Errors in Blood Bank
How to manage?

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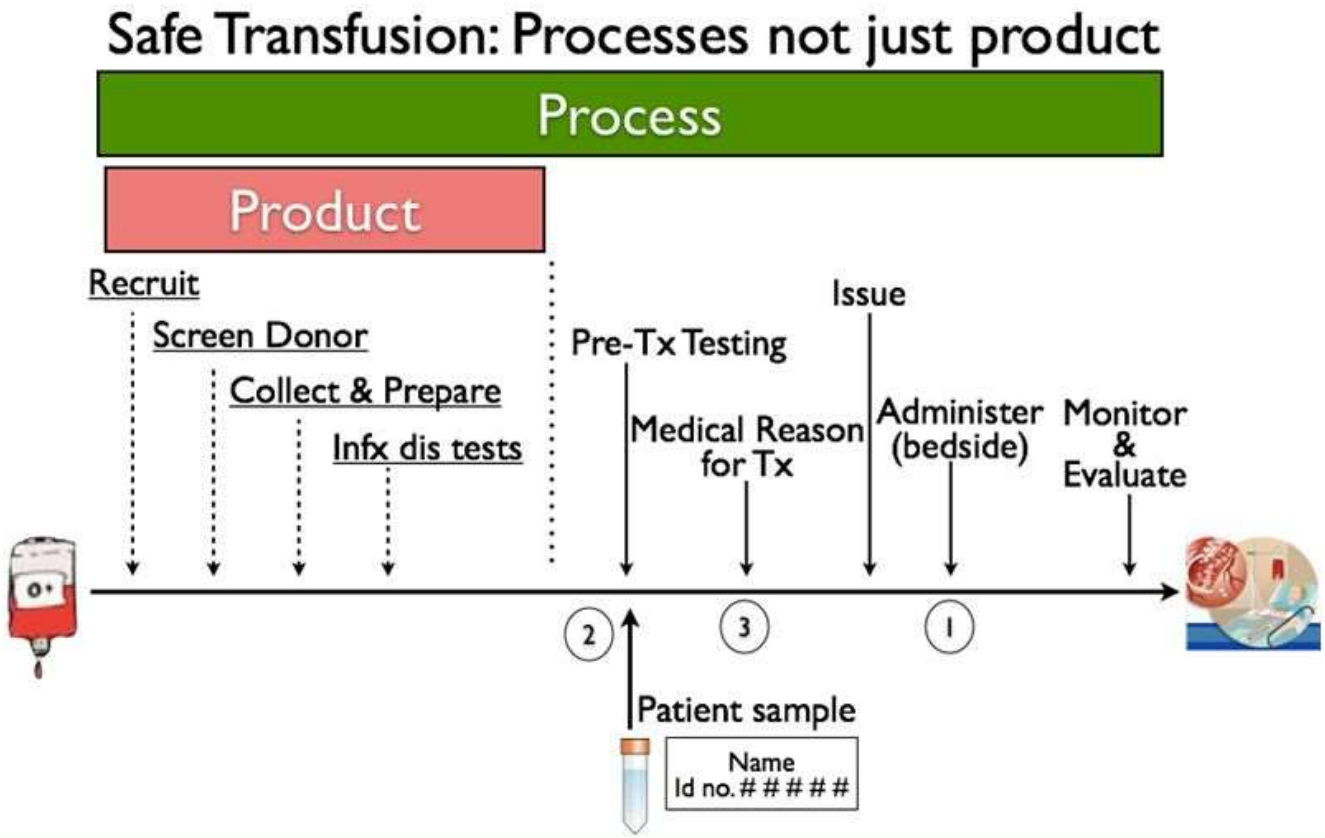
Sources of Error



Various data.....

- 1 in every 19,000 units of red blood cells is transfused to the wrong patient each year, 1 in 76,000 transfusions results in an acute hemolytic reaction, and 1 in 1.8 million units of transfused red blood cell units results in death due to acute hemolytic reaction.- US data
- 1 in 6000, wrong blood Britain
- Indian data different for different set up as not centralised

Types of Errors

- **Adverse Event**- any untoward event or complication experienced by donor/patient before during or after the process
- **Incident-** an unplanned deviation from facility's established policy , process or procedure
- **Near Miss-** an error or deviation from standard procedures or policies discovered before the patient receives transfusion that may lead to transfusion errors
- **Adverse reaction**
- **serious adverse event-** any untended response in donor or in patient associated with the collection or transfusion that is fatal or life threatening or disabling or which results in prolong hospitalization or morbidity

1….WBIT case

Hospital ID AHXXX, blood group in the record found- B positive

Blood group of the sample receive for cross match AB positive

RCA.....

- Wrong blood in tube due to wrong collection
- Wrong label
- Wrong patient identification
- Failure to check by two different identifier
- Lack to follow formal SOP
- Communication barrier

CAPA……

Ask for new sample when there is any such discrepancy

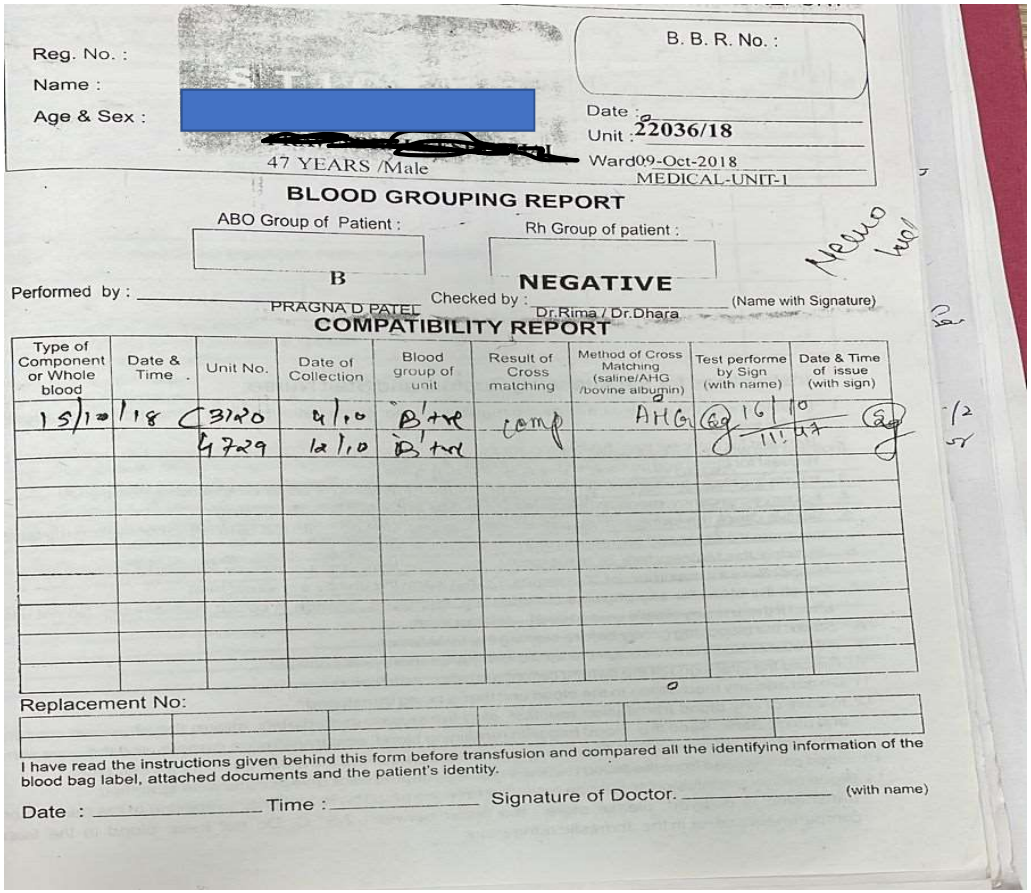
Practice bed side labelling

Idenfication by two different persons by minimum two parametres

Report such incidence

Case 2 …. Wrong cross match

RCA……
Wrong bag reserve
Wrong entry in software/register
Wrong sample added
Failure to follow SOP
Untrained staff- avoid incubation
Wrong group entered
CAPA
Automation use
Training of the principles
Different samples for grouping & cross matching



Reg. No. :
Name :
Age & Sex : [redacted] 47 YEARS /Male

B. B. R. No. :
Date :
Unit : 22036/18
Ward 09-Oct-2018
MEDICAL-UNIT-1

BLOOD GROUPING REPORT

ABO Group of Patient : B
Rh Group of patient : NEGATIVE

Performed by : PRAGNA D PATEL Checked by : Dr.Rima / Dr.Dhara (Name with Signature)

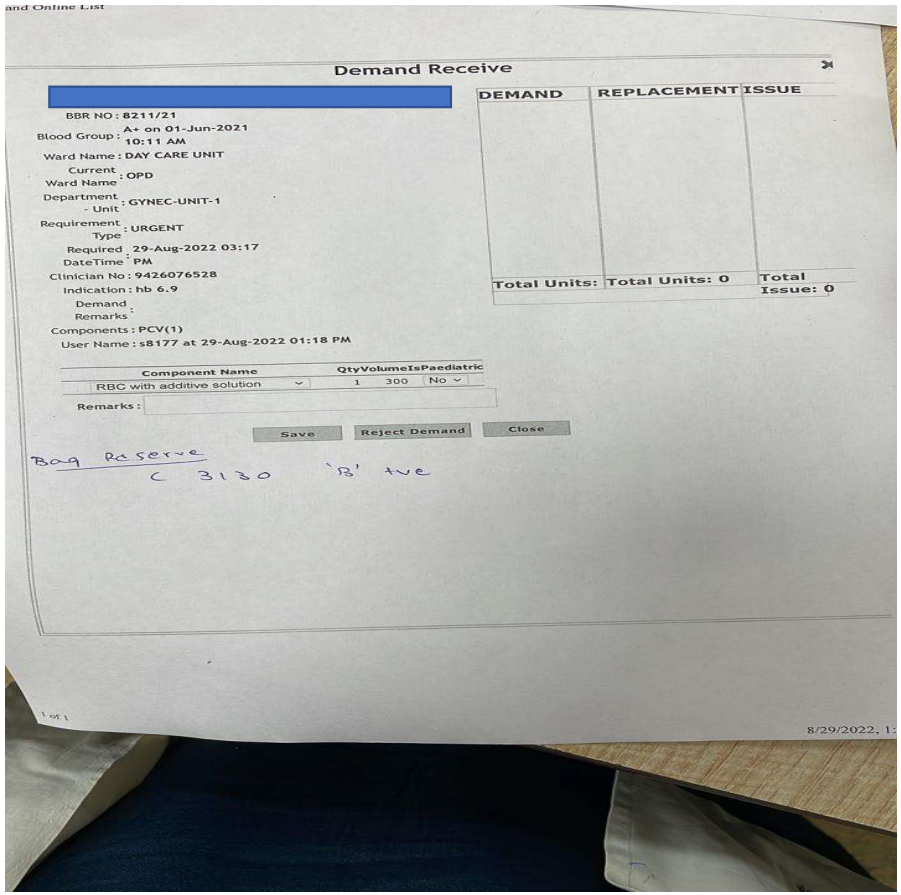
COMPATIBILITY REPORT

Type of Component or Whole blood	Date & Time	Unit No.	Date of Collection	Blood group of unit	Result of Cross matching	Method of Cross Matching (saline/AHG /bovine albumin)	Test performe by Sign (with name)	Date & Time of issue (with sign)
1 5/1	1/18	C 3120	4/1.0	B+ve	comp	AHG	16/10	
		4729	12/1.0	B+ve			11.47	

Replacement No:

I have read the instructions given behind this form before transfusion and compared all the identifying information of the blood bag label, attached documents and the patient's identity.

Date : _____ Time : _____ Signature of Doctor. _____ (with name)



and Online List

Demand Receive

[redacted]

BBR NO : 8211/21
Blood Group : A+ on 01-Jun-2021 10:11 AM
Ward Name : DAY CARE UNIT
Current Ward Name : OPD
Department - Unit : GYNEC-UNIT-1
Requirement Type : URGENT
Required DateTime : 29-Aug-2022 03:17 PM
Clinician No : 9426076528
Indication : hb 6.9
Demand Remarks :
Components : PCV(1)
User Name : s8177 at 29-Aug-2022 01:18 PM

DEMAND	REPLACEMENT	ISSUE
Total Units:	Total Units: 0	Total Issue: 0

Component Name	Qty	Volume	Is Paediatric
RBC with additive solution	1	300	No

Remarks :

Save | Reject Demand | Close

Bag Reserve
C 3130 'B' tve

1 of 1

8/29/2022, 1

Case 3….Wrong issue of blood

RCA..

Wrong ID of patient in issue chit

Wrong issue of bag – PCV instead of PC of same number

Failure to identify true bag

Missed identification in issue chit

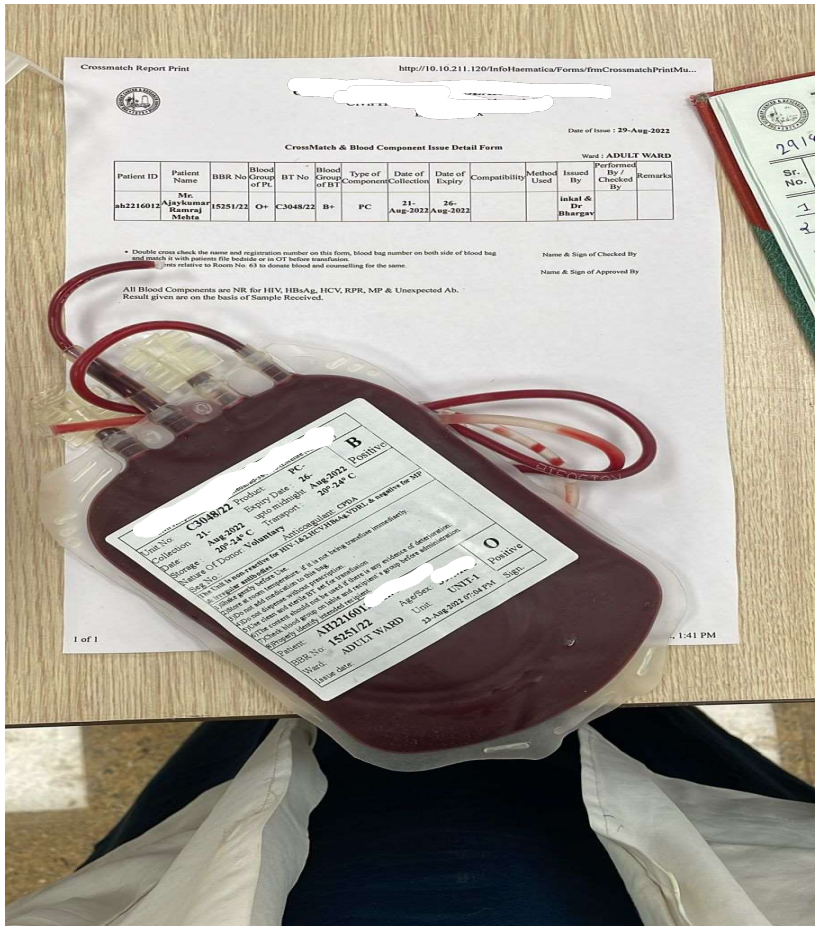
CAPA…

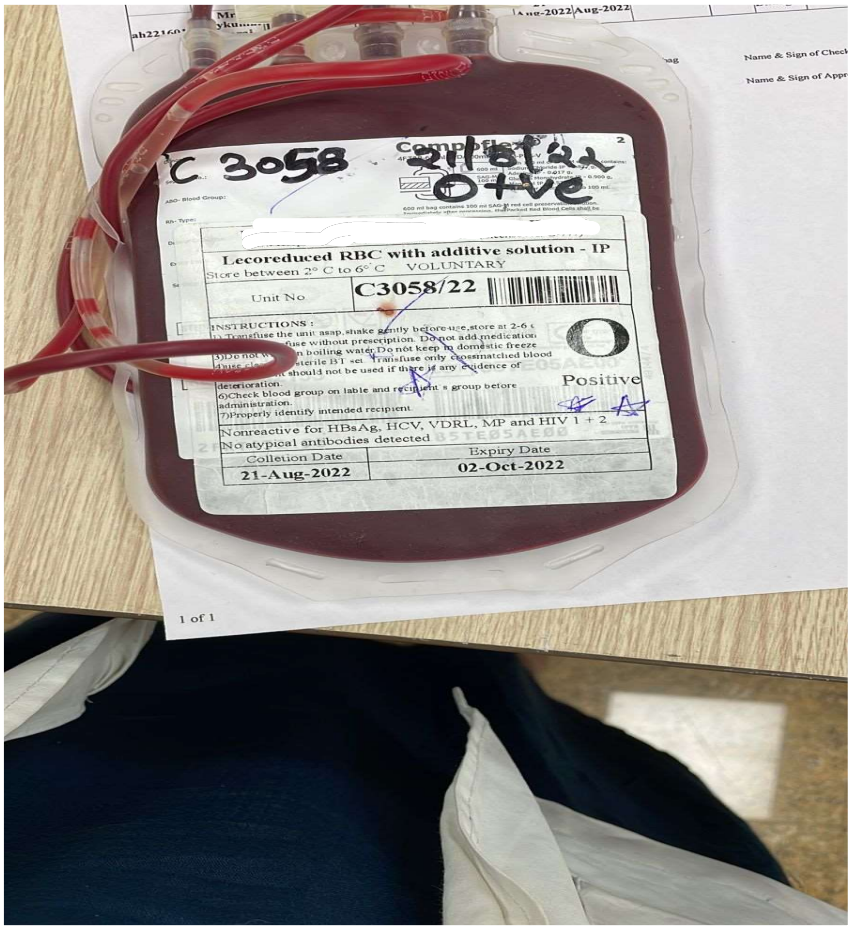
Double check at the time of issue

Blood group confirmation at the time of issue

Identify and entry of true component

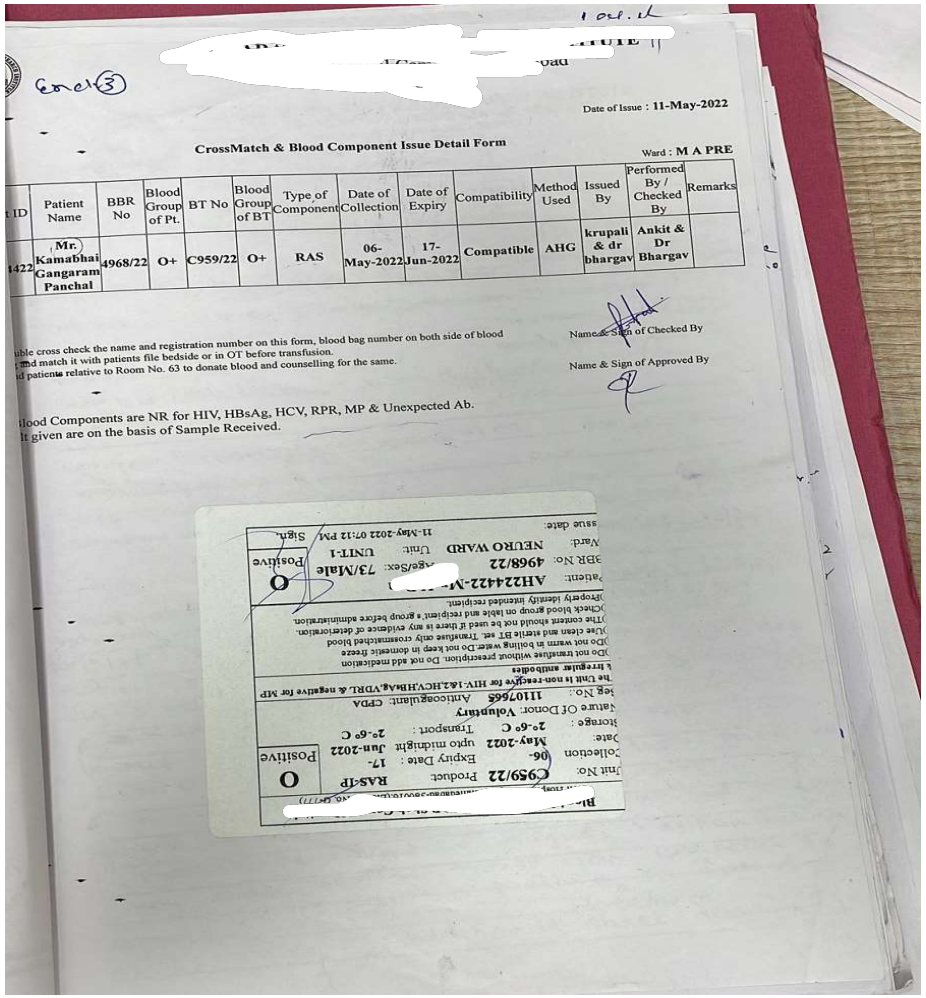
Use of RFID


Crossmatch Report Print
http://10.10.211.120/InfoHaematica/Forms/frmCrossmatchPrintMu...
Date of Issue : 29-Aug-2022
CrossMatch & Blood Component Issue Detail Form
Ward : ADULT WARD
Patient ID | Patient Name | BBR No | Blood Group of Pt. | BT No | Blood Group of BT | Type of Component | Date of Collection | Date of Expiry | Compatibility | Method Used | Issued By | Performed By / Checked By | Remarks
ah2216012 | Mr. Ajaykumar Ramraj Mehta | 15251/22 | O+ | C3048/22 | B+ | PC | 21-Aug-2022 | 26-Aug-2022 | | | inkal & Dr Bhargav |
Name & Sign of Checked By
Name & Sign of Approved By
All Blood Components are NR for HIV, HBsAg, HCV, RPR, MP & Unexpected Ab.
Result given are on the basis of Sample Received.
1 of 1
1:41 PM
B
Positive
C3048/22
Expiry Date 26-Aug-2022
20°-24° C
Anticoagulant: CPDA
Voluntary
O
Positive
AH2216012
15251/22
ADULT WARD
UNIT
Sign


C 3058
21/8/22
O+ve
Lecoreduced RBC with additive solution - IP
Store between 2° C to 6° C VOLUNTARY
Unit No C3058/22
INSTRUCTIONS :
O
Positive
Nonreactive for HBsAg, HCV, VDRL, MP and HIV 1 + 2
No atypical antibodies detected
Collection Date
21-Aug-2022
Expiry Date
02-Oct-2022
1 of 1
Name & Sign of Check
Name & Sign of Appr

Case 4…Wrong Transfusion at ward

RCA:
Failure to double check
Wrong patient identified
Same name patient admitted in ward- failure to check by two different ID points
CAPA..
Identification of patient by two staff by two ID point
Training



Date of Issue : **11-May-2022**

CrossMatch & Blood Component Issue Detail Form

Ward : **M A PRE**

t ID	Patient Name	BBR No	Blood Group of Pt.	BT No	Blood Group of BT	Type of Component	Date of Collection	Date of Expiry	Compatibility	Method Used	Issued By	Performed By / Checked By	Remarks
1422	Mr. Kamabhai Gangaram Panchal	4968/22	O+	C959/22	O+	RAS	06-May-2022	17-Jun-2022	Compatible	AHG	krupali & dr bhargav	Ankit & Dr Bhargav	

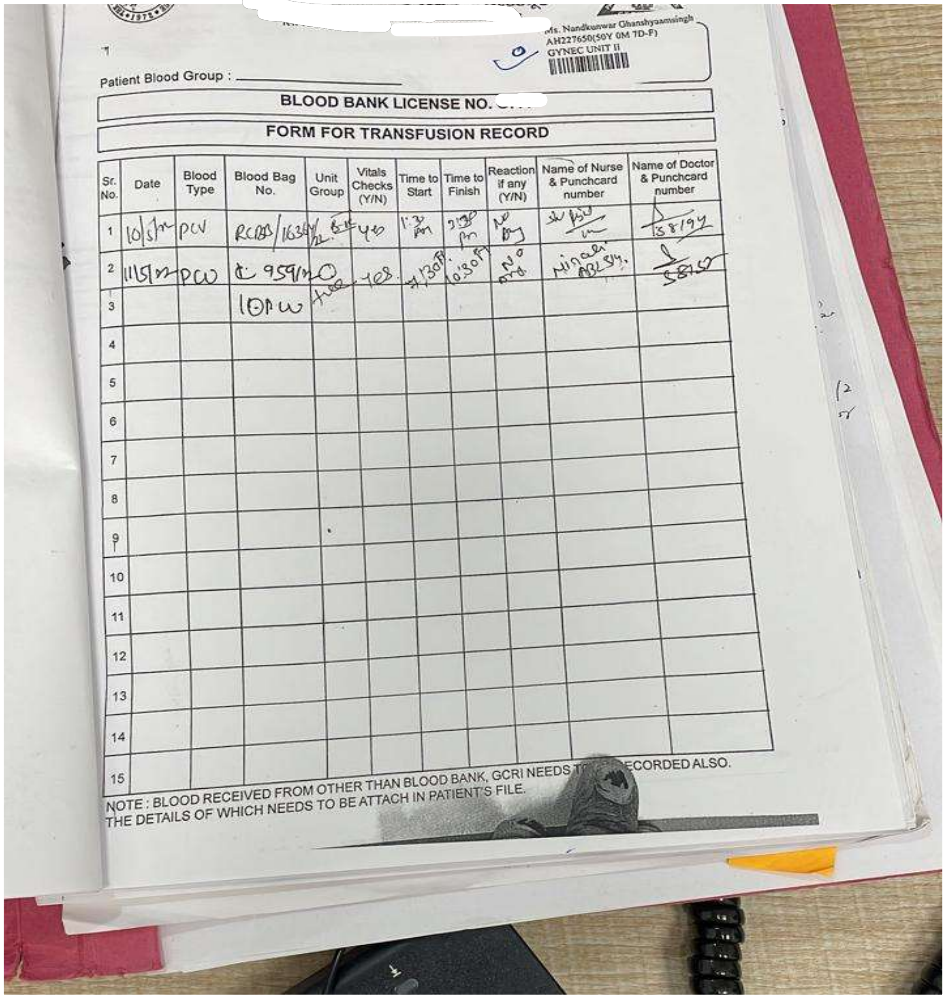
uble cross check the name and registration number on this form, blood bag number on both side of blood
nd match it with patients file bedside or in OT before transfusion.
d patients relative to Room No. 63 to donate blood and counselling for the same.

Name & Sign of Checked By

Name & Sign of Approved By

lood Components are NR for HIV, HBsAg, HCV, RPR, MP & Unexpected Ab.
lt given are on the basis of Sample Received.

Unit No:	C959/22
Collection Date:	06-May-2022
Storage :	20-6o C
Nature Of Donor:	Volunteer
Reg No.:	1110766S
	The Unit is non-reactive for HIV-1&2,HCV,HbsAg,VDRL & negative for MP
	& irregular antibodies
	Do not transfuse without prescription. Do not add medication
	Do not warm in boiling water. Do not keep in domestic freeze
	Use clean and sterile BT set. Transfuse only crossmatched blood
	The contents should not be used if there is any evidence of deterioration.
	Check blood group on table and recipient's group before administration.
	Properly identify intended recipient.
Patient:	AH224422-M... O
BBR No:	4968/22 Age/Sex: 73/Male Positive
Ward:	NEURO WARD Unit: UNIT-I
Issue date:	11-May-2022 07:12 PM Sign:



Mrs. Nandkunwar Ghanshyamsingh
AH227650(50Y 0M TD-F)
GYNEC UNIT II

Patient Blood Group : O

BLOOD BANK LICENSE NO.

FORM FOR TRANSFUSION RECORD

Sr. No.	Date	Blood Type	Blood Bag No.	Unit Group	Vitals Checks (Y/N)	Time to Start	Time to Finish	Reaction if any (Y/N)	Name of Nurse & Punchcard number	Name of Doctor & Punchcard number
1	10/5/22	PCV	RCBB/16349	O+	Y	1:30 pm	2:30 pm	No Dry		15819
2	11/5/22	PCV	C 959/22	O+	Y	11:30 A	10:30 A	No one	Ninad	15850
3			10 ml w							
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

NOTE : BLOOD RECEIVED FROM OTHER THAN BLOOD BANK, GCRI NEEDS TO BE RECORDED ALSO.
THE DETAILS OF WHICH NEEDS TO BE ATTACH IN PATIENT'S FILE.

Case 5

Double number of blood bags,

RCA

- Untrained staff
- Negligence

- **CAPA:**
- Barcoded stickers
- Training & experience

Case 6
Group differ in blood bag & sample

RCA;

Wrong lable

Failure to take sample donor side

Exchange of barcoded tube

Other … causes

Passing on the instruction
Temporary shut down of software- internet
Shifting of component from one storage to another
Expiry of bag if FIFO not followed
Temperature recording missed
SDP started without report
Missed urgent demand
Query solved of automation- entered manually
PC storage with PCV due to untrained staff
TTI positive blood Tx - serious

Other causes

- Therapeutic catheter prescription
- Leakage due to mishandling
- Stock verification as per sOP
- Blood bag in RC or Irradiator
- Mishandling of automation due to untrained staff
- LQ or hemolysed samples in use especially in automation
- 450 ml bag collected for less than 55 kg wt donor

Monitoring errors in blood bank immunohematology lab, implementing strategies for safe blood transfusion
Sudipta Das, GJTM 2017

Table 1: Types and sources of errors in pre-transfusion testing samples (*N*=164)

Errors types and sources	*n* (% of total errors)
Major	31 (18.9)
Clerical	27 (16.5)
Wrong name & ID on blood requisition and sample vials	8 (4.9)
Wrong name & ID on compatibility report and label	4 (2.4)
Wrong entry on issue register	15 (9.1)
Technical	4 (2.4)
Wrong sample in labelled vial	1 (0.6)
Failure to perform correct cross matching	1 (0.6)
Incorrect component issue	2 (0.12)
Minor	133 (81.1)
Clerical	118 (72)
Sample vials with name only	17 (10.4)
Sample vials with ID No. only	13 (7.9)
Samples without date	16 (9.8)
Hand written but non barcoded labels	6 (3.7)
Ineligible/overwritten labels	13 (7.9)
Sample and requisition mismatch	9 (5.5)
Incomplete requisition	26 (15.8)
Errors in component ordering	11 (6.7)
Failure to order special components	7 (4.3)
Technical	15 (9.1)
Failure to perform reverse grouping	3 (1.8)
Failure to perform cell washing	6 (3.7)
Failure to use fresh reagent red cells	5 (3)
Misinterpretation of result	1 (0.6)

Donor sample errors

Table 2: Types and sources of errors in donor samples (*N*=65)

Errors	*N* (%)
Minor errors	65 (100)
Clerical	42 (64.6)
Unlabelled samples	7 (10.8)
Transcription error in blood group register	35 (53.8)
Technical errors	23 (35.4)
Failure to perform reverse grouping	6 (9.2)
Failure to perform cell washing	11 (16.9)
Failure to perform Weak D test	4 (6.2)
Misinterpretation of result	2 (3.1)

Result & Conclusion…

- 72381 samples for patient compatibility and 43700 of donor ABO/Rh.229 errors in total, 0.43% for patient samples and 0.15% of donor samples.164 clerical errors-107 in night shift.

- Near miss event reporting can prevent potential transfusion associated mortality and morbidity caused by simple human ignorance. A good error reporting not only helps in accurate collection and analysis of data but also makes recommendations that improve transfusion safety.

Blood Transfusion Errors Within a Health System: A Review of Root Cause Analyses

Vol. 3 No. 2 (2021): Patient Safety—June 2021

- **Conclusion**
  These RCAs express great variation between VHA facilities, such as process created, number of staff reports, and number of RCAs completed. Lack of standard practices nationwide, training barriers, and technology barriers may explain the variation of transfusion errors throughout the VHA. This study brings to light questions about standardization of transfusion protocols. Future study regarding such standardization is necessary to determine its plausibility.

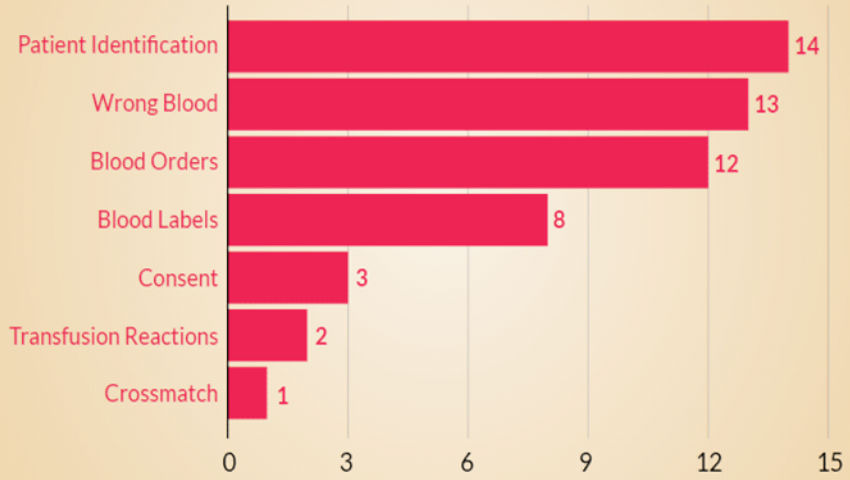
Blood Transfusion Errors Within a Health System: A Review of Root Cause Analyses

Oct 2014–Aug 2019

140 facilities report RCA (root cause analysis)

53 RCA and aggregated reviews included

RCA Event Types



Determined Root Causes:

- *Lack of a Process*
- *Technology Barriers*
- *Communication Barriers*
- *Training Barriers*
- *Low-Frequency Tasks*
- *No Standard Operating Procedure*
- *Complex Process*
- *Equipment Barriers*
- *Environment*
- *Multitasking*
- *No Defined Roles*
- *No Barrier to Prevent Harm*

Lancaster, E., Rhodus, E., Duke, M., & Harris, A. (2021). Blood Transfusion Errors Within a Health System: A Review of Root Cause Analyses. *Patient Safety,* 3(2), 78–91. https://doi.org/10.33940/med/2021.6.6

PSA PATIENT SAFETY

Error management in blood establishments: results of eight years of experience (2003–2010) at the Croatian Institute of Transfusion Medicine

Tomislav Vuk, Marijan Barišić, Tihomir Očić, Ivanka Mihaljević, Dorotea Šarlija, and Irena Jukić Blood Transfus. 2012 Jul; 10(3): 311–320. Published online 2012 Feb 22

Conclusion:

- This study shows that comprehensive management of errors, including near miss errors, can generate data on the functioning of transfusion services, which is a precondition for implementation of efficient corrective and preventive actions that will ensure further improvement of the quality and safety of transfusion treatment.

Monitoring errors in a blood bank immunohematology laboratory: Implementing strategies for safe blood transfusion

January 2017, Global Journal of Transfusion Medicine

Sudipta Sekhar Das

- Results: While a total of 72,381 patient samples were received for pretransfusion testing, 43,762 samples were from blood donors for ABO and Rh grouping. A total of 79782 blood components were issued to patients during the study. Out of 229 errors in the blood transfusion chain, 164 (0.22% of total requisitions and 0.21% of total component issued) were reported in patient pretransfusion samples, and 65 errors (0.15%) were reported in donor samples. Majority of the errors were clerical in nature and related to human errors. Of the 164 errors in pretransfusion testing samples, 107 (65.2) were observed in night shift. The overall error frequency per 1000 requisitions was 2.26.
- Conclusion: Near miss event reporting can prevent potential transfusion associated mortality and morbidity caused by simple human ignorance. A good error reporting not only helps in accurate collection and analysis of data but also makes recommendations that improve transfusion safety.

This is the wrong patient's blood!”: Evaluating a Near-Miss Wrong Transfusion Event

Sarah Barnhard, MD | January 29, 2020

- Transfusion System Infrastructure

1)Identify the patient with two unique identifiers.

2) Connect the patient identifiers to all prepared lab samples, tests, and blood products.

3) Deliver the right blood product to the right patient at the right time, confirming patient ID again.

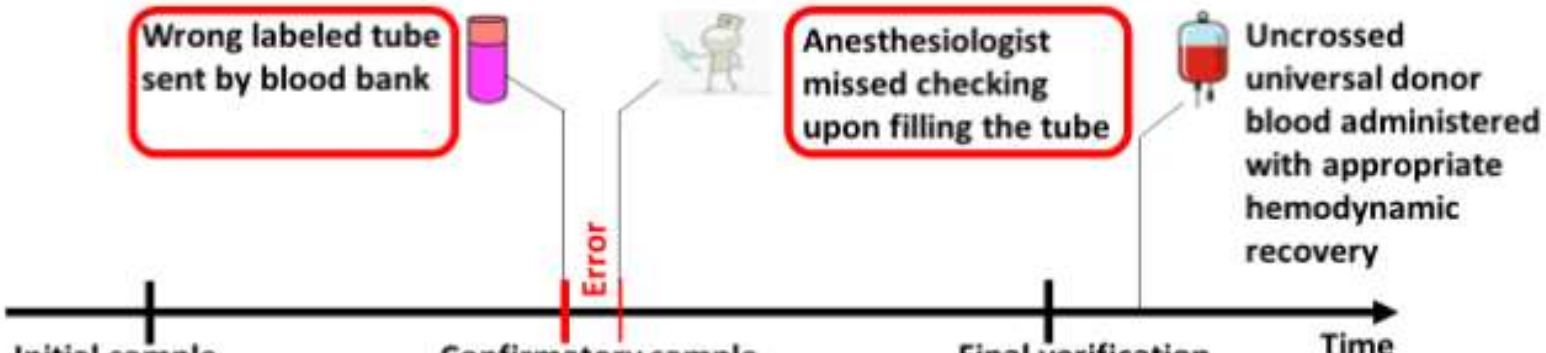
QMS…

.

- All requests for blood contain two independent identifiers of the intended recipient.
- 5.11.2 All patient blood sample labels include two independent identifiers and (5.11.2.1) the label is affixed to the container before the person who obtained the sample leaves the bedside.
- 5.12 The ABO group of each donor unit of red blood cells is confirmed through serologic testing before being placed in stock inventory.
- 5.14.1 The ABO group of the patient is determined by comparing the ABO antigens detected with the presence of expected anti-A and anti-B antibodies.
- 5.16.1 Before issue, a crossmatch demonstrates ABO compatibility.
- 5.16.2 If a computer crossmatch technique is used, two determinations of the recipient's ABO group must be made before transfusing non-group O red blood cell units.
- 5.14.5 The recipient's historical records for ABO group are reviewed before every unit issued.
- 5.23 At the time a unit is issued, two people verify the recipient ABO group and the donor ABO group.
- 5.28.3 After issue and immediately before transfusion, two people verify the ABO group of the recipient and the donor ABO group and confirm recipient identification in the presence of the recipient. One of these two staff members must be the person transfusing the blood.
- 5.14.1 If a discrepancy is identified in the ABO testing, only group O red blood cells are transfused until resolution.

Per FDA, AABB and the College of American Pathologists (CAP), the response to a near-miss high-risk patient safety event in transfusion services must include:

1. Notification of the appropriate accreditation and/or regulatory agencies if required; errors classified as blood product deviations (BPDs) must be reported within 45 calendar days to the FDA.[20]
2. A broad root cause analysis:
    1. Evaluate standard operating procedures to determine if revision is needed.
    2. Interview staff involved to determine what aspects of the system failed and why.
3. A documented corrective and preventative action plan (CAPA) submitted to laboratory leadership:
    1. Notify appropriate accreditation and/or regulatory agencies of CAPA if required.
    2. Retain the document for future inspections.



Case Event	Initial sample -Sent to Blood Bank type & cross	Confirmatory sample -Using tube sent from Blood Bank with premade label	Final verification -Discover wrong labeled blood!
Potential Errors	• Missing sample and/or test request • Wrong or missing identification • Inappropriate containers • Hemolyzed, clotted, and insufficient samples	• Missing sample and/or test request • Wrong or missing labeled samples • Missing identification checking • Inappropriate containers	• Missing sample and/or test request • Wrong or missing identification
Solutions	• Accreditation of technique training • Follow verification steps • Adequate staff training	• Follow verification steps • Adequate staff training • Consider bedside sample labeling	• Follow verification steps

Thank You