NHS
Blood and Transplant

Information for Healthcare Professionals

FACTSHEET
Fresh Frozen Plasma (FFP)

The indications for transfusing FFP are limited and specific. Transfusion of plasma-rich components is associated with an increased risk of adverse events compared to red blood cells.

Please transfuse appropriately.

Fresh Frozen Plasma (FFP)

FFP is leucodepleted plasma that has been obtained from whole blood donations or by apheresis from a male donor. Plasma is sourced from male donors to reduce the risk of transfusion-related acute lung injury (TRALI). The plasma has been rapidly frozen to below -25°C, to maintain the integrity of labile coagulation factors, and may be stored for up to 36 months.

Clinical indications for the use of FFP*

- **Major Haemorrhage** – In the trauma setting transfuse empirically in a 1:1 ratio with red cells. Other settings give FFP in at least a 1 unit:2 unit ratio with red cells until results from coagulation monitoring are available. Once bleeding is controlled, further FFP should be guided by abnormalities in PT and APTT (keep PT/APTT ratio of <1.5x mean normal), or by the use of viscoelastic haemostatic assays in a near-patient setting.
- **PT Ratio/INR >1.5 with bleeding** – Clinically significant bleeding without major haemorrhage. FFP required if coagulopathy. Aim for a PT and APTT ratio of < 1.5, or local protocol range for near-patient viscoelastic assays.
- **PT Ratio/INR >1.5 and pre-procedure** – Prophylactic use when coagulation results are abnormal e.g. disseminated intravascular coagulation and invasive procedure is planned
- **Liver disease with PT Ratio/INR >2 and pre-procedure** – FFP not usually required before invasive procedure if PT ratio/INR is <2 and if there is no significant risk of bleeding
- **Thrombotic Thrombocytopenic Purpura (TTP)/plasma exchange****
- **Replacement of single coagulation factor.**

**National Blood Transfusion Committee Indication Codes for Transfusion, 2020.*

***BSH guidelines for the treatment of TTP recommend the use of solvent detergent FFP (SD-FFP). SDFFP is made from a pool of several hundred donations which are leucodepleted and treated with solvent detergent to destroy viral pathogens; the residual levels of SD are not toxic. SDFFP is a licensed pharmaceutical product so reactions must be reported to the Medicines and Healthcare Products Regulatory Agency (MHRA), via the yellow card scheme, as well as to the Serious Adverse Blood Reactions and Events (SABRE) online scheme. Indications and shelf life of SDFFP are governed by the manufacturer.*

FFP should NEVER be used as circulating volume replacement.

Dosage of FFP

In non-bleeding patients, the recommended starting dose of FFP is 15mL per kg of body weight. This equates to approximately 1L (four units) of FFP for an ‘average’ 70kg patient: heavier patients may require more units (but caution should be used in obese patients) and lighter patients fewer units.

In major haemorrhage, FFP should be used as part of initial resuscitation in at least a 1 unit: 2 unit ratio with red cells, until results from coagulation monitoring are available. Once bleeding is under control, further FFP should be guided by laboratory tests (transfusion trigger of PT and/or APTT >1·5 times normal) at a dose of 15-20mL/kg.

Please note

Following a review of risk reduction measures for variant Creutzfeld-Jakob disease (vCJD), in September 2019 SaBTO reported that **individuals born on or after 1st January 1996 no longer require imported (Methylene Blue MB-pathogen inactivated) plasma**. NHSBT no longer import plasma, however due to its 36 month expiry, hospital blood banks may still fulfil clinical requests with either non-UK (MBFFP) and/or UK plasma (FFP) until stocks of imported plasma are depleted.

Practical instructions for use of FFP

Once thawed, the FFP must not be refrozen and should be transfused as soon as possible using a standard blood administration set with a 170-200 micron filter. If delay is unavoidable, standard FFP and MBFFP may be used within four hours if kept at 22°C±2°C or within 24 hours if stored at 4°C±2°C (note - different conditions apply to SDFFP).

Pre-thawed standard FFP can also be stored at 4°C±2°C for up to 120 hours for use only in patients who develop unexpected major bleeding e.g. following trauma. Note that the post thaw shelf life of MBFFP cannot be extended beyond 24 hours.

In an emergency, where pre-thawed FFP is not available, it is important to factor the thawing time of FFP into the availability of the component (usually 20-30 minutes).

The typical administration rate is 10-20mL/kg/hr, but this may vary depending on the patient's condition.

Compatibility

ABO group identical FFP should be given whenever possible; if not possible, FFP of a different ABO group may be acceptable as guided in the blood group selection table.

ABO compatibility for plasma components is different to that of red cells and **group O FFP MUST only be given to group O recipients.**

Group AB is haemolysin free and may be used if the patient's group is unknown, but is in short supply and should only be used for non AB recipients if absolutely essential.

Guidance on plasma blood group selection following ABO incompatible haematopoietic stem cell transplants is available in the 2018 BSH guidelines on the spectrum of FFP and cryoprecipitate products.

Blood group selection for FFP

FFP units must be high-titre negative (HT-) for anti-A/anti-B

Recipient Group	O	A	B	AB
1st Choice	O	A	B	AB
2nd Choice	A	B	A	A
3rd Choice	B	AB	AB	B
4th Choice	AB			
Blood group selection for MB FFP and HT untested/positive FFP				
1st Choice	O	A	B	AB
2nd Choice	A	AB	AB	A[1]
3rd Choice	B	B[1]	A[1]	B[1]
4th Choice	AB			

[1]Only suitable for emergency use in adults

MB FFP units are not tested for HT- for anti-A/anti-B. Group compatible MBFFP should be used wherever possible.

D group

FFP **does not need to be matched for D group**. D positive plasma components may be given to D negative recipients without the need for anti-D Ig prophylaxis. The EU Blood Directive currently requires that the D group is stated on the label.

If you are unsure about the compatibility of FFP for your patient always check with your hospital transfusion laboratory staff before transfusing.

Specific requirements

FFP has no cellular content and therefore, does not need to be irradiated or to be selected as Cytomegalovirus (CMV) sero-negative.

The use of other frozen components produced by NHS Blood and Transplant is covered in a separate factsheet ‘Cryoprecipitate’.

References

Green, L. et al on behalf of British Society of Haematology (2018) Guidelines on the spectrum of fresh frozen plasma and cryoprecipitate products: their handling and use in various patient groups in the absence of major bleeding. Available at: https://www.b-s-h.org.uk/guidelines/guidelines/spectrum-of-fresh-frozen-plasma-and-cryoprecipitate-products/

Hunt, B. et al on behalf of British Committee for Standards in Haematology Transfusion Task Force (2015) A practical guideline for the haematological management of major haemorrhage. Available at: https://b-s-h.org.uk/guidelines/guidelines/haematological-management-of-major-haemorrhage/

National Blood Transfusion Committee (2020) Indication Codes for Transfusion – An audit tool. Available at: https://www.transfusionguidelines.org/uk-transfusion-committees/national-blood-transfusion-committee/responses-and-recommendations

NHS Blood and Transplant (2019) Portfolio of components and guidance for their clinical use (specification SPN223/10). Available at: https://hospital.blood.co.uk/components/portfolio-and-prices/

Revised advice on vCJD: Risk reduction measures for UK. Available at: https://www.gov.uk/government/publications/risk-reduction-measures-for-variant-creutzfeldt-jakob-disease-pcwg-report

Robinson, S. et al on behalf of the British Society for Haematology (BSH) (2017) Administration of Blood Components. Available at: https://www.b-s-h.org.uk/guidelines/guidelines/administration-of-blood-components/

Contact us

We would welcome your feedback and comments on this leaflet. You can contact us:

By post to:

Customer Services, NHS Blood and Transplant

Part Academic Block – Level 2
John Radcliffe Hospital
Headley Way, Headington
Oxford OX3 9BQ

By email to: **nhsbt.customerservice@nhsbt.nhs.uk**

Or by phone: **01865 381010**

This leaflet was prepared by NHS Blood and Transplant in collaboration with the National Blood Transfusion Committee. Further supplies can be obtained by accessing https://hospital.nhsbtleaflets.co.uk

Individual copies of this leaflet can be obtained by calling 01865 381010.

NHS Blood and Transplant (NHSBT) saves and improves lives by providing a safe, reliable and efficient supply of blood and associated services to the NHS in England. We are the organ donor organisation for the UK and are responsible for matching and allocating donated organs. We rely on thousands of members of the public who voluntarily donate their blood, organs, tissues and stem cells.

For more information visit **nhsbt.nhs.uk**
Email **enquiries@nhsbt.nhs.uk**