Policy

Red Blood Cell Storage and Transport

NSWHP_PD_012

1. Purpose

This policy:

a) Specifies the requirements for an appropriate temperature controlled and monitored environment for the storage and transport of red blood cells.

b) Standardises the packing configuration to be used by NSW Health Pathology Laboratories when transporting red cells between laboratories and the action and acceptance criteria on receipt of the blood products.

Background

This policy has been developed to optimise the use of blood products in NSW Health Pathology in accordance with:

a) Current best and safe practice defined in the *Australian and New Zealand Society of Blood Transfusion Guidelines for Transfusion and Immunohaematology Laboratory Practice January 2020*

b) *Australian Red Cross Blood Service Shippers – Receipt and Use by External Institutions WI-00635 Version 8, 20th Jul 2021*

Scope

This policy is mandatory and applies to all NSW Health Pathology staff involved in pre-transfusion laboratory practice including Laboratory Managers, Staff Specialists, Scientists and Scientific Officers.

2. Definitions

Transport: Transport is the process of shipping blood products from the supplier including:

a) Blood service to the hospital laboratory
b) Base hospital to its satellite laboratories
c) Between laboratories in a network[1] including transferring blood products between NSW Health Pathology Laboratories.

Storage: Products issued by the laboratory to another location are considered to be storage[1] including:

a) Products sent to wards
b) Products sent to theatres
c) Products sent with patients transferred from locations or facilities outside of the jurisdiction of the receiving laboratory and
d) Products accompanying emergency retrieval teams, for example, in a helicopter or an ambulance.

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3. Policy Statement

3.1 Red Blood Cell Storage Temperature Range

3.1.1 Red blood cells must be stored in an appropriate temperature controlled and monitored environment.

3.1.2 Refrigerators and deep freeze cabinets used to store blood products must conform to the Australian Standard AS 3864 *Medical refrigeration equipment – for the storage of blood and blood products*[3].

3.1.3 Red blood cells must be stored between 2ºC and 6ºC [1].

3.1.4 Blood products must not be transfused, except at the discretion of the laboratory director, where:

a) Stored at temperatures outside the specified limits
b) Stored in nonconforming equipment or
c) There is doubt regarding storage conditions.

3.1.5 Any deviations must be clearly documented on the Red Blood Cell Storage and Transport Temperature Deviation Form.

3.1.6 Any deviations must be quarantined until their fate is decided[1].

3.1.7 The laboratory director should consider a risk based approach based on publications such as the *Guidelines for Blood Transfusion Services*[2].

3.1.8 When blood packed inside a blood container is able to demonstrate logged temperature range between 2ºC and 6ºC, this is considered storage.

3.1.9 For remote sites without a laboratory or blood fridge, for example storage at helicopter bases, the red cells must remain in a validated sealed shipper until used and the product must be accompanied with a validated temperature monitoring device.

3.1.10 Red cells will be accepted back into inventory if the shipper is unopened and the data logger confirms the storage requirements of 2-6ºC.

3.2 Red Blood Cell Transport Temperature Range

3.2.1 Red blood cells must be transported between 2ºC and 10ºC [1].

3.2.2 The upper range of 6 to 10ºC is acceptable but should be limited to one occasion not exceeding 12 hours [2].

3.2.3 Blood products must not be transfused, except at the discretion of the laboratory director, where:

a) Transported at temperatures outside the specified limits
b) Transported in nonconforming equipment or

c) There is doubt regarding transport conditions. Any deviations must be clearly documented on the Red Blood Cell Storage and Transport Temperature Deviation Form.

3.2.4 Any deviations must be quarantined until their fate is decided[1].

3.2.5 The laboratory director should consider a risk based approach based on publications such as the *Guidelines for Blood Transfusion Services* [2].

3.2.6 Red blood cells which have been out of controlled storage for less than 30 minutes and not transfused can be returned to storage [4].

3.2.7 If red cells are returned after 30 minutes, they must be discarded or the transfusion must be completed [4].

3.2.8 Where there is any doubt regarding the conditions of storage of any products during transport, the products must not be used for transfusion[1].

3.2.9 A Haematologist or Laboratory Director may, in exceptional circumstances, permit extension of the time allowed 'out of controlled storage' from 30 to 60 minutes for red cells provided the unit/s are quarantined, by placing in a secured refrigerator for at least 6 hours, to allow the unit/s to return to 2-6°C prior to reissue. The laboratory must be able to identify these unit/s so that extended periods 'outside of controlled storage' (i.e. between 30 and 60 minutes) occur on no more than 3 occasions.

3.3 Transport and Receipt of Shippers

3.3.1 The Red Cross[5] has validated several packing configurations see R1 to R3 in the table below.

3.3.2 These vary according to the number of components per shipper and the transport time.

3.3.3 These configurations ensure that the red cells remain within the required temperature specification during transportation.

Table A: Packing Configurations and the Validated Transport Time

Packing Configuration	Max Number of Components per Shipper	Validated Transport Time*
R1	1-10 red cell units	6 hr**. Do not use for air transit
R2	1-12 red cell units	3hr:25 min
R3	1-14 red cell units	8hr:25 min
R4	1-10 red cell units	16hr 18 min
*If anticipated transport time exceeds the maximum transport time, a data logger must be placed in the shipper between the components. **The R1 shipper configuration cannot be used for anticipated transport times exceeding it VTT of 6 hrs, even with a data logger in use		

3.3.4 NSW Health Pathology must use the approved Red Cross Blood Shippers for transport between our laboratories.

3.3.5 Red cells will be accepted into inventory if:

a) Packed by our staff using any of the above configurations
b) There is a sheet on the outside of the box indicating the packing date and time and packing configuration and
c) The laboratory of origin is identified.

3.3.6 If the shipper has been opened during transport then the red cells cannot be accepted into inventory.

3.3.7 The use of a routine validated temperature monitoring device is not required to accept red cells into inventory as long as the shipper meets other requirements as per this policy.

3.3.8 If a validated temperature monitoring device is able to verify that storage temperature is not out of range, blood can be accepted beyond the validated transport times.

3.3.9 Blood products must not be transfused, except at the discretion of the laboratory director, where:

a) Transported at temperatures outside the specified limits
b) Transported in nonconforming equipment or
c) There is doubt regarding the transport condition.

3.3.10 Any deviations must be clearly documented on the Red Blood Cell Storage and Transport Temperature Deviation Form.

3.3.11 Any deviations must be quarantined until their fate is decided[1].

4. Roles and Responsibilities

4.1 This policy applies to all NSW Health Pathology staff involved in pretransfusion laboratory practice including Laboratory Managers, Staff Specialists, Scientists and Technical Officers and laboratory staff.

5. Legal and Procedure Framework

[1] ANZSBT Guidelines for Transfusion and Immunohaematology Laboratory Practice, 1st Edition revised January 2020

[2] Joint United Kingdom (UK) Blood Transfusion and Tissue Transplantation Services Professional Advisory Committee *Guidelines for Blood Transfusion Services*

[3] Australian Standard *AS 3864-2 Medical refrigeration equipment – for the storage of blood and blood products*

[4] ANZSBT Guidelines for Administration of Blood Products, 2011

[5] Australian Red Cross Blood Service Shippers – Receipt and Use by External Institutions WI-00635 Version 8 20th Jul 2021

6. Review

This policy will be reviewed by 01/07/2023.

7. Risk

Risk Statement	The policy ensures the safety of blood products for transfusion by providing clear direction on the appropriate temperature controlled and monitored environment for storage and transport of red blood cells.
Risk Category	Clinical Care and Patient Safety

8. Further Information

For further information, please contact:

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9. Version History

The approval and amendment history for this document must be listed in the following table.

Version No	Effective Date	Approved By	Approval Date	Policy Author	Risk Rating	Sections Modified
1.0	25/08/17	ELT	25/08/17	Transfusion Clinical Stream Lead	High	- New Policy.
2.0	13/09/17	Clinical Governance &Quality Committee	11/09/17	Transfusion Clinical Stream Lead	High	- Changed transport acceptance rangesin accordance with the ANZSBT Guideline. - Removed reference to the Council of EuropeGuide. - Transportation between labs has been incorporated.

3.0	05/04/19	Chair Transformation Governance Committee	29/03/19	Transfusion Clinical Stream Lead	High	- Policy reviewed with no amendments required. - Review date changed.
4.0	06/05/20	Executive Director, Strategy & Transformation	22/04/20	Transfusion Clinical Stream Lead	High	- Policy reviewed with no amendments required. - Review date changed.
5.0	01/02/21	Executive Director, Strategy & Transformation	01/02/21	Transfusion Clinical Stream Lead	High	- 3.2.9 Exceptional circumstances- extension of time allowed 'out of controlled storage' paragraph added - 5.1 ANZSBT Guidelines updated - 6. Review date updated
6.0	26/07/21	Director of Clinical Operations	03/08/21	Transfusion Clinical Stream Lead	High	- **Table A**: R4 Validated transport time updated to **16hr 18min** - **Version update for Reference**: Australian Red Cross Service Shippers to Version 8 20th July 2021