Jack Wilson MLS (ASCP) CM
Immunohematologist

Reactivity Everywhere! Where do you go?

Our Mission:
To provide blood and support services that meet the needs of patients, donors, physicians and hospitals.

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Case 1

- 3/3 patient admitted to hospital for venous stress due to Cellulitis
- Hgb 8.1
- WBC 8.9
- Not transfused

in last 3 months

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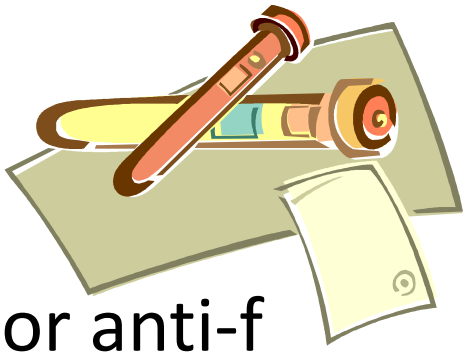
March 6
Sample Arrives in IRL



- Hgb 6.0
- WBC 11.55
- Hospital reports possible anti-e or anti-f
- A negative
- DAT Positive
  - 3+ IgG, complement negative
- Not recently transfused
  - First impression is this sounds like an auto antibody

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Why we're thinking WARM Auto

- DAT is positive, but no recent transfusions
- Patient is Rh Negative
  - Most likely e+
- Hospital is reporting a possible anti-e

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LISS Panel

Consistent with Warm Auto Antibody

	Rh						Kell		Duffy		Kidd		MNSs				Test Results		
	D	C	c	E	e	f	K	k	Fy^a	Fy^b	Jk^a	Jk^b	M	N	S	s	**5' RT**	**LISS 37**	**IAT**
1	+	+	0	+	+	0	0	+	0	+	+	+	0	+	0	+	**0**	**0**	**0**
2	+	+	0	0	+	0	0	+	+	0	0	+	+	+	+	0	**0**	**0**	**0**
3	+	0	+	+	0	0	0	+	+	+	0	+	+	0	+	+	**0**	**0**	**0**
4	+	0	+	0	+	+	0	+	0	0	+	+	+	0	0	0	**0**	**0**	**0**
5	0	+	+	0	+	+	0	+	0	+	0	+	+	+	+	+	**0**	**0**	**0**
6	0	0	+	+	+	+	0	+	+	+	+	0	+	0	+	0	**0**	**0**	**0**
7	0	0	+	0	+	+	+	+	0	+	+	0	+	0	0	+	**0**	**0**	**0**
8	0	0	+	0	+	+	0	+	+	0	+	0	0	+	0	+	**0**	**0**	**0**
9	0	0	+	0	+	+	0	+	0	+	+	+	+	0	0	+	**0**	**0**	**0**
10	+	+	0	0	+	-	+	+	0	+	0	+	+	+	+	+	**0**	**0**	**0**
11	+	0	+	+	+	+	0	+	+	0	+	+	+	0	+	+	**0**	**0**	**0**
AC																	**0**	**0**	**2+**

Ficin Treated Red Cell Panel

	Rh						Kell		Duffy		Kidd		MNSs				Test Results	
	D	C	c	E	e	f	K	k	Fy^a	Fy^b	Jk^a	Jk^b	M	N	S	s	30' 37	IAT
1	+	+	0	+	0	0	0	+	+	+	+	+	+	0	+	0	**0**	**0**
3	+	0	+	+	0	0	0	+	0	+	+	+	0	+	0	+	**0**	**0**
7	0	0	+	0	+	+	+	+	0	+	0	+	+	+	0	+	**1+**	**2+**
9	0	0	+	0	+	+	0	+	0	+	+	0	+	+	+	0	**1+**	**2+**
10	+	+	0	0	+	0	0	+	+	+	0	+	0	+	0	+	**1+**	**M+**

Anti-e detected could still be Warm Auto Antibody

Negative Acid Eluate!

	Rh						Kell		Duffy		Kidd		MNSs				Test Results
	D	C	c	E	e	f	K	k	Fy^a	Fy^b	Jk^a	Jk^b	M	N	S	s	Peg IAT
1	+	+	0	+	+	0	0	+	0	+	+	+	0	+	0	+	**0**
2	+	+	0	0	+	0	0	+	+	0	0	+	+	+	+	0	**0**
3	+	0	+	+	0	0	0	+	+	0	+	+	+	0	+	+	**0**
4	+	0	+	+	+	0	+	+	0	0	+	+	+	0	0	0	**0**
5	0	+	+	0	+	+	0	+	+	+	0	+	+	+	+	+	**0**
6	0	0	+	+	+	+	0	+	+	+	+	0	+	0	+	0	**0**
7	0	0	+	0	+	+	+	+	0	+	+	0	+	0	0	+	**0**
8	0	0	+	0	+	+	0	+	+	0	+	0	0	+	0	+	**0**
9	0	0	+	0	+	+	0	+	0	+	+	+	+	0	0	+	**0**
10	+	+	0	0	+	0	+	+	0	+	0	+	+	+	+	+	**0**
11	+	0	+	+	+	+	0	+	+	0	+	+	+	0	+	+	**0**
EGA Treated Auto Control																	**0**

Not a Warm Auto?!?!

Time for the Ether

Potential Health Effects

Inhalation:

Irritant. **General anesthesia by inhalation can occur**.
Continued exposure may lead to respiratory failure or death.
Early symptoms include irritation of nose and throat, vomiting, and irregular respiration, followed by dizziness,
drowsiness, and unconsciousness.

Ingestion:

Irritating to the mucous membranes. Ingestion of 1 or 2 ounces may be fatal. Because of volatility the stomach
becomes distended, which may cause belching. Other symptoms can include vomiting, unconsciousness, and
coma.

Skin Contact:

Irritating to the skin and mucous membranes by drying effect. Can cause dermatitis on prolonged exposure. May
be absorbed through skin.

Eye Contact:

May cause irritation, redness and pain. Prolonged exposures to high concentrations of vapor can cause eye
damage.

Chronic Exposure:

Repeated exposures may be habit forming. Prolonged exposures may result in headache, drowsiness, excitation,
and psychic disturbances. Teratogenic effects are possible.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye problems or impaired liver, kidney or respiratory function may be
more susceptible to the effects of this substance. Alcoholic beverage con

- Ether Eluate negative
- Now everyone is dizzy

Screening Cell	Peg IAT
I	0
II	0
III	0

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Discussion

What we Know

- DAT Postive IgG
- LISS negative
- Anti-e in FICIN
- Eluate negative (Acid and Ether)

What we need to know

1) Why is the DAT Positive?
    - Requested Drug List to be faxed to IRL
2) What is the nature of the anti-e?
    - Auto or allo?

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Anti-e detected in PEG

	Rh						Kell		Duffy		Kidd		MNSs				Test Results
	D	C	c	E	e	f	K	k	Fy^a	Fy^b	Jk^a	Jk^b	M	N	S	s	Peg IAT
1	+	+	0	+	+	0	0	+	0	+	+	+	0	+	0	+	**M+**
2	+	+	0	0	+	0	0	+	+	0	0	+	+	+	+	0	**1+**
3	+	0	+	+	**0**	0	0	+	+	+	0	+	+	0	+	+	**0**
4	+	0	+	0	+	+	0	+	0	0	+	+	+	0	0	0	**2+**
5	0	+	+	0	+	+	0	+	0	+	0	+	+	+	+	+	**2+**
6	0	0	+	+	+	+	0	+	+	+	+	0	+	0	+	0	**1+**
7	0	0	+	0	+	+	+	+	0	+	+	0	+	0	0	+	**1+**
8	0	0	+	0	+	+	0	+	+	0	+	0	0	+	0	+	**2+**
9	0	0	+	0	+	+	0	+	0	+	+	+	+	0	0	+	**2+**
10	+	+	0	0	+	0	+	+	0	+	0	+	+	+	+	+	**M+**
11	+	0	+	+	+	+	0	+	+	0	+	+	+	0	+	+	**M+**

Rule Out Panel all other common antibodies

	Rh						Kell		Duffy		Kidd		MNSs				Test Results
	D	C	c	E	e	f	K	k	Fy^a	Fy^b	Jk^a	Jk^b	M	N	S	s	**Peg IAT**
1	+	0	+	+	0	0	0	+	0	+	+	0	+	0	+	0	**0**
2	+	0	+	+	0	0	0	+	+	0	0	+	0	+	+	+	**0**
3	+	0	+	+	0	0	+	+	0	+	0	+	+	0	0	+	**0**
4	+	0	+	+	0	0	0	+	0	+	+	+	0	+	0	+	**0**
5	+	w	+	+	0	0	+	+	0	+	+	0	+	0	0	+	**0**
6	+	w	+	+	0	0	0	+	+	+	0	+	0	+	+	0	**0**
7	+	+	0	+	0	0	0	+	+	0	+	+	+	+	0	+	**0**
8	+	+	0	+	0		0	+	+	0	+	+	0	+	0	+	**0**

Patient Phenotype
rr, K- Fy(a+b-) Jk(a-b+) S- s+

- Some e+ patients lack e epitopes
- Can make a clinically significant anti-e
- Would require e-negative blood

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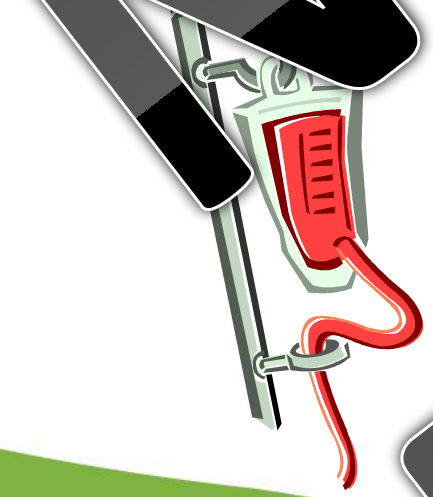
Ho[illegible] wants to transfuse

They [illegible]notypically [illegible]atche[illegible] units

D-, C-, E-,e+ , K- , Fy(b-) Jk(a-), S-



2 choices

1. Send phenotypically matched (e+) nonreactive [illegible]th LISS
   - [illegible]Risks transfusion reaction [illegible]due to e
2. Sent e- units that are not phenotypically matched nonreactive in PEG
   - Expos[illegible]ient to E anti[illegible]n; not h[illegible]tal's pre[illegible]ence

NO NO NO

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Drug List has arrived

- Aspirin
- Balsm-Trypis-Caster Oil
- Famotidine
- Heparin
- Hydralazine
- Insulin
- Nystatin
- Piperacillin/Tazobactum
- Pravastatin
- Sodium Chloride
- Acetaminophen
- Alum-Magnisium Hydroxide-Simeth
- Diazepam
- Docusate Sodium
- Fentanyl Citrate
- Hydrocodine
- Ondansetron HCL
- Polyethylene
- Zolpidem Tartrate
- Vancomycin

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APPENDIX 17-1
Drugs Associated with a Positive DAT and/or Immune Hemolytic Anemia

Drug	Method of Detection			
Aceclofenac			+Drug	
Acetaminophen			+ Drug	
Acyclovir		DT		
Aminopyrine		DT		
Amoxicillin		DT		
Amphotericin B			+ Drug	
Ampicillin		DT	+ Drug	
Antazoline			+ Drug	
Azapropazone	AA	DT		
Butizide			+ Drug	
Carbimazole	AA	DT	+ Drug	
Carboplatin	AA	DT	+ Drug	
Carbromal		DT		
Cefamandole		DT		
Cefazolin		DT		
Cefixime		DT	+ Drug	
Cefotaxime		DT	+ Drug	
Cefotetan	AA	DT	+ Drug	NIPA
Cefoxitin	AA	DT	+ Drug	
Ceftazidime	AA	DT	+ Drug	
Ceftizoxime		DT	+ Drug	
Ceftriaxone			+ Drug	
Cefuroxime		DT		
Cephalexin		DT		
Cephalothin		DT	+ Drug	NIPA
Chloramphenicol	AA	DT		
Chlorinated hydrocarbons	AA	DT	+ Drug	
Chlorpromazine	AA		+ Drug	
Chlorpropamide			+ Drug	

(Continued)

APPENDIX 17-1
Drugs Associated with a Positive DAT and/or Immune Hemolytic Anemia (Continued)

Drug	Method of Detection			
Cimetidine		DT	+Drug	
Ciprofloxacin			+Drug	
Cisplatin		DT		NIPA
Cladribine	AA			
Clavulanate				NIPA
Cyanidanol	AA	DT	+ Drug	
Cyclofenil	AA		+ Drug	
Cyclosporin		DT		
Diclofenac	AA	DT	+ Drug	
Diethylstilbestrol			+ Drug	
Diglycoaldehyde				NIPA
Dipyrone		DT	+ Drug	
Erythromycin		DT		
Etodolac			+ Drug	
Fenoprofen	AA		+ Drug	
Fluconazole		DT	+ Drug	
Fludarabine	AA			
Fluorescein		DT	+ Drug	
Fluorouracil			+ Drug	
Furosemide			+ Drug	
Hydralizine		DT		
Hydrochlorothiazide		DT	+ Drug	
Hydrocortisone		DT	+ Drug	
9-Hydroxy-methyl-ellipticinium			+ Drug	
Ibuprofen			+Drug	
Imatinib mesylate		DT		
Insulin		DT		
Isoniazid		DT	+ Drug	
Levodopa	AA			
Levofloxacin		DT	+Drug	
Mefenamic acid	AA			

Drugs that cause positive DATs and/or DIHA

- Hydralazine
- Acetaminophen
- Insulin
- Vancomycin
- **Piperacillin**

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Rh (D,E,c,E,e)	**Catechin, diclofenac, glafenin, hydrochlorothiaide, ibuprofen, moxalactam, nomifensin, piperacillin, quinine, rifampin, streptomycin, sulindac, tolmetin**
I	Chlorpheniramine, fluorouracil, Isopaque, nitrofurantoin, nomifensine, rifampin, thiopental
P	Elliptinim, melumine iothalamate, nomifensine
Kell	Glafenine, trimethoprim
Lutheran	Elliptinium, rifampin
Kidd	Chlorpropamide
MNS	Streptomycin
H	Sulfamethoxazole

How to distinguish between anti-e or Piperacillin?

- Perform a drug study?
  - Result won't be as helpful as you might think…
  1. Study by ARC showed that when testing with drug coated cells – 91% of their donors already have piperacillin antibody!

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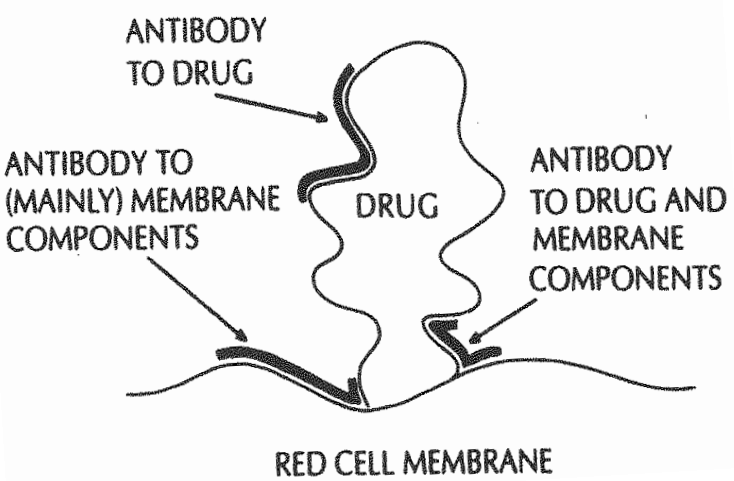
Test Panel Drug Adsorption

Neat Plasma	Drug coated RBC's	Uncoated RBC's
15 ' 22C	1+	0
30' 37C	0	0
IAT	M+	0



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How to distinguish between anti-e or Piperacillin

– Perform a drug study?

- Result won't be as helpful as you might thing…

1. Study by ARC showed that when testing with drug coated cells – 91% of their donor already have piperacillin antibody!
2. "Immune complex" method – recommended method for testing for piperacillin antibodies requires combination of drug and plasma (1:1)

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Test Panel “Immune Complex”

	e+ cell			Ficin tested e+ cell		
	30’ 22C	30’ 37C	IAT	30’ 22C	30’ 37C	IAT
Plasma + drug	2+	2+	2+	4+	4+	4+
Plasma + PBS	0	0	0	0	0	0
Drug + PBS	0	0	0	0	0	0
Eluate + Drug	0	0	1+	1+	2+	2+
Eluate + PBS	0	0	0	0	0	0

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How to distinguish between anti-e or Piperacillin

- Perform a drug study?
  - Result won't be as helpful as you might thing…
  1. Study by ARC showed that when testing with drug coated cells – 91% of their donor already have piperacillin antibody!
  2. Immune complex method – recommended method for testing for piperacillin antibodies requires combination of drug and plasma (1:1)
     - » Sample we have already has piperacillin in it and we know that it's positive
  3. Could test the eluate and drug against cells
     - Piperacillin antibodies do not always react in the eluate
  4. Drug study wasn't ordered (good)
     - Time consuming, expensive, results vary, wouldn't learn anything new

Requested a sample before drug was administered

Summary of the results

NEGATIVE!!!!!!

NEGATIVE!!!!!!

NEGATIVE!!!!!!

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Summary of results

DAT

Panel

PEG

Negative

Negative

- Sent 2 phenotypically matched units nonreactive at LISS IAT
  - D-, C-, E- , K- , Fy(b-) Jk(a-), S-

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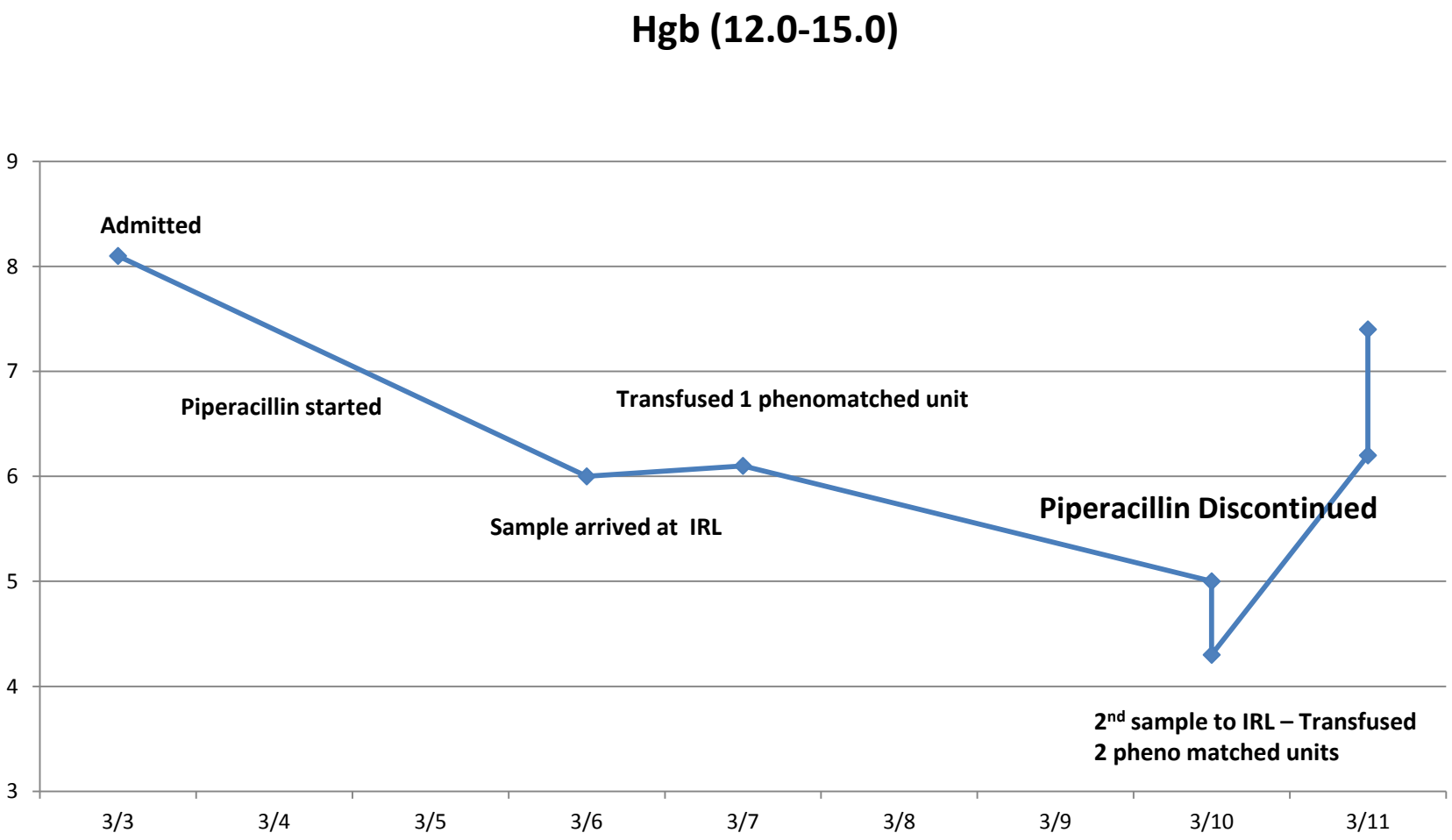
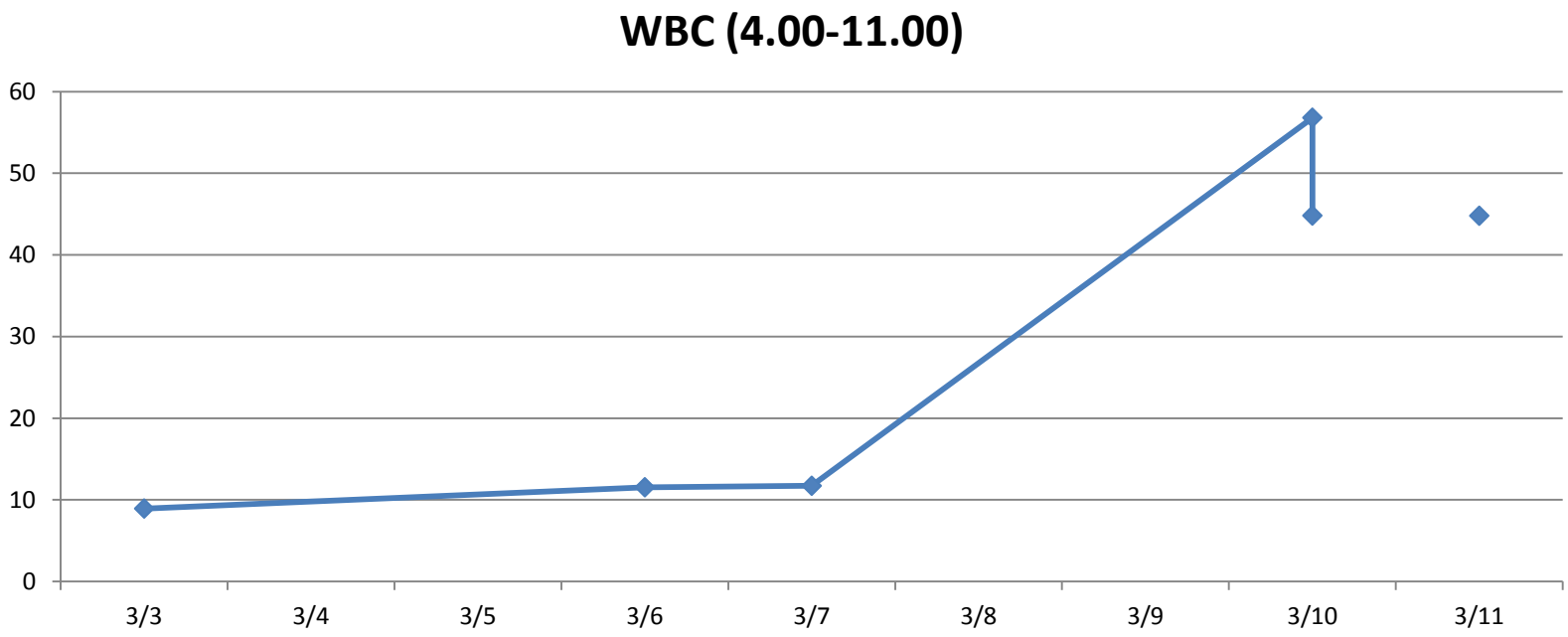
Time Line


Hgb (12.0-15.0)
9
8
7
6
5
4
3
Admitted
Piperacillin started
Transfused 1 phenomatched unit
Sample arrived at IRL
Piperacillin Discontinued
2nd sample to IRL – Transfused
2 pheno matched units
3/3
3/4
3/5
3/6
3/7
3/8
3/9
3/10
3/11

Need for antibiotics



Data from IRL last 19 months

Positive DAT's	Negative Eluate	Patient on drug known to cause positive DAT	Cases where drug was suspected of hemolysis
527	55	26	3

<1% positive DAT's suspected to cause DIHA

VERY RARE

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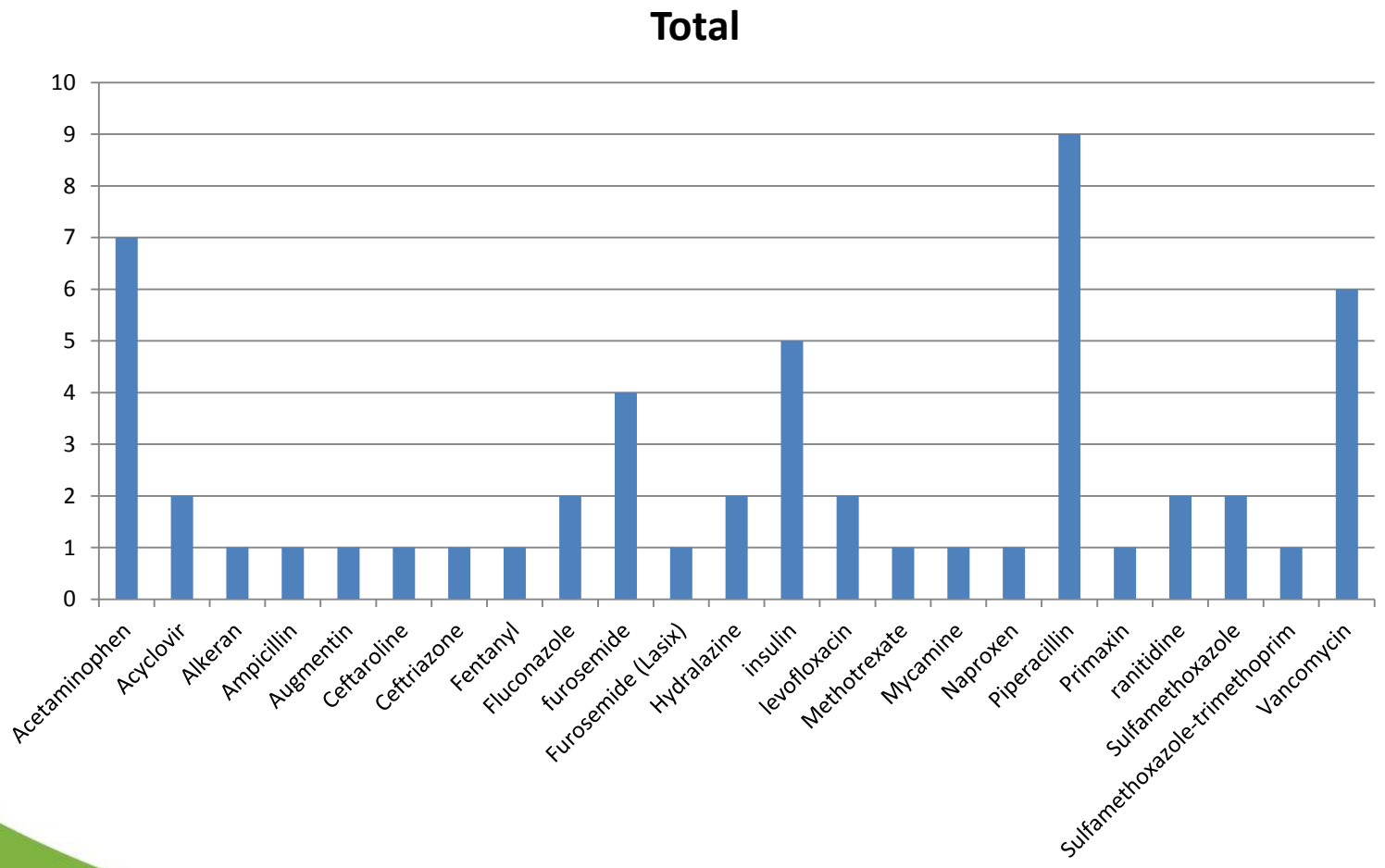
Data from IRL



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Conclusion

- In our case study, we recognized that the reactivity we saw was most likely drug related and consistent with Piperacillin antibody
- The clinicians used that information along with other lab data and clinical evaluation to discontinue the piperacillin treatment and to switch to another antibiotic
- This saved the patient's life
- Important for blood bankers to recognize this phenomenon

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Transition Slide

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The Case of the Cold Nasty Sample Arrives in IRL

- 62 year old
- Female
- AB Positive
- History of Esophageal Varices
- Hgb 8.1
- Last transfused 3 RBC's 10 days prior
- Hospital reports history of cold nonspecific reactivity and hospital has been giving least incompatible
- Sent for antibody ID and units

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Very strong reactivity at 22C

@ = agglutination after washing

	Rh						Kell		Duffy		Lewis		P	Kidd		MNSs				Test Results	
	D	C	c	E	e	f	K	k	Fy^a	Fy^b	Le^a	Le^b	P_1	Jk^a	Jk^b	M	N	S	s	5 ' RT	Peg IAT
1	0	0	+	0	+	+	0	+	0	+	0	+	+	0	+	+	0	0	+	**$2+^s$**	**@**
2	0	0	+	0	+	+	+	+	+	0	0	0	+	+	0	+	+	+	+	**3+**	**@**
3	0	0	+	0	+	+	0	+	0	+	+	0	+	+	+	+	0	+	0	**3+**	**@**
4	+	0	+	+	0	0	0	+	+	0	+	0	+	0	+	0	+	+	+	**3+**	**@**
5	+	0	+	+	0	0	0	+	0	+	0	+	+	0	+	+	0	+	+	**3+**	**@**
6	+	0	+	+	0	0	0	+	0	+	0	0	+	+	+	+	0	+	+	**3+**	**@**
7	+	+	0	0	+	0	0	+	+	0	+	0	0	+	+	+	0	+	0	**$2+^s$**	**@**
8	+	+	0	0	+	0	0	+	0	+	0	+	0	0	+	+	+	+	+	**3+**	**@**
9	+	+	0	+	+	0	0	+	+	+	+	0	+	+	0	+	+	0	+	**3+**	**@**
10	0	+	+	0	+	0	+	+	+	+	+	0	+	+	0	+	+	0	+	**3+**	**@**
11	+	+	+	0	+	+	+	0	+	+	0	+	+	+	0	+	0	+	+	**3+**	**@**
Auto Control																				**0**	**0**

What could this be…

- Lewis, P1, and M are out

- High incidence Cold antibody?
  - Lets start there…

T.J.maxx®

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@ = agglutination after washing

	Rare Factor	Rh						Kell		Duffy		Kidd		MNSs				Test Results	
		D	C	c	E	e	f	K	k	Fy^a	Fy^b	Jk^a	Jk^b	M	N	S	s	5 ' RT	Peg IAT
1	I-	0	0	+	0	+	+	0	+	0	+	0	+	+	0	0	+	**$3+^s$**	**@**
2	I-	0	0	+	0	+	+	+	+	+	0	+	0	+	+	+	+	**3+**	**@**
3	Ge -2 -3	0	0	+	0	+	+	0	+	0	+	+	+	+	0	+	0	**3+**	**@**
4	Ge -1 -2 -3	+	0	+	+	0	0	0	+	+	0	0	+	0	+	+	+	**3+**	**@**
5	Vel -	+	0	+	+	0	0	0	+	0	+	0	+	+	0	+	+	**3+**	**@**
6	Vel -	+	0	+	+	0	0	0	+	0	+	+	+	+	0	+	+	**3+**	**@**
7	Tj (a-) Group O	+	+	0	0	+	0	0	+	+	0	+	+	+	0	0	+	**0**	**$1+^w$**
8	Tj (a-) Group A	+	+	0	+	+	0	0	+	0	+	0	+	+	+	+	+	**3+**	**@**

Could it really be? **Anti-Tj^{a}**

@ = agglutination after washing

	Rare Factor	Rh						Kell		Duffy		Kidd		MNSs				Test Results	
		D	C	c	E	e	f	K	k	Fy^{a}	Fy^{b}	Jk^{a}	Jk^{b}	M	N	S	s	5 ' RT	PEG IAT
1	Tj(a-)	+	+	+	0	+		0	+	0	+	+	+	+	0	0	+	**3+^{s}**	**@**
2	Tj(a-)	+	+	+	0	+		0	+	+	+	+	0	0	+	0	+	**3+**	**@**
3	Tj(a-)	+	0	+	+	0		0	+	+	0	+	0	0	+	0	+	**3+**	**@**

Nope – Too good to be true – Keep hunting

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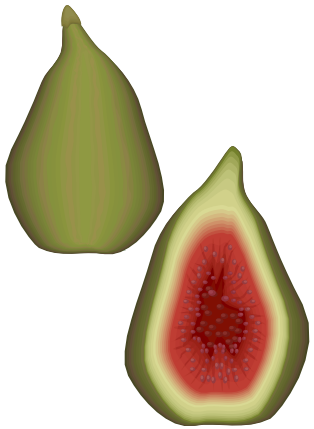
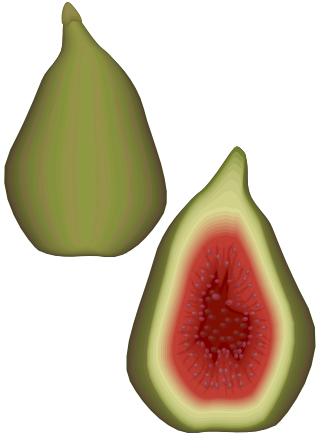


Time for some Ficin

Ficin will destroy M, N, S, s, Fy^a, Fy^b



	Rh					Kell		Duffy		Kidd		MNSs				Test Results	
	D	C	c	E	e	K	k	Fy^a	Fy^b	Jk^a	Jk^b	M	N	S	s	30 ' 37C	IAT
1	+	+	0	+	+	0	+	0	+	+	0	+	+	+	+	**3+**	**@**
2	+	+	+	0	+	+	+	+	0	+	0	+	+	+	+	**3+**	**@**
3	0	0	+	0	+	0	+	0	+	+	+	+	0	+	0	**3+**	**@**
4	+	0	+	+	0	0	+	+	0	0	+	0	+	+	+	**3+**	**@**
5	+	0	+	+	0	0	+	0	+	0	+	+	0	+	+	**3+**	**@**
6	+	0	+	+	0	0	+	0	+	+	+	+	0	+	+	**3+**	**@**
7	+	+	0	0	+	0	+	+	0	+	+	+	0	+	+	**0**	**$1+^w$**
8	+	+	0	+	+	0	+	0	+	0	+	+	+	+	+	**3+**	**@**

2 negative cells

What do our 2 negative cells have in common?

5 min 22C

1) R1R1, K-, Fy(b-), N-, S-

Ficin 30’ 37C

2) R1R1, K-, Fy(b-), N- S-

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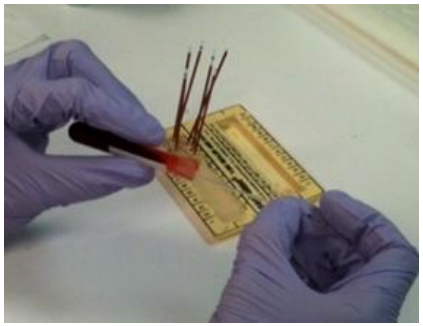
Patient Phenotype

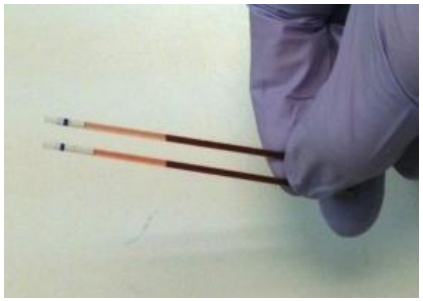
Microhematocrit cell separation

R1R1, K-, Fy(a+b+), Jk(a+b+) M+, N-, S-, s+

Patient can make:

- Anti-E
- Anti-c
- Anti-K
- Anti-N
- Anti-S





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Super Panel

	Rh					Kell		Duffy		Kidd		MNSs				Test Results	
	D	C	c	**E**	e	K	k	Fy^a	Fy^b	Jk^a	Jk^b	M	N	**S**	s	**5 '22C**	**IAT**
1	+	+	0	0	+	0	+	0	+	+	0	+	0	0	+	**0**	**1+**
2	+	+	0	0	+	0	+	0	+	0	+	+	0	0	+	**0**	**1+**
3	+	+	0	0	+	0	+	+	0	+	0	+	0	0	+	**0**	**1+**
4	+	+	0	0	+	+	+	+	0	0	+	0	+	0	+	**0**	**1+**
5	+	+	0	0	+	+	+	0	+	0	+	0	+	0	+	**0**	**1+**
6	+	0	0	0	0	0	+	0	+	+	+	+	0	+	0	**2+**	**@**
7	+	+	0	0	+	0	+	+	0	+	+	+	0	+	0	**2+**	**@**
8	+	+	0	+	+	0	+	0	+	0	+	+	+	0	+	**3+**	**@**
9	+	+	0	+	+	0	+	+	+	+	+	+	0	0	+	**3+**	**@**
10	+	0	+	0	+	0	+	+	0	+	0	+	0	0	+	**2+**	**@**
11	0	0	+	0	+	0	+	0	0	+	+	+	0	0	+	**2+**	**@**

- All reacting at 22C and all agglutinating after washing
  - Still something reacting at IAT 1+ even with antigen matched cells

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What we've identified at 22C

- Anti-E
  - Clinically significant
- Anti-c
  - Clinically significant
- Anti-S
  - Clinically significant

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What we have yet to identify…

- 1+ reactivity at IAT
  - Even with phenotypically matched cells

- Hospital has reported a history of Cold Reactive Autoantibody
  - The weak reactivity at IAT is consistent with a cold
  - Need to prove that's what it is

	Rh					Kell		Duffy		Kidd		MNSs				Test Results			
	D	C	c	E	e	K	k	Fy^a	Fy^b	Jk^a	Jk^b	M	N	S	s	5 '22C	IAT	30 min 4C	PEG Prewarm
1	+	+	0	0	+	0	+	0	+	+	0	+	0	0	+	**0**	**1+**	**4+**	**0**
2	+	+	0	0	+	0	+	0	+	0	+	+	0	0	+	**0**	**1+**	**4+**	**0**
3	+	+	0	0	+	0	+	+	0	+	0	+	0	0	+	**0**	**1+**	**4+**	**0**
4	+	+	0	0	+	+	+	+	0	0	+	0	+	0	+	**0**	**1+**	**4+**	**0**
5	+	+	0	0	+	+	+	0	+	0	+	0	+	0	+	**0**	**1+**	**4+**	**0**
6	+	0	0	0	0	0	+	0	+	+	+	+	0	+	0	**2+**	**@**		**2+**
7	+	+	0	0	+	0	+	+	0	+	+	+	0	+	0	**2+**	**@**		**2+**
8	+	+	0	+	+	0	+	0	+	0	+	+	+	0	+	**3+**	**@**		**3+**
9	+	+	0	+	+	0	+	+	+	+	+	+	0	0	+	**3+**	**@**		**3+**
10	+	0	+	0	+	0	+	+	0	+	0	+	0	0	+	**2+**	**@**		**3+**
11	0	0	+	0	+	0	+	0	0	+	+	+	0	0	+	**2+**	**@**		**3+**
Auto Control																		**4+**	**0**

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Conclusion

- Identified 3 clinically significant antibodies
  - Anti-E, anti-c, and anti-S
  - All reacted strongly at 22C
  - All are clinically significant
- Also identified a cold reactive auto antibody that was circumvented by prewarmed testing
- Patient requires E-, c- , S- units nonreactive with the prewarmed plasma

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Discussion

- Just because it reacts at 22C doesn't mean it can be ignored!!!
- Hospital reported history of cold antibody and had been giving least incompatible….!
- Possible that these are newly forming antibodies
  - Strongly reactive at 22C because they are still in IgM phase

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