.

3.6 The summary of the use of blood products is that consent should be sought wherever possible. Documentation of this attempt to gain consent is encouraged and the summary of the basis on which the clinician proceeded with the transfusion of blood products should be documented. In those instances where consent is not obtained the circumstances surrounding this decision should also be clearly documented.

3.7 The medical practitioner should not proceed with a blood transfusion if the patient gives express written direction that transfusion of blood products are not to proceed under any circumstance. In this event, the medical practitioner should take reasonable steps to understand the scope of the refusal to consent and define the patient’s capacity to make such a refusal. Depending on the findings of the subsequent discussion, blood transfusion may or may not be indicated.

3.8 Cold chain storage of blood and blood products is excluded from the scope of this document as the packaging and storage of blood and blood products is governed by the provider from each of the blood banks within the region. All blood and blood products are stored in validated storage boxes that are cold chain monitored by the associated hospital/transfusion service. No other agents are stored in these validated packs.

4.DEFINITIONS:

4.1 Products covered under this policy include:

4.1.1 Packed Red Blood Cells (RBCs)
4.1.2 Fresh Frozen Plasma (FFP)
4.1.3 Platelets (Plts)
4.1.4 Cryoprecipitate

4.2 Products not covered under this guideline include recombinant products like Factor VIIa and other fractionated products like immunoglobulin and albumin. These products are managed as per the retrieval pharmacopeia and administered through pharmacy.

5.PROCESS:

5.1 Acute Blood Loss. This protocol acts in concert with the Massive Transfusion Protocol (MTP) and the Control of Massive Bleeding C/SOP3 (CH1).

5.2 Where feasible, a pre-transfusion blood sample (5mls Purple top/EDTA) should be collected and immediately labeled according to the local procedure. This will provide important compatibility testing for subsequent tailored blood product transfusion therapy at the receiving institution.

5.3 Consideration of lost circulating volume is useful in guiding transfusion management. Whilst these estimates provide a volume to transfuse to restore euvolaemia, evidence suggests mortality benefit if shocked patients are conservatively resuscitated, minimising fluid resuscitation until surgical haemostasis is achieved.

5.4 A minimum of two units of O Rh(D) Negative are provided by the hospital/Transfusion Service associated with the Retrieval Service location. At times, due to shortages of supply, O Rh(D) Positive blood may also be provided. Rh(D) Positive blood can only be used in males, and sterile/post menopausal women. It should not be used in women of child bearing age because of the risk of Rhesus iso-immunisation.

5.4.1 Indications for transfusion:

- Severe life threatening haemorrhage not expected to respond to crystalloid resuscitation.
- Obvious major bleeding during retrieval with impending cardiac arrest due to anaemia.
- Major bleeding at the referral site resulting in hypotension requiring transfusion prior to hand over to receiving hospital.

5.5 About 1 – 1.5% of patients will have a clinically significant antibody reaction other than anti-D (e.g. Kell and Duffy antibodies). These patients will have a delayed haemolytic transfusion reaction, not evident during the transfusion by the Retrieval Service. The retrieval record must list the unique identification number of the packed cells transfused. The patient inventory, which is located in the blood
eskie must also be checked/countersigned and remain with the patient's record at the receiving hospital.

5.6 ADMINISTRATION OF BLOOD AND BLOOD PRODUCTS

complies with the pre-existent NSW Health Policy Directives related to blood transfusion.

5.6.1 The medical officer is responsible for the transfusion of blood products. They should be accessible at all times during the blood transfusion.

5.6.2 Blood products will be given where resuscitation equipment is available, and the patient must be observed and monitored. All blood is to be given via a dedicated peripheral line, or lumen of a central line.

5.6.3 Administration of all fresh blood products should begin within 30 minutes of removal from the blood eskie. If the unit of blood is removed from the eskie for more than 30 minutes and not used, the risk of bacterial contamination must be considered. The associated hospital/transfusion service linked to the Retrieval Service (who maintains the supply of blood eskies) should be contacted.

5.6.4 All fresh blood products should be administered (and completed) within 4 hours of leaving the blood eskie. This mitigates the risk of bacterial contamination.

5.6.5 Once the unit of RBCs is removed from the blood eskie, the identifying details should be cross checked and confirmed by the treating medical team. Gently inverting the unit several times is encouraged to mix the contents.

5.6.6 The rate of transfusion should be dictated by the patient's clinical condition. In the setting of non urgent transfusion, a rate of no greater than 5mls/minute is recommended, increasing after 15mins if no adverse reaction occurs.

5.7 PATIENT AND BLOOD COMPONENT IDENTIFICATION.

5.7.1 The majority of mortality and morbidity associated with blood component therapy is related to inappropriate transfusion. This is mitigated in the retrieval environ by using O Rh(D) Negative (Universal Donor) blood. However, given that the Retrieval Service may carry
other constituent blood products, vigilance in checking the individual unit and the individual patient is mandatory

5.7.2 Two individuals (the Medical Retrieval team) must check the following:
• If the patient can communicate, ask them to state their name and date of birth.
• Verify the patient and component identification information.
• Verify that the unit is in date and correctly listed on the inventory of blood products contained within the blood eskie.
• Record the blood product serial number on the patient’s retrieval observation record.
• Complete documentation as per 5.11.

5.7.3 The person commencing the blood component should be one of the persons who have identified the patient and the component identity check.

5.7.4 In the rare situation where a single clinician is accompanying a patient who may require a transfusion during transport, and where matched blood products have been provided by the referring hospital, the identity of the patient and the blood products provided should be completed by the clinician and a member of the referring hospital team prior to departure.

5.8 INSPECTION OF BLOOD COMPONENTS

5.8.1 Inspect each unit for:
• Leaks at the ports and the seams.
• Evidence of haemolysis in the unit.
• Evidence of unusual colour or turbidity.
• Check for the presence of large clots.

5.8.2 If there is any evidence of any of the above, do not use the unit of blood. Return it to the blood eskie for return to the associated hospital/Transfusion Service linked with the retrieval base.

5.9 TRANSFUSION GIVING SETS

5.9.1 A standard IV giving set including a 170 – 200 micron filter should be used for all fresh blood component transfusions. This removes the micro-aggregates that may have formed during storage of the component.
5.9.2 Prime the IV giving line either with 0.9% Saline, if time permits, or the blood product for transfusion.

5.9.3 Where feasible the IV giving set should be changed at the completion of the fresh blood components, due to the risk of bacterial contamination.

5.9.4 It is preferred that a maximum of two (2) units of blood are transfused through a single giving set.

5.9.5 In an emergency situation where rapid infusion of the units of blood are to be undertaken on a blood pump set, up to four (4) units of blood may be infused through the single giving set.

5.9.6 In general, a new IV giving set will be used if administering a different blood product. Ideally platelets should not be transfused through an IV giving set that has been used to transfuse RBCs.

5.10 CONCURRENT FLUID ADMINISTRATION

5.10.1 0.9% Saline should preferentially be used for priming or flushing IV giving sets.

5.10.2 Do not use dextrose solutions for priming the IV giving set.
   - Dextrose can cause the red blood cells to swell – resulting in intravascular haemolysis.

5.10.3 Hartmann’s solutions is not recommended for priming the IV giving set.
   - Hartmann’s (or Lactated Ringers solution) contains calcium that may cause the giving set to clot.

5.10.4 It is preferable that drugs and medications are not administered into any blood or blood product infusion line during the transfusion.

5.10.5 Fresh Frozen Plasma and Platelets are not recommended to be infused in the same line as RBCs.

5.11 DOCUMENTATION

5.11.1 All transfusions must be documented on the Retrieval observation chart. This should include:
   - Patient observations (recorded anyway)
   - Product administration start and finish time.
   - Estimated volume and type of blood product.
   - Unique identifier/Batch number of product.
   - Complete the inventory found within the blood eskie.

5.11.2 The empty units must be returned to the associated hospital/Transfusion Service linked with the Retrieval Service. The patient’s details should be completed on the attached card/label.
5.12 PROTOCOLS FOR OBSERVATION DURING TRANSFUSION

5.12.1 Protocol 1 – For a conscious patient actively able to participate in their care, explain the symptoms of significant transfusion reaction. Instruct the patient to report any of the following:
- Pain at the cannulation site
- Shivering
- Fever
- Flushes
- Rashes
- Shortness of breath

Monitor and record the haemodynamic performance of the patient. Document pulse, blood pressure, respiratory rate and temperature (if available) prior to the commencement of the transfusion. Repeat observation 15 minutes after commencing the transfusion, and at the completion of the transfusion. Observe for the features associated with significant transfusion reaction.

5.12.2 Protocol 2 – For an unconscious patient who is unable to comprehend or actively participate in their care:
- As per Protocol 1.
- Continue observations 15 minutely – 30 minutely depending on acuity, during transfusion.
- Observe patient closely for any signs of transfusion reaction – skin rashes, oedema, and abnormal vital signs.

5.13 MANAGEMENT OF SUSPECTED TRANSFUSION REACTIONS

5.13.1 Transfusion reactions commonly occur within the first 15 – 30 minutes of commencement of the blood transfusion.

5.13.2 If a Transfusion reaction is suspected during retrieval:
- Stop infusion immediately.
- Check and document Vital signs.
- Maintain IV access – do not flush the existing giving set.
- Recheck the patient and blood component identification (5.7.2).
- Document the event clearly on the retrieval observation sheet.
• Properly label the RBC’s/FFP suspected of causing the reaction, with the capped IV giving set, and send it to the hospital/Transfusion Service linked to the Retrieval Service.

• The following investigations should also be arranged at the time of or as soon as possible after the reaction:
  • Two EDTA (purple top) tubes for repeat Cross match and D-dimer
  • One CITRATE (blue top) tube for coags and.
  • One plain (red top) tube for UEC, CK, LDH and haptoglobin.
  • MSU for urinary haemoglobin and haemosiderin.
  • Label pathology form clearly “SUSPECTED TRAFUSION REACTION”.

• Complete Incident Notification process upon return to base.

5.14 RETURN OF USED AND UNUSED UNITS OF BLOOD

5.14.1 The hospital/ Transfusion Service associated with the Retrieval Service is responsible for maintaining and managing supply of the blood eskies. The hospital/ Transfusion Service associated with the Retrieval Service will maintain routine cycling of the blood eskies.

5.14.2 If the units of blood have been unused during the mission and the blood eskie has not been opened, return the device to the appropriate storage location at the helicopter base.

5.14.3 If the blood eskie has been opened and used, return the empty units of RBCs and the data logging devices with the blood eskie to the hospital/ Transfusion Service associated with the Retrieval Service. This is most appropriately done by calling the Hospital/Transfusion service upon return to the base and notifying asking for the replenishment of blood product supplies.

5.14.4 If any unit of blood has been removed from the blood eskie for more than 30 minutes, notify the associated hospital/Transfusion Service upon return to base. This unit should be labeled and returned to the hospital/Transfusion Service associated with the Retrieval Service.
5.15 SPECIAL INTEREST GROUPS

5.15.1 Jehovah’s Witnesses (JW’s) are a religious denomination. They believe, based on the teachings of Genesis and Leviticus in the Old Testament, that transfusion of whole blood (even autologous blood), RBCs, and major blood components are forbidden. In receiving a transfusion, they have disobeyed the principles of scripture.

5.15.2 There are, at times, exceptions to these rules. A medical advisory board for Jehovah’s Witnesses is available if time permits. Some JW’s will accept FFP, albumin, immunoglobulin, cryoprecipitate and platelet transfusions, but there is unanimous agreement that red cell transfusion is not acceptable.

5.15.3 There are a number of IV fluids which JW’s have no objection to. These include the crystalloids and colloids.

5.15.4 Blood transfusions administered against the express wishes of a JW may constitute assault. Even in an emergency or life threatening situation, when the patient wishes to refuse treatment are known, such therapy should not be offered. Where possible the current wishes of the patient should be explored by speaking to them directly usually with family members removed from the discussion. In most instances, JW’s who have made this decision carry with them a “No Blood” card, which is reviewed annually.

5.15.5 In instances where blood transfusion is not appropriate, blood component therapy should be clarified. Volume expansion can be undertaken with crystalloid/colloids.

6.REFERENCE LIST

6.1 NSW Health Policy Directives


6.1.2 PD2005_406- Consent to medical treatment

6.1.3 PD2005/332 National Blood Authority: accountability for blood and Blood products in NSW
NEW SOUTH WALES NORTHERN REGION MEDICAL RETRIEVAL SERVICES

6.1.4 PD2005/261 Management of fresh blood components that is intimately linked to the NSW Health Guideline for the management of Fresh Blood components


7. REVIEW DATE

7.1 January 2016

7.2 Document change history:

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<th>Version</th>
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<th>Summary of Changes</th>
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