BLOOD TRANSFUSION THERAPY – BLOOD COMPONENT & BLOOD PRODUCT ADMINISTRATION

GENERAL GUIDE TO SAFE TRANSFUSION PRACTICE

Always confirm the identity of the recipient and check the unit, as well as the expiry date, before commencing the transfusion. Consent is required prior to transfusion.

OBSERVATIONS
- Record baseline temperature, pulse, respiration rate and blood pressure before the start of each unit.
- Closely observe the patient for the first 15 minutes after the start of the transfusion.
- Monitor the patient throughout the transfusion for evidence of adverse reactions.
- Record observations on the patient's chart, including start and stop time of each unit.
- Report all adverse reactions.

RATE OF TRANSFUSION & PRECAUTIONS
- Transfuse blood components within 4 hours, (platelet concentrates within 1 hour).
- Return the blood component to blood bank for appropriate storage if the transfusion can not be started within 30 minutes. Red cell components must only be stored in designated accredited blood fridges.

ADMINISTRATION, INFUSION SETS AND FILTERS
- Select at least an 18-20G cannula for adults, (smaller gauge can be used but they restrict the flow rate), and 22-24G for children. Central venous catheters can be used, check local policy.
- Transfuse blood components via a new blood infusion set containing a 170-200 micron filter. The addition of microaggregate filters is not necessary.
- Change blood infusion sets when the transfusion is completed or every 12 hours. Any number of units may be administered during the 12 hours as long as the flow rate remains adequate.
- Check for specific recommendations from the manufacturer defining the maximum number of red cell units each set can accommodate.
- Bedside leucocyte–depleting filters are not required. Blood components are universally leuco-depleted during processing.

CMV NEGATIVE COMPONENTS
- Required for intrauterine (IUT), exchange transfusion (ET), premature low birth weight (<1500g) or immunocompromised neonates.
- Inform blood bank of CMV requirements.

IRRADIATED COMPONENTS
- Inform blood bank when red cells and platelets require irradiation.

MEDICATION
- Never add medication to blood components or products, or the infusion set, unless specifically approved by the Transfusion Medicine Specialist or Clinical Haematologist.

WARMING
- Never warm components above 41ºC. When warming is clinically indicated ensure only an approved monitored warming system is used.
- Monitor and record warmer temperature on the patient's chart.

ELECTROMECHANICAL VOLUMETRIC INFUSION PUMPS
- Ensure the pump is validated for transfusing red cells and platelets before use. Haemolysis of red cells may occur with some pumps. Check the manufacturer's instructions. Gravity flow infusion sets are acceptable for transfusion.

COMPATIBLE INTRAVENOUS SOLUTIONS
- Use only 0.9% NaCl injection BP.

NEVER use:
- 5% Dextrose solutions (may induce haemolysis).
- Lactated Ringer's (may induce clot formation)

If in doubt contact the Blood Bank, Transfusion Nurse Specialist, Transfusion Medicine Specialist or Clinical Haematologist.

RED CELL COMPONENTS

	Volume
Red Cells Resuspended	220-340mL
Neonatal Red Cells Resuspended (Four units prepared from one donor to reduce allogeneic exposure)	55-85 mL
Autologous Whole Blood (provided by an intended recipient prior to surgery)	440-540mL

- Haematocrit-adjusted blood is used for red cell exchanges and intrauterine transfusion

BLOOD GROUP COMPATIBILITY

ABO

Red cell component compatibility is as follows:

Recipient group	Compatible donor group
A	A,O
B	B,O
AB	A,B,AB,O
O	O

RhD
- RhD identical red cells are normally supplied.
- RhD negative red cells may be given to RhD positive recipients without causing harm.
- In life threatening emergencies, RhD positive red cells may be given to an RhD negative recipient but there is a risk that this will stimulate the production of anti-D. The blood bank will provide guidance and the Clinician **must** be notified.
- RhD positive red cells may be provided for RhD negative males, and for females beyond the reproductive years, if supplies of RhD negative red cells are low.

STORAGE TEMPERATURE
- Stored in a monitored (2-6ºC) refrigerator designated for blood.
- Return the component to the blood bank immediately for appropriate storage, if the transfusion can not be started within 30 minutes.

INFUSION SETS/FILTERS/SPECIAL PRECAUTIONS
- Use a standard blood infusion set that has a 170-200 micron filter.
- Use gravity flow infusion sets or validated volumetric infusion pumps.

RATE AND DURATION OF TRANSFUSION
- Transfuse within 4 hours from time of issue.

MEDICATIONS
- Do NOT add medication to red cell components.

PLATELET COMPONENTS

	Volume	Usual dose
Apheresis Platelet (one apheresis donor)	180-400mL	1 unit (adult)
Pooled Platelets (four donors)	200-350mL	1 unit (adult)
Neonatal Platelets (single donation divided in to small aliquots)	30-60mL	5-10mL/kg

- Occasionally HLA matched single donor apheresis platelets are prepared for specific recipients

BLOOD GROUP COMPATIBILITY

ABO

Platelet Concentrates that are ABO identical or ABO compatible (see red cell compatibility table) will normally be provided. It is not a strict requirement to be ABO compatible.

RhD
- RhD negative platelet concentrates will be provided for RhD negative recipients where possible. Clinical priority is given to females less than 55 years of age and young children.
- Anti-D prophylaxis may be clinically indicated when RhD positive platelet concentrates are given to RhD negative recipients. Blood bank will provide advice.

STORAGE TEMPERATURE
- Stored at 20-24ºC with constant agitation (usually in blood bank).
- Return the component to the blood bank immediately for appropriate storage, if the transfusion can not be started within 30 minutes.
- **Never** store in a refrigerator or chilly bin with ice packs.

INFUSION SETS/FILTERS/SPECIAL PRECAUTIONS
- Use a standard blood infusion set that has a 170-200 micron filter.
- Use gravity flow infusion sets or validated volumetric infusion pumps.
- Platelets must not be transfused through an infusion set that has already been used for red cell components.

RATE AND DURATION OF TRANSFUSION
- Transfuse within 1 hour from time of issue.

MEDICATIONS
- Do NOT add medication to platelet concentrates.

PLASMA & CRYOPRECIPITATE COMPONENTS

	Volume	Usual dose
Fresh frozen plasma -FFP 24 hour (apheresis or whole blood derived)	180-340mL	12-15mL/kg
Thawed plasma -FFP-EL 120 hours (apheresis or whole blood derived)	180- 340mL	12-15mL/kg
Neonatal FFP (single donation divided into small aliquots)	45- 90mL	12-15mL/kg
Apheresis Cryoprecipitate	80-120mL	1 unit/30kg

BLOOD GROUP COMPATIBILITY

ABO

Plasma component compatibility is as follows:

Recipient	Compatible donor group
A	A,AB
B	B,AB
AB	AB
O	O, A, B, AB

Cryoprecipitate compatibility:
Providing the product does not contain a high ABO haemolysin, any ABO group can be provided. Where a high ABO haemolysin is present it may only be given to a recipient with a compatible ABO group (see plasma compatibility table above).

RhD
- Either RhD type plasma and cryoprecipitate can be given without causing harm.
- Anti-D prophylaxis is not indicated if a RhD positive unit is given to a RhD negative recipient.

STORAGE TEMPERATURE
- Stored frozen. Allow 20 minutes for thawing by blood bank prior to issue.

Once thawed:
- **FFP (24hrs)** can be stored for 24 hours in blood bank controlled refrigeration.
- **FFP- EL (120 hours)** can be stored for 120 hours in blood bank controlled refrigeration.

Return FFP to the blood bank immediately for controlled storage if the transfusion cannot be started within 30 min

INFUSION SETS/FILTERS/SPECIAL PRECAUTIONS
- Use a standard blood infusion set that has a 170-200 micron filter.
- Use gravity flow infusion sets or volumetric infusion pumps.
- Monitor for fluid overload.

RATE AND DURATION OF TRANSFUSION
- Transfuse cryoprecipitate within 4 hours from time of issue.
- Transfuse FFP (24hr) & thawed plasma (FFP-EL 120hr) within 4 hours from time of issue.

MEDICATIONS
Do NOT add medication to plasma or cryoprecipitate.

GRANULOCYTE COMPONENTS

	Volume	Usual dose
Apheresis Granulocytes	200-500mL	1 unit
Buffy Coat	35-65mL	4-6 units

BLOOD GROUP COMPATIBILITY

ABO

Granulocytes must be ABO compatible (as per red cell compatibility table).

RhD

Granulocytes should be RhD compatible (as per red cell compatibility table).

STORAGE TEMPERATURE
- Stored at 20-24ºC in blood bank for up to 24 hours post collection.
- Return the component to the blood bank immediately for appropriate storage, if the transfusion can not be started within 30 minutes.

INFUSION SETS/FILTERS/SPECIAL PRECAUTIONS
- Ensure granulocyte components are **irradiated** before transfusing.
- Use a standard blood infusion set that has a 170-200 micron filter.
- **NEVER** use leucocyte-depleting filters.
- **NEVER** use volumetric infusion pumps.
- Ensure the administration of granulocytes and Amphotericin B is separated by several hours.
- Monitor for febrile reactions. These are common and often rate related.

RATE AND DURATION OF TRANSFUSION
- Transfuse within 4 hours from time of issue.
- Transfuse slowly (over 2-4 hours)

MEDICATIONS
Do NOT add medication to granulocyte concentrates.

GENERAL GUIDE TO FRACTIONATED PLASMA PRODUCTS

Always confirm the identity of the recipient and check the product, as well as the expiry date, before administering. Consent is required prior to administration.

OBSERVATIONS
- Ensure baseline observations are recorded.
- Observe the product bottle for turbidity and sediment before administration.
- Monitor the patient for evidence of adverse reactions.
- Report all adverse reactions.
- Report all faults and return product to blood bank.

BLOOD GROUP COMPATABILITY
- ABO & RhD compatibility are not required for fractionated plasma products.

RATE OF INFUSION & PRECAUTIONS
- Rates vary according to product type and clinical status; refer to manufacturers package insert guidelines and local policy.
- Each bottle of Albumin or IVIg product should be infused within 4 hours of spiking.
- Coagulation factors should be administered at 3mL/min and infused within 3 hours of reconstitution.
- Never add medications to fractionated plasma products.

ADMINISTRATION AND FILTERS
- Use a standard IV infusion set, a filter is not needed.
- Allow product bottles and vials to reach room temperature prior to administration.
- Vent glass bottles to administer.
- Coagulation factors are administered as an IV push or via a syringe pump.
- Electromechanical volumetric infusion pumps can be used for Albumin and IVIg products.

IMMUNOGLOBULINS

Intravenous Immunoglobulins (IVIg):
- Intragam®P 6% - 3g or 12g.
- Privigen® 10% - 5g, 10g or 20g.

Subcutaneous Immunoglobulin (SCIg):
- Evogam® 16% - 0.8g, 1.6g or 3.2g

Intramuscular Specific Immunoglobulins:
- Hepatitis B Immunoglobulin-VF 100 IU or 400 IU HyperHEP B™ S/D 220 IU
- Normal Immunoglobulin-VF 5mL
- RhD Immunoglobulin-VF (Anti-D) 250 IU or 625 IU. (IM use only)
- Tetanus Immunoglobulin-VF 250 IU
- Zoster Immunoglobulin-VF 200 IU

Intravenous RhD Immunoglobulin
- Rhophylac® 1500 IU (Anti D)
- *Maximum rate 2mL (1500 IU) / minute*

COAGULATION FACTORS
- Biostate® (factor VIII & vWF) 500 IU & 1000 IU
- MonoFIX®-VF (factor IX) 500 IU & 1000 IU
- Prothrombinex-VF® (factor II, IX, X) 500 IU
- Thrombotrol®-VF (Antithrombin III) 1000 IU

Administration of Coagulation Factors:
- Do not mix with saline.
- Use the reconstitution filter device provided by the manufacturer.
- Once reconstituted use within 3 hours.

ALBUMIN
- Albumex® 4 (Albumin 4%) 50mL & 500mL
- Albumex® 20 (Albumin 20%) 10mL & 100mL

Administration of Albumin Products:
- Monitor for fluid overload

If in doubt contact the Blood Bank, Transfusion Nurse Specialist, Transfusion Medicine Specialist or Clinical Haematologist.

FOR MORE INFORMATION VISIT WWW.NZBLOOD.CO.NZ OR CONTACT YOUR LOCAL BLOOD BANK, TRANSFUSION NURSE SPECIALIST, TRANSFUSION MEDICINE SPECIALIST OR CLINICAL HAEMATOLOGIST.

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