Remote Storage of Blood and Blood Components

Blood Bank Refrigerator and BloodTrack

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Mercy | *Your life is our life's work.*

Objectives

- Present two ways to remotely store blood and components safely
- Discuss the benefits and pitfalls of remote storage

Mercy Hospital St. Louis

- An 859-bed hospital historically known for
  - Maternity services
  - Burn Center
- The only Level I Trauma center in St. Louis County.
- The hospital also has a Level IV NICU, cancer center, a heart and vascular hospital, a low-risk birthing center and Blood Donor Services.

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Emergent Use of Blood - Inventory

- Prepared sets for cooler transport
  - 1 - 6 RBC O+
  - 1 - 6 RBC O=
  - 1 - 2 RBC O+ and 2 A FFP
  - 1 - 2 RBC O= and 2 A FFP
  - 1 - 1 O= NICU
  - 2 - MTP 6 O+/= and 6 A FFP

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Remote Storage

Blood Bank Refrigerator in the Emergency Department[2]

Blood Bank Refrigerator in the ED

- In May of 2022 started storing blood for emergency use in a refrigerator near the adult trauma rooms in the emergency department

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Blood Bank Refrigerator in the ED - Inventory

- Inventory
  - 4 O pos pRBC
  - 4 O neg pRBC
  - 4 A FFP
- Retain a physical copy of each unit and a segment for RBCs
- Update the unit location in the BBIS to ED
- An Emergency Transfusion unit tag is completed and attached to each unit

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Blood Bank Refrigerator in the ED - Usage

- Door alarms in Blood Bank when opened
- The patient info is added to the Attached unit tag(s)
- Tag is given to patient care assistant
- Assistant calls Blood Bank with patient information

Emergency Transfusion Unit Tag

Blood Type	Patient Information	

Unit Number	Component Code

Component	Expiration	Volume

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Mercy Hospital
St. Louis, 63141
SOP.ROUT.G5.ATT1

UNCROSSMATCHED BLOOD STICKER

Version 1

Revision Date: 4/28/2022

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Blood Services

Emergency Department Refrigerator Blood Product Usage Log

Patient Information:

Name: _____

Medical Record Number:_____

Gender: ☒ Male ☐ Female

☐ Notified by ED coworker _____Date/Time/Initials_____

☐ Verified VBG ordered and sent

☐ Verified LAB3019 UNCROSSMATCHED/EMERGENCY ISSUE BLOOD PRODUCTS ordered

☐ T&S resulted   ☐ Check Type resulted   Date/Time/Initials _____

Unit number	Component Code	Removed from ED refrigerator Date/time	BBIS Emer. Issue/XM Check when complete (√)		Returned/ Final Status Date/Time/ Initials
			IS	XM	
RBC					
FFP					

Comments:_____

Blood Bank Refrigerator in the ED - Inventory

- Inventory is replenish as needed
  - Replace used products
  - RBCs with 72 hours or less expiration
  - Plasma products with less than 24-hour expiration

- Each shift performs inventory verification

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INVENTORY VERIFICATION

Active Inventory

12 Records 🔽

— Search

○ Exact Search (Filter) ○ Context Search (Highlight)   [Find]   [Range]   [Sort]   [Clear]   [Undo]

													ed

Prod	PC	Unit Number	Fac UID	BLD Products Batch ID	Status	ABO/Rh ▲	Exp D/T	Collect D/T	Manf	Vol	Fac	Prod Stor
FFT	E2701	W069624006219-K	W069624006219-K	2800277	IN	A NEG	18-Jan-2025 23:59	12/26/2024	010	263	STLO	EDREF1
FFT	E2701	W069624006193-8	W069624006193-8	2800277	IN	A POS	18-Jan-2025 23:59	12/26/2024	010	257	STLO	EDREF1
FFT	E2701	W069624006192-A	W069624006192-A	2800277	IN	A POS	18-Jan-2025 23:59	12/26/2024	010	249	STLO	EDREF1
FFT	E2701	W069624006181-G	W069624006181-G	2800277	IN	A POS	18-Jan-2025 23:59	12/26/2024	010	287	STLO	EDREF1
RBC	E0424	W069625000118-Z	W069625000118-Z	2800774	IN	O NEG	19-Feb-2025 23:59	01/08/2025	010	350	STLO	EDREF1
RBC	E0424	W069624006135-S	W069624006135-S	2799750	IN	O NEG	28-Jan-2025 23:59	12/17/2024	010	350	STLO	EDREF1
RBC	E0424	W069624006190-E	W069624006190-E	2799750	IN	O NEG	28-Jan-2025 23:59	12/17/2024	010	350	STLO	EDREF1
RBC	E0424	W069624006268-2	W069624006268-2	2800200	IN	O NEG	07-Feb-2025 23:59	12/27/2024	010	350	STLO	EDREF1
RBC	E0424	W069625000130-6	W069625000130-6	2800967	IN	O POS	20-Feb-2025 23:59	01/09/2025	010	350	STLO	EDREF1
RBC	E0424	W069625000071-X	W069625000071-X	2800665	IN	O POS	14-Feb-2025 23:59	01/03/2025	010	350	STLO	EDREF1
RBC	E0424	W069624006218-M	W069624006218-M	2800195	IN	O POS	07-Feb-2025 23:59	12/27/2024	010	350	STLO	EDREF1
RBC	E0424	W069624006179-4	W069624006179-4	2800195	IN	O POS	07-Feb-2025 23:59	12/27/2024	010	350	STLO	EDREF1

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Blood Bank Refrigerator in the ED – Benefits and Pitfalls

- Benefits
  - Products are readily available for traumas
  - Reduced Tech time with transport for each trauma case
  - Units must be crossmatched and issued if they leave the blood bank – no longer required

- Pitfalls
  - Wastage
  - Cost of the remote Blood Bank refrigerator
  - Not for use by the pediatric hospital
  - Required increase in inventory

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Offsite Infusion Center [2]

- As of April 2013, we have been storing platelets and packed red blood cells at an offsite infusion center.

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Offsite Infusion Center

- Products are sent via a courier the morning of transfusion

- Stored until the patient arrives and ready for transfusion.

- If the transfusion is canceled or delayed to the next day the products are returned to the Blood Bank.

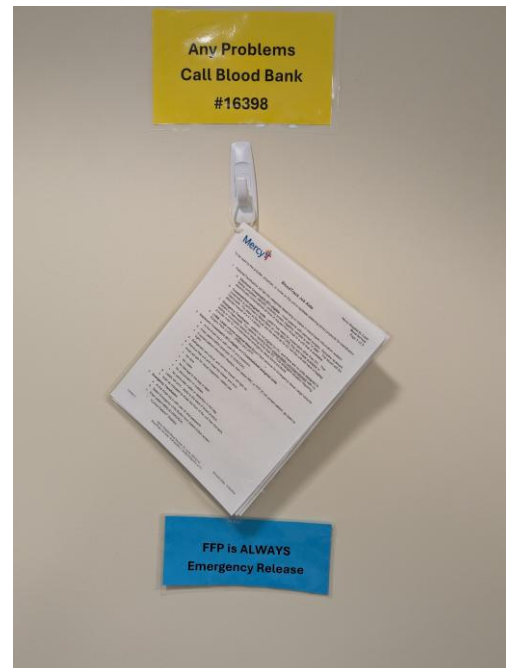- The Hematology MLS are trained in the issue process and QC.

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Remote Storage

BloodTrack® HaemoBank™

BloodTrack[1]

Provides electronically crossmatched, AHG crossmatched, or emergency release blood to patients in heart hospital operating room.

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BloodTrack - Inventory

- Dispensed for patients getting electronic crossmatch (EC), emergency issue (E), or massive transfusion protocol (MTP).

- Include (1) O pos and (1) O neg irradiated RBC.

Blood Type	RBC	FFP	USE
A+	2	0	EC
A neg	2	0	EC
B neg	2	0	EC
O+	2	0	EC, E
O neg	2	0	EC, E, MTP
AB	0	2	MTP, E

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BloodTrack – Inventory Reconciliation & Restocking

- Performed once a day

- BBIS inventory is checked against Haemobank20 inventory listed in BloodTrack Manager

- The physical inventory is restocked in the morning before surgeries
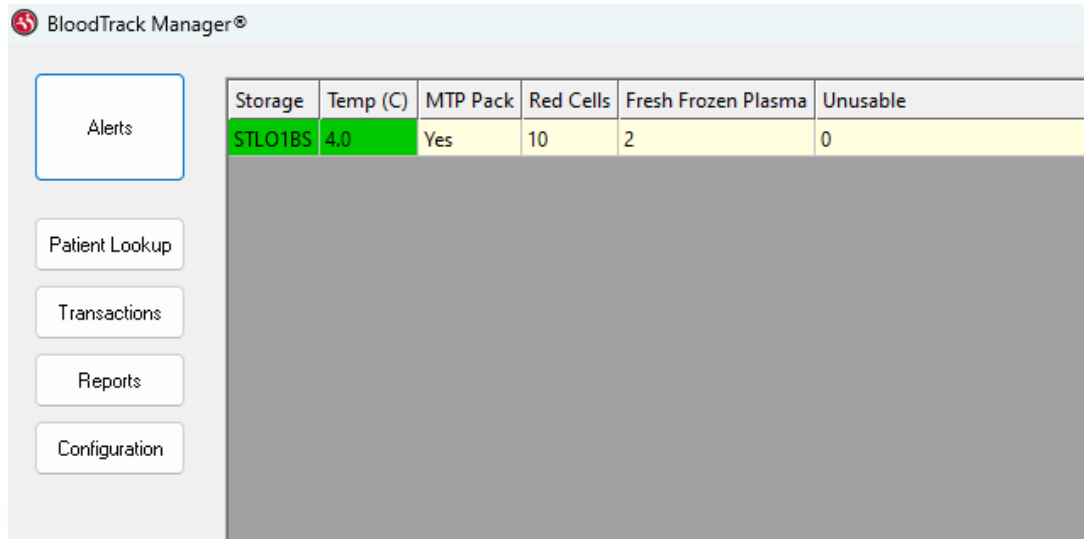
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Inventory Report for | STLO1BS | for units in storage at least | 0 | Days

Unit	Blood Gr... △	Product Code	Product	Expiration Date	Patient	Dereservation Date	Unit Status	Storage Date	Location	Attributes	MTP Pack
W1811 24 172993 N	A Neg	E0336V00	RED BLOOD CELLS CPD>AS1/500mL/refg ResLeu:<5log6	26-Feb-2025 23:59:59			Available	27-Jan-2025 01:38:53	1C	CMV- LR	No
W1811 24 200165 S	A Neg	E0336V00	RED BLOOD CELLS CPD>AS1/500mL/refg ResLeu:<5log6	26-Feb-2025 23:59:59			Available	27-Jan-2025 01:38:45	1B	CMV- LR	No
W0696 25 000363 9	A Pos	E0424V00	RED BLOOD CELLS CPD>AS5/500mL/refg ResLeu:<5log6	06-Mar-2025 23:59:59			Available	29-Jan-2025 15:06:23	2B	CMV- LR	No
W0696 25 000356 7	A Pos	E0424V00	RED BLOOD CELLS CPD>AS5/500mL/refg ResLeu:<5log6	06-Mar-2025 23:59:59			Available	29-Jan-2025 15:06:34	2C	CMV- LR	No
W0696 24 005530 M	AB Pos	E2701V00	Thawed PLASMA CPD/XX/refg Frozen <=24h	07-Feb-2025 23:59:59			Available	02-Feb-2025 01:14:06	4B		No
W0696 24 005937 D	AB Pos	E2701V00	Thawed PLASMA CPD/XX/refg Frozen <=24h	07-Feb-2025 23:59:59			Available	02-Feb-2025 01:13:58	3B		No
W1811 25 287018 Z	B Neg	E0336V00	RED BLOOD CELLS CPD>AS1/500mL/refg ResLeu:<5log6	05-Mar-2025 23:59:59			Available	04-Feb-2025 00:07:46	4A	CMV- LR	No
W0696 25 000172 N	B Neg	E0424V00	RED BLOOD CELLS CPD>AS5/500mL/refg ResLeu:<5log6	06-Mar-2025 23:59:59			Available	04-Feb-2025 00:07:53	4C	CMV- LR	No
W0696 25 000110 E	O Neg	E0424V00	RED BLOOD CELLS CPD>AS5/500mL/refg ResLeu:<5log6	25-Feb-2025 23:59:59			Available	26-Jan-2025 01:52:07	2A	CMV- LR	No
W0696 25 000090 R	O Neg	E0420V00	RED BLOOD CELLS CPD>AS5/500mL/refg Irradiated ResL	21-Feb-2025 23:59:59			Available	26-Jan-2025 01:52:17	3A	CMV- IR LR	No
W0696 25 000472 *	O Pos	E0420V00	RED BLOOD CELLS CPD>AS5/500mL/refg Irradiated ResL	03-Mar-2025 23:59:59			Available	04-Feb-2025 00:07:37	3D	CMV- IR LR	No
W1811 24 192495 W	O Pos	E0336V00	RED BLOOD CELLS CPD>AS1/500mL/refg ResLeu:<5log6	26-Feb-2025 23:59:59			Available	27-Jan-2025 02:02:18	1A	CMV- LR	No

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BloodTrack Manager

- Information system used to view and modify configuration data, view reports, view status of the kiosks, execute transaction, and view and resolve system alerts.

Storage	Temp (C)	MTP Pack	Red Cells	Fresh Frozen Plasma	Unusable
STLO1BS	4.0	Yes	10	2	0

Alerts

Patient Lookup

Transactions

Reports

Configuration

BloodTrack

Patients/Transfusions will fall into categories depending on status in blood bank information system

- **Electronic Crossmatch (EC) eligible**

- **Crossmatched assigned units**

- **Emergency Transfusion**

- **LVSB- Large volume surgical bleed**

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BloodTrack

Electronic Crossmatch (EC) eligible

- Current type, second type and negative screen

- An OR schedule is printed and sent with EC noted

- The blood is electronically crossmatched when requested from Kiosk if a unit is available.

  - Login and enter patient information

  - The door unlocks and one drawer is lit and unlocked

  - Unit is visually inspected

  - A 4x4 sticker will print at time of EC and placed on the back of the unit

  - Scan as required by Kiosk the front of the unit then the back.

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Haemosafe

BloodTrack

Crossmatched assigned units

- This crossmatch is performed in Blood Bank on units BEFORE they are made available in Haemosafe.

- The steps at the Kiosk are the same as for EC

- The unit will have a bagtag attached instead of a 4 x 4 sticker.

BloodTrack

- ## Emergency Transfusion

  - For patients needing blood <u>unexpectedly (uncrossmatched)</u> with no testing or incomplete testing or requiring more than EC.

  - Truly emergent situation requiring provider order for uncrossmatched emergency issue blood products.

- ## LVSB- Large volume surgical bleed

  - Blood Pack removal for Emergency Issue Large Volume Surgery Pack (LVSP) – 2RBCs and 2FFP.

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BloodTrack Manager

- ## Alerts

  - Click on the Alert button and log in

  - Three tabs – Unacknowledged, Acknowledged and Resolved

  - Process thru each tab to resolve.

  - The Alert button will turn grey, and the alarm is silence after it is acknowledged.

    - Examples:

      Temp out of range

      Offline

      Inventory not available for an MTP

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BloodTrack – Benefits and Pitfalls

- Reduced crossmatch:transfusion (C:T) [3]

2024	2 RBC issued/2 returned	2 RBC issued/1 returned	4 RBC Issued	4 RBC returned	3 returned	2 returned	1 returned	6 down and 6 back	Used >6	
January	59	3	10	6	3	1		3	3	
February	63	7	12	5	4	1	2	1	5	
March	55	4	14	9	4		1		9	
April	71	1	14	9	2	1	2	6	8	
May										
June	6		3	1		2			5	
July	3	2	6	3		2	1	2	5	
Aug	2	1	4	1	1	1	1	2	3	
Sept	4		3	3				3	6	

BloodTrack – Benefits and Pitfalls

- Reduced Blood Bank Tech and RN/OR Tech productivity times

Blood Bank Tech		RN/OR Tech		
	time in minutes			time in min
Perform EC	3	Give order for units to be boxed		1
Print tranfusion tags	1	Complete request form		1
Issue in Wellsky	4	Walk to BB		3.5
Perform readback	5	Perform readback for each unit		2
		Deliver cooler to OR		3.5
Inspect blood products	1			
Return products in Wellsky	2	Walk back to BB with cooler		3.5
Return products to refrig	1	Walk bac to work area OR		3.5
Unpack cooler	1			
File paperwork	1			
	19 min			18 min
	24 hours/month			23 hours/month
Inventory Management				
Daily reconciliation	5			
Restocking Wellsky	5			
Wakking down and back	7			
	17 min/day			

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BloodTrack - Benefits and Pitfalls

- Wastage
  - If a blood product is removed and will not be transfused FOR ANY REASON, it will be DISCARDED BY THE BLOOD BANK.

- Interface limitations between BloodTrack and our information system

- Increase total inventory

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References

1. Blood Track, Configuration, Courier, & Manager Manuals, Haemonetics Corporation, Boston, MA, 2022

2. Standards for Blood Banks and Transfusion Services, Current Edition, AABB, Bethesda Maryland, Urgent Requirement for Blood and Components and Process Control sections.

3. Virk, M. S., et al. (2024). Improving RBC inventory by optimizing preoperative ordering and eliminating crossmatch and hold. **Transfusion 64(12): 2279-2285**.

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