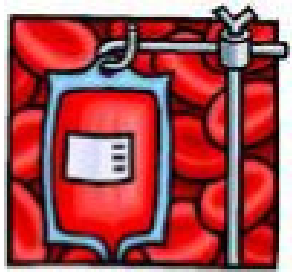
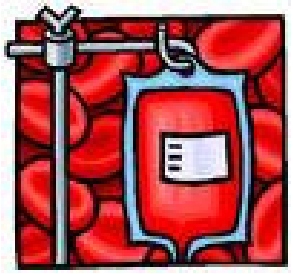




Transfusion Reactions

Megan Rowley and Peter Struik

BMS Education Day

28th January and 4th February 2013

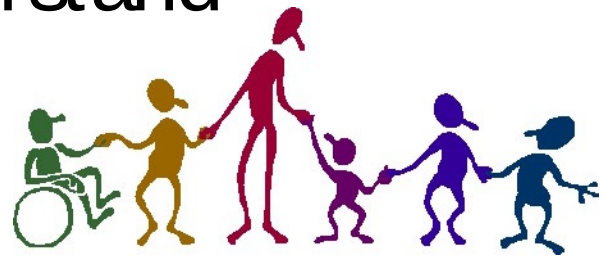
Category of Reaction	Infectious	Non-infectious
[redacted]	**Bacterial contamination**	**<u>Immune</u>** **Febrile Non-Haemolytic** **Allergic** **Acute Haemolytic Reaction -**ABO **Anaphylactic -**anti-IgA **Transfusion Related Acute Lung Injury**
		<u>Non-immune</u> **TACO/TAD**
[redacted]	**Viral –** HIV, Hepatitis, Parvovirus **Protozoal –** Malaria, Syphilis **Prion -** vCJD	**<u>Immune</u>** **Delayed haemolytic reaction** **Transfusion Associated-GvHD** **Post Transfusion Purpura**
		<u>Non-immune</u> **Iron overload**

As you participate in this session please;

- Understand your role in when a patient has an adverse reaction to blood components
- At the same time try and understand everyone else's role too

  DOCTOR, NURSE,

  BIOMEDICAL SCIENTIST, PORTER



- Never forget the patient who is having the reaction. That's why we are all here.....

There are many links in the chain that delivers the right blood to the right patient

NURSE
DOCTOR

CARE OF THE PATIENT DURING TRANSFUSION

NURSE
DOCTOR

CHECKING THE BLOOD AND STARTING THE TRANSFUSION

DOCTOR

ORDERING AND PRESCRIBING THE BLOOD, DOCUMENTING THE TRANSFUSION

PORTER
NURSE

COLLECTING THE BLOOD AND DELIVERING TO THE CLINICAL AREA

BIOMEDICAL SCIENTIST

TESTING THE BLOOD GROUP AND CROSSMATCHING THE BLOOD

PHLEBOTOMIST
NURSE
DOCTOR

TAKING A BLOOD SAMPLE FOR COMPATIBILITY TESTING

How do we know, what we know?

FIRSTLY: What can go wrong?

- We have been reporting **S**erious **H**azards **O**f **T**ransfusion to SHOT since 1996
- MHRA have been collecting **S**erious **A**dverse **B**lood **R**eactions and **E**vents via the SABRE website since 2005

Look at the SHOT definitions and the annual report on the website www.shotuk.org

SECONDLY: What should we do about it?

- Transfusion Medicine Handbook (for clinicians)
  - Useful flow chart

- BCSH guidelines (for laboratory and clinici
  - Compatibility guidelines
  - Acute transfusion reaction guidelines

Look at websites www.bcshguidelines.com and www.transfusionguidelines.org.uk

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Home > Library > Request Forms & Docum
adverse events & reactions

Requests for Investigation of Adve
All files are stored in a PDF format and requ

Summary of actions for transfusio

The hospital blood transfusion laboratory m
reactions & events including those suspect
of a component. The laboratory must docu

- the patient involved
- the type of reaction or event
- the reason for transfusion
- the implicated component (including
- the contact details of the clinical sta

hospital.blood.co.uk

A serious adverse reaction notification report must also be made as soon as possible via SABRE, to both MHRA and SHOT.

Advice on clinical management and investigation of serious adverse reactions can be obtained from the hospital consultant responsible for blood transfusion.

The NHSBT duty consultant for patients must be informed at once of serious adverse reactions to transfusion that require investigation or involvement by NHSBT. This is particularly important in cases of suspected bacterial contamination because other components may need recall. The NHSBT consultant is reached by contacting your local NHSBT Hospital Services department.

Please see the link below and refer to relevant request forms for minimum sample requirements for the investigation of Allo & Autoantibodies, Haemolytic Transfusion Reactions, IgA Deficiency, Transfusion Related Acute Lung Injury (TRALI), Transfusion-Associated Graft-versus-Host Disease (TA-GvHD), Post Transfusion Purpura (PTP), Febrile Non-Haemolytic Transfusion Reaction etc.

Request forms for investigation of adverse events and reactions:

Cases of suspected bacterial contamination

Cases of suspected viral and non bacterial contamination

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Cell Immunohaematology

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nors within NHS Blood and Transplant (NHSBT)

up Alloantibodies and Supply of Blood for Transfusion

ucts for Recipients of ABO/Rh Missmatched Stem Cell

Distinguishing Passive from Immune anti-D in Pregnancy (PDF)

Provision of Red Cell Transfusion Support for Transfusion Dependent Patients (PDF)

Investigation and Clinical Management of Suspected Reactions to IgA (PDF)

Investigation and Clinical Management of Patients with a positive DAT with and without Haemolysis (PDF)

Diagnosis and Management of T Antigen Activation (PDF)

Platelet and White Cell Transfusion, Histocompatibility and Immunogenetics

Transfusion Associated Graft Versus Host Disease (PDF)

Guidelines for The Management of Platelet Transfusion Refractoriness (PDF)

Transfusion Related Acute Lung Injury (TRALI) (PDF)

Post-Transfusion Purpura (PDF)

Clinical Guidelines for the use of Granulocyte Transfusions (PDF)

Neonatal Alloimmune Thrombocytopenia (PDF)

Thrombasthenia (PDF)

Interactive Session

Clinical information

The orange boxes represent the clinical picture.

There are many things going on and transfusion may only be a small part of the picture.

Remember, they know more about the patient than you do

Laboratory information

The blue boxes represent the laboratory situation.

This is often the only information you have access to when deciding what is going on.

Remember, you know more about transfusion practice than they do

Learning Points

To take back and use in everyday practice

Monday 9.30 am Transfusion Dept.

1

- 30 year old woman with suspected ectopic pregnancy came into the ED at 8.45
- Described as 'in severe pain but stable'
- FBC, coag. screen, G&S already processed by out of hours BMS.
- Second G&S sample requested, received and tested
- All 4 core identifiers present on samples; not previously known to your hospital
- Hb 90g/L, coag. screen normal, A RhD positive
- Going to theatre in 10 minutes, request for 4 units of blood immediately

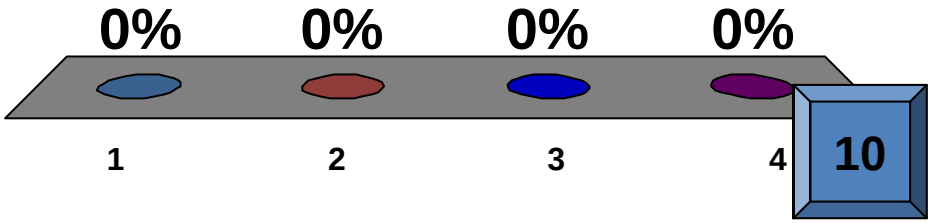
Monday 9.30 am Emergency Dept.

- 30 year old woman with severe left sided abdominal pain arrived 45 mins ago.
- Positive pregnancy test
- Scan suggests ectopic with free-fluid +++
- Following morphine is pain-free but very drowsy & clammy, hypotensive (80/? mmHg) and fast pulse (120/min)
- Decided to operate
- Urgent transfusion needed because of internal bleeding

1

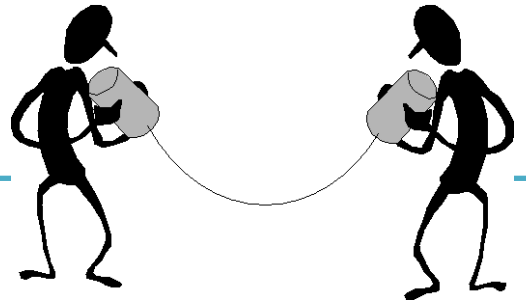
Q1 : What blood would you issue?

1. Emergency O RhD negative, no XM
2. Group specific, uncrossmatched
3. Group specific, electronic issue
4. None of these, something else



Monday 9.45 am Transfusion Dept.

- You ask “do you want to activate the major haemorrhage protocol?”
- Gynae SpR says “no, but please issue 4 units of blood as soon as you can and send it straight to theatres”
- You issue 4 units of A RhD positive red cells by electronic issue by 9.55am



Monday 10 am Gynae. Theatre

1

- 2 units of blood are given over 10 minutes
- Surgery starts at 10.05am
- The ruptured ectopic in the left fallopian tube is removed and bleeding stops
- 1 litre of blood is drained and surgery is finished by 10.30am
- In recovery, patient is cold (35°C) and hypotensive. She is on oxygen and warmed iv fluids. She has produced no urine.

Monday 10.45 am Haematology Dept.

- Repeat FBC and coagulation screen arrive
- After 30 minutes you phone the results

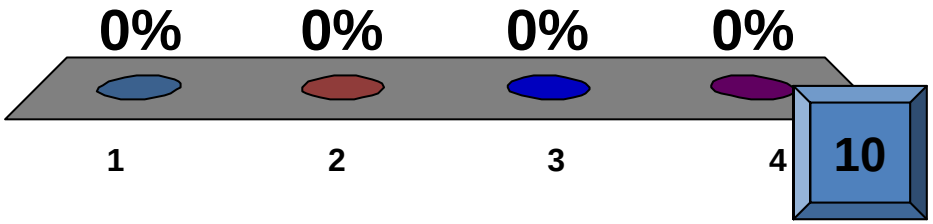
  Hb 50g/L, platelets 45 x10^9/L,

  PT 20 seconds, APTT 60 seconds, fibrinogen 1.0 g/L
- She has moved to intensive care and they request 4 more units of blood, 4 FFP and 1 ATD platelets
- You issue group A blood, platelets and FFP

Q2 : What is the most likely explanation for these blood results?

1

1. She has DIC because of the ectopic
2. She has dilutional coagulopathy because of all the blood and iv fluids
3. The surgery has not succeeded in stopping the bleeding
4. She has DIC because of an ABO incompatible red cell transfusion



Monday 11.15 Intensive Care Unit

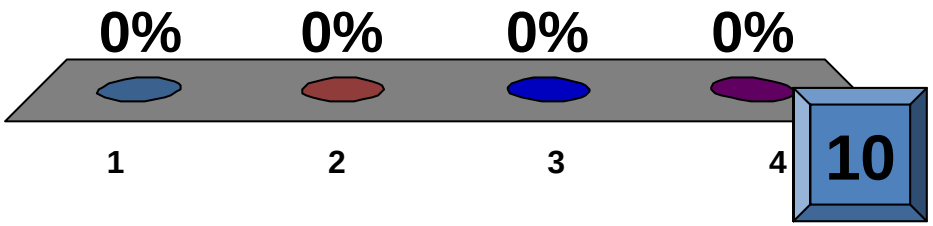
1

- The lab phone to say the blood components are ready
- The lab is concerned that the blood is haemolysed
- You have noticed very poor urine output and very dark urine
- The patient is very sick and deteriorating rapidly
- You discuss with the haematology SpR and both of you are worried about an acute haemolytic reaction

Q3 : The patient is retested and is group O instead of group A. What is the most likely explanation?

1

1. The transfusion laboratory tested the wrong patient's sample
2. The clinicians bled the wrong patient
3. The transfusion laboratory made a mistake when testing the sample
4. There were probably two patients with a similar name admitted at the same time



ABO-incompatible transfusions

1

- The ‘two-sample rule’ can prevent ABO incompatible transfusions IF the samples are taken at separate times (but you don’t always get this in a massive haemorrhage situation)
- Shift hand-over times are error-prone; incomplete handovers, hurrying and cutting corners
- In a complex clinical situation ABO incompatibility (or any transfusion reaction) can be missed because the symptoms are attributed to something else
- If you have any suspicions or clues in the lab there is a WBIT or that wrong blood has been given, always speak out immediately

Thursday 9pm, Care of the Elderly Ward

2

- Mrs. P is 75 and has had myelodysplasia for the last 18 months, requiring red cell transfusions every 3 weeks and occasionally requires platelets. She is refractory to random platelets as a result of HLA-antibodies
- She was admitted 2 days ago with a high fever and is now on iv antibiotics for pneumonia
- The nurse checks todays blood results and contacts the on-call doctor

  Hb 75 g/L, platelets 23 $x10^9$/L, WBC 27 $x10^9$/L
- The doctor reviews the patient, who is quite breathless, and arranges 3 units of blood

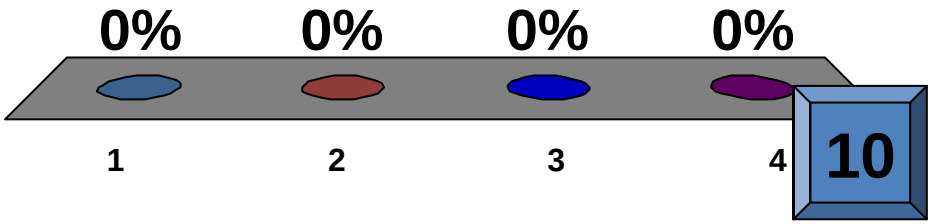
Thursday 10pm, Haematology Dept.

- The on-call BMS takes a verbal request for 3 units of red cells
- The patient is O RhD positive and has anti-Fy^a
- The last transfusion was 10 days ago
- 2 units of O+ Fya- blood have already been crossmatched for tomorrow
- There is also one unit of HLA-matched platelets for her, which expires at midnight tonight

Q4 : What is the most important thing to communicate to the doctor caring for Mrs. P tonight?

2

1. That blood and platelets are available, but give the platelets before midnight
2. That the patient has RBC and HLA antibodies
3. To discuss the case with the haematology team
4. That it is hospital policy to avoid overnight transfusion, unless the patient is unstable



Friday 2.30am, Care of the Elderly Ward

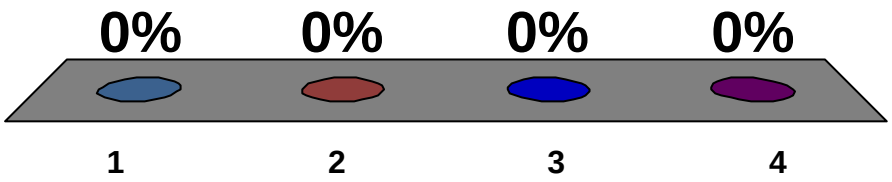
2

- The doctor prescribes the platelets over 30 minutes and each RBC unit over 2 hours, covered with oral furosemide (diuretic)
- The baseline pre transfusion obs. at 11pm were
  - BP 130/85, pulse 102, temp 37.5°C, resp. rate 28
- The platelets were given uneventfully
- Within 15 minutes of the first RBC unit the patient becomes more breathless
  - BP 140/90, pulse 110, temp 39.2°C resp. rate 32

Q5 : You receive a phone call from the nurse on the ward to say Mrs. P is having a transfusion reaction and they have stopped the blood. What would you say?

2

1. Don't call me, there's nothing I can do
2. Get the doctor looking after the patient to assess the reaction and speak to the on-call haematologist for advice
3. Tell the clinical team to document the reaction and send the implicated RBC unit back to the transfusion department
4. None of these, something else



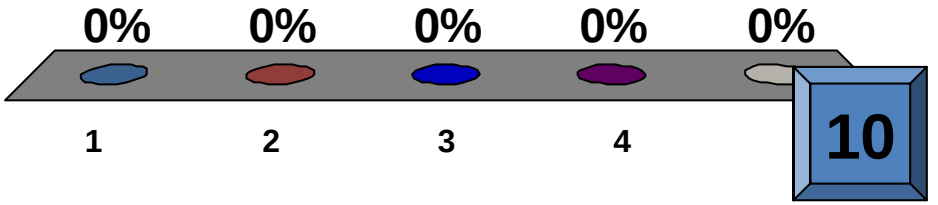
Friday 9am, Haematology Dept.

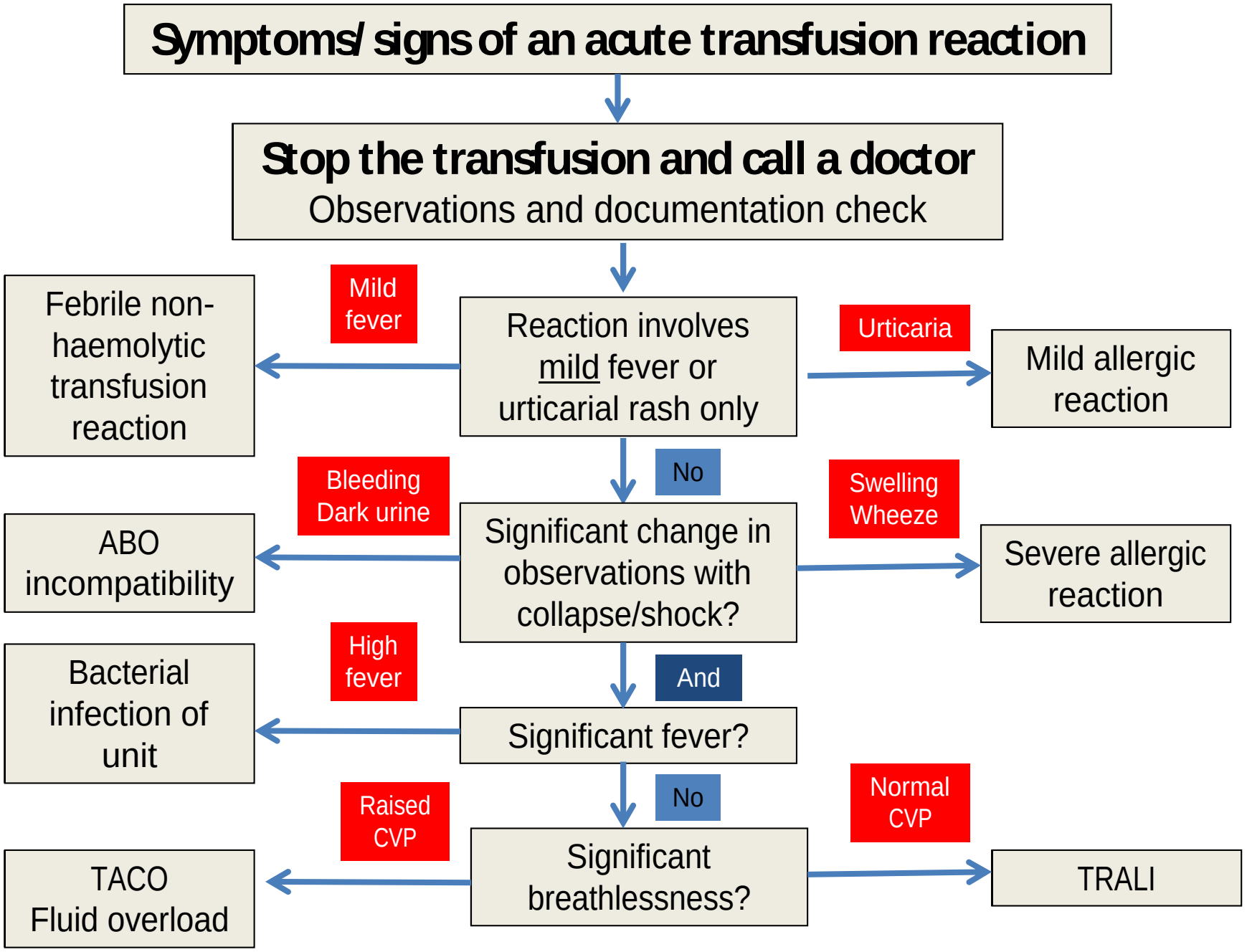
- The haematology SpR reports that Mrs. P is now ventilated on the Intensive Care Unit
- She has had blood cultures and a change of iv antibiotics but is still pyrexial
- She had poor renal function before but this is now much worse
- At 8am her Hb was 60g/L, platelets 55 $x10^9$/L, WBC 12$x10^9$/L

2

Q6 : What do you think the likely cause of this transfusion reaction?

1. Transfusion Associated Circulatory Overload
2. Transfusion Related Acute Lung Injury
3. Haemolytic Transfusion Reaction
4. Anaphylaxis
5. Bacterial contamination the red cells




Symptoms/ signs of an acute transfusion reaction
Stop the transfusion and call a doctor
Observations and documentation check
Reaction involves mild fever or urticarial rash only
Mild fever
Febrile non-haemolytic transfusion reaction
Urticaria
Mild allergic reaction
No
Significant change in observations with collapse/shock?
Bleeding Dark urine
ABO incompatibility
Swelling Wheeze
Severe allergic reaction
And
Significant fever?
High fever
Bacterial infection of unit
No
Significant breathlessness?
Raised CVP
TACO Fluid overload
Normal CVP
TRALI

Friday 11.15am, Intensive Care Unit

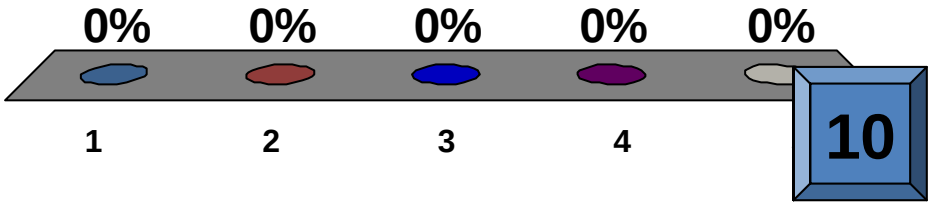
2

- Blood cultures taken the night before grow pseudomonas, the same organism that was detected in the sputum on admission
- Chest X-ray suggests worsening pneumonia with bilateral infiltrates and a large heart
- She has clinical signs to suggest heart failure and is in positive fluid balance
- The haematology SpR reviews the patient and suggests a plan of investigation

Q7 : Which set of investigations would be the most useful in this case?

2

1. Repeat blood group, crossmatch and antibody screen. Check bilirubin and look at a blood film
2. Send the remains of the RBC unit to NHSBT for culture and ask them to recall any associated units
3. Discuss the case with the TRALI panel
4. Check an IgA level and anti-IgA antibodies
5. None of these, something else



Respiratory Complications of Transfusion

- Breathlessness is a feature of most severe acute reactions
- After resuscitating the patient, there needs to be a clinical review to guide further investigations
- It is important to focus investigations on the case – don't do every test on every case
- The pattern of symptoms and the time of onset after the start of transfusion is usually more helpful that laboratory investigations
- Not all breathlessness is transfusion-related!

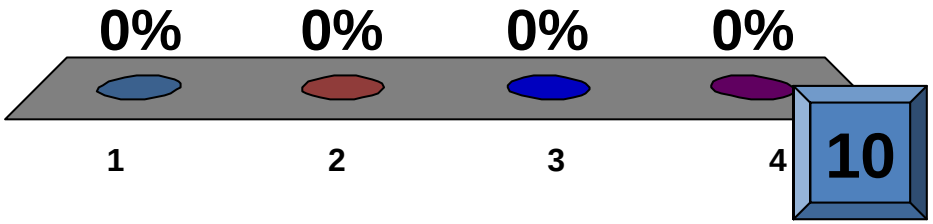
Friday 4pm, Haematology Day Ward

- 21 year old male with very severe aplastic anaemia diagnosed 2 months ago
- He requires platelets twice a week and RBC transfusion every 2 weeks
- He continues to attend his university course and intends to finish his degree. The final exams are in 3 weeks
- He has not had any recent infections
- There have been no previous transfusion reactions
- He is about to go home when he starts to feel itchy and shows you a rash over his arms and body

3

Q8 : What should the day-ward staff do?

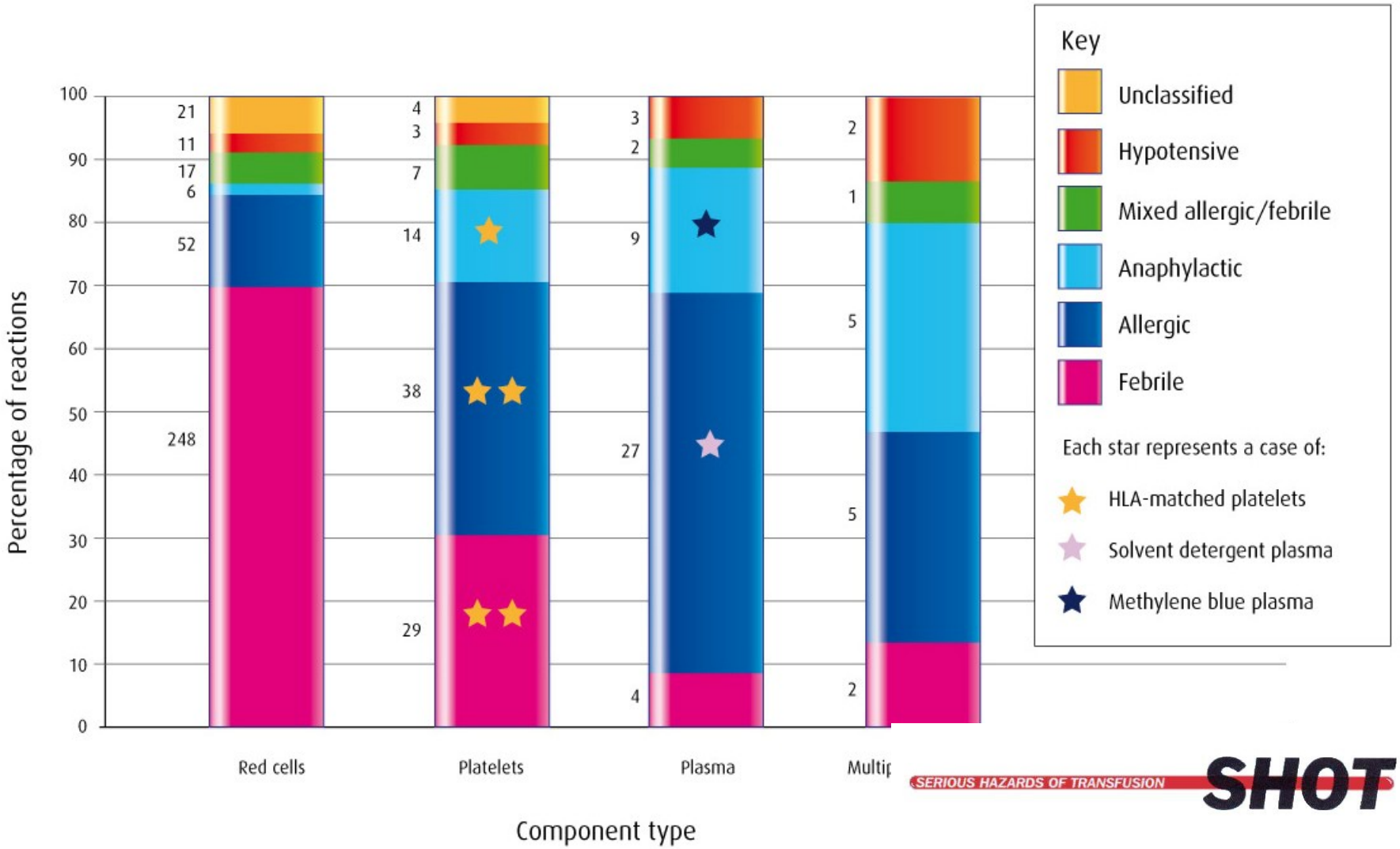
1. Arrange for him to have washed platelets next time
2. Take a set of observations and advise him to wait to be reviewed by the doctor
3. Give him antihistamines and then let him drive home if the rash settles
4. Alert the blood service and send the unit of platelet for culture to exclude bacterial contamination



SERIOUS HAZARDS OF TRANSFUSION SHOT

Category	Mild	Moderate	Severe
Febrile reaction	Temperature rise up to 2°C No other symptoms/signs	Temperature rise of 2°C or more Rigors, chills other inflammatory symptoms	Temperature rise of 2°C or more plus symptoms that require urgent medical review or prolong hospital stay
Allergic reaction	Transient flushing, urticaria or rash	Wheeze or angiooedema but no significant breathlessness or hypotension	Bronchospasm, stridor, angiooedema, circulatory problems. Anaphylaxis
Reaction with both allergic and febrile features	Features of mild febrile and mild allergic reactions	Features of both allergic and febrile reactions One feature in moderate category	Features of both allergic and febrile reactions One feature in severe category
Hypotensive reaction		Isolated fall in BP of 30mm or more No allergic or inflammatory symptoms	Shock without allergic or inflammatory symptoms

Reaction by Component Type



Allergic Reactions

- Are quite common
- Sometimes related to a factor in the donor
- Occur in patients with other allergies
- Sometimes mild reactions can get worse and patients should be observed for a period of time

Learning Points

1. **A multi-professional team approach to transfusion reactions produces the best results**
2. **Patients present with symptoms of their underlying disease as well as those of transfusion reactions**

   It is GOOD when clinical staff consider the possibility of a reaction, so be encouraging!
3. **Symptoms and timing of onset are clues to the cause of the reaction**

   Flowcharts are a useful complement knowledge of the type of reactions
4. **Mild reactions should be discussed and documented in the notes**

   But do not require extensive investigations