Blood on Board

Queenie Huynh, MLT

ornge Sunnybrook HEALTH SCIENCES CENTRE

Disclosures

No conflicts to disclose

Objectives

1. Describe the key features of the Blood on Board Program
2. Describe the cooler validation process
3. Describe the program implementation process
4. Discuss progress post-launch

Where it began

1. **Need**

   Pre-hospital transfusion by Ornge air medical transport.

2. **Collaboration**

   Ornge and Sunnybrook's Division of Transfusion Medicine & Tissue Bank (TMTB).

3. **Initiative**

   TMTB to supply blood in coolers for Ornge air medical transport.

ornge

Sunnybrook
HEALTH SCIENCES CENTRE

The Collaboration

ornge

Sunnybrook
HEALTH SCIENCES CENTRE

BLOOD ON BOARD OPERATIONAL INDEX

HANDBOOK

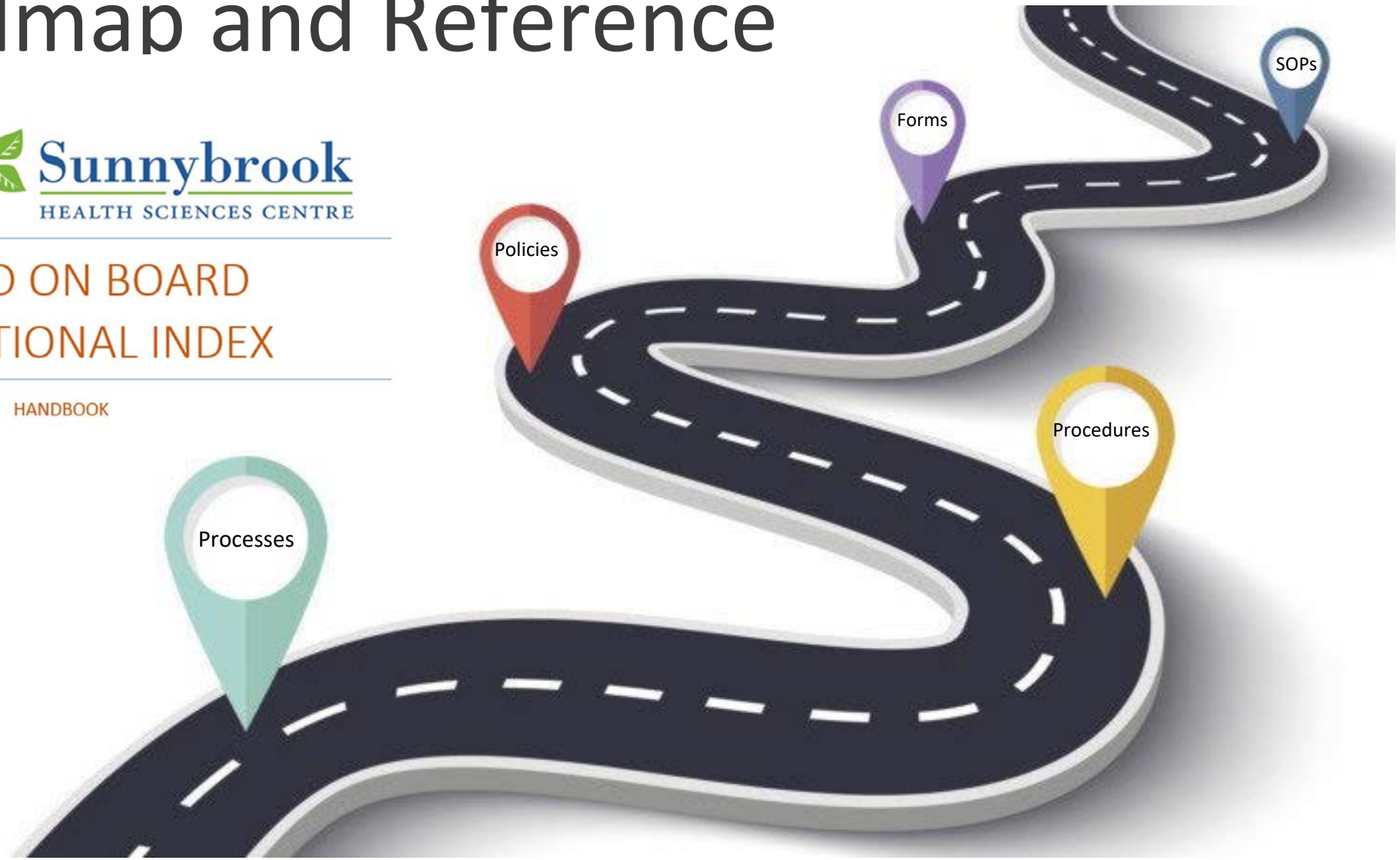
Roadmap and Reference

ornge

Sunnybrook
HEALTH SCIENCES CENTRE

BLOOD ON BOARD
OPERATIONAL INDEX

HANDBOOK



The Challenge

The Challenge

Develop a prehospital transfusion program that meets:

- Blood Regulations under the Food and Drugs Act
- Canadian Standards Association (CSA) Standard for Blood and Blood Components CSA-Z902 (“CSA Standard”)
- Institute for Quality Management in Healthcare (IQMH)/Accreditation Canada standards
- Sunnybrook Transfusion Policies

The Challenge

Policies include the following as per the CSA Standard 1.4 and 4.1.2

- Storage, packing and transportation
- Physical facilities and equipment
- Requests, acceptance criteria
- Transfusion
- Qualification and training of personnel
- Adverse event reporting (transfusion reactions and errors) and surveillance and corrective action
- Recipient notification and informed consent
- Record management
- Traceability (CSA 9.1.2)
- Emergency plan in response to incidents that could endanger, safety, quality or efficacy of blood (CSA 4.2.1.6)
- Periodic Audits (CSA 4.6.3.1)

The Goal:

A temperature monitored cooler used to store RBCs for transfusion by air medical transport

Validate a temperature recorder that:

1. Continuously records the internal cooler temperature
2. Has a programmable alarm for out of range temperatures
3. Is equipped with visual temperature alerts
   - For paramedics to verify that storage temperature is OK at time of transfusion

Validate a cooler that:

1. Maintains RBC storage temperature of 1-6°C
2. Maintains storage temperature for a considerable duration of time
   - Ideally can hold temperature for 3-5 days
   - Goal is to reduce the frequency of cooler switchovers required

Temperature Monitoring

LogTag TRIX-8 Temperature Recorder:

- Records temperature at customizable time intervals (every 5 minutes, 10 minutes, etc)
- High and low customizable alarms
  - 1-6°C range
- Green ‘OK’ & red ‘ALERT’ indicators

Temperature Monitoring

LogTag

Recorder has been Downloaded 26/11/2021 12:48:09

Note: All Date-Time values are in UTC -05:00

Alarm Status

Lower	✓	OK
Upper	✓	OK

Recorder Info

erial #: 2000186527 Model: TRIX-8 Battery: OK Trip #: 23
escription: #2

Recorder Configuration

Start type :	Push button start	Temperature alarms	
Start delay :	30 Minutes	Lower : 0.9 °C after 2 Consecutive	
Interval :	5 Minutes	Upper : 6.1 °C after 2 Consecutive	
Alert indicator :	Enabled lower & upper		
OK indicator :	Enabled		

Recorded Data

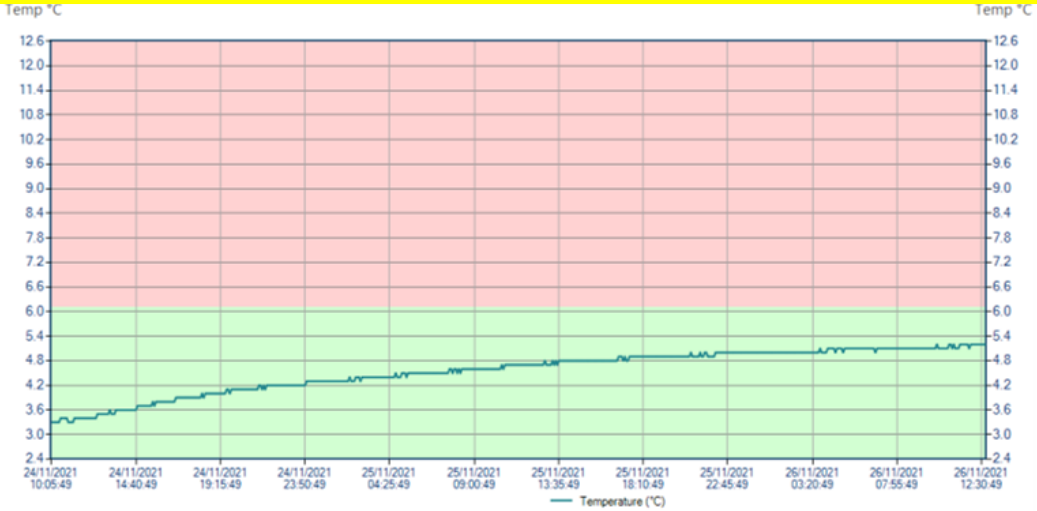
First reading :	24/11/2021 10:05:49	Temperature statistics	
Last reading :	26/11/2021 12:45:49	Lowest :	3.3 °C
Elapsed time :	2 Days 2 Hours 45 Minutes	@	24/11/2021 10:05:49
Total readings :	609	Highest :	5.2 °C
First evaluated :	24/11/2021 10:05:49	@	26/11/2021 10:05:49
Last evaluated :	26/11/2021 12:45:49	Average reading:	4.5 °C
Evaluated Time :	2 Days 2 Hours 45 Minutes	Standard Deviation:	0.5 °C(S)
Evaluated Readings :	609	MKT(ΔH 83.144):	4.6 °C

Lower Alarm

Triggered:	(none)
Time below/equal:	(none)
Occurrences :	0
°C - Minutes below :	0.00

Upper Alarm

Triggered:	(none)
Time above/equal:	(none)
Occurrences :	0
°C - Minutes above :	0.00



Source: TRIX-8- 2000186527 Started 24_11_2021 10_05_49, Finished 26_11_2021 12_45_49.ltd
File Location: C:\Users\labsnstest\Documents\My LogTag Data
Created : 26/11/2021 15:54:34

Page: 1 of 10

Cooler Validation Journey

The Beginning

In-lab validation of initial cooler showed duration of max **47 hours**

Payload Size

6 × 5 × 4 in

152 × 127 × 108 mm

Outer Dimensions

12 × 10 × 8 in

300 × 249 × 196 mm

Product Specifications

Temperature Range	2°C-8°C	Payload Volume	2.00 litres
Duration	120 hours	Coolant Type	PCM Coolant
Payload Size Imperial	6 × 5 × 4 in	Payload Size Metric	152 × 127 × 108 mm
Outer Dimensions Imperial	12 × 10 × 8 in	Outer Dimensions Metric	300 × 249 × 196 mm
Tare Weight Imperial	10 lb	Tare Weight Metric	4 kg
Product Type	Reusable Parcel	Product Series	Series 4

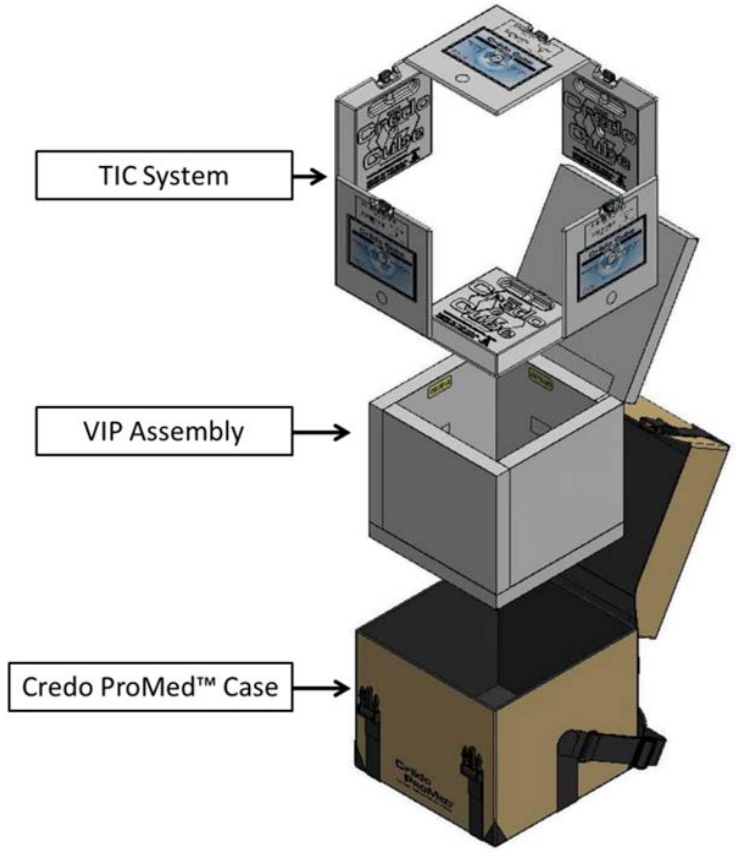
Validation Journey

- Different coolers and bags
- TIC (Thermal Isolation Chamber) panel conditioning time
- Temperature recorder management
- Placement of temperature recorder in cooler
- Vertical/Horizontal RBC unit positioning
- No gel pack vs with gel pack

Date	Cooler type	Cooler	Testing	Method
22/04/2021	Duracube	1	TIC Conditioning Time/Temp	IR thermometer
26/04/2021			LogTag acclimation to lower temps	LogTag in walk in fridge
27/04/2021 - 29/04/202	Duracube	1	TIC conditioning +cooler validation	TIC conditioned in walk in fridge, RBC from walk in fridge, LogTag at RT on top
29/04/2021 - 03/05/202	Duracube	1	TIC conditioning +cooler validation	TIC conditioned at RT, RBC and LogTag from available fridge, LogTag on top
29/04/2021 - 30-04/2021			Temp stability of Specials Fridge for TIC storage	Logtag in specials fridge
29/04/2021 - 30/04/2021			Temp stability of Available Fridge for TIC storage	LogTag in available fridge
03/04/2021 - 06/05/202	Duracube	1	TIC conditioning + Cooler validation	LogTag from available fridge, on side
06/05/2021 - 10-05/202	Duracube	1	TIC conditioning + Cooler validation, validate IR thermometer and LogTag	LogTag from available fridge, on side, Fluke vs LogTag vs IR thermometer when TIC thawing
13/05/2021 - 17/05/202	Duracube	2	TIC Conditoning + Cooler validation	LogTag on top
13/05/2021 - 17/05/202	Duracube	3	TIC Conditoning + Cooler validation	LogTag on top
17/05/2021	Duracube	1	Ambient temperature of SB-Base-Heli	LogTag attached to cooler brought to site visit
19/05/2021 - 25/05/202	Credo Cube	4	TIC conditioning +cooler validation	TIC conditioned in -28C LogTag on side
19/05/2021 - 25/05/202	Credo Cube	5	TIC conditioning +cooler validation	TIC conditioned in -78C for <24hr (frozen), LogTag on side
20/05/2021 - 25/05/202	Credo Cube	6	TIC conditioning +cooler validation	TIC conditioned in -78C for 24hr, LogTag on side
25/05/2021 - 04/06/202	Credo Cube	4	TIC conditioning +cooler validation - parallel run	TIC conditioned in -78C for >24 hours, top of cart, LogTag on side
27/05/2021 - 04/06/202	Credo Cube	5	TIC conditioning +cooler validation - parallel run	TIC conditioned in -78C for >24 hours,middle of cart, LogTag on side
28/05/2021 - 04/06/202	Credo Cube	6	TIC conditioning +cooler validation - parallel run	TIC conditioned in -78C for >24 hours, bottom of cart, LogTag on side
04/06/2021 - 11/06/202	Credo Cube + Bag	4	TIC conditioning +cooler validation	TIC pre-conditioned in -78C for 30 min, conditioned in -28 for min 24 hr, LogTag on side, TIC wiped
09/06/2021 - 14/06/202	Credo Cube + Bag	5	TIC conditioning +cooler validation	TIC pre-conditioned in -78C for 30 min, conditioned in -28 for min 24 hr,LogTag on side
10/06/2021 - 15/06/202	Credo Cube + Bag	6	TIC conditioning +cooler validation	TIC pre-conditioned in -78C for 30 min, conditioned in -28 for min 24 hr,LogTag on side
11/06/2021 - 18/06/2021	Credo Cube + Bag	4	TIC conditioning +cooler validation	TIC pre-conditioned in -78C for 30 min, conditioned in -28 for min 24 hr,LogTag on side, TIC wiped
14/06/2021 - 21/06/202	Credo Cube + Bag	5	TIC conditioning +cooler validation+LogTag placement (sandvich)	TIC pre-conditioned in -78C for 30 min, conditioned in -28 for min 24 hr, thawed on shelf, LogTag in middle, TIC wiped
17/06/2021 - 22/06/202	Credo Cube + Bag	6	TIC conditioning +cooler validation+LogTag placement (sandvich)	TIC pre-conditioned in -78C for 30 min, conditioned in -28 for min 24 hr, thawed on shelf, LogTag in middle, TIC wiped
18/06/2021 - 23/06/202	Credo Cube + Bag	4	TIC conditioning +cooler validation+LogTag placement (sandvich)	TIC pre-conditioned in -78C for 30 min, conditioned in -28 for min 24 hr, thawed on shelf, LogTag in middle, TIC wiped
21/06/2021-28/06/2021	Credo Cube + Bag	4	TIC conditioning +cooler validation+LogTag placement (sandvich)	25 min thaw, no plastic bag, logtag on side and sandviched
22/06/2021-24/06/202	Credo Cube + Bag	6	TIC conditioning +cooler validation+LogTag placement (sandvich)	25 min thaw, no plastic bag, logtag on side and sandviched
23/06/2021 - 30/06/202	Credo Cube + Bag	4	Trial run	25 min thaw, no plastic bag, logtag on side and sandviched, logtag on exterior
28/06/2021 - 03/07/202	Credo Cube + Bag + New pan	5	TIC conditioning +cooler validation	25 min thaw, no plastic bag, logtag on side
28/06/2021 - 03/07/202	Credo Cube + Bag + New pan	6	TIC conditioning +cooler validation	25 min thaw, no plastic bag, logtag on side
03/07/2021 - 09/07/202	Credo Cube + Bag	4	80H validation, logtag alert	delay 15 min recording+2 consecutive alerts, open after 80H
03/07/2021 - 10/07/202	Credo Cube + Bag + New pan	6	80H validation, logtag alert	delay 15 min recording+2 consecutive alerts, open after 80H
30/06/2021 - 09/07/202	Credo Cube + Bag + New pan	5	Open+Close, 80H, logtag alert	delay 15 min recording+2 consecutive alerts, open after 80H, open 5 min @24H and open 5 min @48H
12/07/2021 - 15/07/202	Credo Cube + Bag	4	Closed Cooler Trial run	delay 15 min recording+2 consecutive alerts, closed on multiple flights (3), 72 hours
12/07/2021 - 15/07/202	Credo Cube + Bag + New pan	5	Closed Cooler Trial run	delay 15 min recording+2 consecutive alerts, closed on multiple flights (6), 72 hours
12/07/2021 - 15/07/202	Credo Cube + Bag + New pan	6	Closed Cooler Trial run	delay 15 min recording+2 consecutive alerts, closed in crew room, 72 hours
16/07/2021 - 19/07/202	Credo Cube + Bag	4	Opened Cooler Trial Run	delay 15 min recording+2 consecutive alerts, open twice 20 mins apart, (72 hours, opened 29 hours apart)
16/07/2021 - 19/07/202	Credo Cube + Bag + New pan	6	Opened Cooler Trial Run	delay 15 min recording+2 consecutive alerts, open twice 20 mins apart, (72 hours, not taken on any flights or opened)
16/07/2021 - 20/07/202	Credo Cube + Bag + New pan	5	80H validation, logtag alert	delay 15 min recording+2 consecutive alerts, open after 80H
23/07/2021 - 26/07/202	Credo Cube + Bag	4	Opened Cooler Trial Run	taken on flights, open twice (15s) 20 minutes apart, check for LogTag alert. Cooler taken to SIM, opened 3rd time, 1RBC r
23/07/2021 - 26/07/202	Credo Cube + Bag + New pan	6	Opened Cooler Trial Run	taken on flights, open twice (15s) 20 minutes apart, check for LogTag alert
27/07/2021 - 31/07/202	Credo Cube + Bag + New pan	5	RBC packing configuration	RBC vertical, 1 gel pack sandvhiched in middle, LogTag on side
30/07/2021 - 30/07/2021			Time for TIC Refrigerator conditioning	TICs placed in refirgerator after removing from freezer
30/07/2021 - 05/08/2021			Time for TIC Refrigerator conditioning	TICS placed in refirgerator after Room Temp conditioning (refrigerated hold) for 5 days
05/08/2021 - 09/08/202	Pro-Med Coolers	1	Cooler validation, RBC configuration validation, LogTag Placement	96H, RBC vertical, 1 gel pack in middle, LogTag on top, side, middle
05/08/2021 - 09/08/202	Pro-Med Coolers	2	Cooler validation, RBC configuration validation, LogTag Placement	96H, RBC vertical, 1 gel pack in middle, LogTag on top, side, middle
05/08/2021 - 09/08/202	Pro-Med Coolers	3	Cooler validation (refrigerated TICs), RBC configuration validation, LogTag Placemer	96H, TIC from refrigerator, RBC vertical, 1 gel pack in middle, LogTag on top, side, middle
10/08/2021 - 14/08/202	Pro-Med Coolers	7	Cooler validation, RBC configuration validation	96H, RBC vertical, 1 gel pack in middle, LogTag on side
10/08/2021 - 14/08/202	Pro-Med Coolers	8	Cooler validation, RBC configuration validation	96H, RBC vertical, 1 gel pack in middle, LogTag on side
10/08/2021 - 14/08/202	Pro-Med Coolers	1	Cooler validation, RBC configuration validation	96H RBC flat, no gel, LogTag on side
10/08/2021 - 14/08/202	Pro-Med Coolers	2	Cooler validation, RBC configuration validation	96H RBC flat, no gel, LogTag on side
10/08/2021 - 14/08/202	Pro-Med Coolers	3	Cooler validation, RBC configuration validation	96H RBC flat, no gel, LogTag on side
16/08/2021 - 20/08/202	Pro-Med Coolers	1	Closed Cooler Trial run	96H, gel pack, LogTag on side, closed in crew room
16/08/2021 - 20/08/202	Pro-Med Coolers	2	Opened Cooler Trial Run	96H, gel pack, LogTag on side, opened twice on first flight (open 15s, 20 min apart)
16/08/2021 - 20/08/202	Pro-Med Coolers	3	Opened Cooler Trial Run	96H, gel pack, LogTag on side, opened twice on TWO flights, one day apart (aug 16th & aug 17th) (open 15s,30 and 20 m
17/08/2021 - 21/08/202	Pro-Med Coolers	7	Cooler validation, RBC configuration validation	96H, gel pack, LogTag on side
17/08/2021 - 21/08/202	Pro-Med Coolers	8	Cooler validation, RBC configuration validation	96H, gel pack, LogTag on side
03/08/2021 - 06/09/202	Pro-Med Coolers	4	Cooler validation	96H, gel pack, LogTag on side
03/08/2021 - 06/09/202	Pro-Med Coolers	5	Cooler validation	96H, gel pack, LogTag on side
03/08/2021 - 06/09/202	Pro-Med Coolers	6	Cooler validation	96H, gel pack, LogTag on side

The Final Cooler

Crēdo ProMed™ Series 4 4L

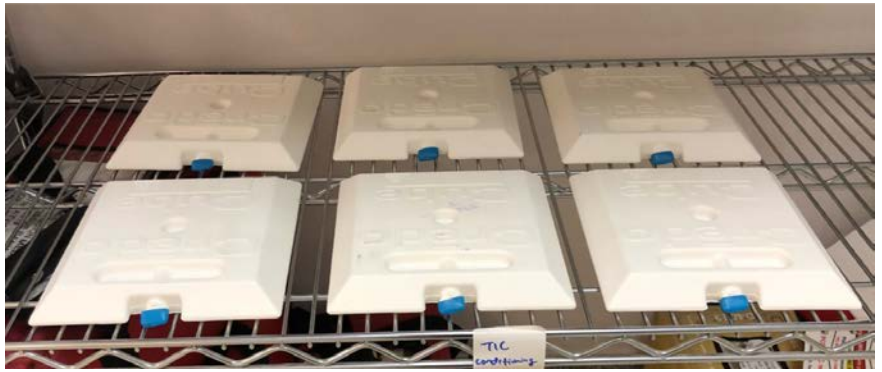


Validation

Series of in-lab and in-flight validations (coolers closed and opened) performed

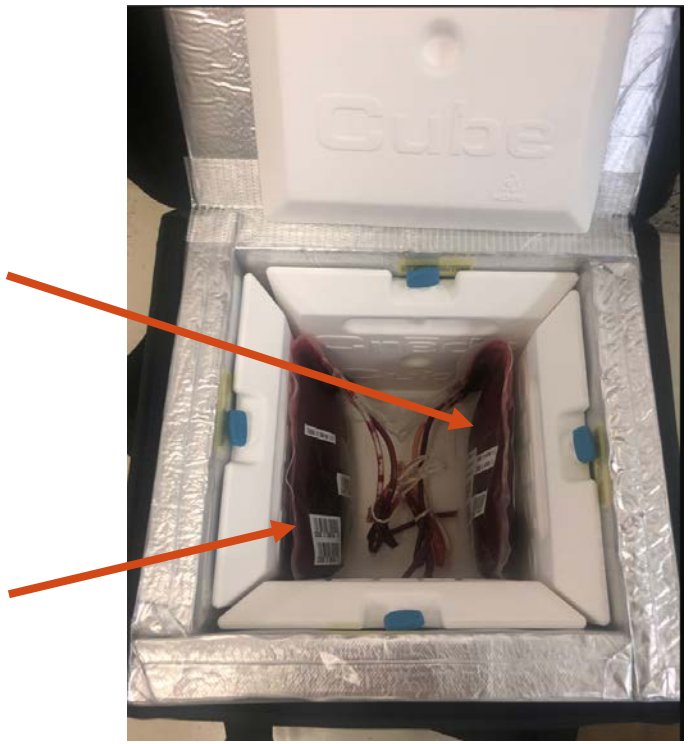
Findings:

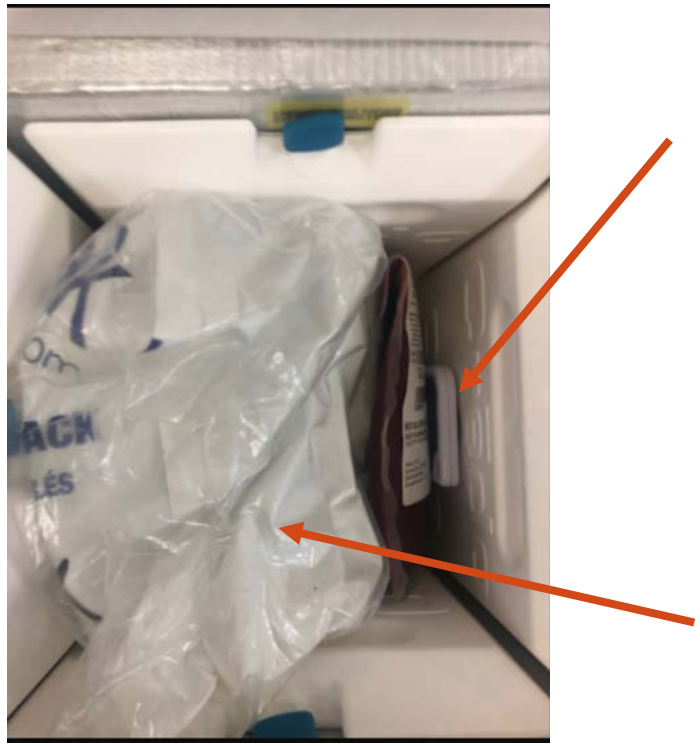
- Cooler's TIC panels must be freezer conditioned at <-18°C for minimum of 24 hours, then room temperature conditioned on ventilated rack for 25 minutes before use.
- Vertical upright placement of RBC's provided longer duration vs flat in cooler.
- Temperature recorder most accurate when placed between RBC and TIC panels in cooler.
- 1 fridge temperature gel pack helps achieve our goal of 96 hour storage.



Final Cooler Configuration

- Stores 2 units of RBC at 1-6°C for up to 96 hours
- Inside:
  - 2 x RBCs (O Negative, tagged K Neg)
  - 1 x fridge temperature gel pack
  - 1 x LogTag temperature recorder





In-Flight Simulation

Test coolers sent to Ornge Toronto Base for use validation

Paramedics were instructed to open the cooler twice, 20 minutes apart

- To simulate taking one unit out at a time for transfusion in-flight

LogTags were attached to the outside of the cooler

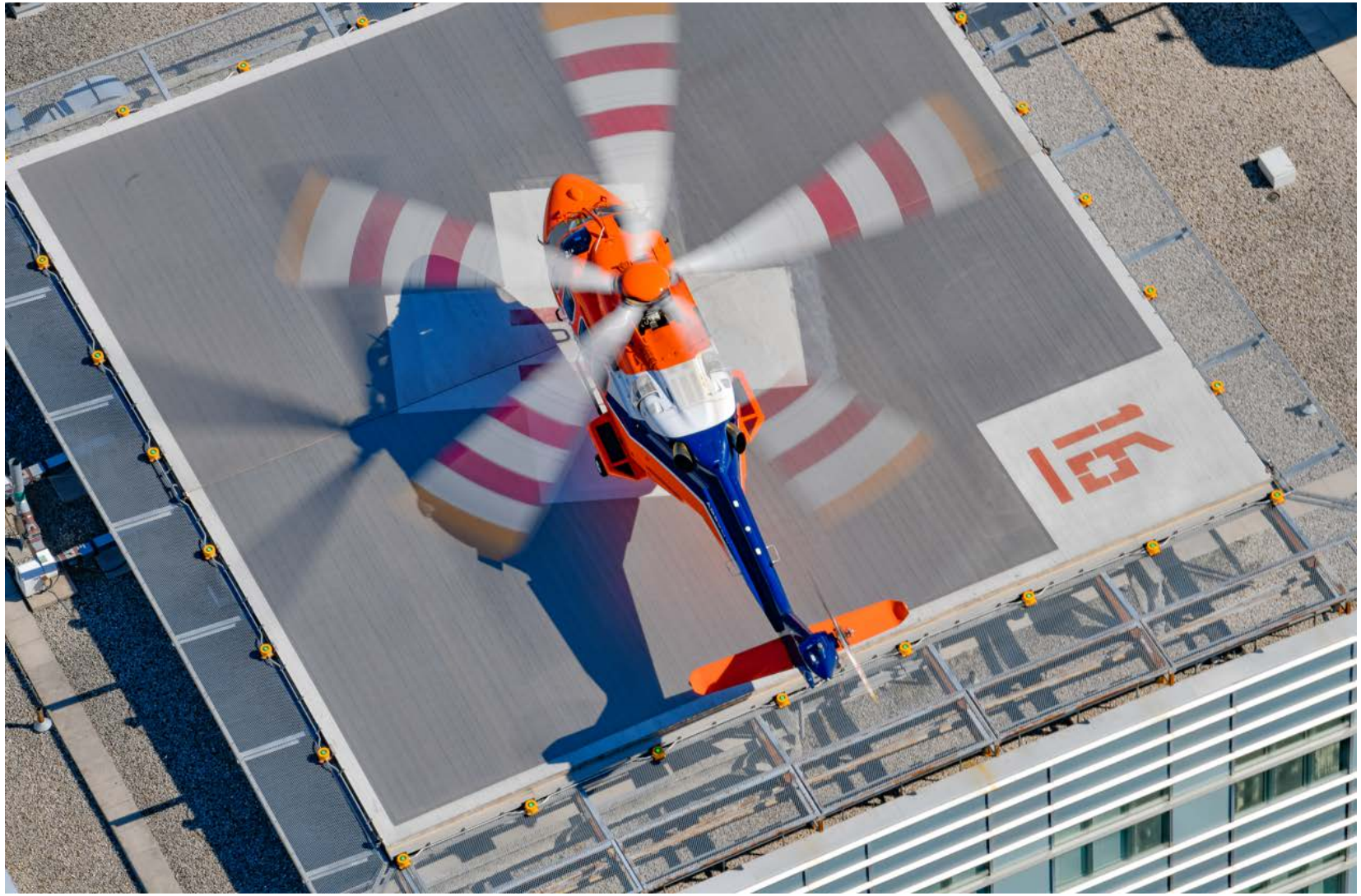
- To help us understand the extremity of temperatures the coolers would be exposed to in summer (August) temperatures.

Findings:

- LogTag within cooler was flashing “OK” at each opening, indicating that the cooler was able to maintain a temperature of 1-6°C at/after each opening.
- Highest temperature the cooler was exposed to was 34.8°C

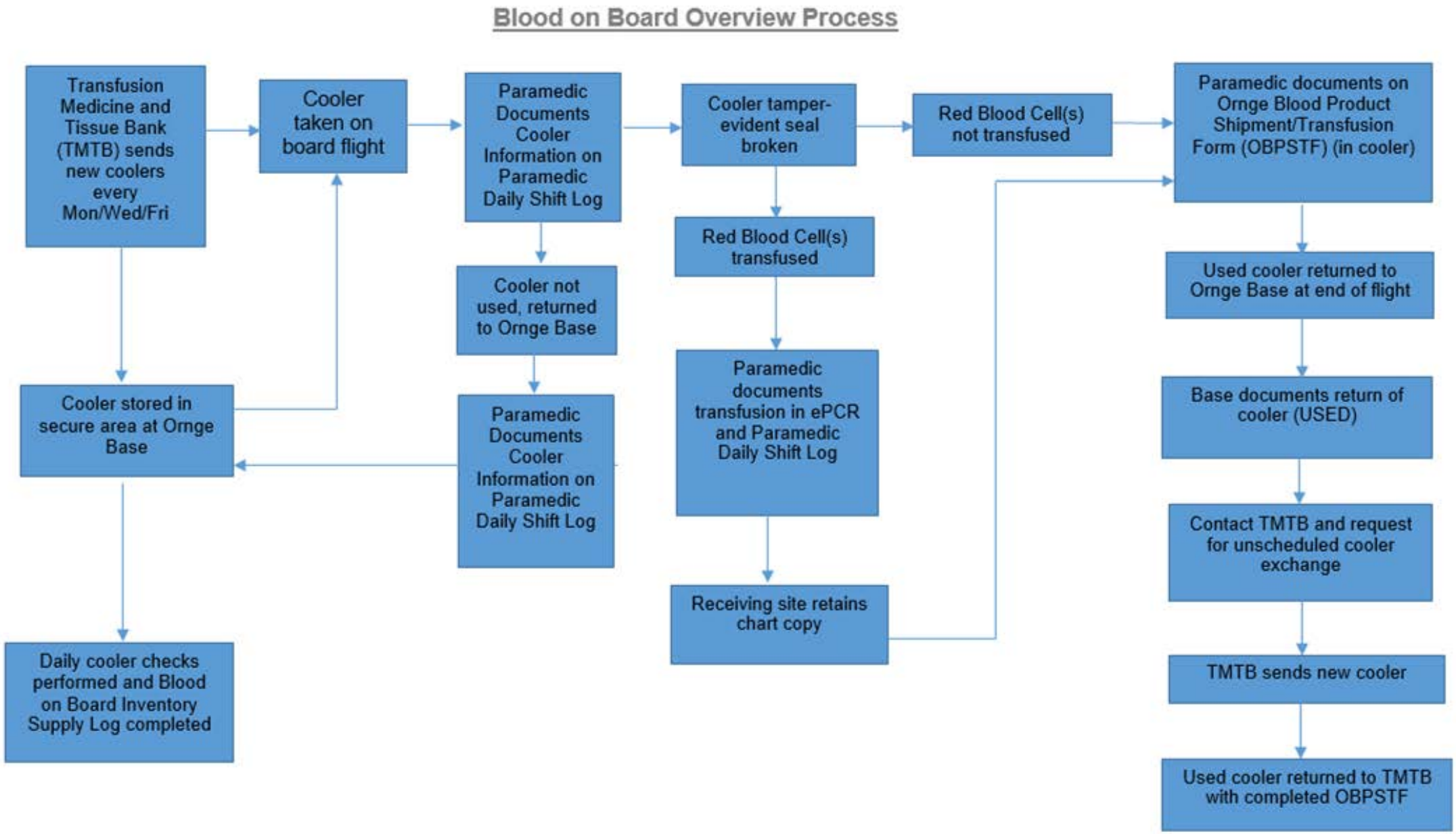
Blood on Board

From lab to scene and back again



Designing “Blood on Board”

- LIS tracking of RBC shipments, returns, and transfusions
- Blood and cooler preparation within the lab
  - Fridge, freezers, RT shelf space for conditioning
- Cooler use and storage at Ornge base
  - How many coolers should they have on hand?
  - Is there a temperature controlled room?
  - Is the room only accessible by paramedics?
- Cooler exchange logistics
  - Exchange schedule?
  - What happens when they use a cooler?
  - Will the courier take the ferry to the island?
- Draft and prepare SOPs, flow charts, documents and forms
- Train lab and Ornge staff


Blood on Board Overview Process
Transfusion Medicine and Tissue Bank (TMTB) sends new coolers every Mon/Wed/Fri
Cooler taken on board flight
Paramedic Documents Cooler Information on Paramedic Daily Shift Log
Cooler tamper-evident seal broken
Red Blood Cell(s) not transfused
Paramedic documents on Ornge Blood Product Shipment/Transfusion Form (OBPSTF) (in cooler)
Cooler not used, returned to Ornge Base
Red Blood Cell(s) transfused
Used cooler returned to Ornge Base at end of flight
Cooler stored in secure area at Ornge Base
Paramedic Documents Cooler Information on Paramedic Daily Shift Log
Paramedic documents transfusion in ePCR and Paramedic Daily Shift Log
Base documents return of cooler (USED)
Contact TMTB and request for unscheduled cooler exchange
Receiving site retains chart copy
TMTB sends new cooler
Daily cooler checks performed and Blood on Board Inventory Supply Log completed
Used cooler returned to TMTB with completed OBPSTF

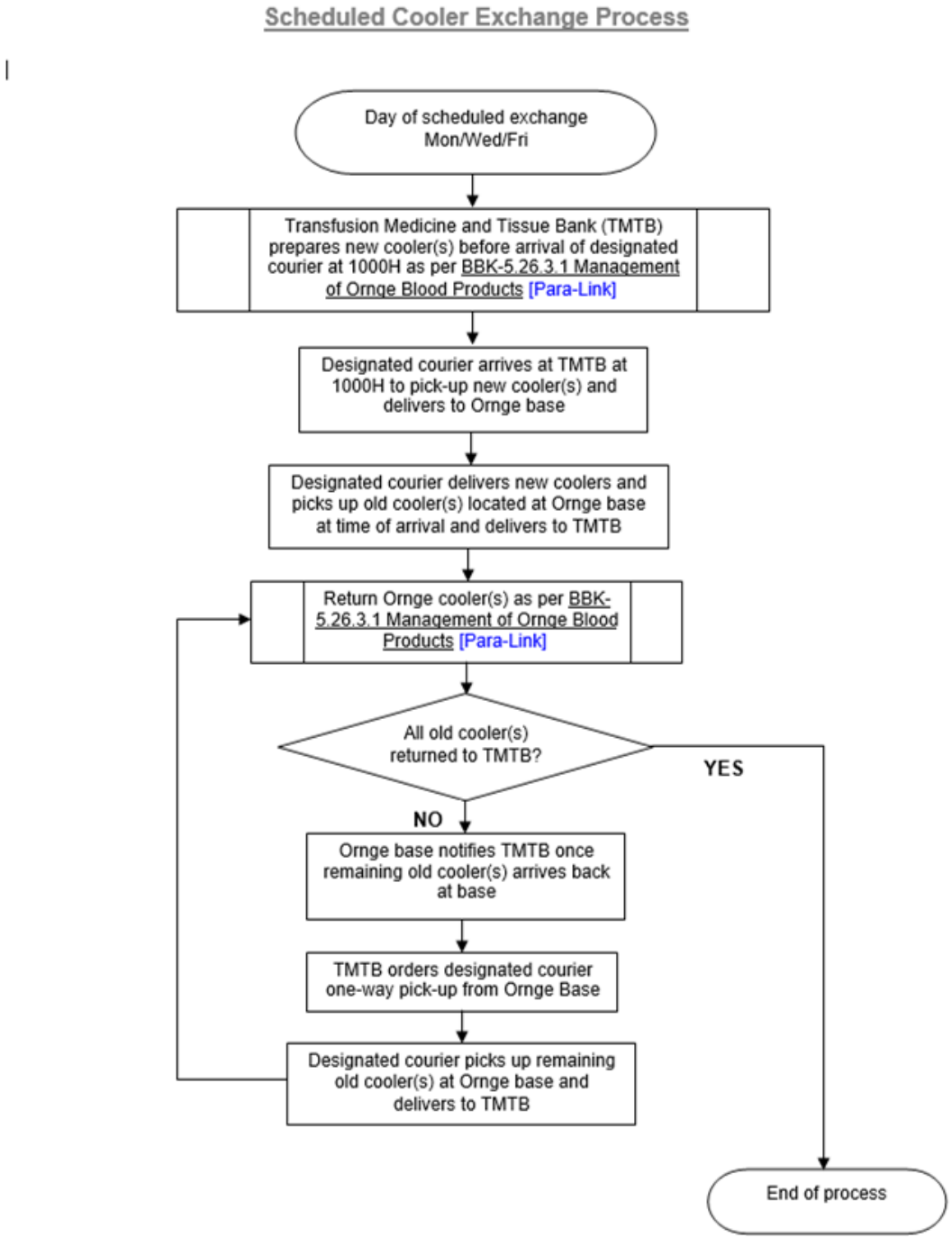
Overview

Scheduled Cooler Exchange

TMTB Process

3 coolers exchanged 3x a week

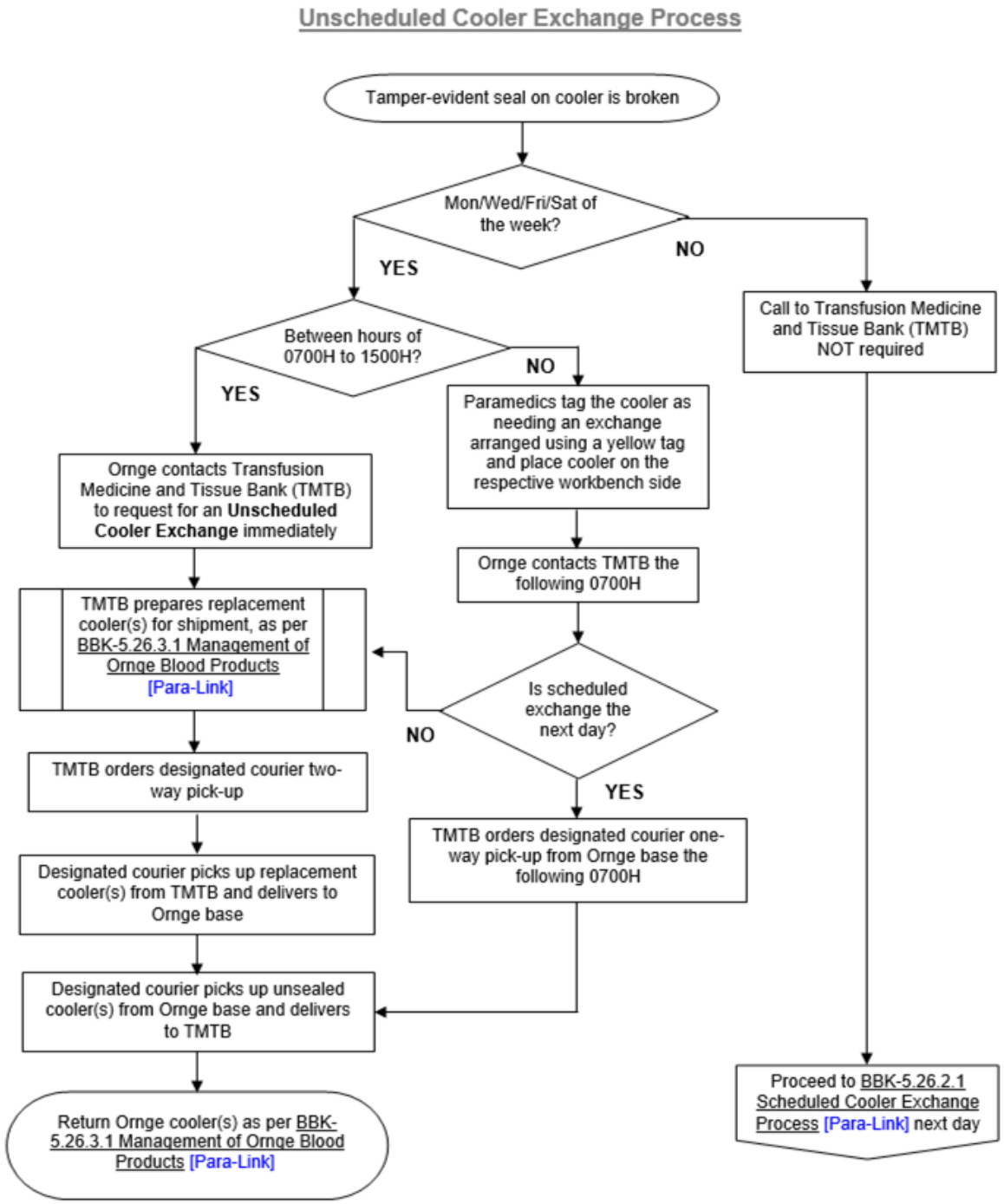
Longest time between exchange being 3 days, giving 1 day buffer



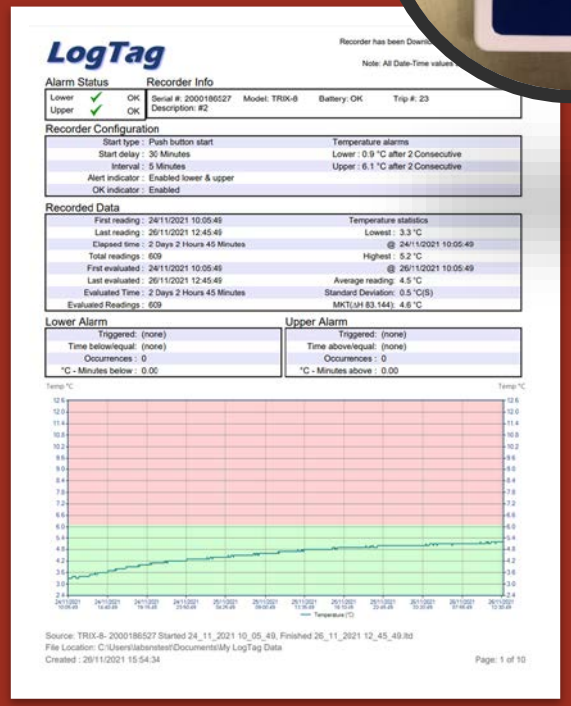
Unscheduled Cooler Exchange

TMTB Process

Occurs when the tamper evident seal on a cooler is broken and/or blood was transfused



Cooler Return Process


LogTag

Alarm Status / Recorder Info

Recorder Configuration

Recorded Data

Lower Alarm / Upper Alarm

Return of Ornge Stock Process

Ornge Stock returned to Transfusion Medicine and Tissue Bank

Green "OK" indicator flashing on LogTag temperature recorder at time of cooler opening?

NO

Take the temperature of the returned unit(s) following BBK-3.25.1.2 Use of the Thermoworks Cold-Zone IR Thermometer [Para-Link]

YES

Tamper-evident seal intact on cooler?

NO

Place product(s) in Quarantine physically and in WellSky as per BBK-5.18.1.1.8 Changing the Status of a Product in WellSky [Para-Link] for minimum of 24 hours

YES

Product acceptance criteria met? As per BBK-5.26.3.1 Management of Ornge Blood Products [Para-Link]

NO

Place product(s) in Quarantine physically and in WellSky as per BBK-5.18.1.1.8 Changing the Status of a Product in WellSky [Para-Link]

Notify manager or delegate for further investigation of product disposition.

YES

Return RBC unit(s) back to available inventory and update location in WellSky as per BBK-5.26.3.1 Management of Ornge Blood Products [Para-Link]

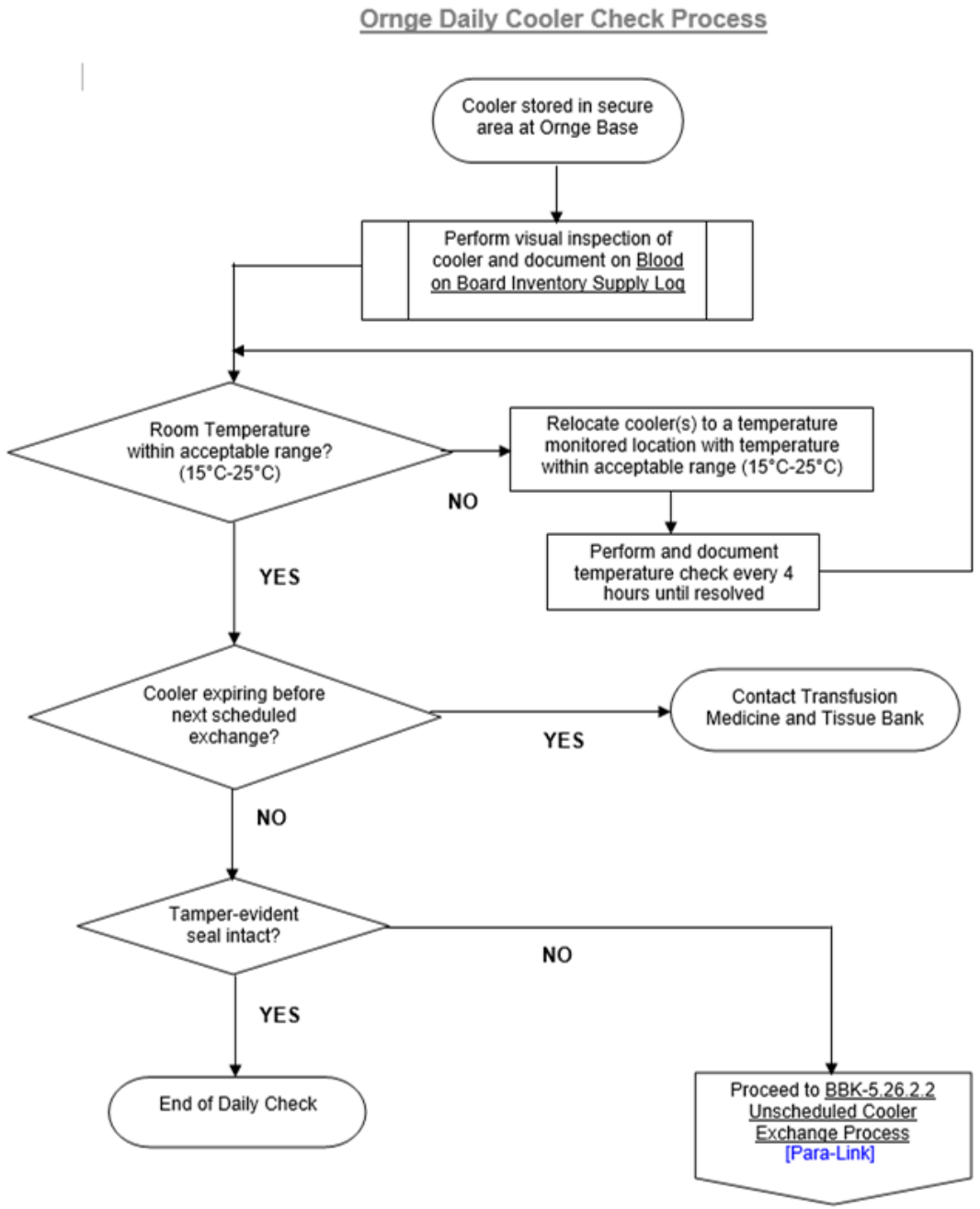
Document final disposition on BBK-5.26.4.3 Ornge Blood Product Shipment-Transfusion Form [Para-Link]

Base Daily Check

Ornge process

Coolers stored in a secured temperature controlled room at base

Prarmedics to take one cooler with them on on flight on a call-to-call basis



Transfusion Process

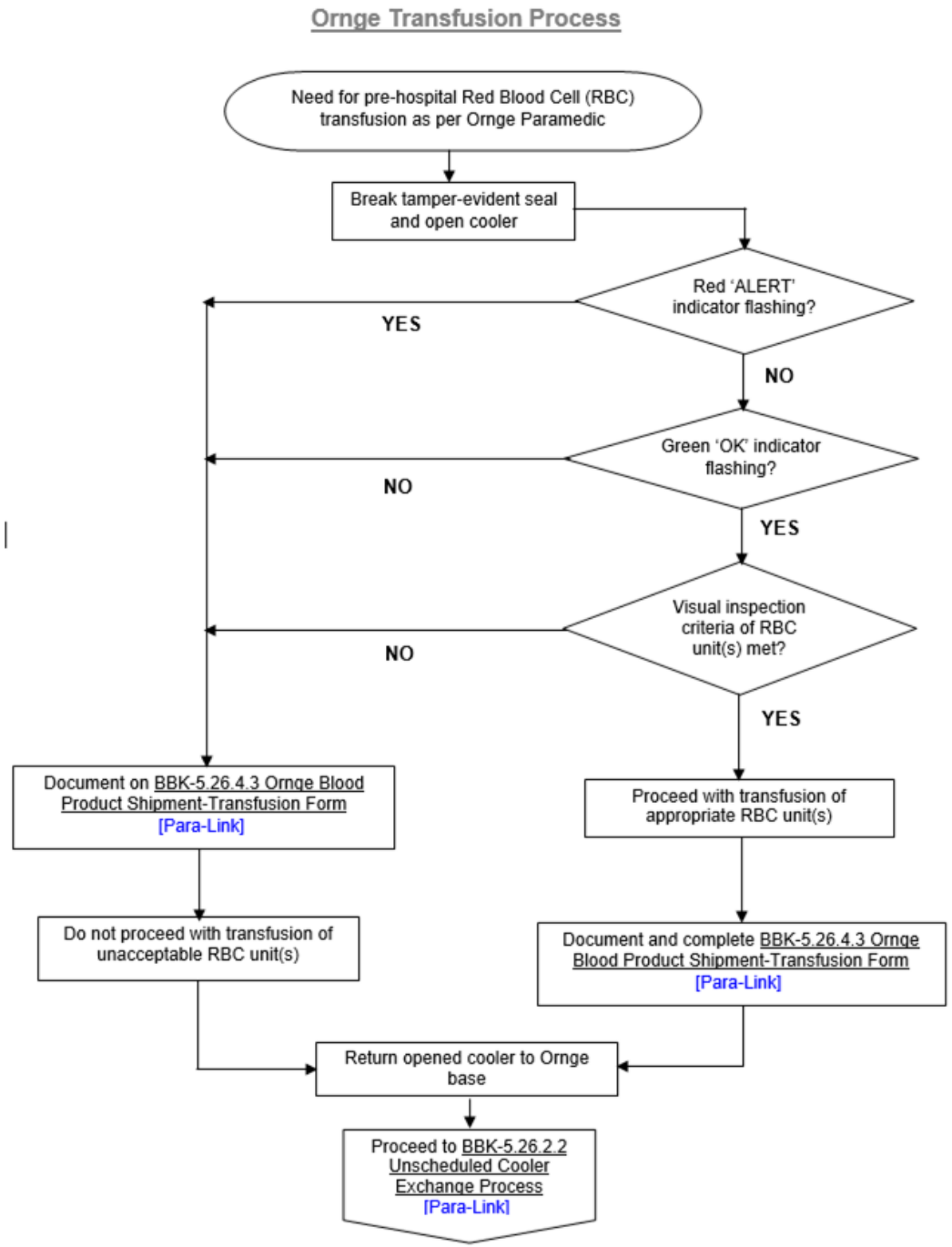
ornge

Patient Care

Clinical Affairs

Ornge Blood Product Transfusion Policy

Title:	**Ornge Blood Product Transfusion Policy**
Policy #:	**CA-POL-001 R0 (Ornge Blood Product Transfusion Policy)**
Applies to:	**Transport Medicine Physicians and Ornge Certified Paramedics**
Issue Date:	**[insert date]**
Issued By:	**Director, Clinical Affairs** **Associate Medical Officer – Operations, Education, OCC**



Ornge Blood Product Shipment/Transfusion Form

Sunnybrook HEALTH SCIENCES CENTRE 2075 Bayview Avenue Toronto, ON M4N 3M5	Department of LMMD Division of Transfusion Medicine and Tissue Bank **Transfusion Medicine**	BBK-5.26.4.3 Version: 1 Page 1 of 2 Effective: 2022/02/28 E-Authorized by: Medical Director

Ornge Blood Product Shipment-Transfusion Form

Shipment Details				**Voucher#:**202X-MM-DD-Cooler#
Date Products Shipped (dd/mm/yyyy)	Time Products Shipped	Cooler ID#	Temperature Recorder#	Packaged by
Cooler Expiry Date (dd/mm/yyyy)	Cooler Expiry Time	Receiving Ornge Base **Toronto**		

Product Details

Product Type and ABO/Rh	Unit Number	Completed by Ornge		Completed by TMTB				
		Transfused	Reason Not Transfused	Date/Time Cooler Returned to TMTB	LogTag Indicator "OK" Upon Unpacking	Unit Returned	Disposition	Date/Tech
		◻ *Yes *Time of Transfusion: ◻ No	◻ Not required ◻ Temperature unacceptable ◻ Other (specify):		◻ Yes ◻ No Date/Time:	◻ Yes ◻ No	◻ Inventory ◻ *Discarded ◻ *Quarantine (*specify reason): ◻ Shipped in WellSky	
		◻ *Yes *Time of Transfusion: ◻ No	◻ Not required ◻ Temperature unacceptable ◻ Other (specify):			◻ Yes ◻ No	◻ Inventory ◻ *Discarded ◻ *Quarantine (*specify reason): ◻ Shipped in WellSky	

Transfusion Documentation Both units transfused to the same patient? ◻ Yes ◻ No (Complete reverse side if 2nd unit was transfused to a different patient)

Date of Transfusion (dd/mm/yyyy)	Name of Paramedic	OASIS#
Flight# / Patient Pickup Location	Patient Receiving Location	
Name of Patient (LAST NAME, First Name)	Date of Birth (dd/mm/yyyy)	Ornge TC#

Transfusion Reaction

◻ Yes ◻ No	Reaction Description:

Ornge and Sunnybrook Health Sciences Centre launch ‘Blood on Board’

Ornge and Sunnybrook Health Sciences Centre launch ‘Blood on Board’

Program to lead to improved outcomes for remote trauma patients and others

August 31, 2021 | Mississauga | By: Ornge Media

Temperature Monitoring Troubleshooting

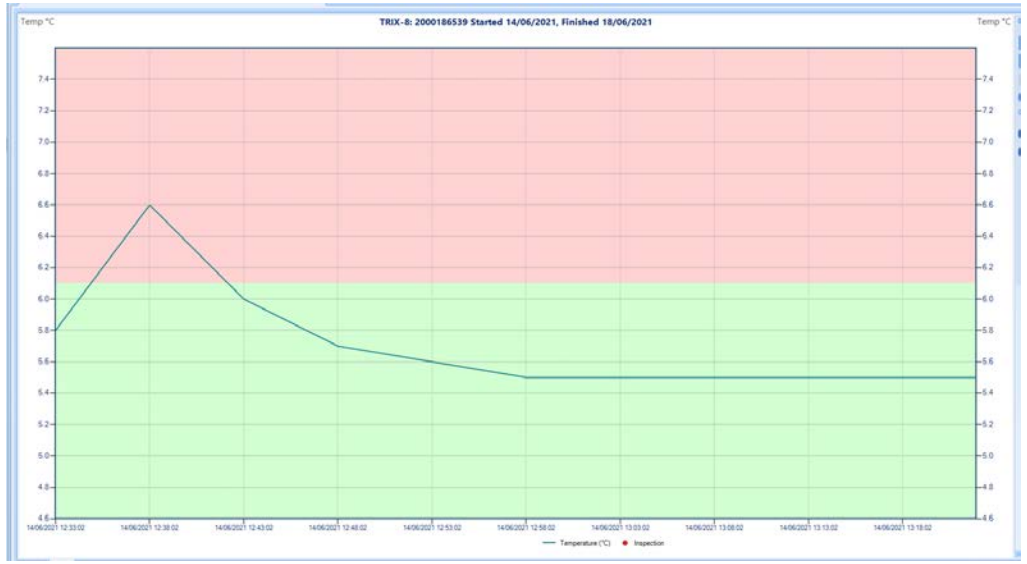
PROBLEM:

HIGH temperature alarm triggered during validation.

Triggered during/shortly after cooler packaging, and recorded data indicated that the recorder and internal of the cooler require some time to cool down.

SOLUTION:

Temperature recorders stored in fridge and adjusted to begin recording after 15 minute delay.



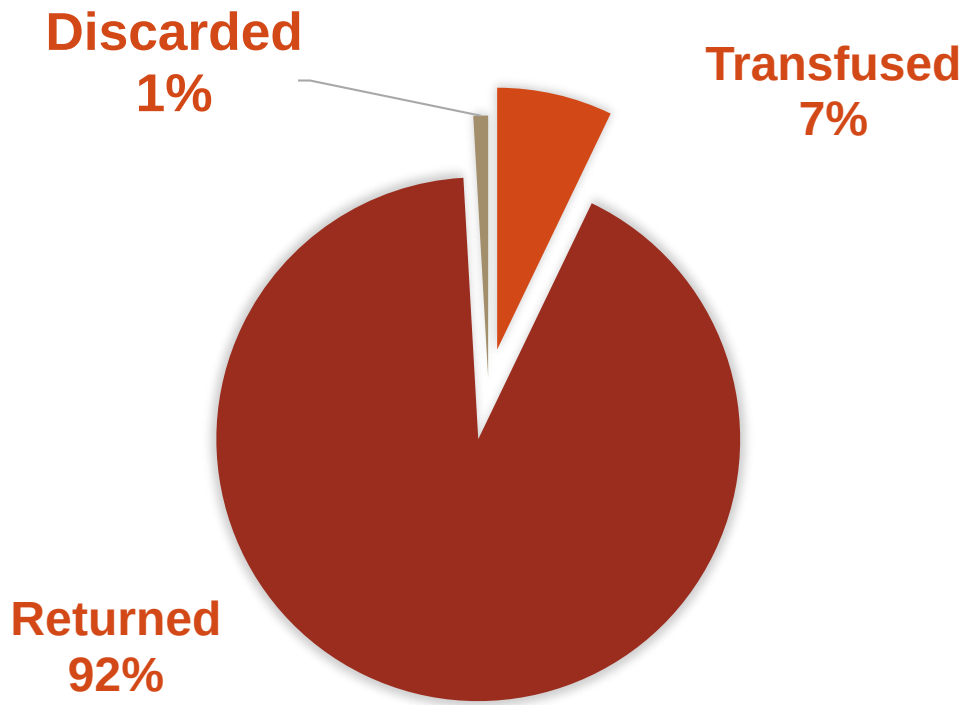
PROBLEM: After program launch, still had some temperature alarms triggered after the 15 minute delay.

SOLUTION:

Increased recording delay to 30 minutes.

Data – Since Program Launch

Metric	Launch To date (August 31, 2021 to July 22, 2022)	Monthly Average
# of Units Transfused	63	5.7
# of Units Discarded	10	0.9
# of Deviations	23	2.1
# of Transfusion Reactions	0	0



Data

Reporting and audit process

- Daily report on utilization
- 100% clinical audit for 3 months
- Monthly Blood transfusion notification

Monthly reconciliation process

- 100% reconciliation of Sunnybrook TMTB unit numbers with Ornge Charts

Monthly recipient notification process

Data reporting and metrics (Sept-Dec 2021)

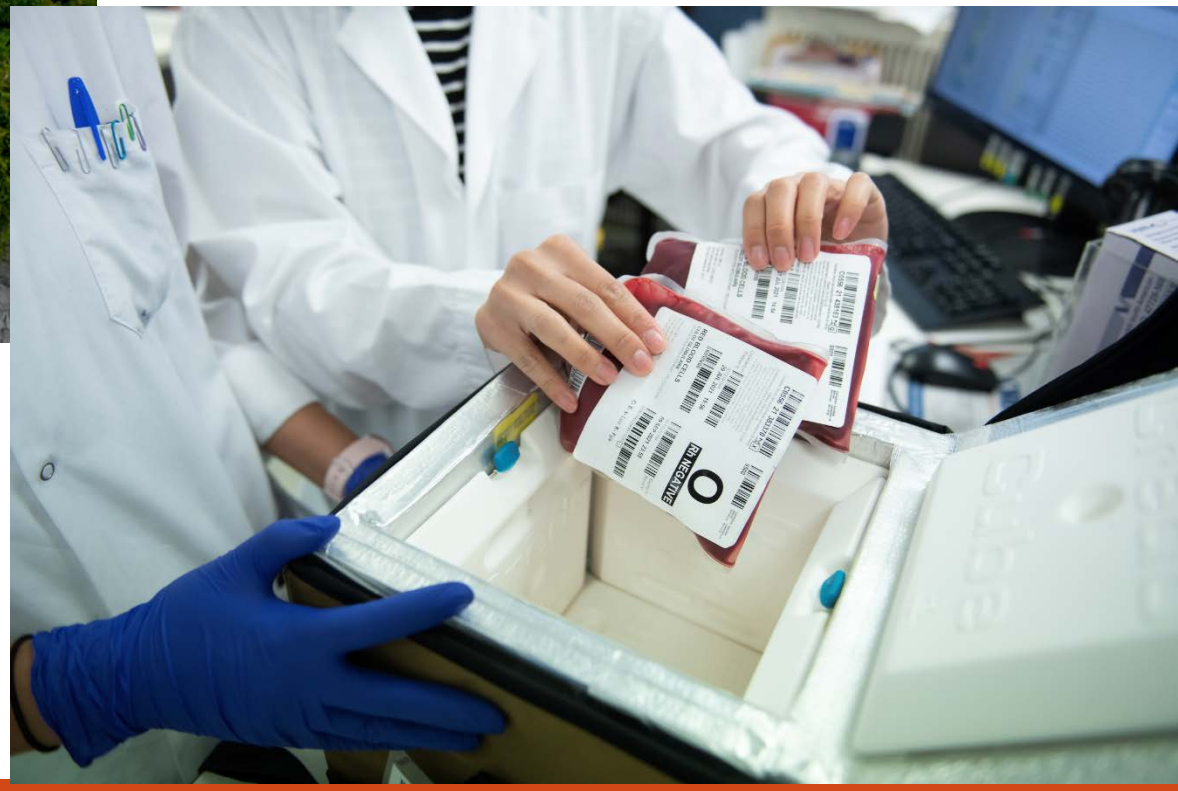
- 14 cases
  - 2 Interfacility – Medical
    - Transfusion delay minutes saved* 20 minutes
  - 12 Trauma
    - 4 Direct from scene
      - Time to transfusion 11-36 minutes
      - Transport Time 53-77 minutes
    - 8 modified
      - Transfusion delay minutes saved* 25 - 55 minutes
- Final Status
  - 5 better
  - 7 no change
  - 2 worse

* Time from unit administration to Ornge Transfer of Care

Expansion to other sites

Thank you to the Teams!

Thank you to the members of the Prehospital Transport Programs in Vancouver (BCEHS), Edmonton/Calgary/Saskatoon/Winnipeg (STARS) for their support.



Questions?