

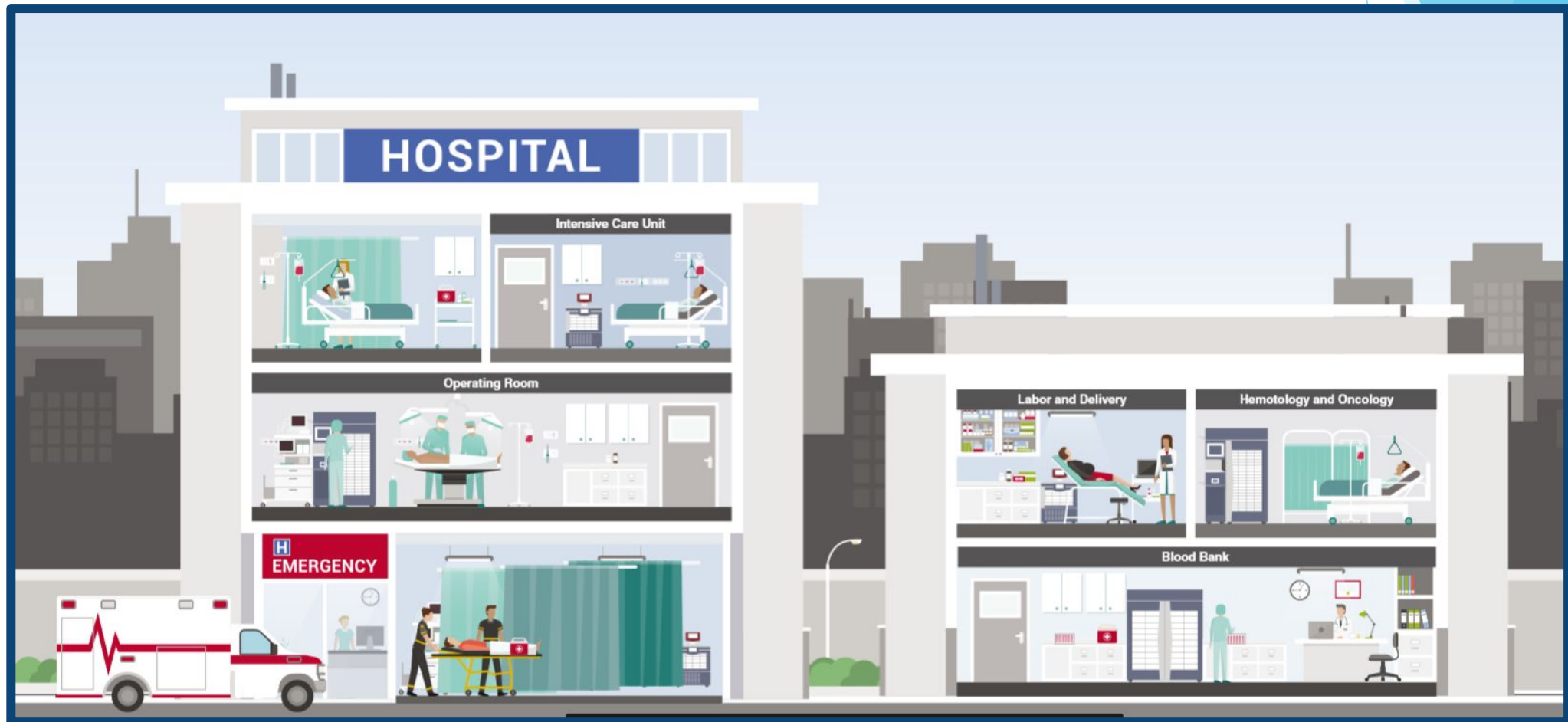
The background features abstract, overlapping geometric shapes in various shades of blue, ranging from light sky blue to deep navy blue. These shapes are primarily located on the left and right sides of the frame, creating a modern, dynamic feel. The central area is a plain white background where the text is located.

Blood Bank Remote Refrigeration

Is Remote Refrigeration right for you?

- ▶ What is remote refrigeration?
- ▶ Why do I need it?
- ▶ Where will I put it?
- ▶ What will it cost me?
- ▶ Is this machine going to take my job?
- ▶ It's fool proof, right?
- ▶ 10 out of 10, would recommend?

Remote refrigeration - It's everywhere you want to be



Any time, any place, remote refrigeration

- ▶ Ability to store blood products closer to the point of care
 - ▶ Both crossmatched and uncrossmatched
- ▶ Blood Bank can allocate blood products remotely
 - ▶ Patient must be eligible for electronic crossmatch
- ▶ Blood Bank can stock remote refrigerators with extended crossmatched RBCs
- ▶ Transactions interface to Blood Bank's LIS
 - ▶ Cerner® Classic, Sunquest®, Meditech®, Cerner Millennium V2012 and 2015, SafeTrace Tx®, Mediware® HCLL, BBCS, SCC Soft

Remote refrigeration when no one else is around

- ▶ Reduce time to transfusion

TABLE 1. Time after request for RBC units to be available for the clinical staff to use at the bedside before and after the implementation of ERBI*

Implementation time	Number of requests	Time to the availability of blood	
		Median (quartiles)	Mean (SD), range
Before implementation of ERBI	30	24 min (12 min, 34 min)	23 min (12 min), 5-47 min
After implementation of ERBI in cardiac theaters	30	59 sec (42 sec, 60 sec)	54 sec (21 sec), 30-120 sec
After implementation of ERBI in cardiac recovery	30	60 sec (50 sec, 75 sec)	64 sec (18 sec), 40-120 sec
After implementation of ERBI (combined cardiac theaters and recovery)	60	60 sec (45 sec, 60 sec)	59 sec (20 sec), 30-120 sec

* Mean difference between before implementation and after implementation of ERBI (95% CI), 22 minutes (17-27 min); $t = 9.92$; d.f. = 29; $p < 0.0001$.

Electronic crossmatch eligibility



Scan Pickup Slip

STAVES, Julie (4130938) is eligible for Remote Release until 26-Jul-2007 10:44.

There are 5 units of A Pos blood available at this location.

Do you want to release a unit of blood?

Yes No

Remote Release

Transfusion

Return To Stock

Update Unit

Done

STAVES
Julie
4130938
28-Dec-1966
F

Ready... Out Connected Logged On: 22579

2



Scan Pickup Slip

STAVES, Julie (4130938) is not eligible for Remote Release.

As a result, the Remote Release process cannot be used to release a unit of blood for this patient.

Contact BloodBank on Ext. 20339 for advice

OK

Remote Release

Transfusion

Return To Stock

Update Unit

Done

STAVES
Julie
4130938
28-Dec-1966
F

Ready... Out Connected Logged On: 22579

2

Just what the doctor ordered

- ▶ Providers can remove units
 - ▶ Already allocated
 - ▶ New or additional units
- ▶ On-demand access
 - ▶ Patient must be eligible for electronic crossmatch
- ▶ Providers may have an increased confidence in the availability of RBC

TABLE 2. RBC units issued to patients undergoing cardiac surgery in a 30-day period and so not available for other patients

Time of implementation	Number of patients	Requests for blood	Number of unused requests (%)	Total number of units issued (%)	Total number of units transfused (% units issued that were transfused)
Before implementation of ERBI					
Cardiac theaters	117	122	48 (39)	320	114 (36)
Cardiac recovery unit	117	29	16 (55)	87	48 (55)
Combined	117	151	64 (42)	407	162 (40)
After implementation of ERBI					
Cardiac theaters	125	58	10 (17)	88	49 (56)
Cardiac recovery unit	125	33	8 (7)	109	73 (67)
Combined	125	91	18 (20)	197 (48)	122 (62)

Remote refrigeration never sleeps

- ▶ Potential Benefits
 - ▶ Accessible 24/7
 - ▶ Traceability
 - ▶ Reduce time to transfusion
 - ▶ Reduce the number of units set up “just in case”
 - ▶ Reduce CT and IT ratios
 - ▶ Reduce the amount of time a tech spends tagging and issuing

I'm not gonna pay a lot for this remote refrigeration

- ▶ Haemonetics & Helmer
 - ▶ BloodTrack kiosk
 - ▶ Haemobank 20
 - ▶ Haemobank 80

The lighter way to enjoy remote refrigeration



\$70,000

BloodTrack kiosk

Half the remote refrigeration - all the taste



\$140,000

Haemobank 20

Now with 50% more refrigeration



\$170,000

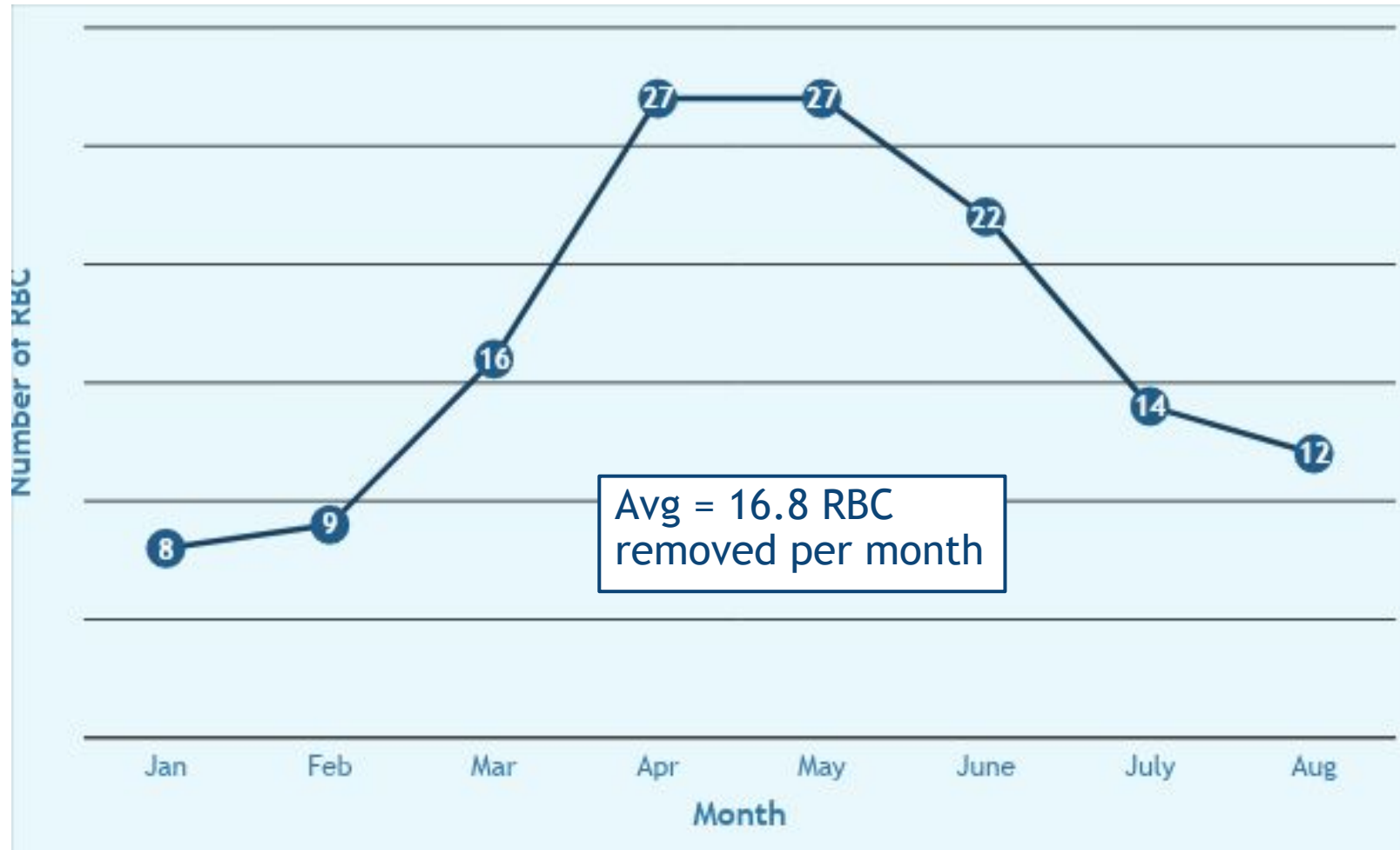
Haemobank 80

Remote refrigeration unscripted

- ▶ Implemented electronic crossmatching August 2005
- ▶ Implemented BloodTrack October 2013
 - ▶ Stock 6 O neg RBC
 - ▶ Only uncrossmatched RBC
- ▶ Common errors include:
 - ▶ Incorrect MR# used to identify patient
 - ▶ Incomplete transactions
 - ▶ Incomplete documentation



RBC removed per month in 2019



Process for removing RBC in ED

(1) **Print the “UNCH ED Blood Refrig MRN” slip**

TO PRINT THIS FORM --- CLICK THE RIGHT MOUSE BUTTON, SELECT THE PRINT MENU ITEM, SELECT THE PRINTER, THEN CLICK ON THE PRINT BUTTON.

UNCH ED Blood Refrig MRN

Unit	Bed	Name	MRN	Age	Gender	DOB
UNC ED	01-B	Disaster, UNC	000000000000	119 y.o.	M	1/1/1990

000000000000

<div> Scan Your Identification </div> <div> (2) </div>	<div> Select Action </div> <div> Taking Out </div> <div> Putting In </div> <div> Touch here for emergency units </div> <div> (3) </div>	<div> Enter MRN </div> <div> <input type="text"/> MRN </div> <div> <input type="button" value="Search"/> <input type="button" value="Cancel"/> </div> <div> (4) </div>	<div> Correct Patient? </div> <div> MRN: 20106832212 </div> <div> Last Name: PATIENT </div> <div> First Name: TRAINING </div> <div> Birth Date: 15-Mar-1967 </div> <div> Gender: M </div> <div> (5) </div>	<div> Scan Unit Number </div> <div> (6) </div>	<div> (7) </div>	<div> Did the emergency label print successfully? If yes, attach the label to the unit and touch the Yes button. If no, touch No to print the emergency label again. </div> <div> <input type="button" value="Yes"/> <input type="button" value="No"/> </div> <div> (8) </div>	<div> Do you want more emergency Red Cells? </div> <div> <input type="button" value="Yes"/> <input type="button" value="No"/> </div> <div> (9) </div>
Scan your badge to start the process.	Touch the RED Button for Emergency Units. *DO NOT select “Taking Out” or “Putting In”.	Scan the MRN from the pick-up slip Or Manually type in the MRN with all leading zeros. *DO NOT scan barcoded CSN on patient sticker.	Verify the correct patient was selected.	Remove ONE (1) unit and scan the Highlighted barcode. The kiosk will prompt you to visually inspect the unit . Select “ Yes ” to confirm the unit is suitable for transfusion.	Three (3) labels will print. 1- Goes on UNIT 2- Goes on attached blood bank FORM 3- Goes in BINDER	Select “ Yes ” to verify all Three (3) labels printed. If labels did NOT print select “ No ”.	If additional units are needed select “ Yes ”. If no further units are needed select “ No ” to be logged out.

Chart Copy

UNC Medical Center
Transfusion Medicine Service

Place product label
sticker here.

Place patient
sticker here.

Vital signs and patient care may be recorded on
☐ Anesthesia Record
☐ Trauma Flow Sheet

Verify patient ID/blood product/product slip match and two licensed staff (one RN or MD) must sign below.

Name	Title	Name	Title

Chart Copy. Please place in patient chart after completing.

Rev. 7/2018

TMS Copy

UNC Medical Center
Transfusion Medicine Service

Place product label
sticker here.

Place patient
sticker here.

For TMS use only:

Entered into STX by: _____ Reviewed by: _____
Date: _____ Date: _____

TMS Copy

Rev. 7/2018

BloodTrack Manager

Alerts

Transactions

Reports

Remote

ASK Manager

Configuration

Storage	Red Cells	Unusable
Trauma Fridge	6	0

Ready...

1 record

Connected

Inventory Report for Trauma Fridge for units in storage at least 0 Days

Unit	Blood Group	Product Code	Product	Expiration Date	Unit Size	Patient	Dereservation Date	Unit St...	Storage Date	Attributes
W2012 19 200282 E	O Neg	E0686V00	Apheresis RED BLOOD CELLS CP2D> AS3/XX/refg ResLeu:	21-Sep-2019 23:59:59	Adult			Available	22-Aug-2019 09:41:30	LR
W2012 19 197329 D	O Neg	E0686V00	Apheresis RED BLOOD CELLS CP2D> AS3/XX/refg ResLeu:	23-Sep-2019 23:59:59	Adult			Available	28-Aug-2019 06:14:37	LR
W2012 19 194301 B	O Neg	E0685V00	Apheresis RED BLOOD CELLS CP2D> AS3/XX/refg ResLeu:	23-Sep-2019 23:59:59	Adult			Available	28-Aug-2019 06:14:46	LR
W2012 19 179766 3	O Neg	E0336V00	RED BLOOD CELLS CPD> AS1/500mL/refg ResLeu:<5log6	03-Oct-2019 23:59:59	Adult			Available	04-Sep-2019 06:47:17	LR
W2012 19 179755 9	O Neg	E0336V00	RED BLOOD CELLS CPD> AS1/500mL/refg ResLeu:<5log6	03-Oct-2019 23:59:59	Adult			Available	04-Sep-2019 06:47:31	LR
W2012 19 219041 K	O Neg	E0336V00	RED BLOOD CELLS CPD> AS1/500mL/refg ResLeu:<5log6	03-Oct-2019 23:59:59	Adult			Available	04-Sep-2019 06:47:38	LR

Back

Generate

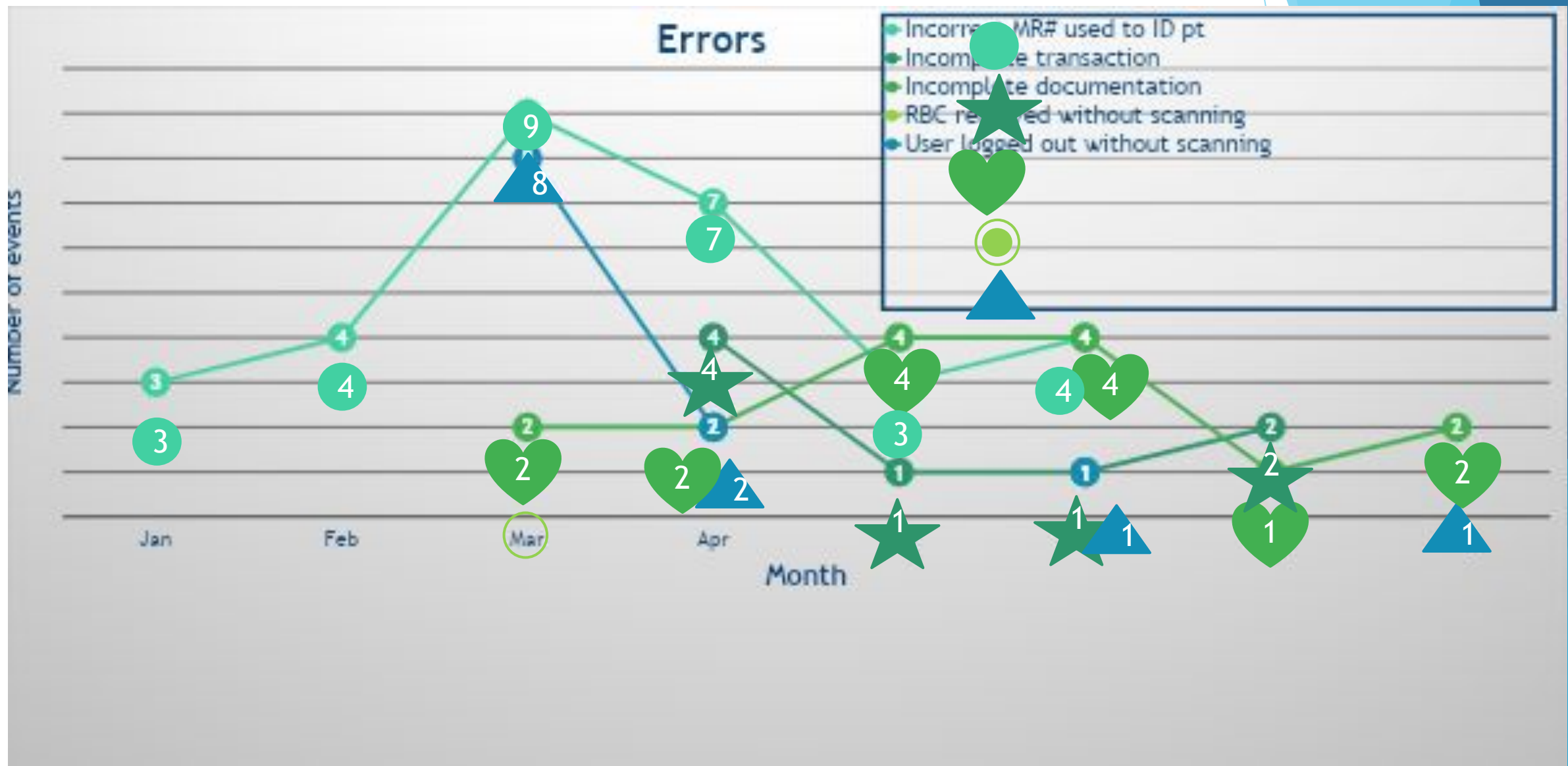
Print

Ready...

6 records

Connected

Remote refrigeration - it's gauranteed



Nothing to worry about with remote refrigeration

- ▶ Potential disadvantages
 - ▶ Increase time required to prepare RBC
 - ▶ Walking to stock the refrigerator
 - ▶ Additional tech time
 - ▶ Monitoring alerts
 - ▶ Returning inventory
 - ▶ Documenting and peer reviewing crossmatches
 - ▶ Errors at the remote refrigerator can impede traceability
 - ▶ Increase time required to investigate and resolve

Barriers to expanding our remote refrigeration suite

- ▶ Logistics
 - ▶ Dedicated IT
 - ▶ Training clinical staff, monitoring access
- ▶ Footprint
- ▶ Cost
- ▶ Time
 - ▶ Management of inventory and crossmatches
 - ▶ Error investigation

I like vending machines 'cause snacks are better when they fall. If I buy a candy bar at a store, oftentimes I will drop it...so that it achieves its maximum flavor potential.

-Mitch Hedberg

References

1. Haemonetics brochure
https://transfusionmanagement.haemonetics.com/~ /media/sharepoint/software/bloodtrack/marketing/brochure/bloodtrack_brochure/col-copy-001182-us_bloodtrack_brochure.pdf.ashx
2. Staves J, Davies A, Kay J, et al. Electronic remote blood issue: a combination of remote blood issue with a system for end-to-end electronic control of transfusion to provide a “total solution” for a safe and timely hospital blood transfusion service. *Transfusion* 2008;48:415-24.
3. Staples S, Staves J, Davies J, et al. Electronic remote blood issue supports efficient and timely supply of blood and cost reduction: evidence from five hospitals at different stages of implementation. *Transfusion* 2019;59:1683-91.
4. Sellen K, Jovanovic A, Perrier L, Chignell M. Systematic review of electronic remote blood issue. *Vox Sanguinis* 2015;109:35-43.
5. Verlicchi F, Pacilli P, Bragliani A, et al. Electronic remote blood issue combined with a computer controlled, automated refrigerator for major surgery in operating theatres at a distance from the transfusion service. *Transfusion* 2018;58:372-8.