



Transfusion Medicine

Immunohematology II

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2/5/2019, LLUMC

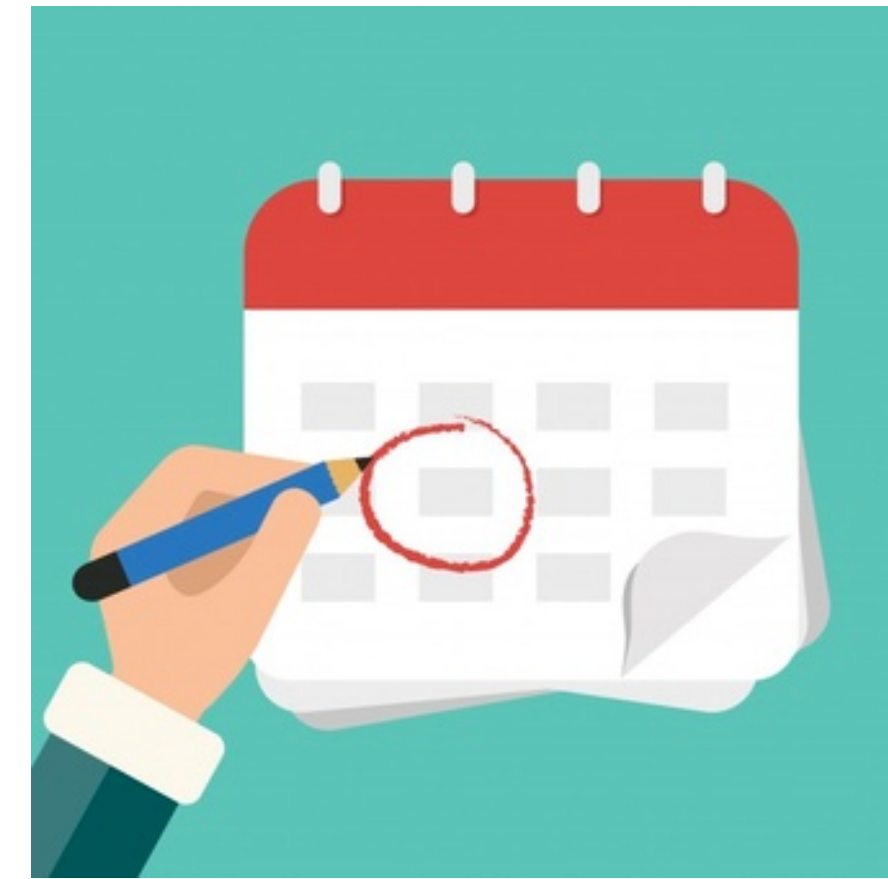


	Tube (PEG)		
	IS	37C	IAT
1	3+	NH	0
2	0	NH	3+
3	0	NH	0
4	0	NH	3+
5	0	NH	0
6	0	NH	0
7	0	NH	0
8	3+	NH	0
9	3+	NH	0
10	3+	NH	0
11	0	NH	0
AC	0	NH	0

Cell	Donor	Rh-Hr						Kell				Duffy		Kidd		Lewis		P	MN				Lutheran		Xg				
		D	C	c	E	e	V	C ^w	K	k	Kp ^a	Kp ^b	Js ^a	Js ^b	Fy ^a	Fy ^b	JK ^a	JK ^b	Le ^a	Le ^b	P ₁	M	N	S	s	Lu ^a	Lu ^b	Xg ^a	
I	R1R1	+	+	0	0	+	0	0	+	+	0	+	0	+	+	+	0	+	0	+	0	+	0	+	0	+	+	+	4+
II	R2R2	+	0	+	+	0	0	0	0	+	0	+	+	0	+	+	+	0	0	+	0	+	0	+	0	+	+	+	4+
III	rr	0	0	+	0	+	0	0	+	+	0	+	0	+	+	0	0	+	0	+	0	+	0	+	0	+	+	0	

What to Expect

- Today: Immunohematology II
- 3/5: Blood Products and Their Uses
- 3/19: Transfusion Reactions





Patterns

GEL			
	IAT		
1	3+		
2	0		
3	0		
4	3+		
5	0		
6	3+		
7	0		
8	0		
9	3+		
10	0		
11	0		
AC	0		

GEL			
	IAT		
1	3+		
2	2+		
3	0		
4	3+		
5	0		
6	4+		
7	0		
8	0		
9	3+		
10	0		
11	0		
AC	0		

Tube (PEG)			
	IS	37C	IAT
1	3+	NH	0
2	0	NH	3+
3	0	NH	0
4	0	NH	3+
5	0	NH	0
6	0	NH	0
7	0	NH	0
8	3+	NH	0
9	3+	NH	0
10	3+	NH	0
11	0	NH	0
AC	0	NH	0

Tube (LISS)			
	IS	37C	IAT
1	1+	0	0
2	2+	0	0
3	0	0	0
4	2+	0	0
5	1+	0	0
6	1+	0	0
7	0	0	0
8	2+	0	0
9	1+	0	0
10	0	0	0
11	0	0	0
AC	0	0	0

Solid Phase			
	IAT		
1	3+		
2	3+		
3	3+		
4	3+		
5	3+		
6	3+		
7	3+		
8	3+		
9	3+		
10	3+		
11	3+		
AC	3+		

Solid Phase			
	IAT		
1	3+		
2	3+		
3	3+		
4	3+		
5	3+		
6	3+		
7	3+		
8	3+		
9	3+		
10	3+		
11	3+		
AC	0		

GEL			
	IAT		
1	2+		
2	0		
3	2+		
4	1+		
5	2+		
6	1+		
7	0		
8	0		
9	0		
10	0		
11	1+		
AC	1+ (mf)		



What's the Pattern?

- A. Warm autoantibody
- B. Single warm-reacting alloantibody
- C. Antibody vs. recently transfused RBCs
- D. Antibody vs. high-frequency antigen
- E. Antibody vs. low-frequency antigen
- F. Multiple warm-reacting alloantibodies
- G. Multiple warm and cold alloantibodies
- H. Single cold-reacting alloantibody





Patterns

Uniform, warm

+ and -, Neg AC

B Single warm alloAb

GEL			
	IAT		
1	3+		
2	0		
3	0		
4	3+		
5	0		
6	3+		
7	0		
8	0		
9	3+		
10	0		
11	0		
AC	0		

Variable, warm

+ and -, Neg AC

F Multiple alloAb
(or single w dosage)

GEL			
	IAT		
1	3+		
2	2+		
3	0		
4	3+		
5	0		
6	4+		
7	0		
8	0		
9	3+		
10	0		
11	0		
AC	0		

Variable, warm/cold

+ and -, Neg AC

G Warm-cold alloAb

Tube (PEG)			
	IS	37C	IAT
1	3+	NH	0
2	0	NH	3+
3	0	NH	0
4	0	NH	3+
5	0	NH	0
6	0	NH	0
7	0	NH	0
8	3+	NH	0
9	3+	NH	0
10	3+	NH	0
11	0	NH	0
AC	0	NH	0



Patterns

Sl. variable, cold

+ and -, Neg AC

H Single cold alloAb

Tube (LISS)			
	IS	37C	IAT
1	1+	0	0
2	2+	0	0
3	0	0	0
4	2+	0	0
5	1+	0	0
6	1+	0	0
7	0	0	0
8	2+	0	0
9	1+	0	0
10	0	0	0
11	0	0	0
AC	0	0	0

Uniform, warm

All + with +AC

A Warm autoAb

Solid Phase			
	IAT		
1	3+		
2	3+		
3	3+		
4	3+		
5	3+		
6	3+		
7	3+		
8	3+		
9	3+		
10	3+		
11	3+		
AC	3+		

Uniform, warm

All + with -AC

D AlloAb vs Hi Freq Ag

Solid Phase			
	IAT		
1	3+		
2	3+		
3	3+		
4	3+		
5	3+		
6	3+		
7	3+		
8	3+		
9	3+		
10	3+		
11	3+		
AC	0		



Patterns

Sl. variable, warm

+ and -, + AC (mf)

C AlloAb, recent Tx

GEL			
	IAT		
1	2+		
2	0		
3	2+		
4	1+		
5	2+		
6	1+		
7	0		
8	0		
9	0		
10	0		
11	1+		
AC	1+ (mf)		

Isolated, warm

Only 1+, Neg AC

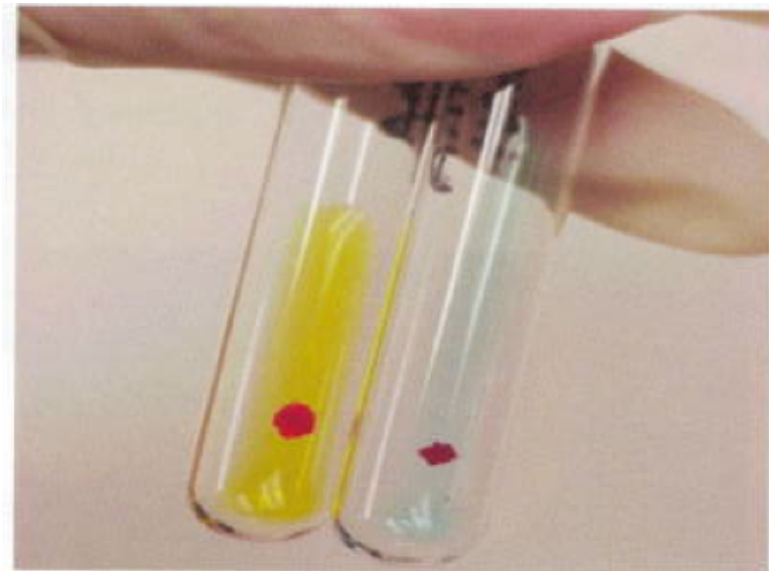
E AlloAb vs Low-freq Ag

Solid Phase			
	IAT		
1	0		
2	0		
3	0		
4	2+		
5	0		
6	0		
7	0		
8	0		
9	0		
10	0		
11	0		
AC	0		



Case 1

25 year old G2P1 female presents for routine prenatal testing at 28 weeks.



Anti-A	Anti-B	Anti-D	Control	A1 cells	B cells
4+	0	4+	0	2+	4+

What do you think is going on?

How do we resolve?



ANSWER

- ABO Discrepancy (extra reaction in reverse group with 2+ on A1 cells)
- Most likely A2 blood group with anti-A1
- Use lectin of *Dolichos biflorus* flower (anti-A1 lectin) to show patient is not A1



Group A Subgroups

- **A₁** (80%) and **A₂** (~20%)
 - A₁ has 5x more A antigen than A₂
 - 1-8% A₂, 25% A₂B form **anti-A₁**
 - ✓ Insignificant unless at 37 C
 - *Dolichos biflorus* lectin + with A₁ not A₂



★ H
★ A

Cell Group		Serum Group	
Anti-A	Anti-B	A1 RBC	B RBC
4+	0	2+	4+



Case 1

25 year old G2P1 female presents for routine prenatal testing at 28 weeks.

		Rh							Kell					Kidd		Duffy		Lewis		MNS				P	Luth.		Results					
Cell	Rh-hr	D	C	E	c	e	f	C ^w	K	k	Kp ^a	Kp ^b	Js ^a	Js ^b	Jk ^a	Jk ^b	Fy ^a	Fy ^b	Le ^a	Le ^b	M	N	S	s	P1	Lu ^a	Lu ^b		IS	37C	AHG	
1	R1R1	+	+	0	0	+	0	0	+	+	0	+	0	+	0	+	0	+	0	+	+	+	+	+	0	+	1	0	0	0	✓	
2	R2R2	+	0	+	+	0	0	0	0	+	0	+	0	+	0	+	+	0	+	+	0	+	0	+	0	+	2	0	2+	3+		
3	rr	0	0	0	+	+	+	0	0	+	0	+	0	+	+	0	+	0	+	0	+	0	+	0	0	+	3	0	2+	3+		

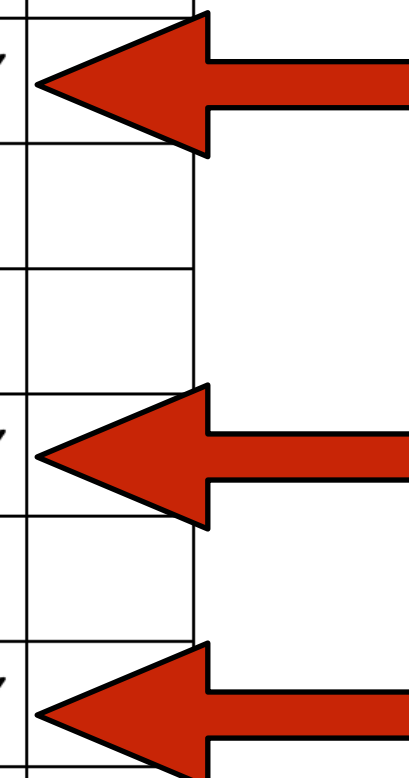


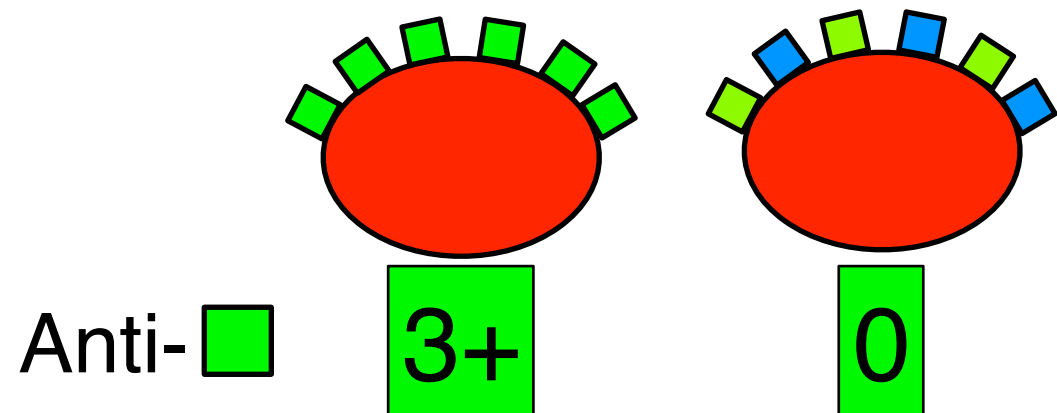
- Check AC
- Pattern
- Use negatives

Case 1

25 year old G2P1 female presents for routine prenatal testing at 28 weeks.

Cell	Rh-hr	Rh							Kell					Kidd		Duffy		Lewis		MNS				P	Luth.		Results				
		D	C	E	c	e	f	C ^w	K	k	Kp ^a	Kp ^b	Js ^a	Js ^b	Jk ^a	Jk ^b	Fy ^a	Fy ^b	Le ^a	Le ^b	M	N	S	s	P1	Lu ^a	Lu ^b		IS	37C	AHG
1	R1R1	+	+	0	0	+	0	0	0	+	0	+	0	+	0	+	0	+	0	+	+	+	+	0	0	+	1	0	0	0 ✓	
2	rr	0	0	0	+	+	+	0	+	+	0	+	0	+	0	+	+	0	+	+	0	+	0	+	0	+	2	0	2+	3+	
3	rr	0	0	0	+	+	+	0	+	0	0	+	0	+	0	+	+	0	0	0	+	0	+	+	0	+	3	0	2+	3+	
4	R1R1	+	+	0	0	+	0	0	0	+	0	+	0	+	+	+	+	0	0	+	0	+	+	0	0	+	4	0	0	0 ✓	
5	<u>r'r</u>	0	0	+	+	+	+	0	0	+	0	+	0	+	0	+	0	+	+	+	0	+	0	0	+	5	0	2+	3+		
6	r'r'	0	+	0	0	+	0	0	+	+	0	+	0	+	+	+	+	0	0	+	+	0	+	+	0	+	6	0	0	0 ✓	
7	R2R2	+	0	+	+	0	0	0	0	+	0	+	0	+	0	0	+	0	+	0	+	0	+	0	0	+	7	0	2+	3+	
8	rr	0	0	0	+	+	+	0	0	+	0	+	0	+	0	+	0	0	+	+	0	+	0	+	0	+	8	0	2+	3+	
9	R1r	+	+	0	+	+	+	0	0	+	0	+	0	+	0	0	+	+	0	+	+	0	+	+	0	+	9	0	0	3+	
10	R2R2	+	0	+	+	0	0	0	0	+	0	+	0	+	0	+	0	+	0	0	+	+	+	+	0	+	10	0	2+	3+	
11	R0R0	+	0	0	+	+	+	0	0	+	0	+	0	+	+	+	0	0	0	+	0	+	0	0	+	0	+	11	0	2+	3+
																											AC	0	0	0 ✓	





Cross-outs/Rule-outs

Jk^a	Jk ^b	IS	37°C	IAT
+	0	0	0	0
+	+	0	0	0
0	+	0	0	3+

Two red arrows point to the right from the right side of the table, one pointing to the first row and one pointing to the second row.



- Check AC
- Pattern
- Use negatives

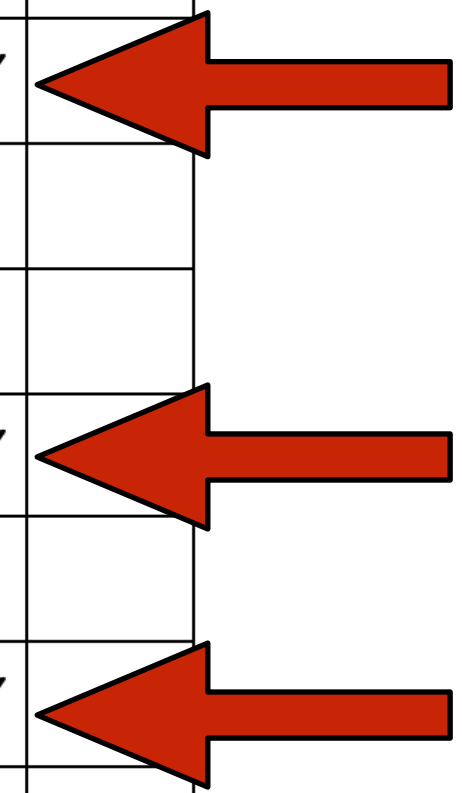
Case 1

Cell	Rh-hr	Rh							Kell					Kidd		Duffy		Lewis		MNS				P		Luth.		Results				
		D	C	E	c	e	f	C ^w	K	k	Kp ^a	Kp ^b	Js ^a	Js ^b	Jk ^a	Jk ^b	Fy ^a	Fy ^b	Le ^a	Le ^b	M	N	S	s	P1	Lu ^a	Lu ^b	IS	37C	AHG		
1	R1R1	+	+	0	0	+	0	0	+	+	0	+	0	+	0	+	0	+	+	+	+	+	+	+	+	0	+	+	1	0	0	0 ✓
2	R2R2	+	0	+	+	0	0	0	+	0	+	0	+	+	0	+	+	0	+	+	0	+	+	+	0	+	+	2	0	2+	3+	
3	rr	0	0	0	+	+	0	0	+	0	+	0	+	+	0	+	+	0	0	0	+	+	+	0	+	+	3	0	2+	3+		

25 year old G2P1 female presents for routine prenatal testing at 28 weeks.

ANSWER:
 -Consider -E, -c,
 -Jka, -S
 -Fyb ruled out
 by screen cell 1
 -Ignore rare ones
 (Kpa etc)
 -Ignore colds
 (Leb, N)

Cell	Rh-hr	Rh							Kell					Kidd	Duffy	Lewis	MNS				P	Luth.	Results										
		D	C	E	c	e	f	C ^w	K	k	Kp ^a	Kp ^b	Js ^a	Js ^b	Jk ^a	Jk ^b	Fy ^a	Fy ^b	Le ^a	Le ^b	M	N	S	s	P1	Lu ^a	Lu ^b	IS	37C	AHG			
1	R1R1	+	+	0	0	+	0	0	+	+	0	+	0	+	0	+	0	+	+	+	+	+	+	+	+	0	0	+	+	1	0	0	0 ✓
2	rr	0	0	0	+	+	+	0	+	0	+	0	+	+	0	+	+	0	+	+	0	+	+	+	0	+	+	2	0	2+	3+		
3	rr	0	0	0	+	+	+	0	+	0	+	0	+	+	0	+	+	0	0	0	+	+	+	0	+	+	3	0	2+	3+			
4	R1R1	+	+	0	0	+	0	0	+	0	+	0	+	+	+	+	+	0	0	+	0	+	+	+	0	0	+	+	4	0	0	0 ✓	
5	r'r	0	0	+	+	+	+	0	0	+	0	+	0	+	0	+	0	+	+	+	0	+	0	+	0	+	5	0	2+	3+			
6	r'r'	0	+	0	0	+	0	0	+	+	0	+	+	+	+	+	+	0	0	+	+	0	+	+	0	+	6	0	0	0 ✓			
7	R2R2	+	0	+	+	0	0	0	+	0	+	0	+	+	0	0	+	0	+	0	+	0	+	0	+	7	0	2+	3+				
8	rr	0	0	0	+	+	+	0	0	+	0	+	0	+	+	0	0	+	+	0	+	0	+	0	+	8	0	2+	3+				
9	R1r	+	+	0	+	+	+	0	0	+	0	+	+	0	0	+	+	0	+	+	0	+	+	0	+	9	0	0	3+				
10	R2R2	+	0	+	+	0	0	0	0	+	0	+	+	0	+	0	+	0	0	+	+	+	+	0	+	10	0	2+	3+				
11	R0R0	+	0	0	+	+	+	0	0	+	0	+	+	+	0	0	0	+	0	+	0	0	+	0	+	11	0	2+	3+				
																										AC	0	0	0	0 ✓			



My mistake:
Should have been 2+



Case 1

- Check AC
- Pattern
- Use negatives
- Match positives

25 year old G2P1 female presents for routine prenatal testing at 28 weeks.

Ab?

Anti-c

Rh Gtype?

R1R1

Dad is Rh neg... Uh-oh?

Dad prob rr, so HDFN unlikely

Cell	Rh-hr	Rh						Kell				Kidd	Duffy	Lewis	MNS			P	Luth.	Results												
		D	C	E	c	e	f	C ^w	K	k	Kp ^a	Kp ^b	Js ^a	Js ^b	Jk ^a	Jk ^b	Fy ^a	Fy ^b	Le ^a	Le ^b	M	N	S	P1	Lu ^a	Lu ^b	IS	37C	AHG			
1		+	+	0	0	+	0	0	0	+	0	+	0	+	0	+	+	0	+	+	0	+	+	0	0	+	1	0	0	0	✓	←
2		0	0	0	+	+	0	+	+	0	+	0	+	+	0	+	+	0	+	+	0	+	+	0	+	2	0	2+	3+			
3		0	0	0	+	+	0	+	0	0	+	0	+	+	0	0	0	0	0	+	0	+	+	0	+	3	0	2+	3+			
4		+	+	0	0	+	0	0	0	+	0	+	+	+	0	0	+	+	0	0	+	0	+	+	0	4	0	0	0	✓	←	
5		0	0	+	+	+	0	0	+	0	+	0	+	0	+	0	+	+	+	0	+	0	0	+	5	0	2+	3+				
6		0	+	0	0	+	0	0	+	+	0	+	+	+	0	0	+	+	0	0	+	+	+	0	+	6	0	0	0	✓	←	
7		+	0	+	+	0	0	0	+	0	+	0	+	+	0	0	+	0	+	0	+	0	0	+	7	0	2+	3+				
8		0	0	0	+	+	0	0	+	0	+	0	+	+	0	0	+	+	0	+	0	+	0	+	8	0	2+	3+				
9		+	+	0	+	+	0	0	+	0	+	0	+	+	0	0	+	+	0	+	+	0	+	9	0	0	3+					
10		+	0	+	+	0	0	0	+	0	+	0	+	+	0	0	+	0	0	+	0	+	+	0	10	0	2+	3+				
11		+	0	0	+	+	0	0	+	0	+	0	+	+	0	0	+	0	0	+	0	0	+	0	11	0	2+	3+				
		+	+	0	0	+																			AC	0	0	0	✓			



R₁ = D Ce

R₂ = D cE

R₀ = D ce

R_z = D CE

r' = d Ce

r'' = d cE

r = d ce

ry = d CE





Case 2

55 year old male pre-op for orthopedic surgery tomorrow following automobile accident 4 months ago. He received 3 units of RBCs at the time of the accident.

Anti-A	Anti-B	Anti-D	Control	A1 cells	B cells
0	4+	3+	0	4+	0

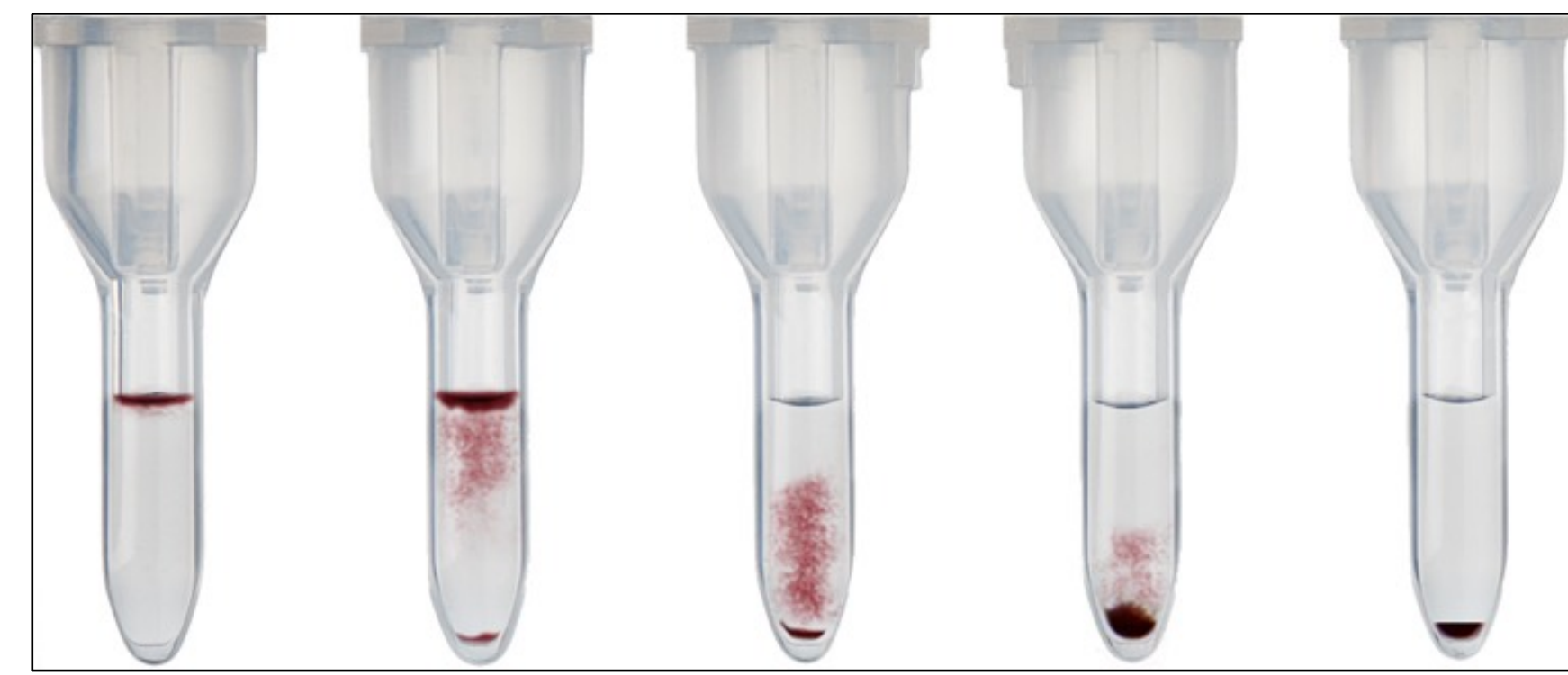
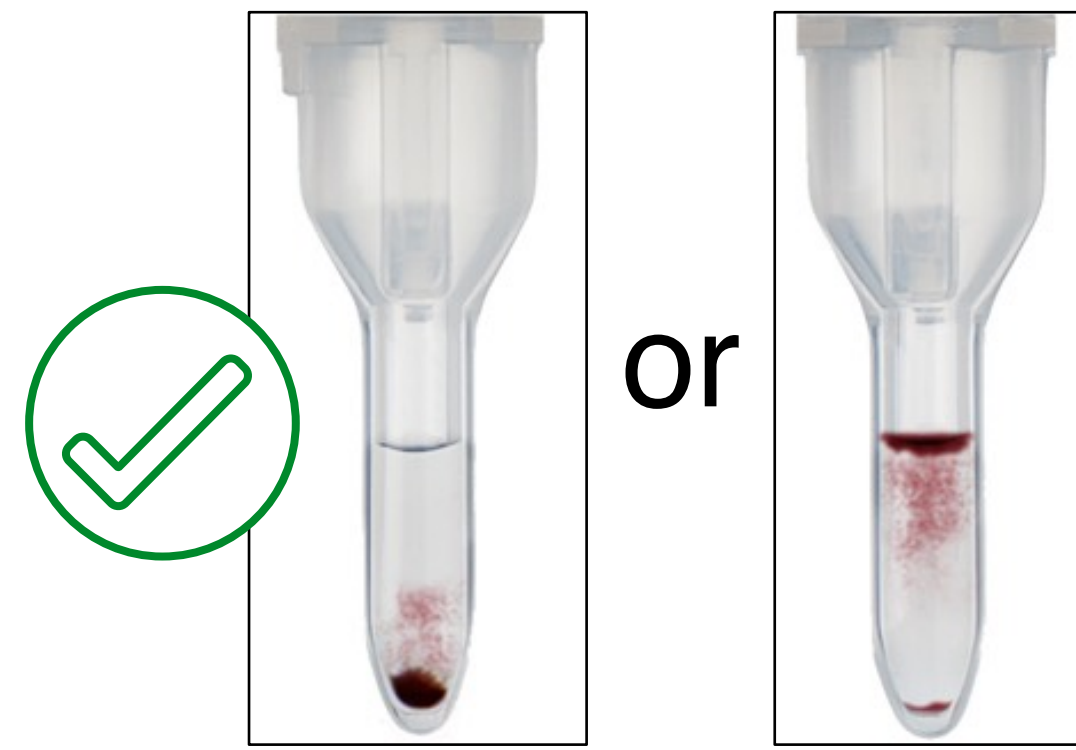
ANSWER:
No problem! B positive



Case 2

55 year old male pre-op for orthopedic surgery tomorrow following automobile accident 4 months ago. He received 3 units of RBCs at the time of the accident.

Cell	Rh-hr	Rh							Kell					Kidd	Duffy	Lewis	MNS				P	Luth.	Results										
		D	C	E	c	e	f	C ^w	K	k	Kp ^a	Kp ^b	Js ^a	Js ^b	Jk ^a	Jk ^b	Fy ^a	Fy ^b	Le ^a	Le ^b	M	N	S	s	P1	Lu ^a	Lu ^b		GEL				
1	R1R1	+	+	0	0	+	0	0	+	+	0	+	0	+	+	+	0	+	0	+	+	+	+	+	0	+	+	1	0				
2	R2R2	+	0	+	+	0	0	0	0	+	0	+	0	+	0	0	+	0	+	+	0	+	0	+	0	+	2	1+					





- Check AC
- Pattern
- Use negatives
- Match positives

Case 2

55 year old male pre-op for orthopedic surgery tomorrow following automobile accident 4 months ago. He received 3 units of RBCs at the time of the accident.

Ab?

Anti-E

XM?

AHG only

Cell	Rh-hr	Rh							Kell					Kidd	Duffy	Lewis	MNS				P	Luth.	Results									
		D	C	E	e	f	F	C ^w	K	k	Kp ^a	Kp ^b	Js ^a	Js ^b	Jk ^a	Jk ^b	Fy ^a	Fy ^b	Le ^a	Le ^b	M	N	S	s	PI	Lu ^a	Lu ^b	GEL		Ficin		
1	R1R1	+	+	0	0	+	0	0	0	+	0	+	0	+	0	+	0	+	+	0	+	+	+	+	0	0	+	1	0		0	
2	rr	0	0	0	+	+	+	0	+	+	0	+	0	+	+	0	+	+	0	+	+	0	+	0	+	0	+	2	0		0	
3	rr	0	0	0	+	+	+	0	+	0	0	+	0	+	0	+	+	0	0	0	+	0	+	+	0	+	3	0		0		
4	R1R1	+	+	0	0	+	0	0	0	+	0	+	0	+	+	+	+	+	0	0	+	0	+	+	0	0	+	4	0		0	
5	r'r	0	0	+	+	+	+	0	0	+	0	+	0	+	0	+	0	+	0	+	+	+	0	+	0	0	+	5	0		1+	
6	r'r'	0	+	0	0	+	0	0	+	+	0	+	0	+	+	+	+	+	0	0	+	+	0	+	+	0	+	6	0		0	
7	R2R2	+	0	+	+	0	0	0	0	+	0	+	0	+	+	0	0	+	0	+	0	+	0	+	0	0	+	7	1+		2+	
8	rr	0	0	0	+	+	+	0	0	+	0	+	0	+	0	+	+	0	0	+	+	0	+	0	+	0	+	8	0		0	
9	R1r	+	+	0	+	+	+	0	0	+	0	+	0	+	+	0	0	+	+	0	+	+	0	+	0	+	9	0		0		
10	R2R2	+	0	+	+	0	0	0	0	+	0	+	0	+	+	0	+	0	+	0	0	+	+	+	+	0	+	10	1+		2+	
11	R0R0	+	0	0	+	+	+	0	0	+	0	+	0	+	+	+	0	0	0	+	0	+	0	0	+	0	+	11	0		0	
																											AC	0		0		

Fantastic Four



R₁ DCe

R₀ Dce

R₂ DcE

r dce

Anti-E and -c Together



R₁ **R₁** DCe

R₀ Dce

r dce

R₂ DcE



Case 3

45 year old male with Crohn's Disease and history of multiple previous surgeries and transfusions (most recent transfusion 2 years ago, at another facility). Type and cross for 2 units ordered.

Anti-A	Anti-B	Anti-D	Control	A1 cells	B cells
0	0	3+	0	4+	4+

Group O positive, no discrepancies



Case 3

45 year old male with Crohn's Disease and history of multiple previous surgeries and transfusions (most recent transfusion 2 years ago, at another facility). Type and cross for 2 units ordered.

Cell	Rh-hr	Rh							Kell					Kidd		Duffy		Lewis		MNS				P	Luth.		Results					
		D	C	E	c	e	f	C ^w	K	k	Kp ^a	Kp ^b	Js ^a	Js ^b	Jk ^a	Jk ^b	Fy ^a	Fy ^b	Le ^a	Le ^b	M	N	S	s	P1	Lu ^a	Lu ^b		PEG IAT			
1	R1R1	+	+	0	0	+	0	0	+	+	0	+	0	+	0	+	0	+	0	+	+	+	+	+	+	0	+	1	0✓			
2	R2R2	+	0	+	+	0	0	0	0	+	0	+	0	+	0	+	+	0	+	+	0	+	0	+	0	0	+	2	2+			

“Check” in cell 1 refers to “Coombs control” which is done for negative tube IATs or DATs. Should be +



- Check AC
- Pattern
- Use negatives
- Match positives

Case 3

45 year old male with Crohn's Disease and history of multiple previous surgeries and transfusions (most recent transfusion 2 years ago, at another facility). Type and cross for 2 units ordered.

What else?

-Phenotype

Ab?

-At this point, can't say

Cell	Rh-hr	Rh						Kell					Kidd	Duffy	Lewis	MNS				P	Luth.	Results									
		D	C	E	e	e	f	C ^w	K	k	Kp ^a	Kp ^b	Js ^a	Js ^b	Jk ^a	Jk ^b	Fy ^a	Fy ^b	Le ^a	Le ^b	M	N	S	s	PI	Lu ^a	Lu ^b	1	PEG IS	PEG IAT	
1	R1R1	+	+	0	0	+	0	0	+	0	+	0	+	0	+	0	+	+	0	+	+	+	+	0	0	+	1	0	0	✓	
2	rr	0	0	0	+	+	+	0	+	+	0	+	0	+	0	+	+	0	+	+	0	+	0	+	0	+	2	0	w+		
3	rr	0	0	0	+	+	+	0	+	0	+	0	+	0	+	+	0	0	0	+	0	+	+	0	+	3	0	0	✓		
4	R1R1	+	+	0	0	+	0	0	0	+	0	+	0	+	0	+	+	0	0	+	0	+	+	0	0	+	4	0	0	✓	
5	<u>r'r</u>	0	0	+	+	+	0	0	+	0	+	0	+	0	+	0	+	0	+	+	+	0	+	0	0	+	5	0	1	+	
6	r'r'	0	+	0	0	+	0	0	+	+	0	+	0	+	0	+	+	0	0	+	+	0	+	+	0	+	6	0	0	✓	
7	R2R2	+	0	+	0	0	0	0	+	0	+	0	+	0	0	+	0	+	0	+	0	+	0	0	+	7	0	2	+		
8	rr	0	0	0	+	+	+	0	0	+	0	+	0	+	+	0	0	+	+	0	+	0	+	0	+	8	0	0	✓		
9	R1r	+	+	0	+	+	+	0	0	+	0	+	0	+	0	0	+	+	0	+	+	0	+	+	0	+	9	0	w+		
10	R2R2	+	0	+	0	0	0	0	0	+	0	+	0	+	0	+	0	+	0	0	+	+	+	+	0	+	10	0	2	+	
11	R0R0	+	0	0	+	+	+	0	0	+	0	+	0	+	0	0	0	0	+	0	+	0	0	+	0	+	11	0	0	✓	
				0										0													AC	0	0	✓	

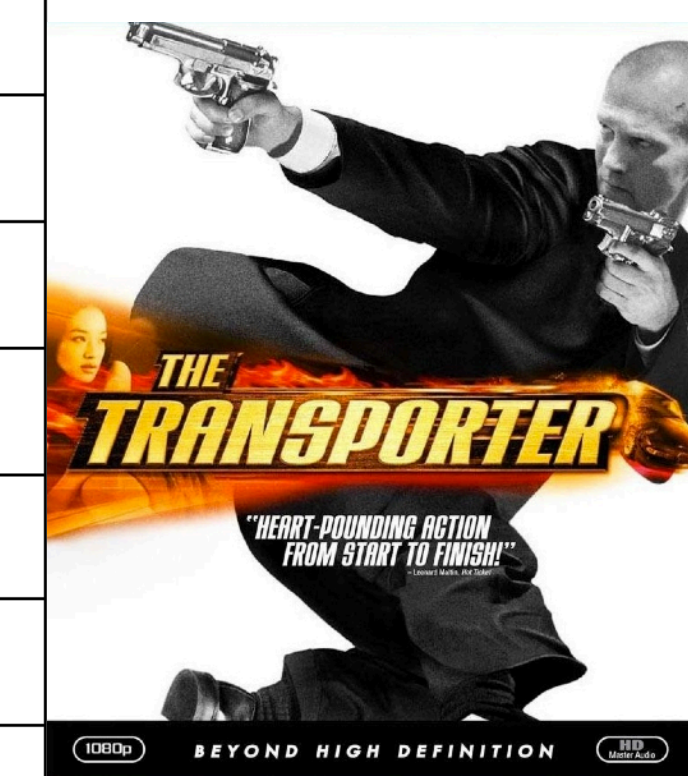
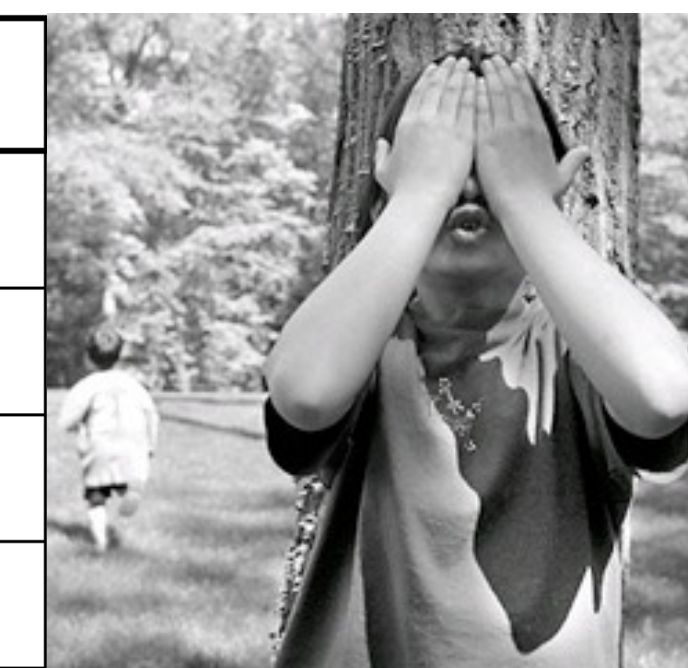


Case 3

45 year old male with Crohn's Disease and history of multiple previous surgeries and transfusions (most recent transfusion 2 years ago, at another facility). Type and cross for 2 units ordered.


Anti-E, -Jka^a

Cell	Rh-hr	Rh							Kell				Kidd		Duffy		Lewis		MNS				P		Luth.		Results					
		D	C	E	c	e	f	C ^w	K	k	Kp ^a	Kp ^b	Js ^a	Js ^b	Jk ^a	Jk ^b	Fy ^a	Fy ^b	Le ^a	Le ^b	M	N	S	s	P1	Lu ^a	Lu ^b		Ficin 37C	Ficin IAT		
1	R1R1	+	+	0	0	+	0	0	0	+	0	+	0	+	0	+	0	+	+	0	+	+	+	+	0	0	+	1	0	0	✓	
2	rr	0	0	0	+	+	+	0	+	+	0	+	0	+	+	0	+	+	0	+	+	0	+	0	+	0	+	2	0	2+		
3	rr	0	0	0	+	+	+	0	+	0	0	+	0	+	0	+	0	0	0	0	+	0	+	+	0	+	3	0	0	✓		
4	R1R1	+	+	0	0	+	0	0	0	+	0	+	0	+	+	+	+	0	0	+	0	+	+	0	0	+	4	0	1+			
5	<u>r</u> 'r	0	0	+	+	+	+	0	0	+	0	+	0	+	0	+	0	+	0	+	+	+	0	+	0	0	5	1+	2+			
6	r'r'	0	+	0	0	+	0	0	+	+	0	+	0	+	+	+	+	0	0	+	+	0	+	+	0	+	6	0	1+			
7	R2R2	+	0	+	+	0	0	0	0	+	0	+	0	+	0	0	+	0	+	0	+	0	+	0	0	+	7	2+	3+			
8	rr	0	0	0	+	+	+	0	0	+	0	+	0	+	+	0	0	+	+	0	+	0	+	0	+	8	0	0	✓			
9	R1r	+	+	0	+	+	+	0	0	+	0	+	0	+	0	0	+	+	0	+	+	0	+	+	0	+	9	0	2+			
10	R2R2	+	0	+	+	0	0	0	0	+	0	+	0	+	0	0	+	0	0	0	+	+	+	+	+	0	10	2+	3+			
11	R0R0	+	0	0	+	+	+	0	0	+	0	+	0	+	0	0	0	+	0	0	+	0	0	+	0	+	11	0	2+			
																											AC	0	0	✓		





Enzyme Classification

Enhanced	Decreased	Unaffected
<p>ABO-related</p> <ul style="list-style-type: none">-ABO/H-Lewis-I-P1PK/GLOB <p>Rh System</p> <p>Kidd System</p>	<p>MNS System</p> <p>Duffy System</p>	 <p>Kell System</p>



Case 4

69-year-old female admitted for right hemicolectomy due to recently diagnosed colon cancer. G3P3 pregnancy history. No previous transfusions.

Anti-A	Anti-B	Anti-D	Control	A1 cells	B cells
4+	0	0	0	0	4+

A negative, no discrepancies



Case 4

69-year-old female admitted for right hemicolectomy due to recently diagnosed colon cancer. G3P3 pregnancy history. No previous transfusions.

Cell	Rh-hr	Rh							Kell					Kidd		Duffy		Lewis		MNS				P	Luth.		Results						
		D	C	E	c	e	f	C ^w	K	k	Kp ^a	Kp ^b	Js ^a	Js ^b	Jk ^a	Jk ^b	Fy ^a	Fy ^b	Le ^a	Le ^b	M	N	S	s	P1	Lu ^a	Lu ^b		SP				
1	R1R1	+	+	0	0	+	0	0	+	+	0	+	0	+	0	+	+	0	+	0	+	+	+	+	+	0	+	1	2+				
2	R2R2	+	0	+	+	0	0	0	0	+	0	+	0	+	0	+	+	0	+	+	0	+	0	+	0	+	2	1+					





- Check AC
- Pattern
- Use negatives
- Match positives

Case 4

69-year-old female admitted for right hemicolectomy due to recently diagnosed colon cancer. G3P3 pregnancy history. No previous transfusions.

rr'

Ab?

Anti-D, -K

Cell	Rh-hr	Rh						Kell					Kidd	Duffy	Lewis	MNS				P	Luth.	Results								
		D	C	E	c	e	C ^w	K	k	Kp ^a	Kp ^b	Js ^a	Js ^b	Jk ^a	Jk ^b	Fy ^a	Fy ^b	Le ^a	Le ^b	M	N	S	s	PI	Lu ^a	Lu ^b	SP	Ficin	DTT	
1	R1R1	+	+	0	0	+	0	0	+	0	+	0	+	0	+	0	+	+	0	+	+	+	+	0	0	+	1	2+	2+	2+
2	rr	0	0	0	+	+	+	0	+	0	+	0	+	+	0	+	+	0	+	+	0	+	0	+	0	+	2	1+	1+	0
3	rr	0	0	0	+	+	+	0	0	+	0	+	0	+	+	0	0	0	0	+	0	+	+	0	+	3	0	0	0	
4	R1R1	+	+	0	0	+	0	0	+	0	+	0	+	+	+	+	+	0	0	+	0	+	+	0	0	+	4	2+	2+	2+
5	r'r	0	0	+	+	+	0	0	+	0	+	0	+	0	+	0	+	0	+	+	+	0	+	0	0	+	5	0	0	0
6	r'r'	0	+	0	0	+	0	0	+	0	+	0	+	+	+	+	+	0	0	+	+	0	+	+	0	+	6	1+	1+	0
7	R2R2	+	0	+	+	0	0	0	+	0	+	0	+	+	0	0	+	0	+	0	+	0	+	0	0	+	7	2+	2+	2+
8	rr	0	0	0	+	+	+	0	0	+	0	+	+	0	+	0	+	+	+	0	+	0	+	0	+	8	0	0	0	
9	R1r	+	+	0	+	+	+	0	0	+	0	+	+	0	0	+	+	0	+	+	0	+	+	0	+	9	1+	1+	1+	
10	R2R2	+	0	+	0	0	0	0	+	0	+	0	+	+	0	+	0	+	0	0	+	+	+	+	0	+	10	2+	2+	2+
11	R0R0	+	0	0	+	+	+	0	0	+	0	+	+	+	0	0	0	+	0	0	+	0	0	+	0	+	11	2+	2+	2+
		0	+	0	+	+																				AC	0			



Your Page

- Don't forget: BBGuy.org/LLU
- (PW: LLUPathology)
 - Notes, slides, new stuff!



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Welcome LLU Pathology Residents!

I'm Happy to Help You!

Lecture Sessions for LLU Path Residents

1/31/2019:

In case you didn't see the email, I have sent you the handout we will discuss for next Tuesday's session (2/5/19). You can [download it here as well](#).

Please note: I won't just be asking you to identify the antibody! We need to go further than that, so be prepared to discuss details of the blood group systems involved and what the results mean. It won't be high pressure, but I do want you to take some time to learn before the session. This will be fun!

-Joe

1/11/2019: UPDATE

OK, here's the new plan: We will get together one more time than originally planned (schedule below). This way, I can finish the Immunohematology I talk on 1/22/19, then go on as planned. Here is the updated schedule:

- 1/22/19: Immunohematology I (finish)

Lecture Notes


[Immunohematology II Cases for Discussion](#)


[Immunohematology I Slides \(UPDATED\)](#)

Video Handouts

[Basic Antibody ID](#)

Recent Podcast Episodes

 [062CE: Autologous and Directed Donation with Julie Karp](#)
January 18, 2019

 [061CE: Better AABB Assessments with Anne Chenoweth](#)
December 12, 2018

