Administration of blood products

Standard
All infants who require a blood component transfusion will have the procedure carried out in a safe manner.

Risk assessment of the patient environment prior to achieving Aseptic Non-Touch Technique:

- assess the procedure environment for any avoidable environmental clutter
- establish clear access of the patients IV cannula e.g. removing any blankets
- identify how many Key parts and Key sites are involved in administering flush and drugs via bolus injection

Equipment
Administration: IV blue tray, non sterile gloves, white disposable apron, neonatal blood IV giving set (170 micron filter) (see note 2), a 50mL syringe, blood product/component, syringe pump.

Procedure

Prior to setting up the equipment, attach the infant to a multi-parameter monitor so that the continuous physiological monitoring of temperature, HR, BP and respiration can be automatically populated into the electronic record. If an arterial line is not in-situ, take and document a peripheral blood pressure. If the infant cannot be attached to a multi-parameter monitor then the observations must be taken and recorded prior to starting the transfusion, again 15 minutes after starting the transfusion and hourly thereafter until the transfusion is complete.

- Equipment is assembled and placed in an accessible position for carrying out the procedure. Cleanse hands according to NICU policy.
- Put on white disposable apron and non-sterile gloves.
- With another registered nurse/midwife, check the identity of the infant (surname, date of birth and identity number) at the cotside against his/her ID name-band (baby's ID is name-band is located on baby or attached to the incubator) or cot card and the fluid prescription chart. Check that the identity details match those on the blood component traceability tag (attached to pack).
- The correct traceability tag must be attached to the pack so check that the:
    - Check that the donation number on the compatibility/traceability tag matches the donation number on the blood component. The donation number is the 12 digit ‘G’ number.
    - Check the patient’s blood ABO group and Rh group on the compatibility/traceability tag are identical to the blood ABO group and Rh group on the blood component. In general these groups should be identical. Where this is not the case a specific comment from the transfusion laboratory staff regarding the compatibility of the component for the patient will be found on an attached card. If this comment is not found the component should not be transfused until any discrepancy has been clarified with the transfusion laboratory.
    - Check the expiry date that is printed on the main blood pack label. Blood components must not be used if they are beyond their expiry date.
    - (see note 3 for additional checking of documentation).
- Prepare the IV blue tray (General Aseptic Field) by cleaning with a detergent cloth from front to back; allow this to dry.
- Remove blood component pack from outer wrap and inspect the bag for leaks, discolouration &/or clumping of cells. If the pack is damaged or abnormal do not proceed. Telephone the hospital transfusion laboratory to clarify whether or not to proceed with the transfusion.
- Remove the infusion set from the outer wrapping; close off the red and the white clamp; connect the 50mL syringe to the luer lock attachment.
- Grasp the administration port of the blood component bag and using a non-touch technique, remove the protective cover from the spike of the infusion set into the administration port with a twisting action.

- Squeeze the IV giving set chamber unit until the filter and internal ring mark are covered but leaving a 2cm gap between the fluid level and the top of the chamber.
- Rest the blood bag on the trolley.
- Release the red clamp and draw back on the syringe to the prescribed amount of blood product/component, plus approximately 5mls extra. Do not disconnect the blood product/component bag from the infusion set. Close off the red clamp.
- Open the white clamp and loosen the cap at the end of the giving set. Prime the line expelling all air and ensuring blood reaches the 'white cap'. Close off the white clamp.
- Load the syringe into the pump; adjust the rate and hourly volume, pressure alarm settings and cancel previously infused volume. Hang the blood bag on the syringe clamp; it is therefore lower than the syringe.
- Clamp T-connector at IV cannula site, vigorously rub the 'no needle' luer lock port (blue hub) for 30 seconds with an alcohol swab. Allow drying for 30 seconds. Then connect the extension line ensuring the key part is not touched.
- Release the white clamp and start the pump.

Post procedure

- Discard sharps and equipment safely as per NNU policy.
- Clean IV blue tray with a detergent cloth from front to back and allow to dry.
- Remove white disposable apron and non sterile gloves, disposing of same in clinical waste.
- Clean hands immediately as per NNU policy.
- Observe and record the infant's physiological responses to the blood transfusion and report abnormal findings to nurse/midwife in charge.
- Complete procedure documentation (see note 3).
- Inspect cannula site for extravasation/infiltration of surrounding tissues with prescribed fluid or leakage at least once hourly

On completion of the transfusion

- Turn off the pump. Apply gloves
- Disconnect the extension line from the cannula; remove the cannula if no longer required or flush cannula with approximately 1mL of 0.9% NaCl and replace the 'no needle' luer lock port (blue hub).
- Position infant comfortably within incubator/cot.
- Take and record another BP measurement and temperature, HR and respiration if not attached to the multi-parameter monitor.

Disposal

- On completion of the transfusion, keep the giving set securely attached to the RCC, FFP or platelet pack and dispose both together in the clinical waste bin.
- If using more than 1 paedipack in a single transfusion episode, keep all packs until the end of the transfusion and then discard as per protocol.

Adverse reaction

Adverse reactions are highly unlikely in the newborn infant but if it is suspected please carry out the following:

- When a transfusion reaction is suspected, the transfusion must be stopped and the Doctor/ANNP notified. The duty BTS haematologist should also be contacted.
- The infusion line and blood component should be disconnected and the end wrapped in an empty specimen bag.
- The giving set and blood component bag must be bagged and a 'Transfusion reaction' form attached - the form is obtained from the hospital transfusion laboratory. The bag and form is then sent to the hospital transfusion laboratory.
- Continue with continuous physiological monitoring.

Potential complications
Mis-identification, extravasation, infection, incompatibility reaction and circulatory overload.

Notes

1. Blood components are the therapeutic constituents of human blood (red cells, white cells, platelets, plasma and cryoprecipitate).
   In contrast, blood products are therapeutic products manufactured from human whole blood or plasma donations (eg albumin, anti-D, intravenous immunoglobulin. Most blood products are now stored in, and issued from, pharmacy (including intravenous immunoglobulin (IVIgG), albumin, hepatitis B immunoglobulin, tetanus immunoglobulin, varicella-zoster immunoglobulin and rabies immunoglobulin). This guideline does not deal with the use of blood products.
   - Paedi-packs (RCC): There are usually 4 paedi-packs in a 'set', all having the same pack number; each 'set' is from a single donation and is always CMV negative. They are available only as O negative and O positive blood. Transfusions of RCC must be commenced within 30 minutes of removal from cold storage and completed within 4 hours. RCC that has been out of the fridge for longer than 30 minutes and has not been used must be marked as such and returned to the hospital transfusion laboratory.
   - Fresh frozen plasma (FFP): Should be infused as soon as possible on arrival to the NNU but within 4 hours of being issued from the hospital transfusion laboratory (infusing time generally 30 minutes). Methylene-blue treated FFP is slightly green in colour and the pack shape is different from untreated FFP. Storage and administration is the same as for untreated FFP.
   - Platelets: Should be infused as soon as possible on arrival to the NNU but within 4 hours of spiking the pack (infusing time generally 30 minutes). Packs must not be refrigerated.
   - Cryoprecipitate: Should be infused as soon as possible on arrival to the NNU but within 4 hours of being issued from BTS (infusing time generally 30 minutes.
2. Special requirements: Whole blood is used for exchange transfusions, washed blood is used for infants with NEC or who are autoimmune deficient. All blood components require to be filtered with a 170 micron filter (blood IV giving set).
3. Safety check: 2 qualified nurses/midwives must check the accuracy of the following documentation:
   - prescription sheet for infant's name and ID number, weight, blood component prescription (between 10-20mls/kg), mls/kg, volume to be infused and hourly rate and signature;
   - traceability tag donation number (G number) and that the blood group on the tag are the same as those on the blood component pack.
     Where there is a discrepancy in information, clarification from the Blood Issue Laboratory must be sought. NB Pooled platelets will not be labelled with blood group. If the infant is known to have special transfusion needs the prescription and paedipack must be checked to ensure these have been met.

- both nurses /midwives must check that the blood component is attached to the correct line and the pump rate is correct; the traceability tag is signed by both nurses /midwives. On the traceability tag: peel off the signed pink portion and stick this to the prescription sheet (where you would previously have signed); complete and detach the 'return to laboratory' blue label and place this in the box provided on the main reception desk. The blue labels will be collected by staff of the hospital transfusion laboratory.

STOP, SEE BACK OF THIS TAG BEFORE TRANSFUSION

NHS SCOTLAND

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Donation No: G101 602 597 229 N
Component: Red Cells
Signature 1: Date Given:
Signature 2: Time Given:

Peel off label above and place in patient's Medical Records

Surname: MACDONALD	Forename: MORAG
DOB: 11/07/1956	Gender: FEMALE
25 HILL STREET TOWN CENTRE	
Patient Identity No: 100198E	Date/Time Required: 20/12/06
Patient Blood Group: O Rh POS	Component: Red Cells
Donation Number: G101 602 597 229 N	
Special Requirements:	

Once transfusion has been started, you must send the completed section below to the Hospital Transfusion Laboratory. This is a legal requirement

Surname: MACDONALD	Forename: MORAG
Patient Identity No: 100198E	Lab Sample No: 6792385
Donation Number: G101 602 597 229 N	
Component: Red Cells	
Date Given:	Time Given:

I confirm that the above patient received this blood component.
Sign and Print Name

4. Indications of extravasation include localised swelling, blanching, coolness of the affected tissue and possibly discomfort. If extravasation is suspected, the cannula must be removed and if possible, elevate the affected limb.

References

- The Blood Safety and Quality Regulation 2005
- Blood Transfusion Clinical Policies and Procedures 2016 Version 5 accessed November 2021 from: http://intranet.lothian.scot.nhs.uk/Directory/medicinesjh/Documents/Blood%20Transfusion%20Policy.pdf
- Disposal of Clinical, Laboratory and General Waste HAEM/CLIN/062.07 accessed November 2021 from: http://intranet.lothian.scot.nhs.uk/Directory/Haematology/NursingSOP/Documents/Disposal%20of%20Clinical,%20Laboratory%20and%20General%20Waste.doc
- McCormack K (1998) Neonatal Blood transfusions. Journal of Neonatal Nursing 4(5) : 12-17.
- Bruce M (1997) Routine observations of babies during top up blood transfusions: a ritualistic? Journal of Neonatal Nursing 3(3) : 19-22.
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