Guidelines for the Blood Transfusion Services

Annexe 4: Redundant Components

http://www.transfusionguidelines.org/red-book/annexe-4

Annexe 4:

Redundant Components

This section contains information for reference regarding redundant components.

Redundant Component

A4.1 Granulocytes, Apheresis

A component prepared from anticoagulated blood, which is separated into components by a suitable apheresis machine with retention of granulocytes as the major cellular product, suspended in a portion of the plasma. The remaining elements may be returned to the donor.

A4.1.1: Technical information

- The component is not leucocyte depleted.
- The component contains red cells and requires compatibility testing.
- Granulocytes may be collected by a variety of apheresis systems using different protocols. Since yields may vary, each procedural protocol must be fully validated, documented and specifications set accordingly.
- Cytomegalovirus (CMV) seronegative granulocytes should be considered for CMV seronegative recipients.
- The component must not be agitated during storage.
- The component must be irradiated before use.
- Granulocytes, Apheresis should be transfused through a 170–200 µm filter.

A4.1.2: Labelling

For general guidelines, see section 6.6.

The following shall be included on the label:

(* = in eye-readable and UKBTS approved barcode format)

- Granulocytes, Apheresis* and volume
- the blood component producer's name*
- the donation number*
- the ABO group*
- the RhD group stated as positive or negative*
- the date of collection
- the expiry date and time*
- the temperature of storage
- the statement 'Do not agitate'
- the blood pack lot number*
- the name, composition and volume of the anticoagulant solution.

In addition, the following statements should be made:

INSTRUCTION
Always check patient/component compatibility/identity
Inspect pack and contents for signs of deterioration or damage
Risk of adverse reaction/infection, including vCJD

A4.1.3: Storage

For general guidelines, see section 6.7.

- Granulocytes, apheresis should be used as soon as possible after their preparation. If storage is unavoidable, provided the component has been prepared using a closed system, the component should be stored, without agitation, at a core temperature of 22 ±2°C and used within 24 hours of collection.

A4.1.4: Testing

In addition to the mandatory and other tests required for blood donations described in Chapter 9, all components tested for the parameters shown in Table A4.1 shall meet the specified values.

Table A4.1 Granulocytes, Apheresis – additional tests

Parameter	Frequency of test	Specification
Volume	1% or as determined by statistical process control (if <=10 components produced per month then test every available component)	Within locally defined nominal volume range (<=500 mL)
Total granulocyte count		>1 × 10^{10}/unit

A4.1.5: Transportation

For general guidelines, see section 6.11.

- Containers for transporting Granulocytes, Apheresis should be equilibrated at room temperature before use. During transportation the temperature of the component must be kept as close as

possible to the recommended storage temperature and, on receipt, unless intended for immediate therapeutic use, the component should be transferred to storage at a core temperature of 22 ±2°C.

- Plastic overwraps should be removed prior to storage.

Redundant Component

A4.2 Convalescent Plasma (COVID-19), FFP, Leucocyte Depleted

Plasma that has been obtained from whole blood or by apheresis from donors who have recovered from COVID-19 infection, for treatment of patients with COVID-19. The plasma contains less than 2.5×10^6 leucocytes per component and has been rapidly frozen to a temperature that will maintain the activity of labile coagulation factors.

A4.2.1: Technical information

- Donations of whole blood where the bleed time exceeded 15 minutes are not suitable for the production of plasma components for direct clinical use.
- Plasma can be selected from male or female donors. Female donors must be screened and negative for HLA/HNA antibodies, as a TRALI risk reduction measure. Plasma should only be selected as CP for treatment of patients with COVID-19 if it is validated to contain a minimum concentration of SARS-CoV-2 antibody levels according to national clinical guidelines.
- When manufactured from whole blood the plasma should be separated before the red cell component is cooled to its storage temperature. Greater FVIII yields will be obtained when the plasma is separated as soon as possible after venepuncture and rapidly frozen to –25°C or below.
- The method of preparation should be validated to ensure there is no evidence of significant activation at 24 hours shelf life, with minimum cellular contamination. The production process should be validated to ensure that components meet the specified limits for FVIII concentration. If plasma collected for CP were to be re-manufactured for any other purpose these procedures must be fully validated and in accordance with the specification of the alternative component.
- Component samples collected for the quality monitoring assessment of FVIII should be from an equal mix of group O and non-O donations due to the difference in FVIII levels between ABO blood groups.
- Convalescent Plasma (COVID-19), FFP, Leucocyte Depleted should be administered through a CE marked transfusion set.

A4.2.2: Labelling

For general guidelines, see section 6.6.

The following shall be included on the label:

(* = in eye-readable and UKBTS approved barcode format)

- Convalescent Plasma (COVID-19), FFP, Leucocyte Depleted* and volume
- the blood component producer's name*
- the donation number and, if divided, sub-batch number*
- the ABO group*
- the RhD group stated as positive or negative*
- the date of collection
- the expiry date of the frozen component*
- the temperature of storage
- the blood pack lot number*
- a warning that the component must be used within four hours of thawing if maintained at 22 ±2°C, or up to a maximum of 24 hours of thawing if stored at 4 ±2°C.
- the name, composition and volume of the anticoagulant.

In addition, the following statements should be made:

INSTRUCTION
Always check patient/component compatibility/identity
Inspect pack and contents for signs of deterioration or damage
Risk of adverse reaction/infection, including vCJD

A4.2.3: Storage

For general guidelines, see section 6.7.

- The component should be stored at a core temperature of –25°C or below for a maximum of 36 months.

- Although a storage temperature below –25°C improves the preservation of labile coagulation factors, lower temperatures increase the fragility of plastic. Particular care must be taken when handling such packs.

- The component should be thawed in a waterbath or other equipment designed for the purpose, within a vacuum-sealed overwrap bag according to a validated procedure. The optimal temperature at which the component should be thawed is 37°C; temperatures between 33°C and 37°C are acceptable.

- Protocols must be in place to ensure that the equipment is cleaned daily and maintained to minimise the risk of bacterial contamination. After thawing, and at the time of administration, the content should be inspected to ensure that no insoluble cryoprecipitate is visible and that the container is intact.

- Once thawed, the component must not be refrozen and should be transfused as soon as possible. If delay is unavoidable, the component may be stored and should be used within 4 hours if maintained at 22 ±2°C or up to a maximum of 24 hours if stored at 4 ±2°C.

- Transfusion of Convalescent Plasma (COVID-19), FFP, Leucocyte Depleted should be completed within 4 hours of issue out of a controlled temperature environment.

A4.2.4: Testing

In addition to the mandatory and other tests required for blood donations described in Chapter 9, and leucocyte counting (see sections 6.3 and 7.1.1 and Table A4.2), a minimum of 75% of those components tested for the parameters shown in Table A4.2 shall meet the specified values with the exception of FVIII:C.

Table A4.2 Convalescent Plasma (COVID-19), FFP, Leucocyte Depleted – additional tests

Parameter	Frequency of test	Specification
Volume	1% or as determined by statistical process control (if <=10 components produced per month then test every available component)	Stated volume ± 10%
Total protein		>=50 g/L
Platelet count		<30 × 10^9/L*** /******
Red cell count		<6 × 10^9/L***
FVIII****/*****		Mean >=0.70 IU/mL
Leucocyte count*	As per sections 6.3 and 7.1.1 (but see ** below for leucocyte count)	<2.5 × 10^6/unit**/**
* Methods validated for counting low numbers of leucocytes must be used		
** 90% units should have less than 2.5 × 10^6 leucocytes and more than 99% of units should contain less than 5 × 10^6 leucocytes, both with 95% confidence		
*** Pre-freeze in starting component		
**** Units tested and found to have < 0.3 IU/mL should not be issued for transfusion		
***** A minimum of 90% of those components tested should have >=0.50 IU/mL		
****** Units tested and found to have a platelet count >100 × 10^9/L should not be issued for transfusion		

A4.2.5: Transportation

For general guidelines, see section 6.11.

Every effort should be made to maintain the core storage temperature during transportation. Unless the component is to be thawed and used straightaway it should be transferred immediately to storage at the recommended temperature.

Redundant Component

A4.3 Convalescent Plasma (COVID-19), FFP, for Neonates and Infants, Leucocyte Depleted

Convalescent Plasma (COVID-19), FFP, for Neonates and Infants, Leucocyte Depleted is plasma that has been obtained from whole blood or by apheresis from donors who have recovered from COVID-19 infection, for treatment of patients with COVID-19. The plasma contains less than 2.5 × 10^6 leucocytes per component.

Using a closed system the component may be subdivided into approximately equal volumes and rapidly frozen to a temperature that will maintain the activity of labile coagulation factors.

A4.3.1: Technical information

- Section 7.7 provides general guidance on the requirements for components for use in neonates and infants under 1 year.
- Donations of whole blood where the bleed time exceeded 15 minutes are not suitable for the production of plasma components for direct clinical use.
- The component should be free from clinically significant irregular blood group antibodies including high-titre anti-A and anti-B. Testing for CMV antibodies is not required.
- Plasma can be selected from male or female donors. Female donors must be screened and negative for HLA/HNA antibodies, as a TRALI risk reduction measure. Plasma should only be selected as CP for treatment of patients with COVID-19 if it is validated to contain a minimum concentration of SARS-CoV-2 antibody levels according to national clinical guidelines.
- When manufactured from whole blood the plasma should be separated before the red cell component is cooled to its storage temperature. Greater FVIII:C yields will be obtained when the plasma is separated as soon as possible after venepuncture and rapidly frozen to -25°C or below.
- The method of preparation should be validated to ensure there is no evidence of significant activation at 24 hours shelf life, with minimum cellular contamination. The production process should be validated to ensure that components meet the specified limits for FVIII:C concentration. If plasma collected for CP were to be re-manufactured for any other purpose these procedures must be fully validated and in accordance with the specification of the alternative component.
- Component samples collected for the quality monitoring assessment of FVIII:C should be from an equal mix of group O and non-O donations due to the difference in FVIII levels between ABO blood groups.
- Convalescent Plasma (COVID-19), FFP, for Neonates and Infants, Leucocyte Depleted should be transfused through a CE marked transfusion set.

A4.3.2: Labelling

For general guidelines, see section 6.6

The following shall be included on the label:

(* = in eye-readable and UKBTS approved barcode format)

- Convalescent Plasma (COVID-19), FFP, for Neonates and Infants, Leucocyte Depleted* and volume
- the blood component producer’s name*
- the donation number and, if divided, sub-batch number *
- the ABO group*
- the RhD group stated as positive or negative*
- the date of collection
- the expiry date of the frozen component*
- the temperature of storage
- the blood pack lot number*
- a warning that the component should be used within 4 hours of thawing if maintained at 22 ±2C or up to a maximum of 24 hours of thawing if stored at 4 ±2°C
- the name, composition and volume of the anticoagulant.

In addition, the following statements should be made:

INSTRUCTION
Always check patient/component compatibility/identity
Inspect pack and contents for signs of deterioration or damage
Risk of adverse reaction/infection, including vCJD

A4.3.3: Storage

- For general guidelines, see section 6.7.
- The component should be stored at a core temperature of –25°C or below for a maximum of 36 months.
- Although a storage temperature below –25°C improves the preservation of labile coagulation factors, lower temperatures increase the fragility of plastic. Particular care must be taken when handling such packs.
- The component should be thawed in a waterbath or other equipment designed for the purpose, within a vacuum-sealed overwrap bag according to a validated procedure. The optimal temperature at which the component should be thawed is 37°C; temperatures between 33°C and 37°C are acceptable.
- Protocols must be in place to ensure that the equipment is cleaned daily and maintained to minimise the risk of bacterial contamination. After thawing, and at the time of administration, the content should be inspected to ensure that no insoluble cryoprecipitate is visible and that the container is intact.
- Once thawed, the component must not be refrozen and should be transfused as soon as possible. If delay is unavoidable, the component may be stored and should be used within 4 hours if maintained at 22 ±2°C, or up to a maximum of 24 hours if stored at 4 ±2°C.
- Transfusion of Convalescent Plasma (COVID-19), FFP, for Neonates and Infants, Leucocyte Depleted should be completed within 4 hours of issue out of a controlled temperature environment.

A4.3.4: Testing

In addition to the mandatory and other tests required for blood donations described in Chapter 9, and leucocyte counting (see sections 6.3 and 7.1.1 and Table A4.3), the component shall be free from clinically significant irregular blood group antibodies and high-titre anti-A and/or anti-B. Furthermore, a minimum of 75% of those components tested for the other parameters shown in Table A4.3 shall meet the specified values with the exception of FVIII:C.

Table A4.3 Convalescent Plasma (COVID-19), FFP, for Neonates and Infants, Leucocyte Depleted – additional tests

Parameter	Frequency of test	Specification
Volume	1% or as determined by statistical process control (if <=10 components produced per month then test every available component)	Stated volume ± 10%
Total protein		>=50 g/L
Platelet Count		<30 × 10^9/L*** /******
Red cell count		<6 × 10^9/L***
FVIII****/*****		Mean >=0.70 IU/mL
Leucocyte count*	As per sections 6.3 and 7.1.1 (but see ** below for leucocyte count)	<2.5 × 10^6/unit**/***
* Methods validated for counting low numbers of leucocytes must be used		
** 90% units should have less than 2.5 × 10^6 leucocytes and more than 99% of units should contain less than 5 × 10^6 leucocytes, both with 95% confidence		
*** Pre-freeze in starting component		
**** Units tested and found to have < 0.3 IU/mL should not be issued for transfusion		
***** A minimum of 90% of those components tested should have >=0.50 IU/mL		
****** Units tested and found to have a platelet count >100 × 10^9/L should not be issued for transfusion		

A4.3.5: Transportation

For general guidelines, see section 6.11.

Every effort should be made to maintain the core storage temperature during transportation. Unless the component is to be thawed and used straightaway it should be transferred immediately to storage at the recommended temperature.

Redundant Component

A4.4: Cryoprecipitate, Methylene Blue Treated and Removed, Leucocyte Depleted

This component is made for neonatal use – refer to section 7.7.12.

Redundant Component

A4.5: Plasma, Cryoprecipitate Depleted, Leucocyte Depleted

The supernatant plasma removed during the preparation of Cryoprecipitate, Leucocyte Depleted. The plasma from which the Plasma, Cryoprecipitate Depleted, Leucocyte Depleted was made contains less than 1×10^6 leucocytes per component and is derived from a previously tested donor.

A4.5.1: Technical information

- Donations of whole blood where the bleed time exceeded 15 minutes are not suitable for the production of plasma components for direct clinical use.
- Plasma should be selected from male donors or consideration should be given to screening female donors for HLA/HNA antibodies, as a TRALI risk reduction measure.
- Plasma, Cryoprecipitate Depleted, Leucocyte Depleted should be frozen to a core temperature of –25°C or below within 2 hours of separation from its Cryoprecipitate, Leucocyte Depleted.
- Plasma, Cryoprecipitate Depleted, Leucocyte Depleted should be transfused through a 170–200 µm filter.

A4.5.2: Labelling

For general guidelines, see section 6.6.

The following shall be included on the component label:

(* = in eye-readable and UKBTS approved barcode format)

- Plasma, Cryoprecipitate Depleted, Leucocyte Depleted* and volume
- the blood component producer’s name*
- the donation number*
- the ABO group*
- the RhD group stated as positive or negative*
- the date of collection
- the expiry date of the frozen component*
- the temperature of storage
- the blood pack lot number*
- a warning that the component must be used within 4 hours of thawing if maintained at 22 ±2°C, or 24 hours of thawing if stored at 4 ±2°C
- the name, composition and volume of the anticoagulant.

In addition, the following statements should be made:

INSTRUCTION
Always check patient/component compatibility/identity
Inspect pack and contents for signs of deterioration or damage
Risk of adverse reaction/infection, including vCJD

A4.5.3: Storage

For general guidelines, see section 6.7.

- The component should be stored at a core temperature of –25°C or below for a maximum of 36 months.
- Although a storage temperature below –25°C improves the preservation of labile coagulation factors, lower temperatures increase the fragility of plastic. Particular care must be taken when handling such packs.
- The component should be thawed in a waterbath or other equipment designed for the purpose, within a vacuum-sealed overwrap bag according to a validated procedure. The optimal temperature at which the component should be thawed is 37°C; temperatures between 33°C and 37°C are acceptable.
- Protocols must be in place to ensure that the equipment is cleaned daily and maintained to minimise the risk of bacterial contamination. After thawing, the content should be inspected to ensure that no insoluble cryoprecipitate is visible and that the container is intact.
- Once thawed, the component must not be refrozen and should be transfused as soon as possible. If delay is unavoidable, the component may be stored and should be used within 4 hours if maintained at 22 ±2°C or 24 hours if stored at 4 ±2°C, but it should be borne in mind that extended post-thaw storage will result in a decline in the content of labile coagulation factors.

A4.5.4: Testing

In addition to the mandatory and other tests required for blood donations described in Chapter 9, and leucocyte counting (see sections 6.3 and 7.1.1), a minimum of 75% of those components tested for the parameters shown in Table A4.5 shall meet the specified values.

Table A4.5 Plasma, Cryoprecipitate Depleted, Leucocyte Depleted – additional tests

Parameter	Frequency of test	Specification
Volume	1% or as determined by statistical process control (if <=10 components produced per month then test every available component)	Stated volume ±10%
Platelet count		$<30 \times 10^9$/L**
Red cell count		$<6 \times 10^9$/L**
Leucocyte count*	As per sections 6.3 and 7.1.1	$<1 \times 10^6$/unit**
* Methods validated for counting low numbers of leucocytes must be used		
** Pre-freeze in starting component (fresh frozen plasma)		

A4.5.5: Transportation

For general guidelines, see section 6.11.

Every effort should be made to maintain the core storage temperature during transportation. Unless the component is to be thawed and used straightaway it should be transferred immediately to storage at the recommended temperature.