

# Transfusion reactions

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# Introduction

- Blood transfusion is generally very safe
  - Preventable death & morbidity still occurs
  - Reduce inappropriate transfusions
  - Serious acute reactions are unpredictable
  - Good care of patient is vital
- 
- In event of reaction:
  - STOP the transfusion (resuscitate the pt)
  - Check pt details & compatibility label
  - Call for medical assistance



# Haematology nurses & blood

- Approx 70% units go to medicine, over 50% goes to Cancer directorate
- Haem patients, significant co-morbidities (Sepsis)
- Reaction can be difficult to recognise
- Ambassadors for good practice!

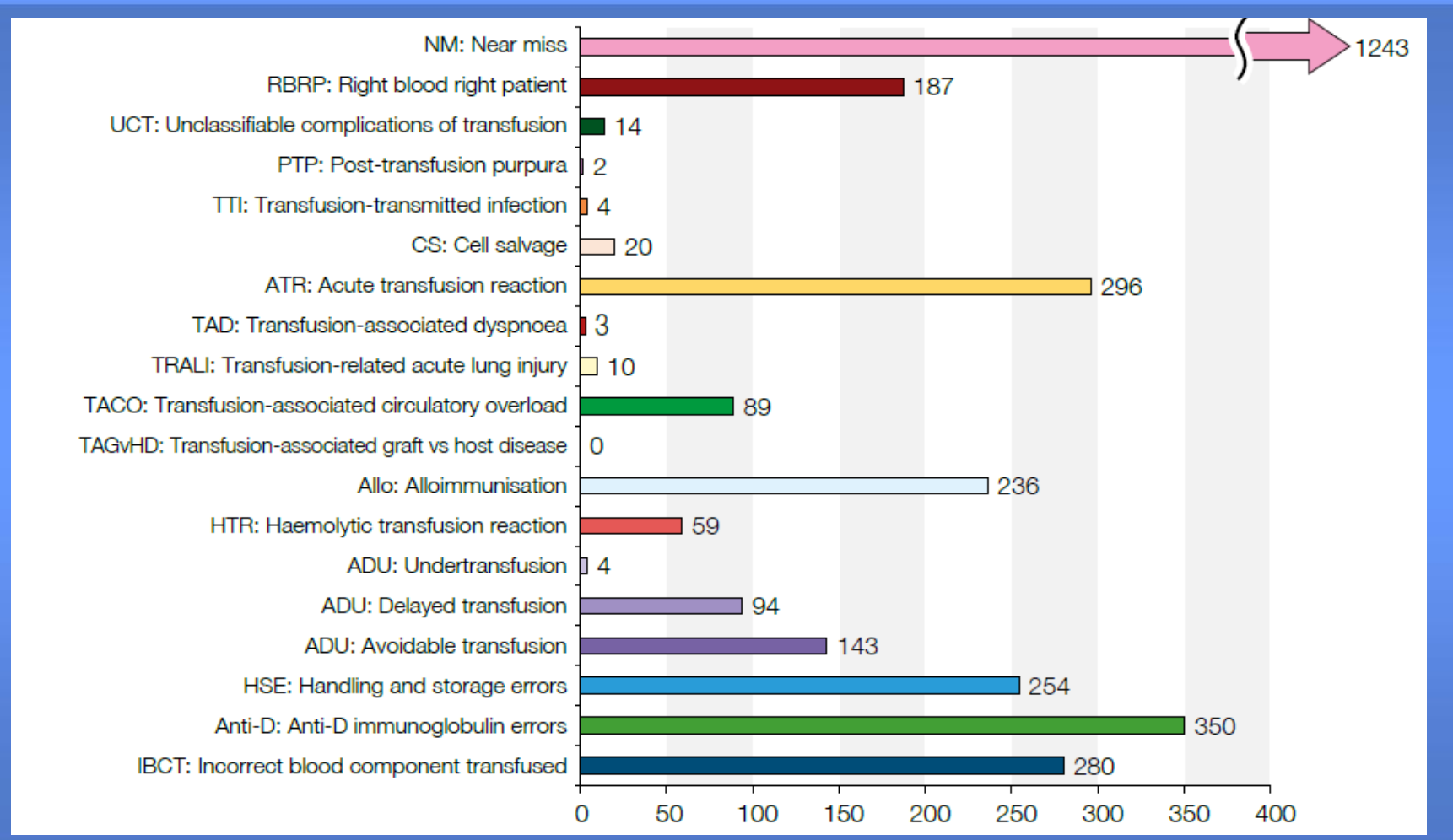


# Haemovigilance

- Aim: Improve transfusion safety
- Transfusion reactions & adverse events are investigated by clinical team & HTT
- SHOT welcomes reports of serious adverse transfusion reactions, errors and events as well as near-miss incidents.
- SHOT reports highlighted TRALI as serious risk of transfusion & FFP now only is sourced from male donors



# SHOT data 2015



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# Definition

- ‘An unintended response in a patient that is associated with a transfusion of blood components that is fatal, life-threatening, disabling or incapacitating’ SHOT 2015



# Consent in blood transfusion

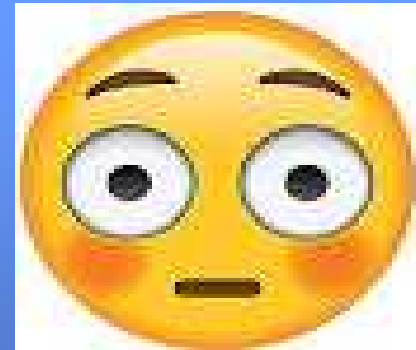
- The health team inc Dr's & nurses
- Informed consent inc:
  1. Reason for transfusion
  2. Potential benefits
  3. Risks
  4. Expected outcomes



# Case Study 1

- Female being investigated for suspected reaction:
- Transfusion RC started at: 06:43
  - Temp 37.4
  - BP 145/70
  - Resps 16
  - HR 68

After 20 minutes transfusion stopped as patient felt hot & sweaty, change in face colour noted.





## Case study 1 contd...

- Pre-transfusion G&S negative for antibodies.
- Post-transfusion, sample was treated with enzyme & positive for anti-E.
- Pt had 2 recent transfusions, 1 unit was E positive.
- This unit stimulated the anti body but was still undetectable pre-transfusion
- Anti E may have come from pregnancy, previous tx or can be naturally occurring (V rare).
- Enzyme only anti-E
- Patient recovered well but will receive only E antigen neg units in future.



# Types of reactions

- Acute transfusion reactions:
- Within 24 hours of transfusion varying from mild febrile or allergic reactions to life-threatening events.
- Early recognition is vital (initial 15 minute)
- Patients should be aware of post transfusion reactions for the next 24 hours.



## Key Principles:

- Direct observation by appropriately trained staff
- Recognition & immediate management is vital
- Care of the patient
- Appropriate investigation, specific treatment & prevention
- Returning unit to transfusion lab, subsequent blood samples
- Early symptoms do not ignore!



## Acute haemolytic reactions:

- Transfusion of ABO incompatible red cells which react with patient's anti A or Anti B antibodies.
- Rapid destruction of transfused red cells.
- Patient becomes shocked, may develop acute renal failure & DIC
- Transfusion of less than 30 mls may prove fatal
- Red cells transfused to the wrong patient 30% chance they will be ABO incompatible.
- Unconscious patients: tachycardia, hypotension



## Case study 2:

- Patient admitted for 2 unit blood transfusion
- 1<sup>st</sup> ever transfusion
- Group A unit started
- Patient started to feel nauseous less than 10 minutes, transfusion stopped.
- Desaturation
- Sats falling
- Respiratory arrest
- Arrest team resuscitate patient.



## Case study 2 contd...

- G & S (DAT determine if the person has made an antibody that has attached to the transfused RBCs ), blood cultures, FBC, U&E's repeated.
- Patient admitted onto ICU
- Repeat group & screen showed ABO incompatible transfusion. Pt group O, blood issued group A.
- Sample labelling error had occurred



# Severe allergic or anaphylactic reactions

- Wheeze, Stridor, laryngeal oedema or swelling of face etc.
- Flushing, urticaria (less severe)
- Most common in plasma-rich components
- IM adrenaline first line therapy (anaphylaxis)
- Steroids & antihistamines may be given (allergic).
- Recurrent episodes: Washed red cells or platelets in additive solution
- Little evidence to support common practice of prophylactic antihistamines or steroids. Ethical not to give???



# Transfusion-related acute lung injury (TRALI)

- Antibodies in donor blood react with the patient's white cells.
- Inflammatory cells are hidden in the lungs causing plasma to leak into alveolar spaces.
- Occurs mainly in acutely unwell patients
- Presentation within severe respiratory distress
- CXR: bilateral nodular shadowing
- Supportive treatment, high concentration O<sub>2</sub> therapy.
- Symptoms similar to TACO (different treatments)





# Transfusion associated circulatory overload (TACO)

- Acute or worsening pulmonary oedema.
- ARD, Tachycardia, Hypertension & positive fluid balance.
- Cause significant morbidity & mortality
- Poor pre-transfusion clinical assessment & inadequate monitoring common feature
- Stop the tx
- Administer oxygen
- Diuretic therapy with careful monitoring



## Case study 3

- 51 yr old lady admitted to ED with Hb of 37
- 2 week history of feeling lethargic, no evidence of bleeding
- 3 units of red cells prescribed over 2 hours each.
- Hb checked after 3<sup>rd</sup> unit found to be 74.
- Further 3 units prescribed.
- No diuretic indicated for either prescriptions.
- 15 minutes into 5<sup>th</sup> unit patient noted to be breathless.
- Transfusion stopped







## Case study 3 contd....

- Pre obs: 148/68, HR: 70, 99% (air), RR: 16
- Post obs: 162/93, HR: 83, 93% (air), RR: 23, 36.5.
- CXR ordered (suspicious of fluid overload), IV piriton given, 40mg Frusemide given.
- Patient had good diuresis & subsequent recovery, discharged 24hrs later.
- Hb noted to be 100.
- Conclusions:
- Monitor & r/v Hb more closely (NICE recommendations)
- Patient later diagnosed with iron deficiency anaemia.



# TACO calculator weightings

Diagnostic Category	Status	Score
 <b>Respiratory</b>	Acute or worsening respiratory distress with no apparent alternative cause	2
	Acute or worsening respiratory distress with possible alternative cause	1
 <b>Imaging</b>	Pulmonary oedema (+/- cardiomegaly) not on pre-transfusion image, OR worsening compared to pre-transfusion image	2
	Pulmonary oedema (+/- cardiomegaly) on imaging with no pre-transfusion image for comparison, OR no change from previous image	1
	Pulmonary oedema not present on image, OR no image available	0
 <b>Fluid Balance</b>	Clinically significantly positive fluid balance	1
	Unable to assess fluid balance	0
	Neutral or negative fluid balance	-1
 <b>Diuretics</b>	Improvement with diuretics and/or morphine and nitrates alone (not administered with steroid, anti-histamine or bronchodilator)	2
	Improvement with diuretics and/or morphine and nitrates (also administered with steroid, anti-histamine or bronchodilator)	1
	No improvement or worsening after diuretic	-1
	Unable to assess response to diuretic or diuretic not given	0

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## Less severe ATR

- Febrile non-haemolytic transfusion reactions: Fever, shivering, muscle pain (less common due to leucodepletion)  $<2^{\circ}\text{C}$  from baseline. Slow or temporarily stop tx, anti-pyretic (may be early signs of more severe reaction)
- Mild reaction (itching, nettle rash) no other change in vitals. Antihistamine
- Delayed reactions: Can occur more than 24hrs after transfusion. Easy to miss esp day case who has been discharged.



# Conclusion

- Blood transfusion is extremely safe.
- But deaths & major morbidity do occur
- Errors in Patient ID, blood sampling are at root cause of many preventable serious adverse events.
- Monitoring patient
- Avoid inappropriate & unnecessary transfusions.



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