Fresh Frozen Plasma Transfusion Policy
Neonatal Unit, St. Peter’s Hospital

Guidelines for FFP Transfusions in Neonates

FFP is used to treat significant coagulopathy in neonates. However routine use of FFP to treat coagulopathy in the absence of bleeding has not been shown to reduce morbidity or mortality. Treatment of the underlying cause is the primary goal.

In congenital coagulopathies, if specific test results cannot be waited for, then FFP is used to provide functional coagulation factor levels. FFP is not sufficient treatment for severe Haemophilia A or B. Acquired coagulopathies are however much more common than congenital coagulopathies.

Acquired coagulopathies in neonates most commonly are:
- Vitamin K deficiency
- Disseminated Intravascular Coagulation (DIC)
- Liver dysfunction

DIC is conventionally defined as a pattern of reduced platelets, prolonged coagulation variables (prothrombin time, APTT with or without thrombin clotting time), reduced fibrinogen, and increased D-dimers (or other markers of fibrin or fibrinogen degradation). Although this pattern is likely to be present in a neonate with fulminating DIC, findings can vary, and a number of factors complicate the diagnosis during the neonatal period.

Causes of DIC
Fetal/Neonatal
- Hypoxia-acidosis
- Sepsis, NEC
- Meconium aspiration
- Haemolysis
- Rare causes include: Aspiration of amniotic fluid, Hypothermia, Giant Haemangioma (Kasabach-Merritt Syndrome), Homozygous Protein C/S Deficiency etc

Maternal/Obstetric Disorders
- Dead twin
- Placental abruption
- Severe pre-eclampsia

Vitamin K is given intravenously to treat coagulopathy caused by deficiency, with a rapid response (30-120 min). Factors II, VII, IX and X are vitamin K dependant. If a baby is actively bleeding then FFP should also be given. See Vitamin K guideline for dose details

DIC is treated with FFP. If the fibrinogen level falls acutely to less than 1.0g/l then cryoprecipitate should also be given (5ml/kg). Platelets may also be required – See Platelet transfusion guideline

Liver dysfunction is common but variable in severity. Mild coagulopathies may not require treatment unless invasive procedures are required. Severe presentations may require FFP and cryoprecipitate. Platelets may also be required – See Platelet transfusion guideline

Treatment with FFP should be given where there is:
- Haemorrhagic disease of the newborn with significant bleeding
- Baby with coagulopathy who is bleeding
- Baby with coagulopathy about to have an invasive procedure

FFP transfusions:
Parents should be informed if possible
Dose of FFP is usually 10-15ml/kg over 15-30 minutes. The dose of FFP does, however, depend on the clinical situation and laboratory parameters which may justify higher doses. Take care in babies at risk of heart failure.

**Requesting FFP for transfusion:**

All specimen tubes MUST be hand-written at the cot-side with 4 identifiers – patient’s forename (or m/i or f/i), surname, DOB, hospital number. The tube must be signed and dated. Addressograph labels, unclear or incorrectly labelled samples will NOT be accepted.

It is helpful to give the mother’s details to the laboratory so that they can link mother and baby on the system – this is important in case the mother has any blood group antibodies.

The laboratory may require a sample of maternal blood.

**Administration of FFP**

Administration of all blood products is a procedure which must be carried out by two qualified medical/nursing staff.

**Equipment**

- Fluid balance chart
- Unit of platelets with label
- Infusion pump or syringe driver
- Baby’s notes
- Platelet transfusion form
- Correct size intravenous syringe (luer lock)
- Blood component infusion set (with filter)
- Manometer line (may not be required if using syringe driver)

**Policy on checking is as per Trust Guidelines**

**Infusion Table**

Blood products should be preceded by a flush of 0.5 – 1 ml of 0.9% or 0.45% NaCl.

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Pre- transfusion testing</th>
<th>Infusion Time</th>
<th>Shelf Time</th>
<th>Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methylene blue treated FFP</td>
<td>Citrated plasma separated from whole blood</td>
<td>ABO compatibility – see table below neonates will normally receive group A/B</td>
<td>15 – 30 minutes</td>
<td>12 months at -30°C. Use immediately after thawing – only viable for 4 hours once thawed.</td>
<td>Filter with 20 µm filter</td>
</tr>
</tbody>
</table>

**Observation of the Infant**

The infant should be continually monitored during the procedure for heart rate and saturation levels. Record baseline temperature, HR, respiration and O2 saturations pre-transfusion if not on continuous monitoring. Record blood pressure if appropriate. The cannulation site must be checked.

**General Points**

All blood components supplied for babies are negative for CMV and leucocyte-depleted FFP Transfusions are not to be given by long-lines but can be given via UVC or UAC.
Transfusion therapy with FFP: selection of the ABO phenotype of units to transfuse

<table>
<thead>
<tr>
<th>ABO phenotype of recipient</th>
<th>ABO phenotype of unite to transfuse (in order of preference)</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>O,A,B,AB</td>
</tr>
<tr>
<td>A</td>
<td>A,AB</td>
</tr>
<tr>
<td>B</td>
<td>B, AB</td>
</tr>
<tr>
<td>AB</td>
<td>AB</td>
</tr>
</tbody>
</table>

Nursing Notes

<table>
<thead>
<tr>
<th>Action</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check FFP is prescribed by the doctor and confirm amount.</td>
<td>As per Trust Policy</td>
</tr>
<tr>
<td>On receipt of the FFP, check the name and hospital number on the platelets label.</td>
<td>To ensure it is for the correct baby</td>
</tr>
<tr>
<td>If the FFP transfusion is not required immediately, store FFP in the Labour ward blood fridge and enter details in the Labour ward blood register. <strong>- FFP MUST BE USED WITHIN 4 HOURS OF THAWING</strong></td>
<td>To ensure FFP remains at correct temperature and does not deteriorate prior to administration. <strong>FFP must be commenced within 30 minutes of leaving the fridge.</strong></td>
</tr>
<tr>
<td>Explain procedure and rationale to parents if present.</td>
<td>To ensure parental understanding and consent</td>
</tr>
<tr>
<td>Obtain and record baseline temperature, apex/pulse, respiration rate and saturations. BP if appropriate</td>
<td>To establish measurements for comparison during and after procedure.</td>
</tr>
<tr>
<td>When the FFP is to be administered, two qualified staff must check the baby’s name, the blood group of the baby and the unit, the unit number, and expiry date, and that it is CMV negative. Cross check with the FFP form. Also check baby’s name and hospital number against those on the baby/child's notes.</td>
<td>To ensure the right baby receives the correct FFP.</td>
</tr>
<tr>
<td>Enter the date and time of administration, blood group of baby and unit, unit number and signatures of the two checking staff onto the blood mount sheet in the baby’s notes and attach the pink Blood Transfusion form</td>
<td>To maintain accurate records</td>
</tr>
<tr>
<td>Wash and dry hands. Gloves to be worn</td>
<td>To minimise risk of cross infection.</td>
</tr>
<tr>
<td>Draw up the required amount of FFP into the syringe via the blood infusion set (integral filter) connect to the manometer line (if used) and run through</td>
<td>To prepare for infusion</td>
</tr>
<tr>
<td>Insert syringe into the syringe pump/driver set the rate of infusion.</td>
<td>To ensure baby receives prescribed volume of FFP.</td>
</tr>
<tr>
<td><strong>The final check MUST be the compatibility tag label versus the baby wrist band</strong></td>
<td>NPSA Guidelines</td>
</tr>
<tr>
<td>Flush with saline (0.9% or 0.45%) then connect infusion line to the venous cannula and commence infusion. If dextrose has previously been infused through the cannula, it must be flushed with normal saline before the FFP is connected.</td>
<td>To administer the FFP.</td>
</tr>
<tr>
<td>Record on the fluid balance chart, the time infusion commenced, hourly volume infused, time completed and the FFP unit number.</td>
<td>To maintain accurate records.</td>
</tr>
<tr>
<td>Observe baby</td>
<td>To observe for adverse reactions, change in condition. To allow prompt action should a reaction occur</td>
</tr>
<tr>
<td>On completion of the transfusion, disconnect the transfusion line and flush with saline. Reconnect any other infusion that may be required.</td>
<td>To maintain patency of line</td>
</tr>
<tr>
<td>Discard the syringe and infusion set safely. The FFP unit should be resealed and disposed of in a clinical waste bag.</td>
<td>To prevent cross infection.</td>
</tr>
<tr>
<td>Fill in relevant details on FFP unit tag. <strong>Return FFP completion tag to transfusion card holder.</strong></td>
<td>Kept on record for 30 years. Transfusion tag rates are monitored by the Trust and departments are benchmarked</td>
</tr>
</tbody>
</table>

**Policy Drafted by:** Dr. Peter Reynolds, Consultant Neonatal Paediatrician Sept 2007  
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**Reviewed by:** Jean Hatton, Lead BMS & HTP, Blood Transfusion Department, ASPH

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**Review Date:** October 2010  
**Re-reviewed:** Jan 2011  
**Next review:** Jan 2014

**References**

Northern Neonatal Nursing Initiative Trial Group Randomised trial of prophylactic early fresh-frozen plasma, gelatine or glucose in pre-term babies: outcome at 2 years 1996 Lancet, 348;229-232


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