

Trauma is like a box of chocolates

**You never know what
you are going to get**

Irene Calvin MT(ASCP)

**BEEP BEEP BEEP
BEEP BEEP**

Do you know what day and time it is?

Trauma Stat Level 1 15yo male. Mode of injury MVC



1527 Trauma Pager goes off

1541 Emergency Blood Cooler Ordered

1548 2 RBC and 1 FFP leaves the blood bank in a cooler

1552 MTP ordered

NOOOOOO!

MTP ordered before patient arrived.

Perception



Reality



- 1556 Patient Arrives Verbal narrative
- 15 year old male restrained backseat passenger
- Head on high speed fatality collision. Patient ejected through windshield to hood of car.
- Pneumothorax decompressed and intubated at scene.
- Transported to nearest community hospital for stabilization. **Receives blood.**

Trauma Assessment:

Multiple lacerations and wounds at waist and hips. Laceration at back of scalp. Hypotensive, bloody chest Tube drainage, copious amounts of mucus suctioned from mouth., distended abdomen.

Difficulty establishing lines and drawing blood noted.

Emergency blood products from cooler started. Rapid ultrasound at 1611 identifies internal bleeding.

Bedside xrays at 1614 and 1621 reveal multiple fractures of spine, ribs.

Meanwhile in the blood bank.....



- BEEP BEEP BEEP BEEP BEEP
- 1630 Trauma stat level 1 15yo male mode of injury MVC

What's going on here?

No one has picked up the MTP blood for 40 minutes.

The page is going out again.

Still no patient samples.



Phone calls

Yes we still want the MTP. Currently using cooler blood. Patient headed to CT then OR.

Yes it's a 2nd Trauma, same accident twin brothers. 2nd boy not here yet.

Working on drawing labs



1640 Second Trauma cooler prepared for Trauma #2. Never picked up.

1702 Specimen Received for Trauma #2. Nothing yet for Trauma #1

1705 Runner arrives and takes MTP pack (5 RBC and 5 FFP) to OR.

1713 Specimen Received for Trauma #1

Trauma #1 Results:

Anti A	Anti B	Anti D	A1	B	Type	SC1	SC2	SC3	Interp
0	0	1+ mf	3	3	?	0	0	0	Neg

Phone call

Yes the patient was transfused in route from the community hospital
3 units O negative.



Trauma 1 Results

Anti A	Anti B	Anti D	A1	B	Type	SC1	SC2	SC3	Interp
0	0	1+ mf	3	3	O pos	0	0	0	Neg

1741 MTP pack 2 of 5 RBC 3 FFP and 1 PLT leaves

1753 Second Specimen drawn on Trauma 1. Same results.

1853 MTP officially stopped. Only PLT used from pack 2. Post operative report notes surgical repair of splenic laceration and 3 bowel perforations. **Total transfusions from us was 7 O neg RBC, 4 FFP and 1 platelet.** Trauma #2 used no products.

Following Days:

Day 2 Volume resuscitation with FFP for surgical drainage, low BP, elevated coags, high lactic acid levels. Surgery for more bowel resection and chest tube replacement. New type and screen with real patient name with same results. **5 FFP, 1 RBC (o pos) given.**

Day 3 Continued Volume resuscitation with plasma. Elevated coags, liver enzymes, BUN, creatinine, respiratory failure and worsening heart function. **6 FFP given.**

Day 4 Coags improved, Hgb and Platelets steady. Another surgery for bowel resection, but no blood used.

Day 5 Another type and screen done.

Anti A	Anti B	Anti D	A1	B	Interp	SC1	SC2	SC3	Interp
0	0	1+	4	4	O Pos	0	0	0	Neg

Abdominal washout performed. Fibrinopurulent fluid noted throughout abdomen.
Fluid leaking from staples.

Day 6 Patient Febrile. Blood pressure dropping. Cultures done. Platelet and FFP given

	Hgb	Plt	AST	ALT	Bili
Day 4 am	12.1	57	535	255	1.5
Day 5 am	12.0	49	437	239	2.1
Day 5 pm	10.8	56			

Day 7 Pseudomonas Aeruginosa in blood culture and Tracheal aspirate culture.

Labs day 6 and 7:

	Hgb	Plt	AST	ALT	Bili
Day 6	10.0	74	277	180	2.5
Day 7	10.6	99	226	179	3.5

Day 8 Scheduled Abdominal washout and Debridement. Full thickness necrosis of flank and large amounts of purulent debris. Blood products electronically crossmatched from day 4 specimen but none used.

Progress notes report Increased responsiveness and purposeful movement. Eyes opening.

Day 9 New Type and Screen drawn.

Anti A	Anti B	Anti D	A1	B	Interp	SC1	SC2	SC3	Interp
0	0	Wk+	4	4	O pos	0	2+	2+	Pos

Last RBC transfusion was day 3

AM labs look back

	Hgb	Plt	AST	ALT	Bili
Day 5	12.1	56	535	255	1.5
Day 7	10.0	74	277	180	2.5
Day 8	10.6	99	226	179	3.5
Day 9	11.7	158	116	150	2.4

Antigram

Cell #	Rh-hr	Donor Number	Rh-hr										KELL				DUFFY				KIDD	Ser Linked	LEWIS		MNS				P	LUTHERAN	Special Antigen Typing	Test Results						
			D	C	E	c	e	f	C ^w	V	K	k	Kp ^a	Kp ^b	Js ^a	Js ^b	Fy ^a	Fy ^b	Jk ^a	Jk ^b	Xg ^a	Le ^a	Le ^b	S	s	M	N	P ₁	Lu ^a	Lu ^b								
1	R1R1	314376	+	+	0	0	+	0	0	0	0	+	0	+	/	+	0	+	0	+	+	+	0	0	+	+	0	+	0	+	0	+						
2	R2R2	319963	+	0	+	+	0	0	0	0	0	+	0	+	/	+	+	0	+	+	0	0	+	+	0	+	0	+	0	+	0	+						
3	rr	319371	0	0	0	+	+	+	0	0	+	+	0	+	/	+	+	0	+	0	+	0	+	+	+	+	+	0	0	+								
	Patient Cells	-																																				

Shaded columns indicate those antigens which are destroyed or depressed by enzyme treatment.

Reagent Red Blood Cells
0.8% Surgiscreen®
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LOT NO.
VSS924

EXP. DATE
2017-08-15
CCYY-MM-DD

ANTIGRAM®
Antigen
Profile
635200621

"/" represents "Not Tested" for new donors.

80% in use
7/18/17 R

Need 3 RBC Immediate Surgery, Now!!!!!!!!!!!!



Specimen sent to IRL for stat workup. Random gel crossmatching started.

11 units total crossmatched

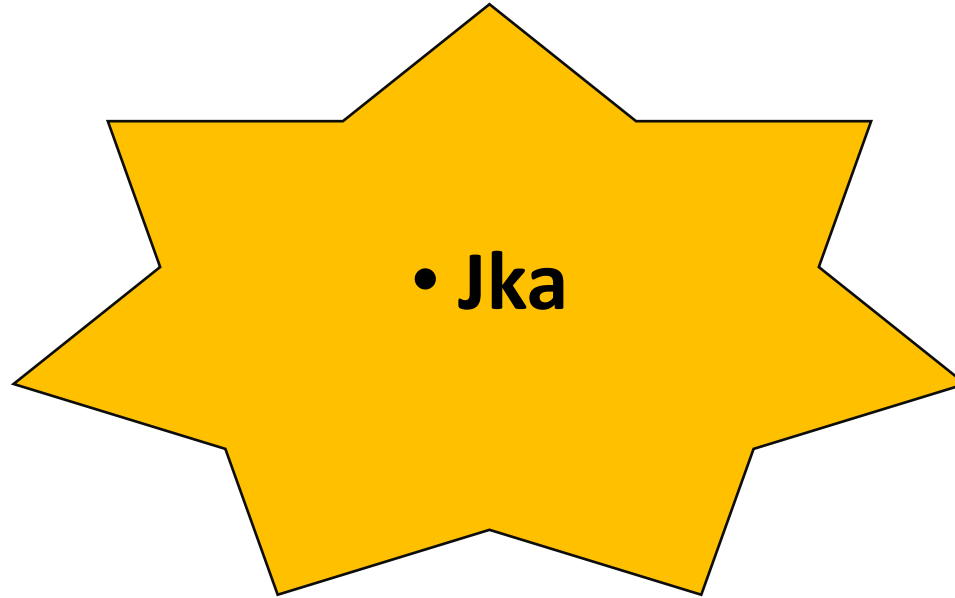
8 units incompatible

3 units compatible

Any guesses????????????????

No blood products used in OR

Results from IRL



4 units O pos Jka neg blood delivered and crossmatched compatible

Jka quick facts

- Found on RBC membranes and kidneys
- Prevalence: 77% Caucasian, 92% Black, 72% Asian
- Reactivity: Antihuman Globulin phase, enhanced by enzymes, expresses dosage
- Transfusion Reactions: More often extravascular, but does has the ability to bind complement and cause intravascular hemolysis.
- HDN: mild to moderate
- Unique capability: Antibody can drop to very low or undetectable levels after exposure

Day 10 All quiet for blood bank

Day 11 Another exploratory surgery and abdominal washout. 4 RBC ordered **2 O pos Jka negative units transfused.**

Type and Screen drawn post surgery.

Anti A	Anti B	Anti D	A1	B	Interp	SC1	SC2	SC3	Interp
0	0	2	4	4	O pos	0	2	2	Positive

Day 12 OR again for wound debridement. Cultures grow Pseudomonas, Enterococcus faecalis and Coagulase negative staphylococcus. Post operative Hgb 6.4 **1 unit RBC O pos Jka negative given**

AM LABS

	HGB	PLT	Bili
Day 13	7.6	559	1.7
Day 14	7.2	759	0.7
Day 15	7.6	1229	0.7

Day 15 New Type and Screen

Anti A	Anti B	Anti D	A1	B	Interp	SC1	SC2	SC3	Interp
0	0	3	4	4	O Pos	0	1	0	Pos

More surgery for wound debridement. 1 unit O pos Jka neg unit given post op. Hgb 8.1

More AM labs

	Hgb	AST	ALT	Bili
Day 16	7.5	45	69	0.8
Day 17	6.6	50	78	0.7

Day 17 More surgery for bowel resection, Ileostomy and tracheostomy. 4 units ordered.
1 unit O pos Jka neg given prior to surgery. Post op hgb. 10.8

	Hgb	AST	ALT	Bil
Day 18	8.2	130	55	1.4
Day 19	7.8	87	55	1.1

Day 19 Type and Screen 2 units ordered for OR

Anti A	Anti B	Anti D	A1	B	Interp	SC1	SC2	SC3	Interp
0	0	4	4	4	O Pos	2	3	0	Pos



Usual Suspects K Fya S are negative for SC1. Jkb? C and E combo on Rh pos patient?

			Rh-hr										KELL				DUFFY				KIDD	Sex Linked	LEWIS			MNS				P	LUTHERAN		Special Antigen Typing	
Cell #	Rh-hr	Donor Number	D	C	E	c	e	f	C ^w	V	K	k	Kp ^a	Kp ^b	Js ^a	Js ^b	Fy ^a	Fy ^b	Jk ^a	Jk ^b	Xg ^a	Le ^a	Le ^b	S	s	M	N	P ₁	Lu ^a	Lu ^b				
1	R1R1	314376	+	+	0	0	+	0	0	0	0	+	0	+	/	+	0	+	0	+	+	+	0	0	+	+	0	+	+	0	+	0	+	
2	R2R2	319963	+	0	+	+	0	0	0	0	0	+	0	+	/	+	+	0	+	+	0	0	+	+	0	+	0	+	+	0	+	0	+	
3	rr	319371	0	0	0	+	+	+	0	0	+	+	0	+	/	+	+	0	+	0	+	0	+	+	+	+	+	+	0	0	+			
	Patient Cells																																	

Shaded columns indicate those antigens which are destroyed or depressed by enzyme treatment.

Ortho Clinical Diagnostics

Reagent Red Blood Cells
0.8% Surgiscreen®
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LOT NO.
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ANTIGRAM®
Antigen
Profile
635200621

80%

2 O neg Jka negative units on the shelf are compatible. We take a close look at the history

DAY	Anti A	Anti B	Anti D	A1	B	Interp	SC1	SC2	SC3	Interp
0	0	0	1+mf	3	3	O pos	0	0	0	Neg
Day 5	0	0	1+mf	4	4	O pos	0	0	0	Neg
Day 8	0	0	wk	4	4	O pos	0	2+	2+	~Jka
Day 11	0	0	2+	4	4	O pos	0	2+	2+	No chg
Day 15	0	0	3+	4	4	O pos	0	1+	0	< stgth

We notice that the anti D only got stronger after receiving 5 O pos RBC between days 9 and 13

Could he be O neg and received O pos emergency blood in transport? His twin is O neg.



Calling the community hospital blood bank confirms patient typed as O negative and received 2 O pos RBC emergency units in addition to 1 O neg RBC

Meanwhile in OR, things are going well. No signs of infection.
Ostomy looks healthy. No blood given.



Specimen sent to IRL with newly discovered information. IRL confirms anti D.

Genotyping requested and confirms patient is O negative.

Remainder of stay:

Day 20 Patient is alert and interactive

Day 23 Wound closure surgery. Type and screen done. **One phenotypically matched O Neg RBC used.**
Last unit given!

7 more surgeries for skin grafts and wound therapy. Continual improvement noted in therapy notes.

Remaining Types and Screens:

	Anti A	Anti B	Anti D	A1	B	Interp	SC1	SC2	SC3	Interp
Day 36	0	0	2	4	4		2	3	0	
Day 40	0	0	2	4	4		1	2	0	
Day 46	0	0	1	4	4		1	2	0	

Day 55 Discharged to home state for continued care. 22 surgeries and 35 blood products used.
17 RBC (9 O neg and 8 O pos), 16 FFP, and 2 Platelets Transfused.

Conclusions:

1. Twins in a Trauma are confusing.
2. Always investigate 1+ or weak anti D even if you think you have the answer.
3. Sometimes antibodies play by the rule book, sometimes they don't.
4. Delayed transfusion reactions can be masked by other issues and go unnoticed.
5. Seatbelts save lives, but can also be the source of serious injury.