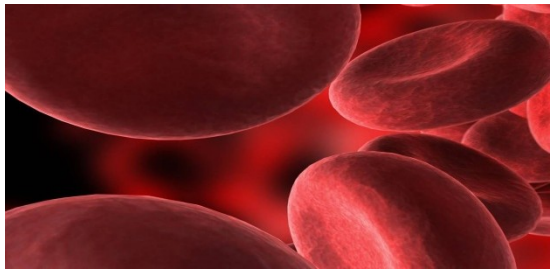
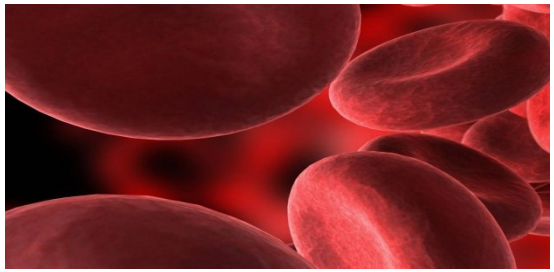


FY1 PDP

Safe Transfusion Practice

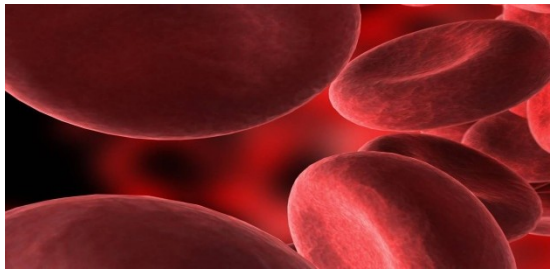
Presented by The Yorkshire & Humber Regional Transfusion Practitioner Group

Aim



To review real life case studies of transfusion incidents, identifying;

- What went wrong
- Why
- What should have happened
- Consequences to the patient/clinician

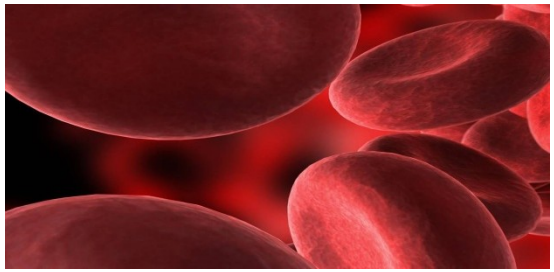


Objectives

Raise awareness of:

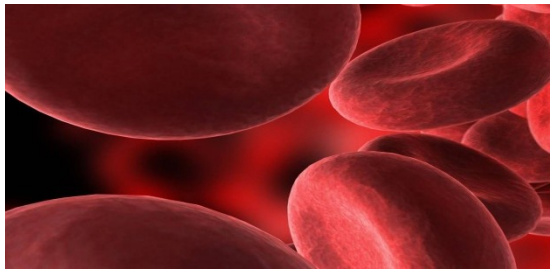
- Serious Hazards of Transfusion
- Inappropriate & unnecessary transfusions
- Transfusion reactions
- Recognising how transfusion errors can occur through limitations in knowledge/ experience
- The effects of these on patient outcome
- Where to go for advice/ support

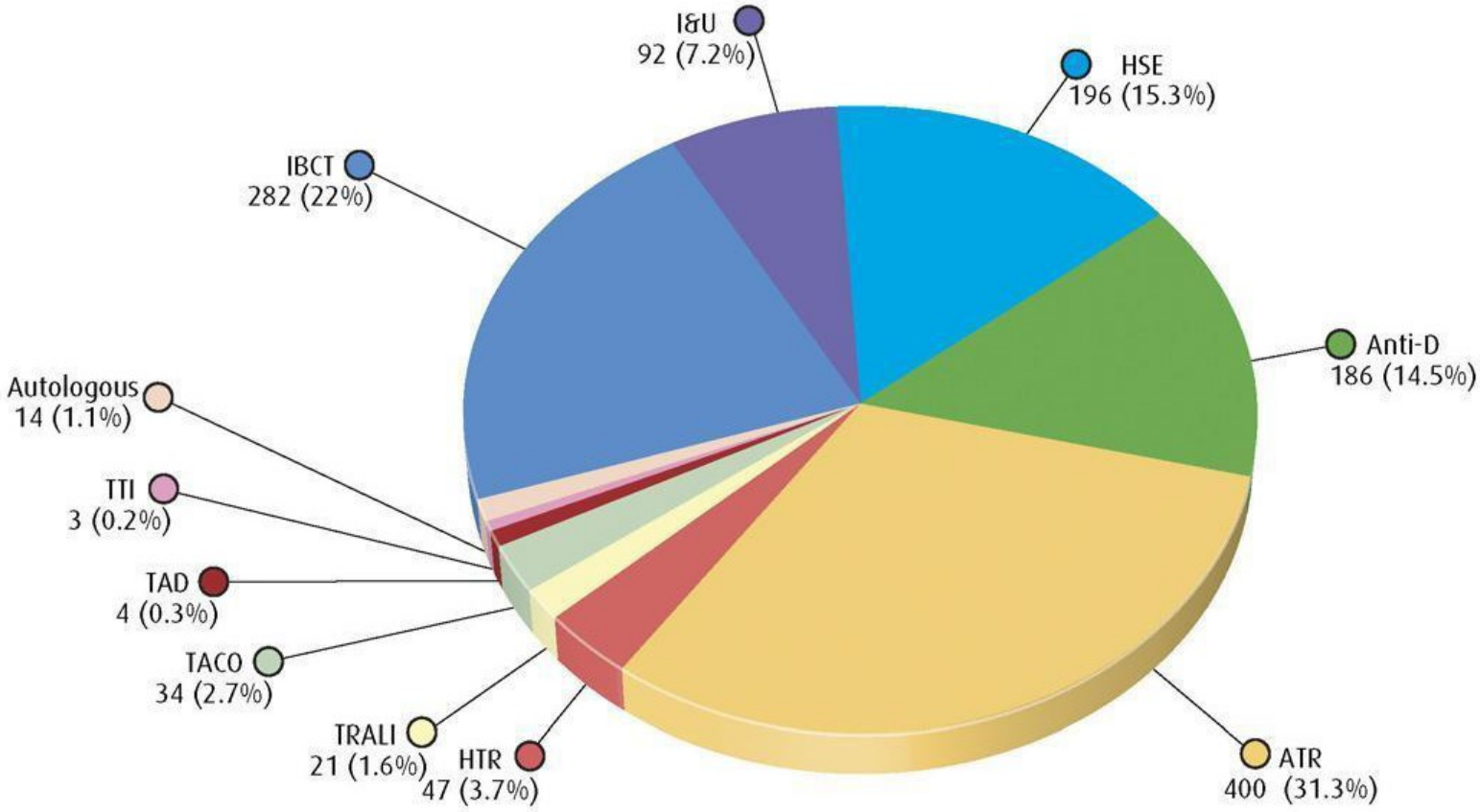
Serious Hazards of Transfusion SHOT

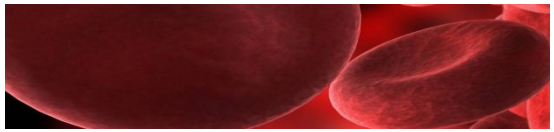


- SHOT is the United Kingdom's independent, professionally led haemovigilance scheme.
- Started in 1996 and was the first such scheme in the world.
- SHOT collects and analyses anonymised information on adverse events and reactions in blood transfusion from all healthcare organisations that are involved in the transfusion of blood and blood components in the United Kingdom.

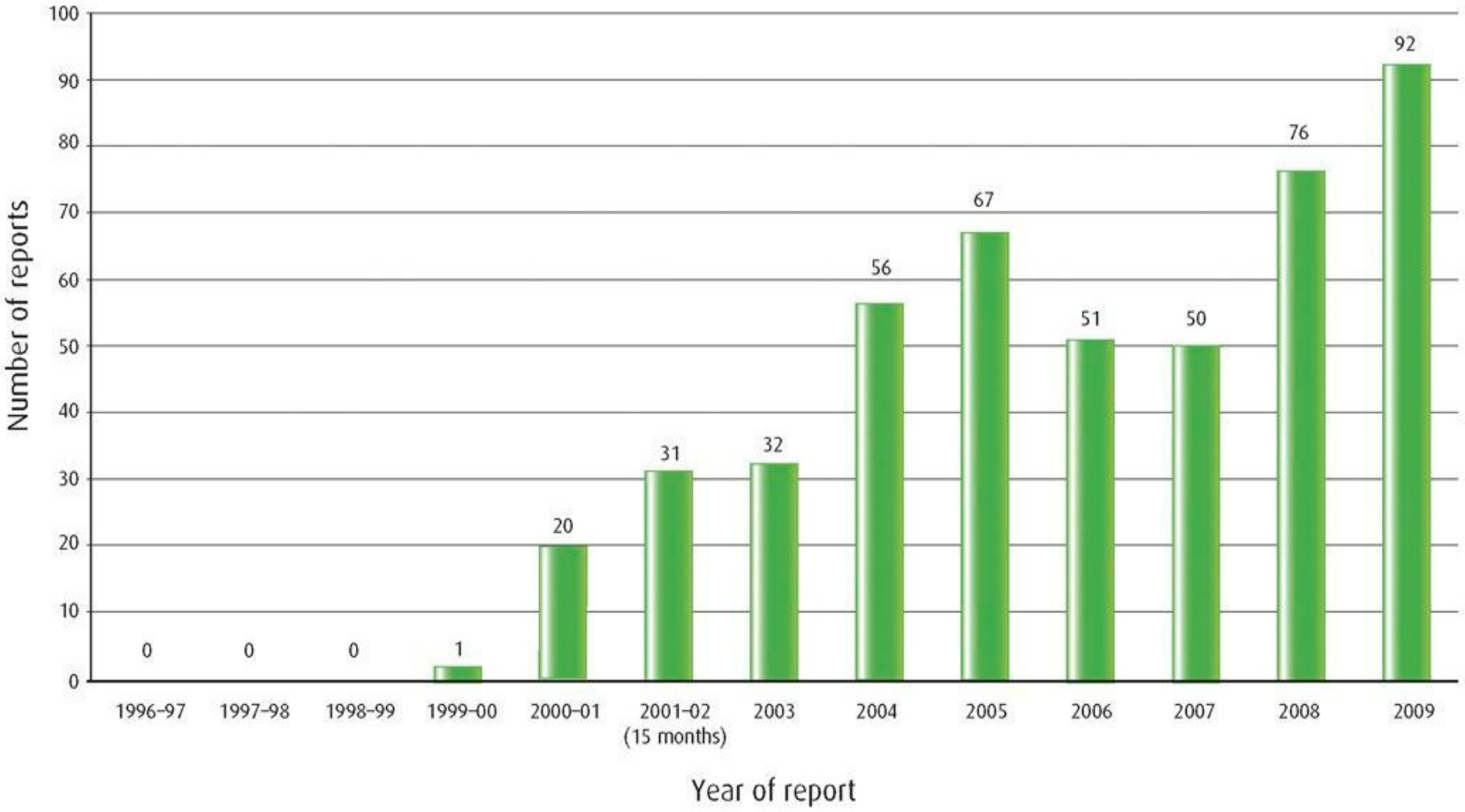
SHOT 2009 Report- 1279 reports



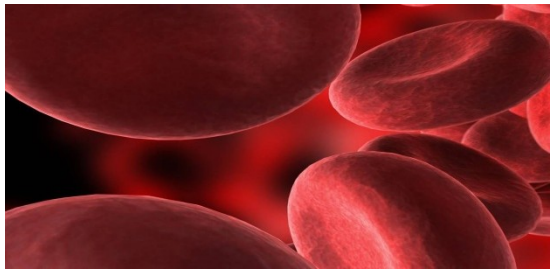




SHOT Cases of inappropriate and unnecessary transfusion 1996 - 2009

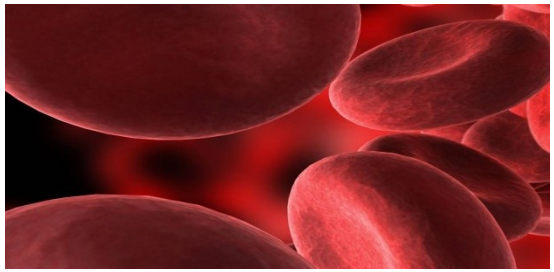


Inappropriate & unnecessary transfusion (I&U) SHOT Report 2009



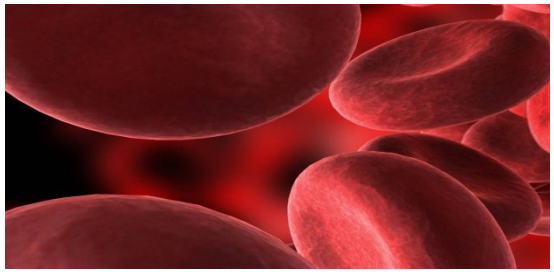
- There were 92 cases of inappropriate and unnecessary transfusion in 2009 compared with 76 in the 2008 report.
- This is an increase of 21% since last year.
- Two patients in this group died following over-transfusion, and this may have contributed to their deaths.
- The majority of cases relate to lack of knowledge and errors of judgement (often due to inexperience) in clinical staff

Inappropriate & unnecessary transfusion (I&U)



- Transfusions given on the basis of erroneous, spurious, or incorrectly documented laboratory testing results for haemoglobin, platelets and coagulation tests.
- Transfusions given as a result of poor understanding and knowledge of transfusion medicine, such that the decision to transfuse puts the patient at significant risk, or was actually harmful.
- Under transfusion or delayed transfusion resulting in poorer patient outcome

Transfusion Case Studies

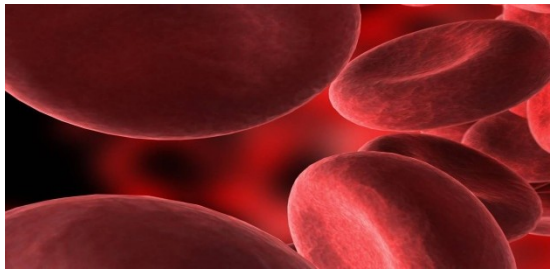


Read through each case study and consider:

- What went wrong?
- Why?
- What should have happened?
- Consequences to the patient/clinician?
- What was the transfusion reaction?

List your findings on flip chart provided and select a spokesperson to feedback

Transfusion Case Study 1.



'Patient dies following transfusion'

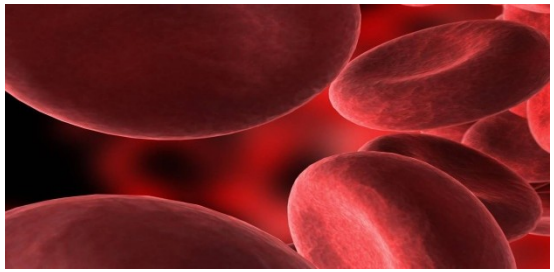
- Elderly man with chronic renal failure, anaemia and a history of falls attends A&E
- Symptomatically anaemic with Hb 6.8 g/dl.
- Cross matched using a blood sample taken in A&E
- On ITU after < 100 mL blood had been transfused, developed fever, hypotension, bronchospasm and died a few hours later

On investigation:

Patient blood was group O RhD negative, he received a unit of A RhD negative blood.

Show slides 11, 12, 13 & 14 following feedback

Transfusion Case Study 1.



What went wrong?

- No checking of patient's ID at the bedside, either with the patient or with the patients wristband.

- Wrong patient had been bled in A&E resulting in a '**wrong blood in a tube**' incident. The sample was labelled for the intended patient.

Why?

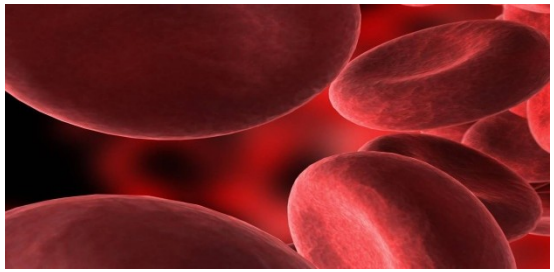
- Transfusion sample protocol not followed.

What should have happened?

- All patients being sampled must be positively identified.

Reaction? ***Acute Haemolytic Transfusion Reaction***

Sampling Procedure



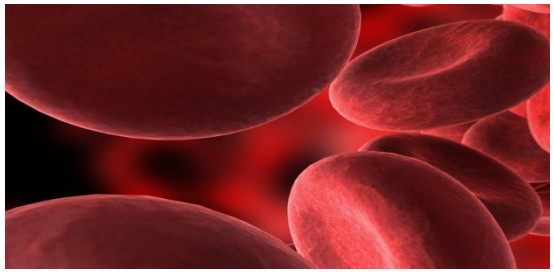
Step 1: Ask the patient to tell you their:

Full name and date of birth

Check this information against the patient's ID wristband

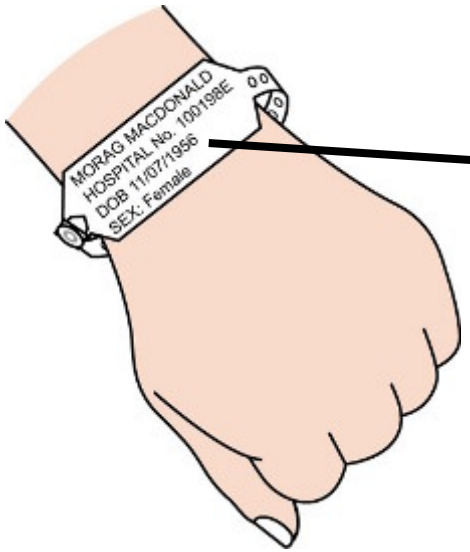
Get a second independent check when the patient is unconscious / compromised

Sampling Procedure

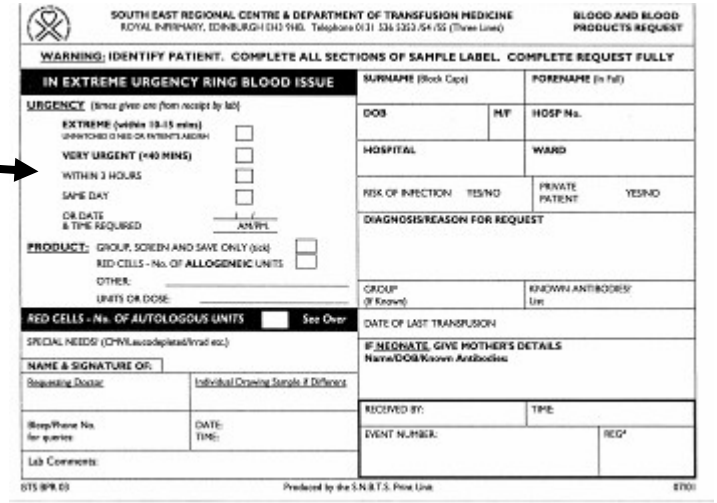


Step 2: Check the patient's ID wristband against documentation e.g. case notes or transfusion request form

- First name
- Surname
- Date of birth
- Hospital number



EXAMPLE REQUEST FORM



SOUTH EAST REGIONAL CENTRE & DEPARTMENT OF TRANSFUSION MEDICINE
ROYAL INFIRMARY, EDINBURGH EH3 9HB. Telephone 0131 536 1353 /54 /55 (Three Lines)

BLOOD AND BLOOD PRODUCTS REQUEST

WARNING: IDENTIFY PATIENT. COMPLETE ALL SECTIONS OF SAMPLE LABEL. COMPLETE REQUEST FULLY

IN EXTREME URGENCY RING BLOOD ISSUE

URGENCY (times given are from receipt by lab)

EXTREME (within 10-15 mins)
UNMATCHED O NEG OR PATIENT'S BLOOD

VERY URGENT (<40 MINS)

WITHIN 3 HOURS

SAME DAY

OR DATE & TIME REQUIRED ___/___/___ AM/PM

PRODUCT: GROUP, SCREEN AND SAVE ONLY (tick)

RED CELLS - No. OF ALLOGENEIC UNITS

OTHER:

UNITS OR DOSE:

RED CELLS - No. OF AUTOLOGOUS UNITS See Over

SPECIAL NEEDS/ (CMV/Leucodepleted/Irrad etc.)

NAME & SIGNATURE OF:

Requesting Doctor | Individual Drawing Sample if Different

Bleep/Phone No. for queries | DATE: TIME:

Lab Comments:

SURNAME (Block Caps) | FORENAME (in full)

DOB | M/F | HOSP No.

HOSPITAL | WARD

RISK OF INFECTION YES/NO | PRIVATE PATIENT YES/NO

DIAGNOSIS/REASON FOR REQUEST

GROUP (If Known) | KNOWN ANTIBODIES/ List

DATE OF LAST TRANSFUSION

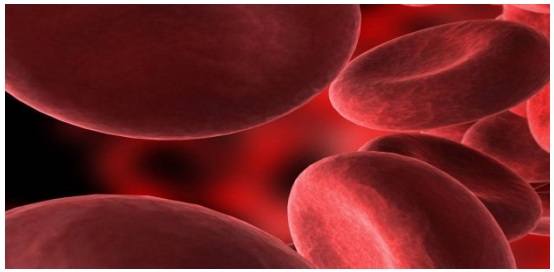
IF NEONATE, GIVE MOTHER'S DETAILS
Name/DOB/Known Antibodies

RECEIVED BY: | TIME:

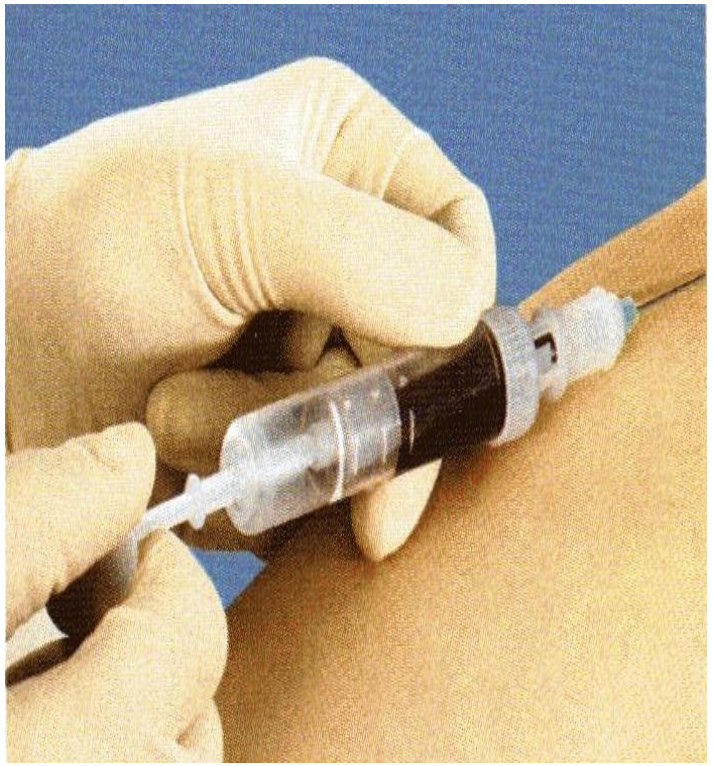
EVENT NUMBER: | REQ#

STS BPR 03 Produced by the S.N.B.T.S. Print Unit BTD1

Sampling Procedure

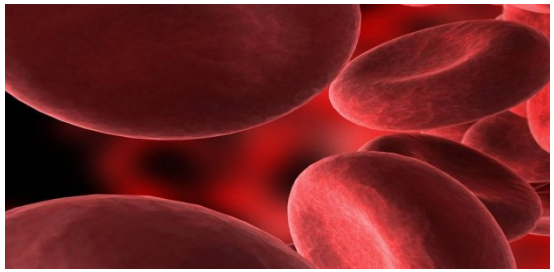


- Only bleed one patient at a time
- Do NOT use pre-labelled tubes
- Hand write the sample tube before leaving the patients side!



NB: Do not take samples from a IV drip arm.

Transfusion Case Study 2.

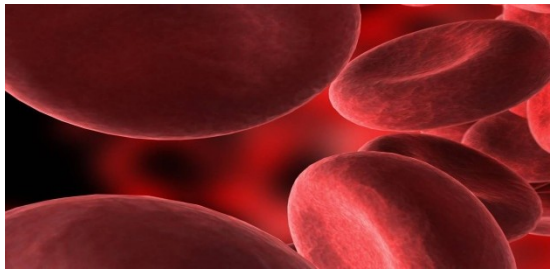


- 67 year old man diagnosed Prostate cancer
- Visited GP as felt 'tired' for some time
- Hb 7.6g/dl. - admission arranged 2/3 days later as a 'day case' for **3 unit blood transfusion**
- **9am** - arrives on day unit & informs staff he is the main carer for his disabled wife, anxious transfusion is completed as soon as possible
- **11am** - group & cross match sample taken
- **2pm** - blood sample arrives in transfusion lab
- **4pm** - 3 units available for collection
- **5.45pm** - 1st unit commenced and transfused within 2 ½hours – uneventful
- **8.15pm** - patient very anxious to go home, however, 2 more units still to be transfused. **Day unit due to close at 9pm**

Show slide 16 following feedback

Transfusion Case Study 2.

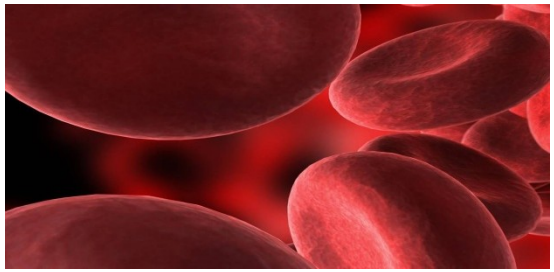
What happened next?



Decision made to transfuse both units together, one in each arm. Patient found collapsed in chair 15 minutes into transfusion, developed rash on trunk and anterior aspects of legs, which subsided over the next few hours.
Transfusion aborted. SpR persuaded patient to stay overnight for observation (none done by nursing staff).

Discharged the following morning by SpR. **Incident/ decision not documented in patients medical notes and not reported to transfusion lab as a transfusion reaction**. Discharge letter stated 'Bilateral transfusion to expedite discharge'

Transfusion Case Study 3.

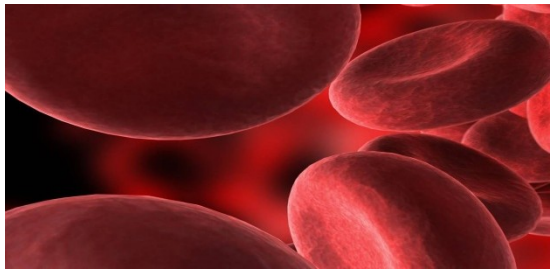


'Failure to check patient history'

- Elderly patient with history of heart failure, admitted for routine weekly transfusion
- No beds on haematology ward
- Transferred to surgical day ward by bed manager
- Transfusion prescribed by haematology Dr (first day in post) no evidence of clerking/checking patient history, no diuretic cover
- Transfusion commenced on surgical day ward. When day ward closed, transferred to private ward overnight (during transfusion)
- Patient developed acute SOB within 2 hrs of completion of transfusion
- Received oxygen, bronchodilators and diuretics
- Chest x-ray and E.C.G performed
- Consultant haematologist informed following day, completed adverse event form. Patient recovered and discharged next day

Show slides 18 & 19 following feedback

Transfusion Associated Circulatory Overload (TACO)



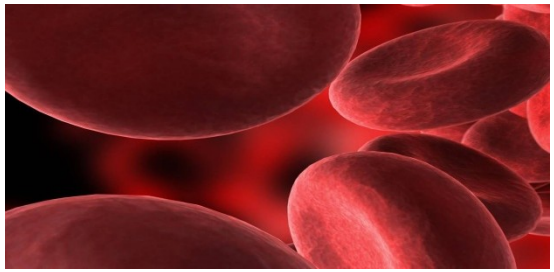
Definition:

Any four of the following occurring within 6 hrs of transfusion:

- Acute respiratory distress
- Tachycardia
- Increased blood pressure
- Acute or worsening pulmonary oedema
- Evidence of positive fluid balance

SHOT 2008

Transfusion Associated Circulatory Overload (TACO)



34 cases reported in SHOT 2009 report:

- No deaths definitely related, however, **TWO deaths** probably related and

  TWO deaths possibly related.

- TACO accounts for the highest number of cases of mortality & major morbidity in the 2009 annual report.

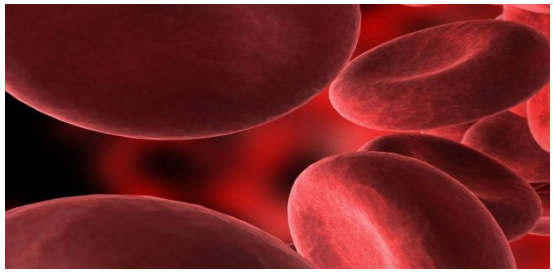
- TACO is relatively common & potentially avoidable complication.

- Doctors should consider whether transfusion is appropriate & take note of concomitant medical conditions that increase the risk.

- The use of diuretic cover for blood transfusion is likely to reduce the risk of TACO and should also be considered.

SHOT 2009

Transfusion Case Study 4.



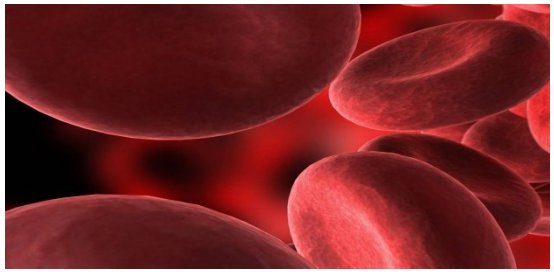
'Is that Hb correct?'

- Patient admitted acutely – GI bleed (witnessed estimated blood loss 200mls)
- **12.12hrs** - Hb 5.8g/dl (telephoned to ward) – 5 units blood requested by doctor, 4 to be transfused that day
- **16.47hrs**- repeat Hb result 11.1g/dl on pathology system
- **17:00hrs** - endoscopy: no source of bleeding noted/food visible in stomach
- **23:00hrs** – patient reviewed by 'on call' team – 1st unit transfusing – to continue overnight. Hb result seen by team, *presumed* to be post transfusion Hb

cont……..

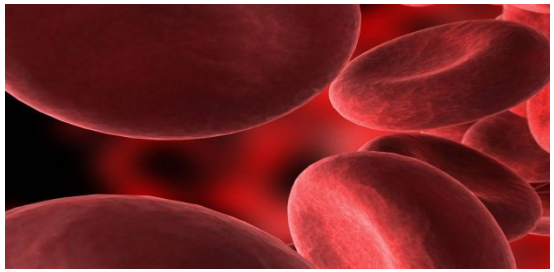
Transfusion Case Study 4.

'Is that Hb correct?'



- Patient transfused 4 units blood (overnight- despite night nurse querying transfusion)
- Repeat endoscopy following day – no source of bleeding found
- Day 2 Hb 15.5g/dl.
- Comment in notes 'no ill effects from over transfusion'
- Diuretic given as BP slightly raised
- Day 3 Hb 16.9g/dl.
- Patient discharged 6 days later

Transfusion Case Study 5.



'What's the indication?'

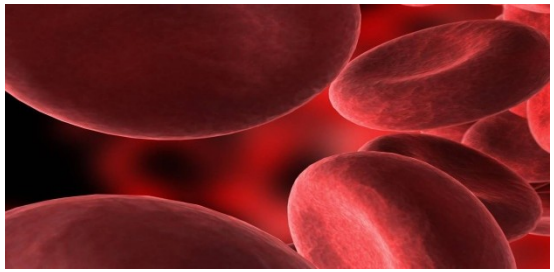
- 34yr old man on ICU, removal of cerebral haematoma & respiratory arrest-3 days post surgery
- Ventilated and sedated
- INR 2.2
- No bleeding
- Condition stable
- 2 units FFP administered, patient stable throughout transfusion

15 minutes post transfusion

- Developed rash over neck, chest and abdomen, red face
- De-saturated to 86%
- Remained cardiovascularly stable

Show slides 23 & 24 following feedback

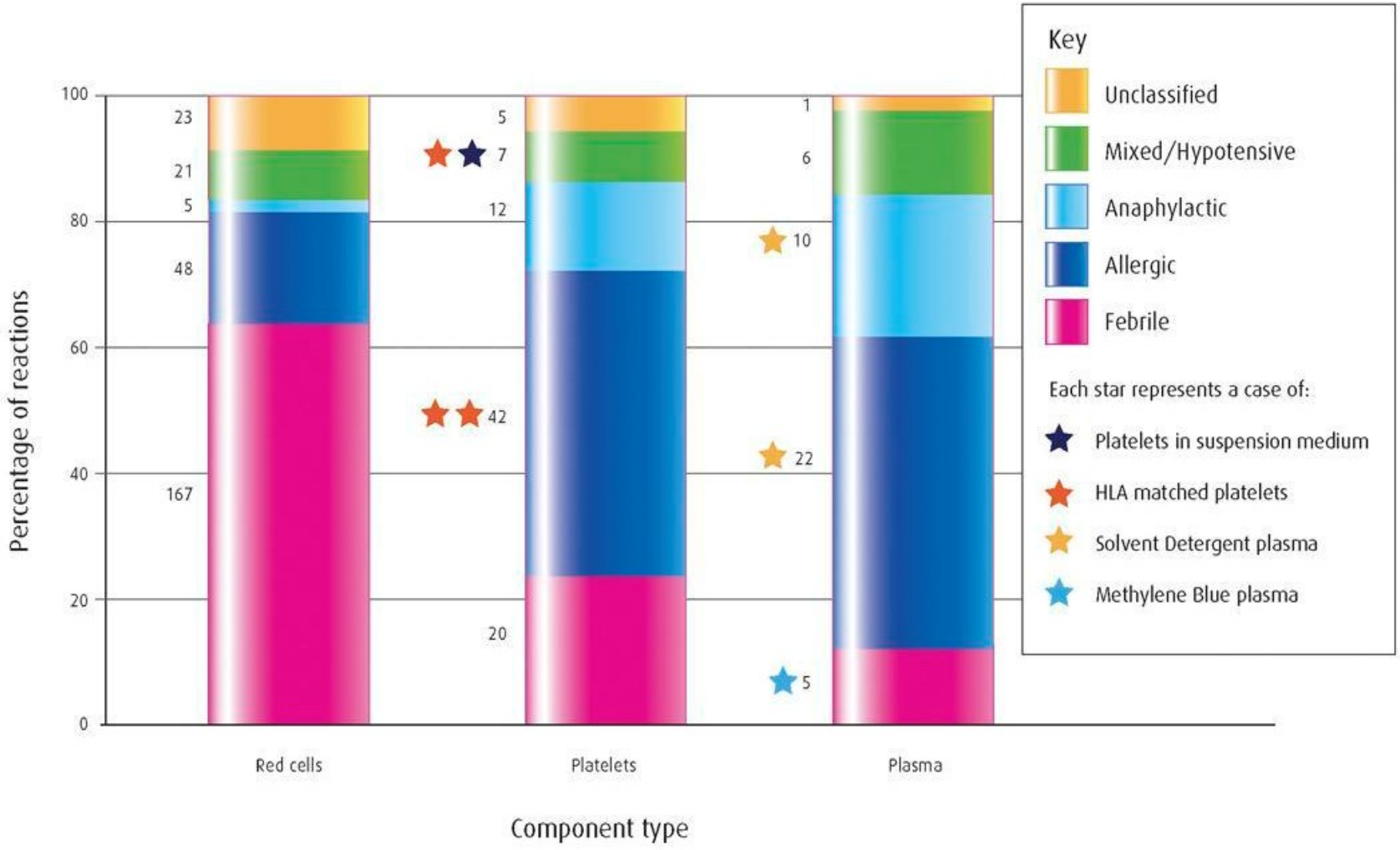
Indications for FFP



- Replacement of single coagulation factor deficiencies or combined factor concentrates unavailable e.g. FV
- Immediate reversal of warfarin effect in presence of life-threatening bleeding. FFP has only partial effect & is not optimal treatment; prothrombin complex concentrates are preferred
- Acute DIC in the presence of bleeding & abnormal coag results
- Thrombotic thrombocytopenic purpura (TTP), usually in conjunction with plasma exchange
- Massive transfusion & surgical bleeding; use of FFP guided by timely coag tests
- Liver disease; patients with a PT within 4 seconds of the control value are unlikely to benefit from FFP

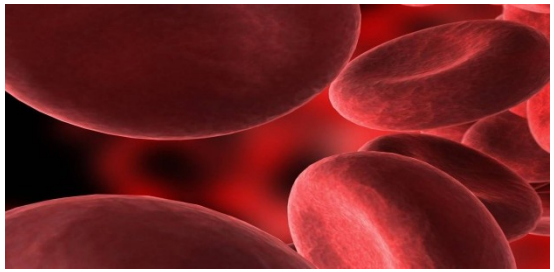
Reaction by component type SHOT 2009

(Excluding 6 reactions that could not be attributed to a particular component)



Transfusion Case Study 6.

SHOT case 2008

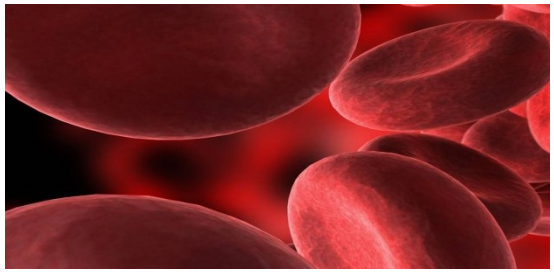


'Smoke screen?'

- Elderly woman on warfarin for AF, admitted with PR bleed
- Hb 6.8 g/dl and INR of 7.2
- Persistent hypotention
- Given 2 mg vitamin K IV & 3 units of FFP
- 3 units of FFP administered over 3 hours
- After completion of 3rd unit, patient developed itchy erythematous rash
  and given IV chlorpheniramine & hydrocortisone
- 6hrs later - patient found collapsed, resuscitation unsuccessful
- Post mortem showed fresh blood in the bowel
- Cause of death - haemorrhage from large bowel

Transfusion Case Study 7.

'Listen to the Patient'



Patient prescribed blood transfusion for iron deficiency anaemia

Day 1

1st unit - Patient complained of wheeze & agitation. Seen by Dr and given nebuliser, prednisolone 40mg & co-amilofruse with good effect

Day 2

2nd unit - Patient complained of wheeze, no urticaria/ angioedema. Furosemide given

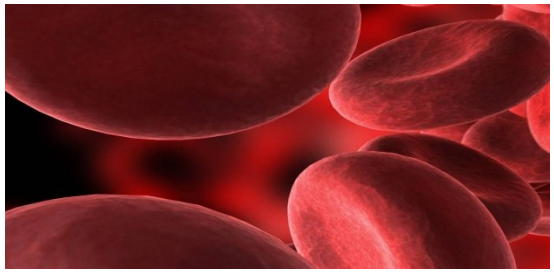
Day 3

3rd unit - 2 hours into transfusion, patient complained of 'feeling funny'. This unit was transfused in a faster time to "ensure complete infusion"!?

On investigation the patient described feeling wheezy (just for the duration of the transfusions), nauseous, loin pain and agitated.

Show slide 27 following feedback

Transfusion Case Study 7.
'Listen to the Patient'



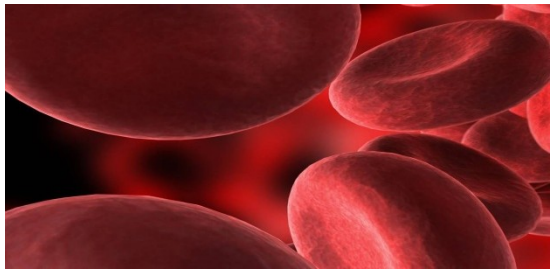
Trust your instincts...

- Wheeze
- Angioedema
- "Impending doom/feeling funny" – listen to the patient not just the obs'
- Nausea
- Loin pain
- Pyrexia >1.5ºC from baseline

STOP the transfusion & report any signs/symptoms of severe allergic reaction to Blood Bank / Transfusion Practitioner immediately and act on their advice; take blood samples as requested, return blood units, re-XM and await new set of components.

NB: Don't treat iron deficiency anaemia with transfusion unless symptoms are life threatening – consult with haematologist!

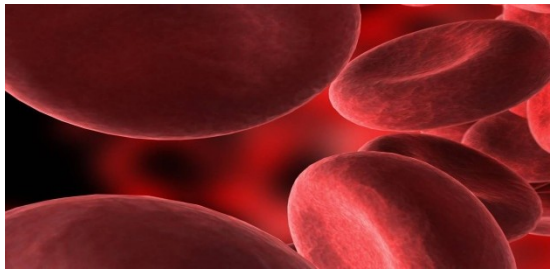
Transfusion Case Study 8.



'Feeling Dreadful'

- 78 year old female under the c/o haematologist
- Admitted for 2 unit transfusion - symptomatic chronic anaemia
- No recent transfusion history (last transfusion over 30 years ago)
- Alloantibody (anti-E) found. ABO and RhD compatible, red cell units cross matched
- 1st unit commenced, 15 minute obs unchanged from baseline
- 25 mins into transfusion c/o feeling unwell, shaky, pain in back radiating to neck, "feeling really dreadful" Obs still virtually unchanged from baseline
- Patient receiving no other treatment to account for symptoms
- Transfusion discontinued
- Evidence of haemolysis in urine and raised bilirubin, patient admitted to ward overnight for observation. Condition settled. Patient described that "she thought she was going to die" she felt so dreadful.

Transfusion Case Study 9.



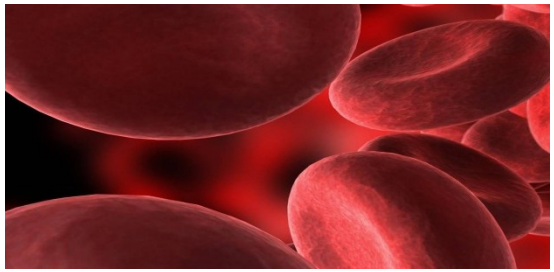
'Heed advice from laboratory!'

- 88 year old female due for discharge to nursing home
- 02.00hrs had coffee ground vomit and malaena
- Hb 14.3g/dl. (previous Hb 14.7g/dl)
- Haemodynamically stable
- Further IV fluids given
- 04.30hrs - obs unrecordable
- 05.10hrs - 2 units red cells given
- 06.10hrs – small amount of malaena noted, haemodynamically stable
- Further 4 units red cells requested.
- **Lab staff asked for repeat Hb - not taken**.
- 08.30hrs – Haemodynamically stable – 2 units red cells given
- 12.00hrs - Hb 16.6g/dl. (post transfusion) results not reviewed until 5 pm.
- Following day Hb 18.3g/dl, then 20.8g/dl. No action taken.

A total of 6 units of blood transfused

Show slide 30 following feedback

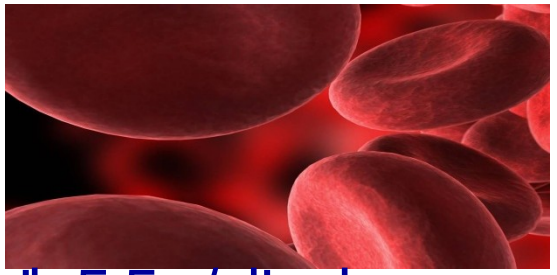
SHOT 2009 Case study



'Request from BMS for repeat sample not heeded'

Following abdominal surgery a patient fell in the ward and fractured her femur. Her most recent previous Hb was 15.9 g/dL. ***On testing a new FBC sample the BMS called the ward, gave an Hb of 6.1 g/dL, and requested another sample as he thought the result was incorrect****. However, the result was passed to the medical team on the ward round by a nurse who did not mention the need to repeat the test. On the basis of the erroneous result, even though clinically there was not extensive bleeding, a 4-unit red cell transfusion was ordered by the consultant, and all 4 units were given without further review. The patient's Hb was 20.2 g/dL before surgery on the following day, and the anaesthetist was aware of this. The patient developed cardiac failure and died. This was thought to be probably related to the excessive transfusion.*

Transfusion Case Study 10.

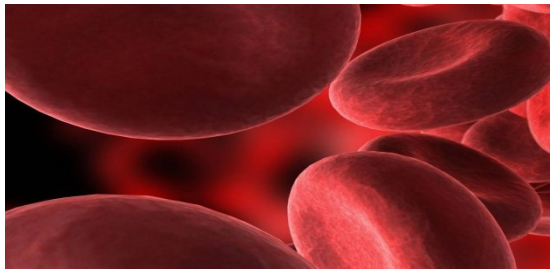


'Whose life is it?'

- A young woman with iron deficiency anaemia, Hb 5.5 g/dL, due to longstanding menorrhagia, sent to the ED by her GP
- She was reluctant to have a blood transfusion and went home with a supply of iron tablets
- GP was not satisfied and sent her back
- Transfusion practitioner discussed the patient's concerns with her and then requested the GP to reconsider the alternative options
- The patient was sent back again, this time with a letter instructing that transfusion was needed
- The request was not discussed at any point with a haematology consultant, and the patient was eventually, reluctantly, transfused

Show slide 32 following feedback

Chronic Anaemia



Patients with chronic anaemia are usually normovolaemic or hypervolaemic, and may have signs of cardiac failure before any fluid is infused.

If such a patient must be transfused, each unit should be given slowly with diuretic (e.g. furosemide 20-40mg), and the patient closely observed.

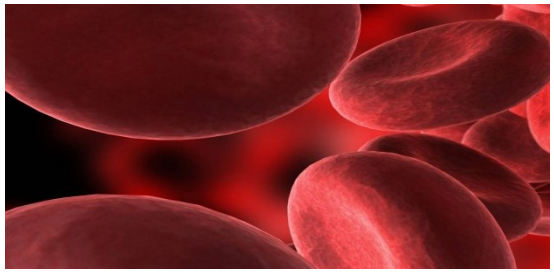
Restricting transfusion to one unit of RBC in each 12 hour period should reduce the risk of LVF.

Volume overload is a special risk with 20% albumin solutions.

Handbook of Transfusion Medicine 4th **Ed. 2007**

Transfusion Case Study 11.

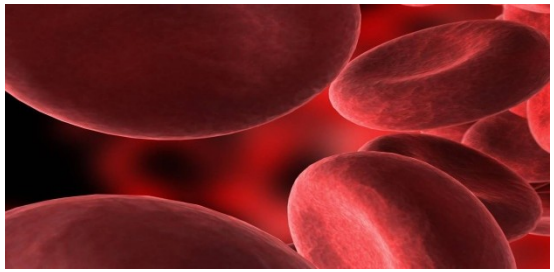
'What's the problem?'



- Female aged 29 years
- Admitted following sepsis due to necrotising fasciitis, IV drug user
- ICU, intubated & ventilated due to respiratory episode previous day
- DIC due to sepsis
- Transfused with 10 cryoprecipitate, 4 FFP, 2 pooled platelets, 2 red cells (given on haematologist's advice)
- 16:20hrs transfusions commenced - ended 19:10hrs.
- 20:15hrs SpO2 dropped - oxygen increase from 35% to 60%.
- 20.45hrs given furosemide 50mg IV with excellent diuresis, 2280mls)
- PEEP on ventilator increased
- 21:00hrs CXR showed bilateral pulmonary infiltrates
- CVP stable pre-transfusion and post reaction

Total volume transfused: 2,227mL in 2hours 50 mins

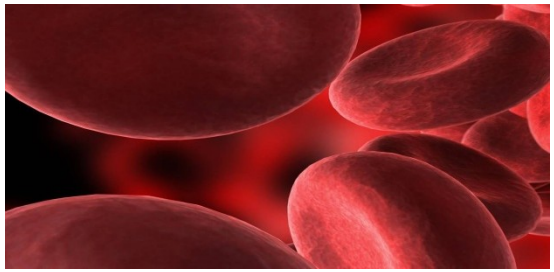
Transfuse or not to transfuse?



'The final responsibility in the vast majority of these cases lies with medical staff, who assess the patient both clinically and in the light of laboratory results, make the decision to transfuse, and decide upon the component, dose and rate of transfusion. In effective teams a form of friendly surveillance of others' decisions and actions means that there should be supportive input from nursing and biomedical staff, which may highlight problems and prevent errors – but ultimately the knowledge and experience of the doctor is the most important factor, and with that rests the final responsibility for the decision'.

2008 SHOT report

Further Information



- Hospital Blood Transfusion Policy & Guidelines
- The Handbook of Transfusion Medicine [4th Ed] (2005)
  www.transfusionguidelines.org.uk
- BCSH Guidelines: www.bcshguidelines.com
- Serious Hazards of Transfusion Annual Report
  www.shotuk.org
- Consultant Haematologist
- Hospital Transfusion Laboratory
- Transfusion Practitioner
- Safer Blood Transfusion www.npsa.nhs.uk