

# FACTSHEET

## Standard Fresh Frozen Plasma (FFP), Methylene Blue treated FFP, and Solvent Detergent treated FFP Information for Healthcare Professionals

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  $-25^{\circ}\text{C}$ , 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** – Early infusion of FFP is recommended in a ratio of 1-unit FFP to 1-unit red cells for trauma and at least 1-unit FFP to 2 units of red cells in other major haemorrhage settings. Once bleeding is under control, FFP administration should be guided by timely tests for coagulation
- **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  $\leq 1.5$
- **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 with risk of clinically significant bleeding
- **Liver disease with PT Ratio/INR  $>2$  and pre-procedure** – FFP should not be routinely administered to non-bleeding patients or before invasive procedures when the PT ratio/INR is  $\leq 2$
- **Thrombotic Thrombocytopenic Purpura (TTP)/plasma exchange**
- **Replacement of single coagulation factor.**

(\*National Blood Transfusion Committee Indication Codes for Transfusion, 2016.)

**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 15-20 mL/kg.

### **Methylene Blue treated FFP (MBFFP) and Solvent Detergent treated FFP (SDFFP)**

MBFFP and SDFFP pathogen inactivated plasmas are made from non-UK sourced plasma. They should be used for individuals born after 1st January 1996. Patients who are likely to receive large or repeated doses of FFP should also receive pathogen reduced plasma.

MBFFP is made from a single donation from a previously tested donor, either a male, or a female who has been screened for any Human Leucocyte Antigens in the last 2 years; it is leucodepleted and treated with methylene blue (MB) followed by exposure to visible light to inactivate viral pathogens. Any residual MB is then removed.

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.

**If MBFFP or SDFFP are not available, patients should be treated with standard FFP, when indicated, in an emergency.**

### **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  $22^{\circ}\text{C}\pm 2^{\circ}\text{C}$  or within 24 hours if stored at  $4^{\circ}\text{C}\pm 2^{\circ}\text{C}$  (note – different conditions apply to SDFFP).

Pre-thawed standard FFP can also be stored at  $4^{\circ}\text{C}\pm 2^{\circ}\text{C}$  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 (this must be discussed with the hospital transfusion laboratory staff or haematologist).

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 FFP contains no ABO antibodies and can be given to anyone, but it is in short supply and should only be used for non- AB recipients if essential. If FFP is urgently needed for bleeding adult patients with unknown blood group, Group A FFP should be used which is high titre (HT) negative for anti-B activity.

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 Standard FFP HT negative

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 Standard FFP

Recipient Group	O	A	B	AB
1st Choice	O	A	B	AB
2nd Choice	A	AB	AB	A*
3rd Choice	B	B*	A*	B*
4th Choice	AB			

\*Only suitable for emergency use in adults

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

MB FFP units are not tested for HT- for anti-A/anti-B. Group compatible MBFFP and SDFFP should be used wherever possible. Discuss possible options with your transfusion laboratory staff or haematologist.

## 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:

- Standard Cryoprecipitate and Methylene Blue treated 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/>
- Joint United Kingdom (UK) Blood Transfusion and Tissue Transplantation Services *Professional Advisory Committee Guidelines for blood transfusion services* (red Book). Available at: <https://www.transfusionsguidelines.org/red-book/chapter-7-specifications-for-blood-components/7-15-fresh-frozen-plasma-leucocyte-depleted>
- National Blood Transfusion Committee (2016) *Indication Codes for Transfusion – An audit tool*. Available at: <http://www.transfusionsguidelines.org.uk/>
- New, H *et al* on behalf of British Committee for Standards in Haematology (2016) *Guidelines on transfusion for fetuses, neonates and older children*. Available at: <https://b-s-h.org.uk/guidelines/guidelines/transfusion-for-fetuses-neonates-and-older-children/>
- NHS Blood and Transplant (2016) *Portfolio of components and guidance for their clinical use* (specification SPN223/8). Available at: <http://hospital.blood.co.uk/products/>
- Norfolk D. (Ed) (2013) *Handbook of Transfusion Medicine* 5th Edition, The Stationery Office
- 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/>

Further supplies of this factsheet can be ordered by accessing <https://hospital.nhsbtleaflets.co.uk>

**For further information please consult your Hospital Blood Transfusion Policy or contact a member of your Hospital Transfusion Team.**

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## NHS Blood and Transplant

NHS Blood and Transplant (NHSBT) saves and improves lives by providing a safe and reliable supply of blood components, organs, stem cells, tissues, and related services to the NHS and other UK health services. We manage the UK-wide voluntary donation system for blood, tissues, organs, and stem cells and turn these donations into products that can be used safely to save lives or radically improve the quality of people's lives.

We rely on thousands of members of the public who voluntarily donate their blood, organs, tissues, and stem cells. Their generosity means each year we're able to supply around 2 million units of blood to hospitals in England and 7,500 organ and tissue donations within the UK, which save or improve thousands more people's lives.

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