ISABB Case Study
Winter 2010

Otto Know

History: Patient arrives at the facility into the ER. The patient has been seen by the blood bank on a monthly basis transfused through the Oncology Clinic. The patient's H/H are currently 5/15 and the patient is SOB. He is put on oxygen support pending urgent transfusion.

Sex: M
Race: Caucasian
Diagnosis: CHF, Emphysema

Transfusion History:

- Multiple transfusions
- Last Transfusion 1 month ago

Currently: 4 units ordered to transfuse

Pre-transfusion testing reveals that the patient is Group B, Rh Negative.

	Blood group system	Rh					MNSs				P	Lewis		Kell		Duffy		Kidd		Lutheran		PEG/IgG
		D	C	E	c	e	M	N	S	s	P_1	Le^a	Le^b	K	k	Fy^a	Fy^b	Jk^a	Jk^b	Lu^a	Lu^b	
1	R_1R_1	+	+	0	0	+	+	+	0	+	+	+	0	+	+	+	+	+	0	0	+	2+
2	R_2R_2	+	0	+	+	0	0	+	+	+	+	0	+	0	+	+	0	0	+	0	+	0√
3	rr	0	0	0	+	+	+	0	+	0	0	0	+	0	+	0	+	+	+	+	0	2+
	Auto control																					$+^w$

DAT results

Poly	$+^w$
IgG	$+^w$
C3	$+^w$
Saline control	0✓

Reference
Rodack JD, et al. Technical Manual, 16th Edition. AABB, Bethesda, MD. 2008

Initial Panel Testing **Serum testing and since DAT is positive, eluate testing.**

	Blood group system	Rh					MNSs				P	Lewis		Kell		Duffy		Kidd		Lutheran		IS	PEG/IgG	Eluate
		D	C	E	c	e	M	N	S	s	P_1	Le^a	Le^b	K	k	Fy^a	Fy^b	Jk^a	Jk^b	Lu^a	Lu^b			
1	R1R1	+	+	0	0	+	+	0	+	0	+	0	+	0	+	+	+	+	+	0	+	0	1+	4+
2	R1R1	+	+	0	0	+	+	+	0	+	+	0	+	0	+	+	+	+	0	0	+	0	1+	4+
3	R2R2	+	0	+	+	0	0	+	0	+	+	0	+	0	+	0	+	0	+	0	+	0	0√	2+
4	R2R2	+	0	+	+	0	+	0	+	0	+	+	0	+	+	+	0	+	0	0	+	0	0√	2+
5	RzR2	+	+	+	+	0	+	0	+	0	+	0	+	0	+	0	+	+	+	0	+	0	0√	2+
6	rr	0	0	0	+	+	+	+	0	+	0	0	+	0	+	+	0	0	+	0	+	0	1+	4+
7	rr	0	0	0	+	+	+	+	+	+	+	0	+	0	+	+	+	+	0	0	+	0	1+	4+
8	rr	0	0	0	+	+	0	+	0	+	+	+	0	0	+	+	0	0	+	0	+	0	1+	4+
9	R1R1	+	+	0	0	+	+	+	+	+	+	+	0	0	+	0	+	0	+	0	+	0	1+	4+
10	R0r	+	0	0	+	+	+	+	0	+	0	0	0	0	+	0	0	+	0	+	+	0	1+	4+
11	rr	0	0	0	+	+	+	0	+	+	+	0	+	+	+	0	+	+	+	0	+	0	1+	4+
																						DAT Negative Autologous red cells**	1+	4+

**Autologous cells harvested by microhematocrit centrifugation were DAT negative.

Reference
Rodack JD, et al. Technical Manual, 16th Edition. AABB, Bethesda, MD. 2008

1. What is the most likely conclusion from this panel?

Suggestive of warm autoantibody with a preference for e+ cells

- It is a warm autoantibody because
  - The patient's retics (last row on panel) are reactive with the patient's eluate and serum.
- Eluate stronger with e+ cells compared to e- cells.
- Serum non-reactive with e- cells.

What would you do next?

Perform a complete phenotype

- Patient types as e+
- This confirms the evidence that patient's sample demonstrates an autoantibody with a preference for e+ cells.

	C	E	c	e	M	N	S	s	P_1	Le^a	Le^b	K	Fy^a	Fy^b	Jk^a	Jk^b
Patient B	0	0	+	+	+	+	+	+	+	0	+	0	0	+	0	+

3. What is the most likely conclusion

- Verify all common alloantibodies are excluded at AHG.
  - Anti-C cannot be excluded homozygously and may be honored for provision of blood.

4. How to provide blood for this patient

Crossmatch testing with PeG-AHG

	PeG-IgG	Interpretation
Unit 1 – B, D Negative	1+	Least Incompatible
Unit 1 – B, D Negative	1+	Least Incompatible
Unit 1 – B, D Negative	1+	Least incompatible
Unit 1 – B, D Negative	1+	Least incompatible

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Summary and Discussion

In many cases of warm autoimmune hemolytic anemia (WAIHA), the autoantibody demonstrated in the serum has no apparent preference. When an autoantibody demonstrates an apparent specificity, most often they are in the Rh system. In the Rh system, D, C, E, c and e relative autoantibody specificities have been documented in the literature. Autoantibody specificity is assigned if an apparent pattern of an alloantibody is demonstrated (for example anti-C), while the patient possesses the same antigen (C+). Warm autoantibody preference is not limited to the Rh system. Other specificities that have been reported include, but are not limited to; the Kell, LW, Kidd, Duffy, Ge, Lan and Diego blood group systems. This is case study is an example of a warm autoantibody with a preference for e+ cells. This preference is apparent since the patient's serum and eluate demonstrate a pattern of anti-e, but the patient's red cells were confirmed as e+.

Selection of blood for this patient is a challenge.

If	Then
Give D-e-	The blood would be compatible. • Blood not generally available. • If one would want to honor the e antigen for provision of blood for this patient, it would require an extremely rare D-e- (r"r") unit, or one would have to give a D+e- unit thus exposing the patient to the D antigen.
Give D+e-	The blood would be compatible • Blood is available, but D+e- blood is only 2% of the population and may or may not be readily available. • By giving D+ blood, you have exposed the patient to the D antigen, and they may make anti-D
Give D-e+	The blood would be least incompatible. • Blood is available, but the crossmatch is reactive due to the autoantibody. In the presence of an autoantibody, the donor blood will have the same survival as the patient's own cells. Transfusion of patients with warm autoantibodies is known to stimulate increased production of auto or alloantibodies. • By giving D- blood, you will not expose the patient to the D antigen. • The patient is e+, so the blood matches the patient's red cell phenotype.

So, if this patient came to your facility. What unit would you request? It's up to your facility to weigh the advantages and disadvantages for each patient with an autoantibody.

Reference
Rodack JD, et al. Technical Manual, 16th Edition. AABB, Bethesda, MD. 2008