



Alder Hey Children's
NHS Foundation Trust

HAEMATOLOGY/ONCOLOGY UNIT AND PAEDIATRIC ONCOLOGY SHARED CARE UNITS GUIDELINE FOR BLOOD PRODUCT SUPPORT IN PAEDIATRIC ONCOLOGY PATIENTS

Version Control Table				
Version	Date	Author	Status	Review date
3	26/07/2023		Ratified at HTC	
3	10/05/2023	DR JESSICA SANDHAM	APPROVED	10/05/2026
2	07/07/2020	DR MARK CASWELL	APPROVED	07/07/2023
1	10/07/2017	DR MARK CASWELL	APPROVED	10/07/2020

Introduction

This guideline is intended to be used in addition to the Alder Hey Children's NHS Foundation Trust transfusion policy. It is for use for haemato-oncology/oncology patients only and is primarily to help advise staff about the special requirements when using blood products in this patient group.

All patients and families are issued with a transfusion information pack and should the need arise for special transfusion requirements they will be given an alert card detailing requirements and the time span as appropriate.

Patients and parents will be signposted to the below leaflets.

[The Amazing You NHSBT leaflet](#) (younger patients)

[Receiving a Blood Transfusion NHSBT leaflet](#) (older patients and parents)

Consent prior to transfusion

It is a general legal and ethical principle that valid consent should be obtained from a patient before they are treated. Consent for blood transfusion will be taken from parents (or patients where appropriate) in Alder Hey at commencement of a course of treatment, and will be valid for duration of their course of systemic anti-cancer therapy. It will be necessary for clinical teams in shared care centres to follow their local policy for consent around transfusion or affirm this consent verbally and document this in local notes if felt sufficient to satisfy local policy. An electronic copy of the patients consent form can be forwarded to shared care centre upon request.

Avoidance of unnecessary transfusions is the safest policy.

Any blood product transfusion should be carefully considered in relation to the current clinical condition of the potential recipient. The indication for any transfusion and consent should be documented in the medical notes.

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1. Red Cell Transfusion

Indication to transfuse red cells:

Transfuse if anaemic **and** symptomatic. Consider if Hb is less than 70g/l.
Transfuse minimum required to achieve post transfusion Hb of 100g/l or one adult unit (whichever is the smaller volume).

- Hb < 70 g/l, asymptomatic and Hb likely to rise, then transfusion may be withheld.
- Hb 70-80g/l and symptomatic and/or Hb likely to fall further then transfusion may be indicated.

Adult or paediatric bags:

Paedipack consists of 6 packs from one donor. The volume is approximately 40mls/pack, total volume ~240mls

- If volume required is >150mls then an adult pack could be ordered with clear instructions to limit the volume given by prescribing dose required in mls.
- If <150 mls required then order appropriate number of paedipacks and consider reserving the remaining packs if further transfusion likely to be required.

2. Platelet transfusion

Indications to transfuse platelets

The indication to give platelets is often on an individual basis and the threshold at which to transfuse a patient can vary depending on their previous bleeding history and the current clinical setting. The platelet threshold needs to be viewed in the clinical context.

Review need for transfusion with three things in mind:

- The **count**,
- The **trend**,
- And most importantly the **patient's individual clinical picture**.

Platelet requirements will be increased in the presence of:

- Infection / fever
- Bleeding
- Splenomegaly
- Antifungal treatment

If in doubt liaise with a Consultant Haematologist or Oncologist

Specific Guidelines for platelet count requirements

a) Prophylactic platelet transfusion

Clinical scenario	Desired platelet count (x 10 ⁹ /L)
Well child	>10
Febrile	>20
Patients with brain or spinal tumours	>30
History of bleeding with low platelets	Level pre-determined by consultant

b) Platelet threshold for procedures

Procedure	Desired platelet count (x 10 ⁹ /L)
Lumbar puncture	>50
Central line insertion/removal	>50
Surgery (except neurological)	>50
Neurosurgical procedures	>100
Ophthalmological procedures	>100

c) Patients who are bleeding

If bleeding then consider platelet transfusion if platelet count low.

It is an individual clinical decision required as to whether platelet transfusion is indicated unless count clearly very low. If count < 50 and bleeding, transfuse.

If count < 100 and bleeding consider platelet transfusion though priority is to ensure clotting corrected and other modalities of treatment considered. If in doubt liaise with a Consultant Haematologist or Oncologist

Adult or single donor bags

Neonates should receive 10-20 ml/kg (single donor packs)

Children <20kg 10-20mls/kg (single donor packs or adult pack with volume limit on prescription)

Children >20kg one adult dose

Ideally apheresis packs should be used but pooled platelet packs can also be used if required.

3. HLA matched platelets for platelet refractoriness

Some patients may have poor increments from platelet transfusions, this should be suspected clinically by failure to ameliorate bleeding/bruising symptoms and by a platelet increment of $<20 \times 10^9/l$ 30min post-transfusion or an increment of $<10 \times 10^9/l$ 24 hours post-transfusion, confirmed on 2 consecutive transfusion episodes. The most common causes are non-immune

- Sepsis
- Bleeding
- Disseminated intravascular coagulopathy (DIC)
- Veno occlusive disease (VOD)
- Antibiotic or antifungal therapy
- Splenomegaly

rather than immune (anti-HLA or anti-platelet antibodies).

If a patient fails to increment then non-immune causes should be considered and treated if possible.

If non-immune causes are not identified, then HLA matched platelet concentrates may be indicated.

Blood should be sent to the Blood Bank for anti-HLA antibody testing and HLA typing. This will require a specific NHSBT form obtained online or via local transfusion laboratory.

If a report confirms a relevant antibody then the patient will require HLA matched platelets – please discuss with Haematology Registrar or Consultant. NHSBT will often wish for the Consultant Haematologist on call to confirm the request prior to ordering and so good communication is essential to prevent delay.

It is essential that the local Blood Bank is kept in the picture as any HLA-matched platelets will be issued through the lab and may take up to 72 hours to obtain.

When transfusing HLA matched platelets a 1 hour increment must be done to check whether the platelets are effective.

Repeat samples should be sent to the Blood Bank at the beginning of each subsequent course of treatment as antibodies may reduce or increase their specificity.

Rarely platelet specific antibodies may be encountered when increments remain poor with HLA matched transfusions– please discuss with Haematologist.

4. Fresh Frozen Plasma (FFP) transfusion

Indications to transfuse FFP

In the face of bleeding **and** abnormal clotting, FFP may be indicated.

Please discuss with Haematologist on call.

Vitamin K and tranexamic acid may also be indicated.

FFP has the highest rate of serious adverse reactions of any blood component and must always be used for a firm clinical indication.

Do not use for correction of minor clotting abnormalities prior to procedures or in the absence of bleeding unless advised by Haematologist.

5. Fibrinogen replacement

Cryoprecipitate transfusion

Cryoprecipitate is rich in fibrinogen (140mg/single unit) and may be indicated in the context of deranged coagulation and bleeding, especially if there is a suggestion of DIC (Disseminated intravascular coagulopathy) with low fibrinogen.

Please discuss with Haematologist on call

Fibrinogen concentrate (Fibryga)

May be preferable especially if there are any concerns re fluid overload, obtained from pharmacy. Dose according to fibrinogen level or at 70mg/kg if level not known. Check clotting screen and fibrinogen level 1h after infusion.

6. Quick reference table (from AHC NHS FT Transfusion Guidelines)

Component	Volume	Administration time
Red cells	Vol (ml) = desired Hb rise (g/l) x wt (kg) x 0.4	4 hours maximum to include transport and set up time
Platelets	< 20kg, 10-20ml/kg > 20kg, 1 adult dose	30 minutes
FFP/Octaplas	10-20ml/kg	2 hours
Cryoprecipitate	5-10ml/kg (usual max 10 units – approx 300ml)	1 hour
Riastap (fibrinogen concentrate)	70mg/kg or calculate dose using SmPC	Max 10ml/min

NOTE: Transfusion volumes are based on current practice and are only for guidance. Exact volumes given will depend on the clinical status of the patient. Always be aware of the risk of transfusion associated circulatory overload.

7. Other Modalities of Therapy

If bleeding occurs consider a local cause and local remedy such as surgical intervention or interventional radiology procedure.

Other pharmacological interventions include

- Vitamin K
- Tranexamic acid
- Novoseven
- Prothrombin Complex Concentrate
- Fibrinogen Concentrate

Use of Novoseven and PCC must be discussed with Haematologist on call

8. CMV (cytomegalovirus) seronegative blood products

Indications:

- intra-uterine transfusions
- neonates (i.e. up to 28 days post expected date of delivery)
- possible/confirmed pregnancy

9. Irradiated products

For more detail please refer to BSH guidelines in the use of irradiated blood components (2020) [link](#); most relevant summary provided below

Indications for irradiated blood products

- Bone marrow/stem cell transplant recipients:
 - from 1 week pre-transplant
 - until 3 months post-autograft
 - until 6 months post-allograft (or cessation of immunosuppression/resolution of GvHD)
- Bone marrow or stem cell harvest patients:
 - from 1 week pre-harvest
- Patients who have EVER received purine analogues (such as fludarabine, pentostatin, deoxycoformycin) or anti-CD52 alemtuzumab (campath) or anti-thymocyte globulin (ATG) for haematological disease.
 - Most solid organ chemotherapy is not in this category
- All patients with Hodgkin lymphoma (past or present)
- All patients with confirmed OR POSSIBLE congenital cellular immunity deficiencies (eg Di George)
- All intra-uterine transfusions (IUT)
- Neonatal exchange or top-up transfusions after previous IUT
- All neonatal exchange transfusions *IF* this does not lead to an unacceptable delay in provision of blood

- HLA-matched platelet transfusions
- Directed donations from family members
- All granulocyte transfusions