



# MHP- Blood Transport Issues

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# MHP- Transport Issues





# Objectives

1. Identify the importance of a standardized process for blood packaging.
2. Explain where processes fall short and blood is wasted.
3. Identify areas for quality improvement.



# Standardized Process

## Definition of Standardization

*“The act of bringing a process into conformity with a standard”.*



# Standards

## Canadian Standards Association (CSA) Z902-15

- Blood components must be stored at temperatures demonstrated to be optimal for its function and safety
- Standard Operating Procedures must be in place to define who can sign out and transport blood, how it will be transported, and how long it can be in transit
- All blood products must be stored in a controlled environment until they are released for transfusion
- When RBCs are transported in a validated transport system <24 hours, the system must maintain a temperature of 1-10°C



# Storage and Transport Standards

## Blood Component Storage, Transportation, and Expiration

Category	Storage °C	Transport °C	Expiration
Red Blood Cells	1-6	1-6 (or in accordance with Clause 9.5.2.2)	As specified on the blood bag
Platelets	20-24	20-24	As specified on the blood bag
Fresh Frozen Plasma (Once Thawed)	1-6	1-6	5 days if collected in a closed system
Cryoprecipitate	20-24	20-24	4 h if the cryoprecipitate is pooled in an open system

(From Table 2, CSA Z902-15)



## Return of Blood for Re-issue

For blood to be accepted back into inventory:

- Unit must be unopened
- All movement of the unit in and out of the blood bank must be documented
- Must be at the proper temperature
- Must be returned within the proper time frame (defined by the validation of the transport system)

***Blood that is not issued in a cooler must be returned to the blood bank within 60 minutes of issue, and at <math><14^{\circ}\text{C}</math>.***



# Standards

Similar Standards from:

- Health Canada – Blood Regulations
- Canadian Society of Transfusion Medicine (CSTM)
- American Association of Blood Banks (AABB)
- Institute for Quality Management in Healthcare (IQMH)





## Why is a standardized process for MHP blood packaging important

1. Ensures adherence to the standards and regulations
2. Reduces confusion for laboratory and clinical professionals who work at multiple sites
3. Increases efficiency
4. Ease of transport between institutions
5. Reduced wastage of O Negative RBC & AB FP



# Where do our processes fall short?



## What is the consequence of Inappropriate storage

When blood is returned to the transfusion service in an unacceptable condition, it must be discarded.





## Our Sunnybrook Experience

- Validated Coolers for internal transportation of RBCs
- MHP (Code Omega) since 2010
  - previously at Women's College Hospital for post partum hemorrhage
- Implemented Platelet Transport Bags 2018



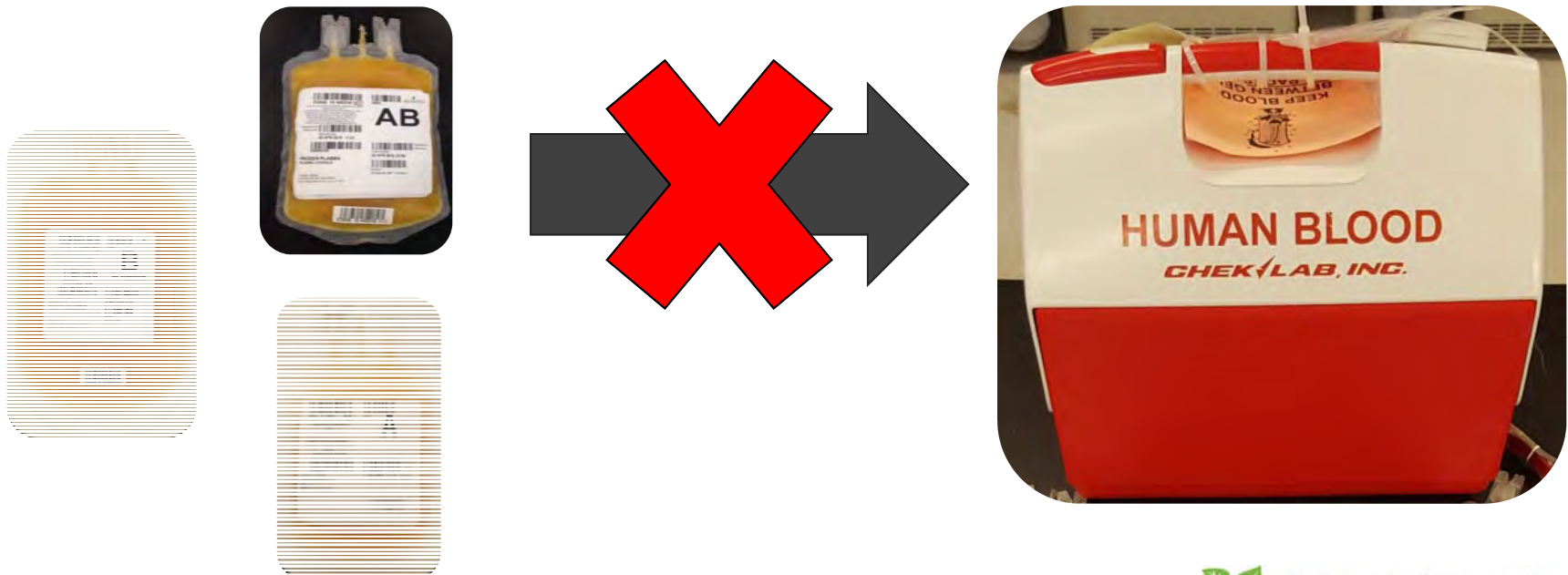
## What goes wrong

- Blood is removed from the cooler before it is actually needed and is placed back into the cooler incorrectly:
  - RBC units are out of the cooler too long and end up warm.
  - RBC units are returned to the cooler but not placed between the cold gel packs and end up warm.
  - RBC units end up in contact with ice packs, which can lead to hemolysis.
  - The lid of the box is left up/open and the red cells get warm.



## What goes wrong

**PLATELETS, PLASMA AND CRYO DO NOT GO IN THE BLOOD COOLER!**





# Product Discards

Red Blood Cell Units Destroyed									
	2008	2009	2010	2011	2012	2013	2014	2015	2016
Packaging error on return to the TS	17	14	7	18	19	18	18	12	11
All Cause Error	133	92	84	68	66	58	56	59	46
	<b>13%</b>	<b>15%</b>	<b>8%</b>	<b>26%</b>	<b>29%</b>	<b>31%</b>	<b>32%</b>	<b>20%</b>	<b>24%</b>



# Product Discards

Frozen Plasma (Thawed) Units Destroyed									
	2008	2009	2010	2011	2012	2013	2014	2015	2016
Packaging error on return to the TS	0	2	0	8	2	19	7	10	9
All Cause Error	32	18	21	22	54	39	33	33	22
	<b>0%</b>	<b>11%</b>	<b>0%</b>	<b>36%</b>	<b>4%</b>	<b>49%</b>	<b>21%</b>	<b>30%</b>	<b>41%</b>

Platelets (Pooled or Apheresis) Destroyed									
	2008	2009	2010	2011	2012	2013	2014	2015	2016
Packaging error on return to the TS	1	0	0	3	2	1	3	1	7
All Cause Error	3	3	6	6	7	9	8	10	18
	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>50%</b>	<b>29%</b>	<b>11%</b>	<b>38%</b>	<b>10%</b>	<b>39%</b>





# Quality Improvement Education

- Collins et al<sup>1</sup> demonstrated that education for clinical staff regarding wastage and storage requirements for blood products helped to reduce product wastage over a 16 month period.
- Including blood product storage and transport requirements within the MHP education modules allows for wide spread dissemination of the information.
- Storage and transport requirements can be reinforced with labels and tags on the transport containers/coolers.

1. Collins RA, Wisniewski MK, Waters JH, Triulzi DJ, Yazer MH. Effectiveness of Multiple Initiatives to Reduce Blood Component Wastage. Am J Clin Pathol 2015;143:329-335.



# Quality Improvement

Standardized validated packaging for transportation of Red Blood Cells

- ✓ **Cost effective**
- ✓ **Efficient**
- ✓ **Available**
- ✓ **Practical for the MLTs and the Clinical Team**

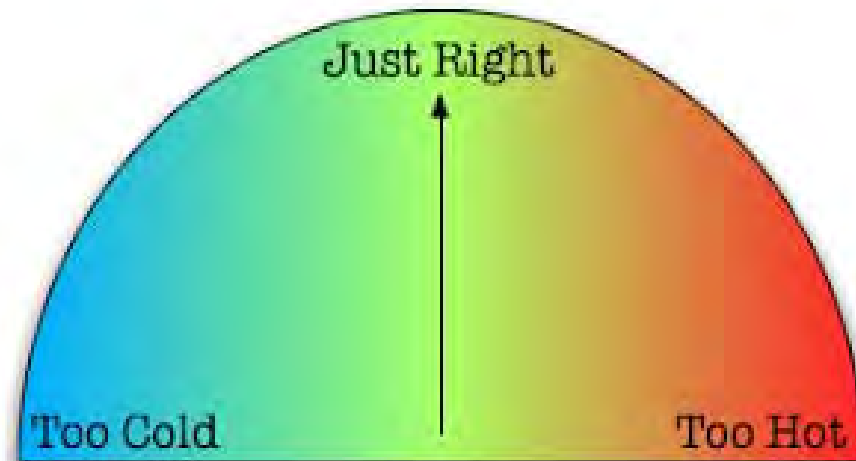


# Quality Improvement

## Room Temperature Transport

- Platelets
- Cryoprecipitate

20-24° C





# The Plasma Problem

- Frozen plasma is thawed at 30-37°C
- Thawed plasma must be stored and transported at 1-6°C
- During an MHP, there is not enough time for plasma to cool to 1-6°C before issuing





# The Plasma Problem

## Multiple Plasma Scenarios

- 1) Pre-thawed plasma that is 1-6°C
- 2) Warm plasma that is taken directly out of the water bath
- 3) Semi-Cold plasma (in the fridge for some time, but not long enough to reach <6°C)

## *At Sunnybrook:*

- *If plasma is issued directly from the water bath, it can be accepted back into inventory if it is returned within 60min.*
- *If plasma is issued from the fridge, it must be returned within 60min AND at 1-6°C (Never happens)*



## Standard Transport Process

- Validated storage containers for all blood products
- Interventions within the RBC coolers to ensure products are put back correctly
- Education for all staff involved in transport and transfusion of products during MHP (e-learning)
- Labels and Tags on the transport containers to reinforce storage requirements





# Review

1. Identify the importance of a standardized process for blood packaging.
  - A Standardized process for blood packaging can decrease wastage of blood products and increase efficiency
2. Explain where processes fall short and blood is wasted.
  - Blood Packaging processes fall short when products are returned to the Transfusion service inappropriately packaged.
3. Identify areas for quality improvement
  - Develop a standardized packaging process for all blood products issued during and MHP
  - Integrate blood product storage education for clinical staff into the MHP training modules.



## Take Home Message

Store it how it arrived!





Thank You