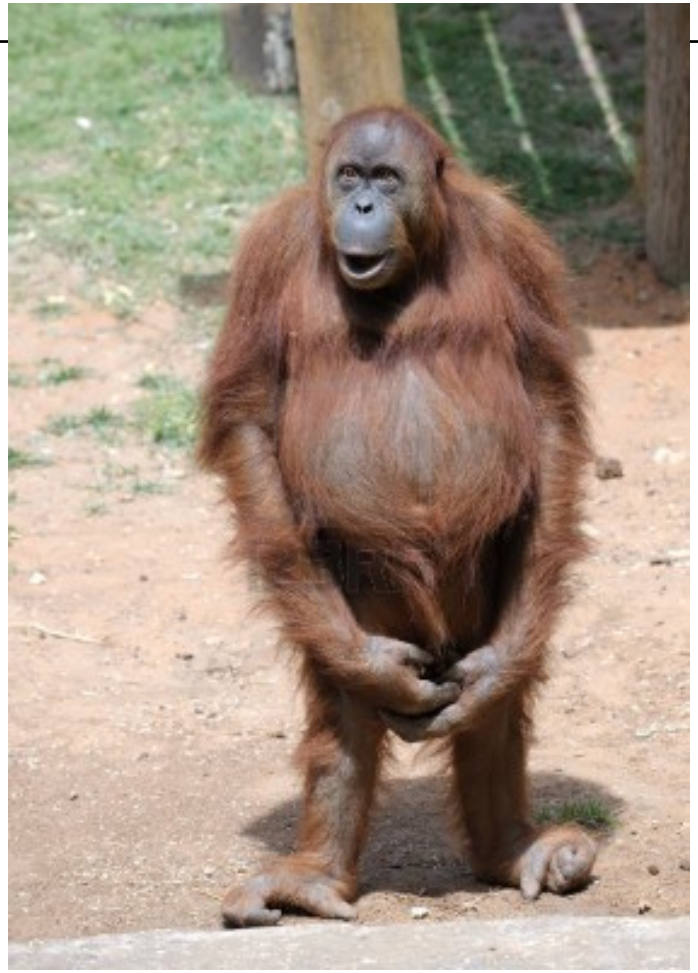
Challenging Requests for Blood Components – Yes or No?

Carol Cantwell & Brian Robertson

January 2013

Who are we…?

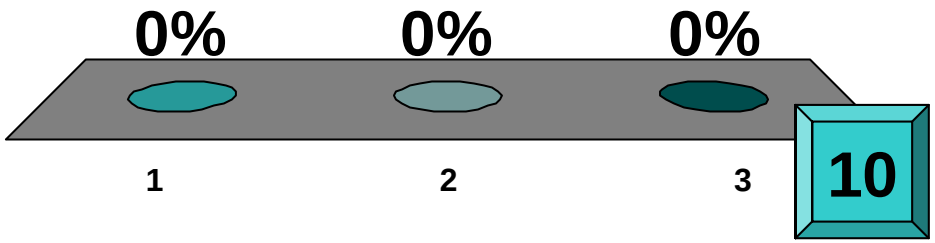
Carol Cantwell (Skinny!)



Brian Robertson (with Hair!)

What gender is on your passport?

1. Male
2. Female
3. Undecided

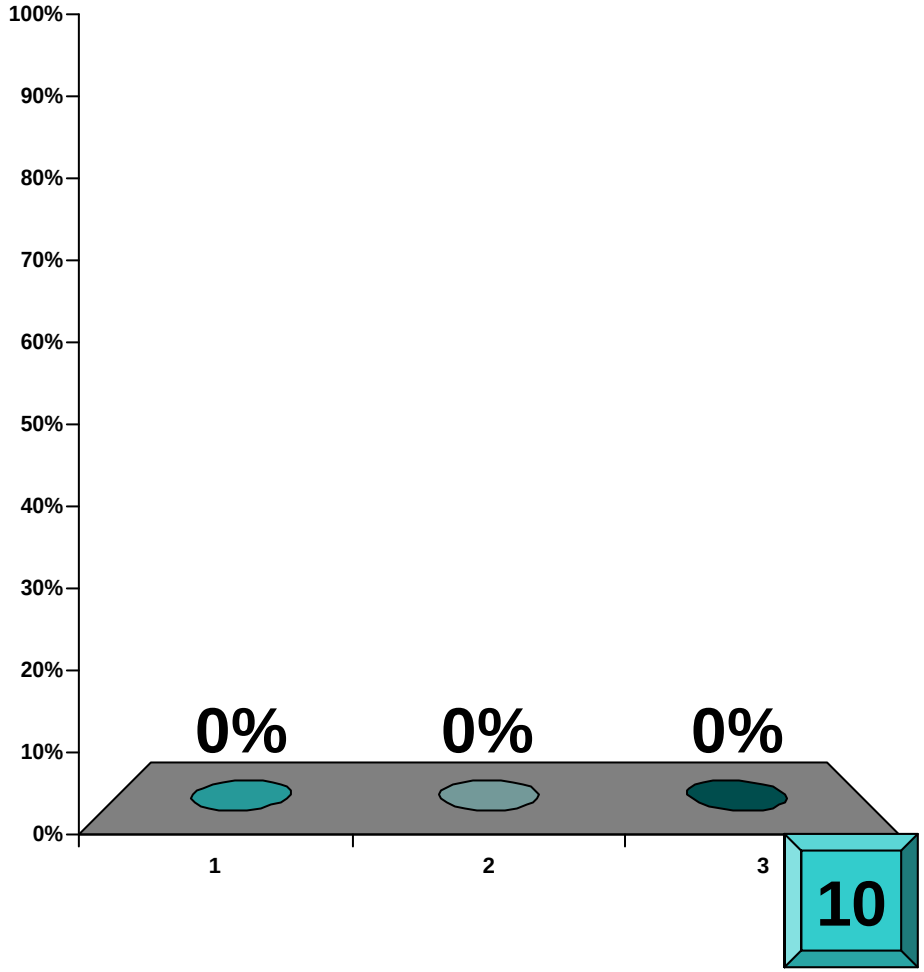


Who are you?

1. Trainee BMS 17%
2. BMS band 5 17%
3. BMS band 6 17%
4. BMS band 7 17%
5. BMS band 8 17%
6. BMS Transfusion Practitioner 17%

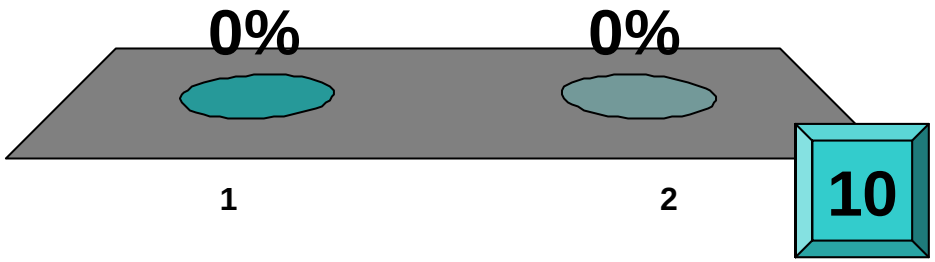
Who thinks a BMS should screen transfusion requests for appropriateness?

1. Yes
2. No
3. Not sure



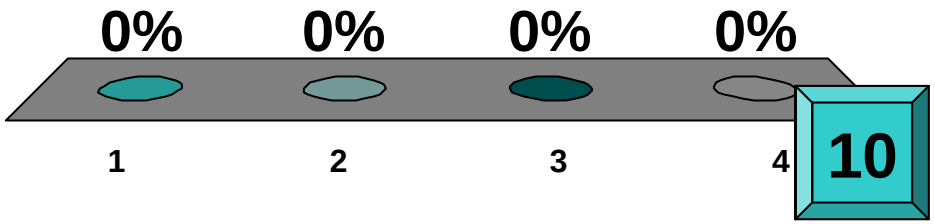
Do you feel empowered to screen requests?

1. Yes
2. No



Do you feel you have the appropriate knowledge to screen requests?

1. Yes
2. No
3. Not sure
4. Not for all components



Patient Blood Management

Is an evidence-based, multidisciplinary approach to optimising the care of patients who might need transfusion

Only transfuse only when it is in the patient's best interest to do so

If doctors have the knowledge about blood transfusion and alternatives as well as the competence to follow correct procedures we will

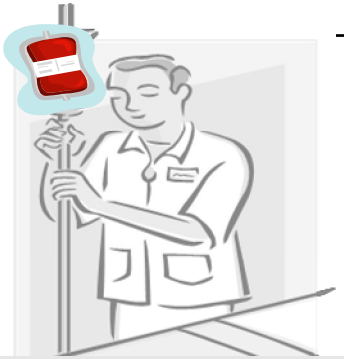
ALWAYS transfuse the RIGHT BLOOD to the RIGHT PATIENT

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

NURSE
DOCTOR

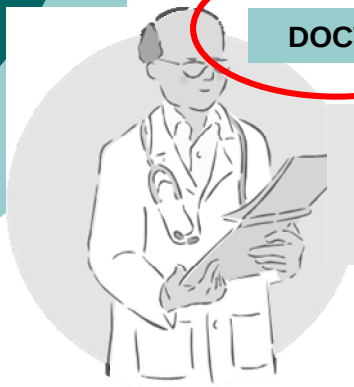
CARE OF THE PATIENT DURING TRANSFUSION

NURSE
DOCTOR



CHECKING THE BLOOD AND STARTING THE TRANSFUSION

DOCTOR



ORDERING AND PRESCRIBING THE BLOOD, DOCUMENTING THE TRANSFUSION

PORTER
NURSE

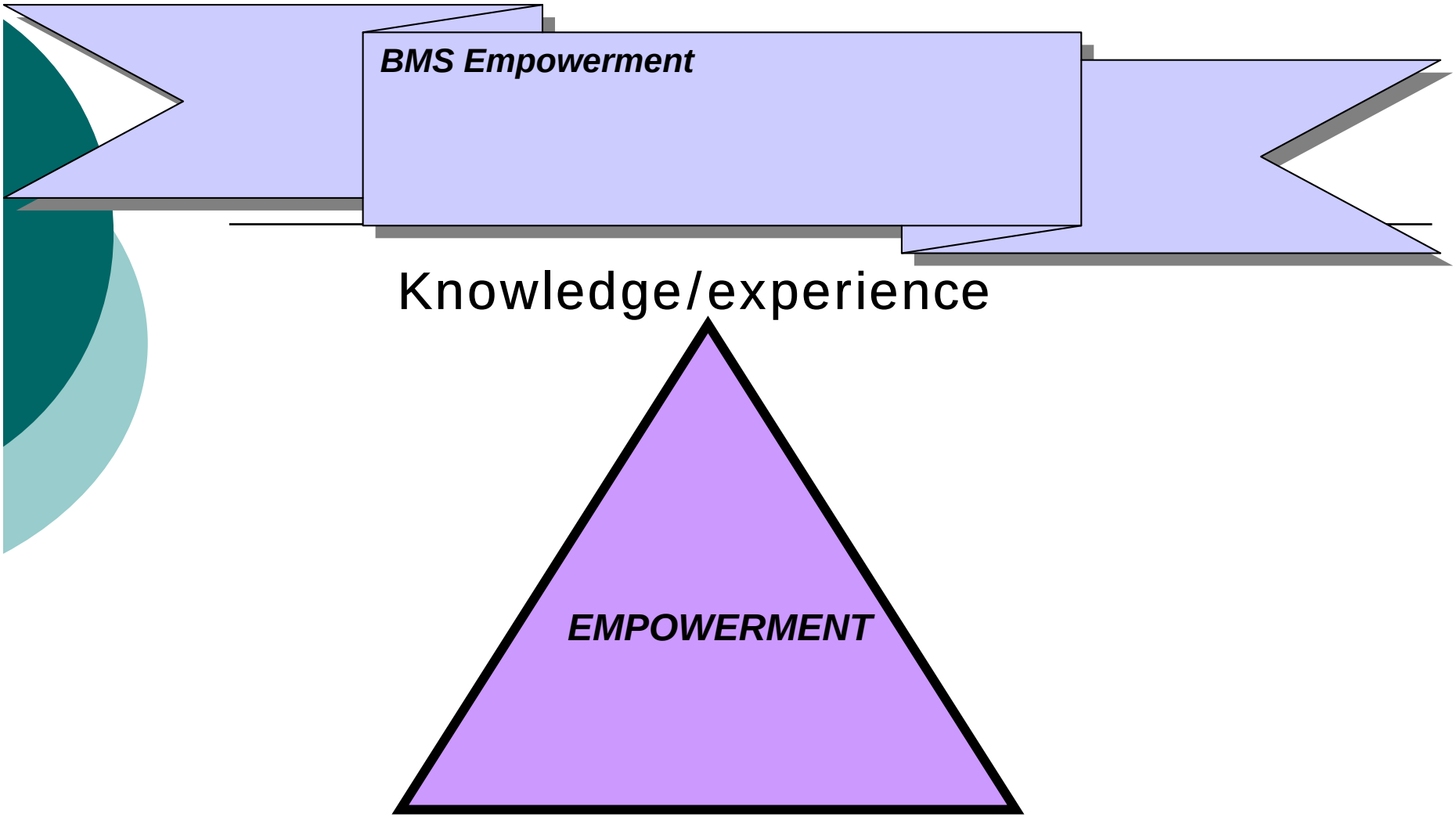
COLLECTING THE BLOOD AND DELIVERING TO THE CLINICAL AREA

BIOMEDICAL
SCIENTIST

TESTING THE BLOOD GROUP AND CROSSMATCHING THE BLOOD AND GATEKEEPING REQUESTS

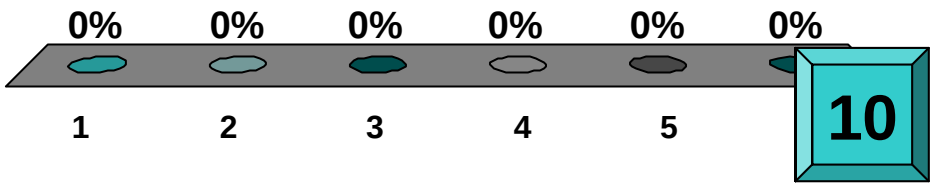
PHLEBOTOMIST
NURSE
DOCTOR

TAKING A BLOOD SAMPLE FOR COMPATIBILITY TESTING

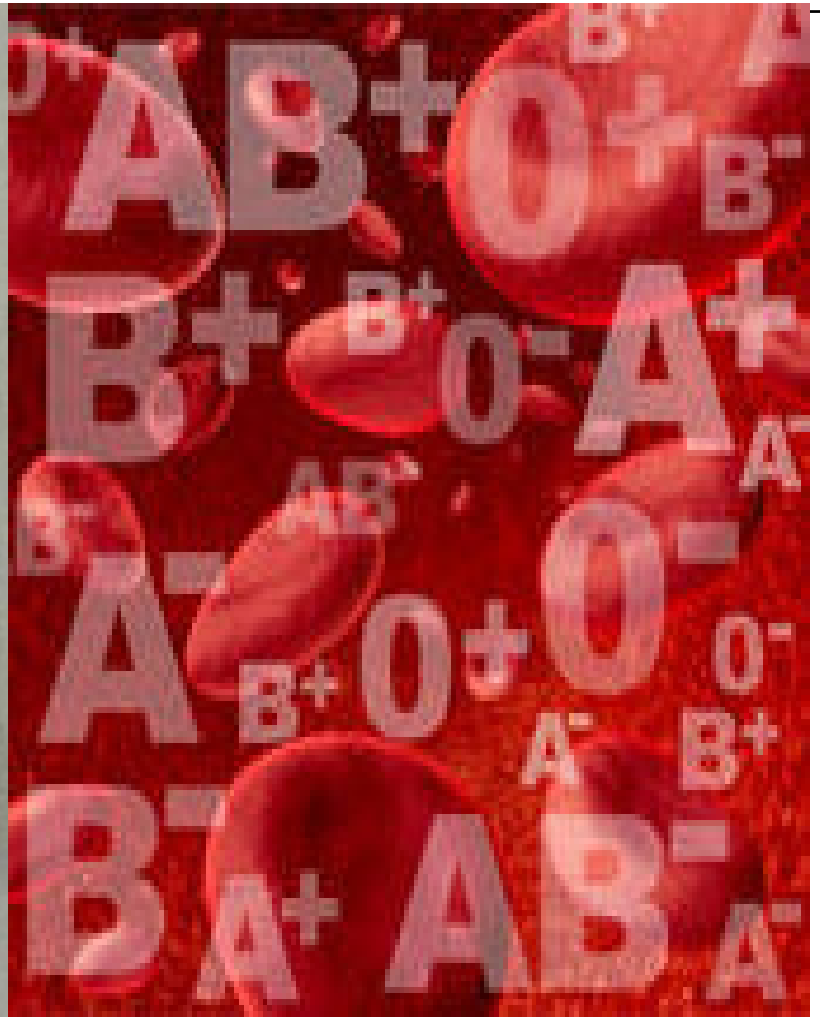

BMS Empowerment
Knowledge/experience
EMPOWERMENT
Behaviour/Skills
Confidence/Training

Who do you generally refer your request queries to?

1. Haematology SpR
2. Haematology Consultant
3. Transfusion Practitioner
4. Transfusion Laboratory Manager
5. There is no one to help
6. The laboratory policy is to agree to all transfusion request as the Dr knows best, so no need to refer



Red Cells…..



What do we know about red cells?

1. 35 day expiry
2. Volume 180-350 ml (Mean 282ml)
3. SAGM (~20 mls residual plasma) allows….
4. HT- no longer required
5. E.D.N & Phenotypes
6. Irradiation: Cellular component
7. Cost is £ 122.09

RBC triggers for transfusion in adults

1. Transfusion in acute blood loss

2. Peri-operative transfusion

3. Transfusion in Critical Care

Transfuse to maintain the Hb above 7g/dl In patients with septic shock, or those actively bleeding, aim to keep Hb 9-10g/dl

4. Transfusion post-chemotherapy

Transfuse to maintain the Hb above 8g/dl

5. Transfusion during radiotherapy

Transfuse to maintain the Hb above 10g/dl

6. Transfusion in chronic anaemia

Many patients with chronic anaemia may be asymptomatic with an Hb above 8g/dl

What does symptomatic mean?

ADULTS:

- Breathlessness for no other reason
- Tachycardia – for no other reason
- Syncope / postural hypotension when normo-volaemic
- ECG showing ST depression
- Angina

Inappropriate transfusions can lead to TACO.

Paediatric Red Cell Transfusion

Paediatric

- Paediatric transfusions should be prescribed in mls
- Single unit red cell transfusions are recommended where possible, especially in non-bleeding patients.

Dosage: (Top-up transfusion)

Desired Hb (g/dl)) - actual Hb X weight (kg) X *3* (usually ~10–20 ml/kg)

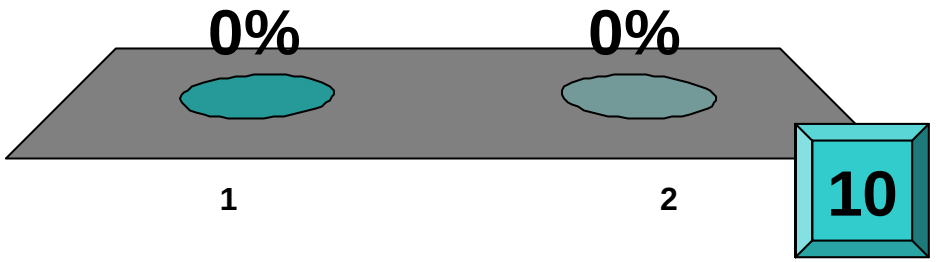
General Duration Rate 5 ml / kg / hr

Case Studies……..

Red cell – Case Study 1

A request for 2 units of red cells for a 74 year old male presenting with a Hb of 7.6 g/dL, PR bleeding, symptomatic and unstable. Do you think that this is an appropriate request?

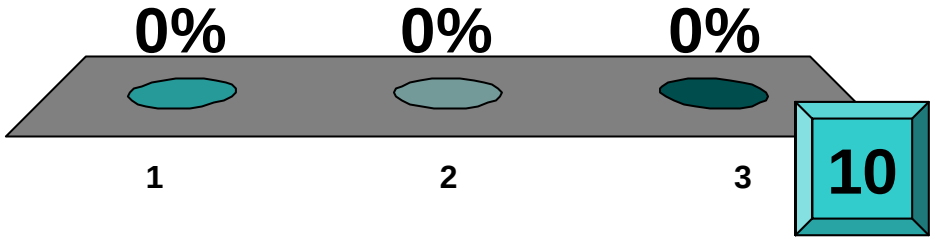
1. Yes
2. No



Red cell – Case Study 2

A request for 2 units of red cells for a 74 year old male presenting with a Hb of 7.6 g/dL. Do you think that this is an appropriate request?

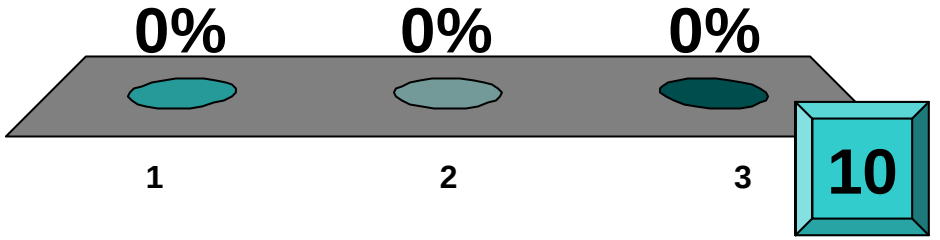
1. Yes
2. No
3. More info



Red cell – Case Study 2 (more info)

The MCV is 71 and the MCH is 23.7. The patient is not bleeding, there are no cardiac issues and he is stable. However the patient is pale and tired. Do you think that this is an appropriate request?

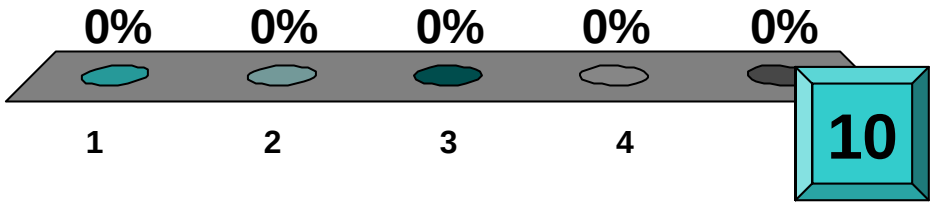
1. Yes
2. No
3. More info



Red cell – Case Study 2 (the phone call continues

However the Dr insists the patient requires a red cell transfusion. What step would you take next?

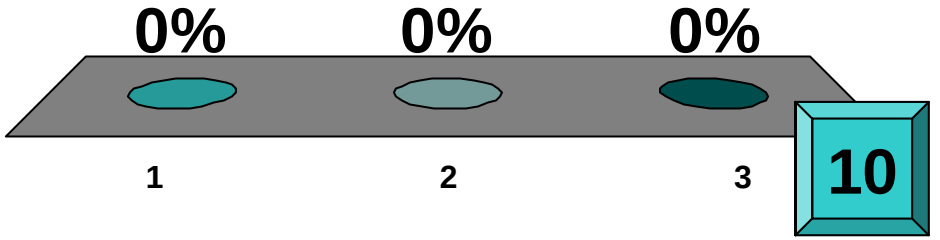
1. Hang up
2. Argue
3. Refer to TP
4. Refer to Haematology SpR/Consultant
5. Issue the red cells



Red cell – Case Study 3

A request for 2 units of red cells for a 45 year old female going for a Mastectomy.
Do you think that this is an appropriate request?

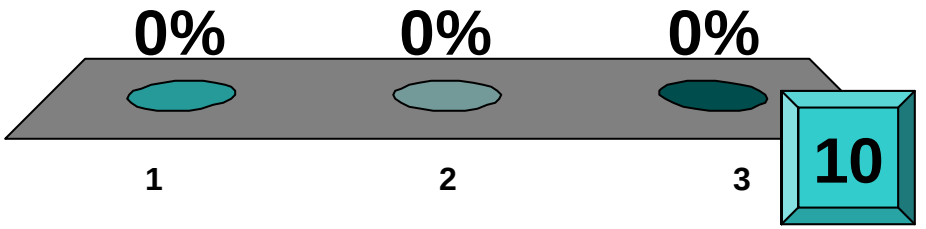
1. Yes
2. No
3. More info



Red cell – Case Study 3 (more info)

Her Hb is currently 12.4 g/dl, family history of bleeding in surgery, clinically stable and worried about amount of blood loss.
Do you think that this is an appropriate request?

1. Yes
2. No
3. Refer



Fresh Frozen Plasma

What should we know about FFP?

1. Frozen Plasma Doh!
2. Volume 240-300 ml (Mean 273ml)
3. Fibrinogen Conc ~ 20-50 g/l
4. ABO compatible
5. No need for Rh matching
6. Thawed expiry 24 hours
7. Types: SD MB
8. Cost is £ 27.98

Indications for the use of FFP

1. **A bleeding or unstable patient** if PTR or APTTR > 1.5 (*It may be necessary to issue FFP without INR result e.g. massive obstetric bleed*)

2. **Prior to an invasive procedure** if PTR or APTTR > 1.5 (consider vitamin K first). A threshold of 1.3 is used for patients with renal disease planned to undergo a high risk procedure e.g. renal biopsy

3. **To treat Thrombotic Thrombocytopenic Purpura (TTP)** - (solvent/detergent treated FFP should be used for this e.g. Octaplas)

4. **Treatment of patients with isolated deficiency of coagulation factors** These patients should be managed through the Haemophilia centre (solvent/detergent treated FFP is used).

5. **Massive transfusion and surgical bleeding**; in a major blood loss situation FFP is used with red cells to resuscitate the patient; otherwise the use of FFP should be guided by timely tests of coagulation (coagulation screens), including near patient testing**.** *NB these patients should have on-going bleeding rather than just coagulopathy as an indication for FFP.*

FFP: Paed

1 Neonates with coagulopathy and bleeding, or at risk of bleeding

2 Infants with hypoxia (respiratory distress), hypotension, sepsis or liver disorders associated with significant coagulopathy and bleeding, or who are at risk of bleeding from an invasive procedure because of significant coagulopathy

Dosage:
(10–20 ml/kg) is indicated, as well as intravenous vitamin K

Rate:
Paediatric dose is 10-20 mls/kg

When shouldn't we use FFP

1-Hypovolaemia

Crystalloids are safer, cheaper and more readily available.

2- Plasma exchange (except for TTP)

In the rare event that haemorrhage occurs, a platelet count check before giving FFP is advisable. There may be a problem with pseudo-cholinesterase levels being low as a result of many plasma exchanges with saline/albumin

3-To reverse a prolonged PT in the absence of bleeding.

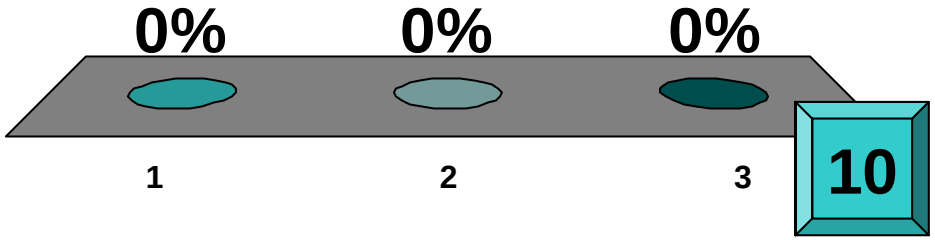
4-To reverse a prolonged INR in patients on Warfarin (PCC).

FFP – Case Study 1

A 45 year old female, ETOH. Her PT ratio is 1.7. The Dr would like 4 units of FFP ASAP.

Is this an appropriate request?

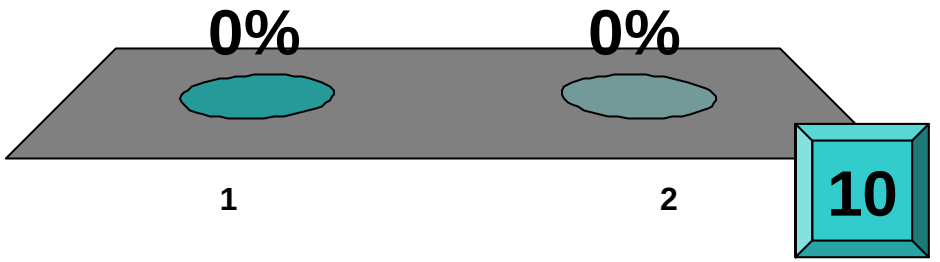
1. Yes
2. No
3. More info



Hang on a mo…….
FFP – Case Study 1 (more info)

She is stable, not bleeding, not going to theatre but the Dr would like to get her INR normal before discharge.

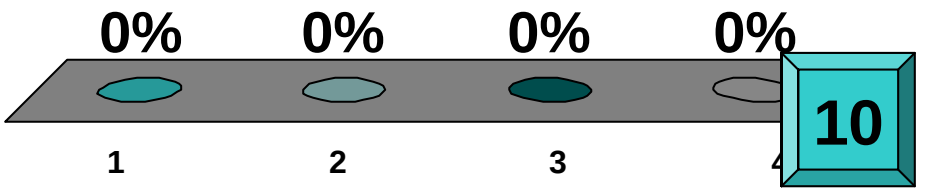
1. Yes
2. No



FFP – Case Study 1 (more info)

However the Dr relates that the consultant would like the patient to have the component. What step would you take next?

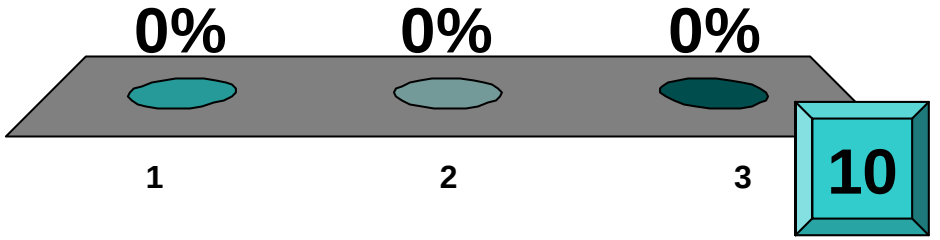
1. Hang up
2. Discuss with Dr
3. Refer
4. Issue the FFP



FFP – Case Study 2

A 2 year old child is post surgery on PICU. Her clotting is abnormal with a PT ratio of 2.0. The Dr would like 3 units of FFP ASAP. Is this an appropriate request?

1. Yes
2. No
3. More info

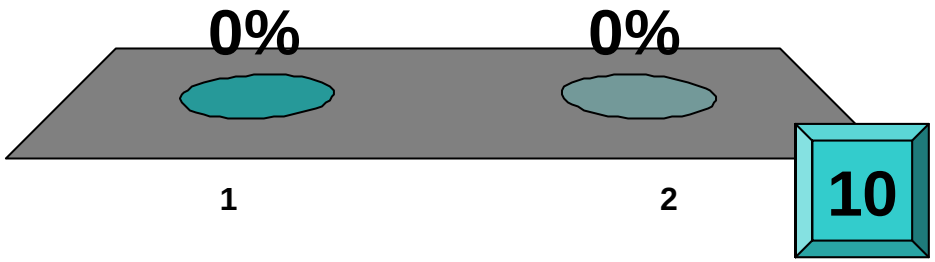


FFP – Case Study 2 (more info)

The child weighs 10kgs.

Is this an appropriate request?

1. Yes
2. No



FFP – Case Study 2, explanation

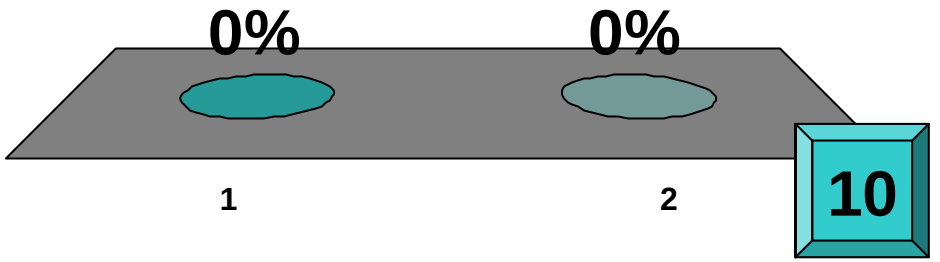
- FFP prescription is weight-dependent. Transfusion staff should ensure appropriate volume is issued to prevent TACO and to ensure a therapeutic dose.

- In this case the child weighed 10kgs so a volume of 120-150mls of FFP is indicated.

FFP – Case Study 3

A request for 4 units of FFP is received for a patient on Warfarin with an INR of 12.0. She has bruising on the right side of her temple. Is this an appropriate request?

1. Yes
2. No



Cryoprecipitate

What do we know about Cryo?

1. Controlled thawing of frozen plasma to precipitate high molecular weight proteins: FVIIIc, vWF and fibrinogen.
2. ABO compatible
3. No need for Rh matching
4. Use within 4 hours, kept at room temperature
5. Types: pooled, single, single MB
6. Children born after 1.1.1996 should have Methylene Blue treated (viral inactivation) cryoprecipitate, no pooled MB treated cryo
7. Cost is £ 193.53 per pool

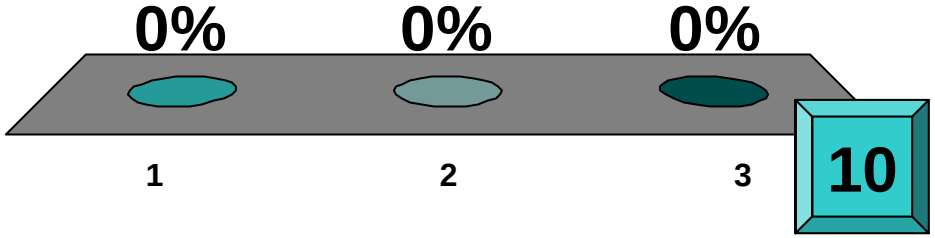
Indications for the use of cryo

1. Use in the bleeding patient when the fibrinogen is < 1.5 g/l
2. Advanced liver disease, to correct bleeding or as prophylaxis before surgery, when the fibrinogen level is <1-1.5g/l
3. Adult dose is 2-3 pools, which will raise the fibrinogen level by approx 1g/l
4. Paediatric dose is approximately 5mls/kg (single units are available for paediatrics)
5. Bleeding associated with thrombolytic therapy causing hypofibrinogenaemia

Cryo – Case Study 1

Patient is going for surgery (TURP) and the fibrinogen results have come back as 0.8g/dl? The doctor wants some cryo pre operatively. Is this an appropriate request?

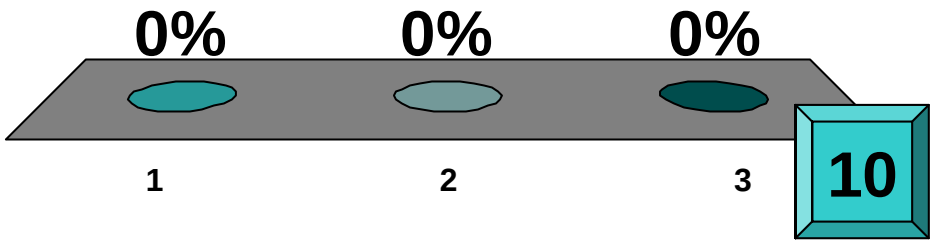
1. Yes
2. No
3. More info



Cryo – Case Study 1

Patient Diagnosis of congenital afibrinogenaemia

1. Yes
2. No
3. Refer



PLATELETS

What do we know about platelets?

1. For a 70 kg adult, 1 ATD typically gives an immediate rise in platelet count of 20−40 x 109 ml
2. Apheresis or pool of 4-6 donations
3. Aphersis volume 180-300 ml (Mean 215ml)
4. Pool volume 250-400 ml (Mean 310ml)
5. All blood groups available (should be)
6. 7 day expiry with bacterial testing
7. Preferable ABO and Rh D matched with patient
8. Rh D neg females of child bearing potential must be given Rh D Neg plts
9. Cost is £ 208.09

Indications for the use of platelets

1. Thresholds for prophylactic platelet transfusion
   Patients with thrombocytopenia secondary to marrow failure <10 x 10^9/L

2. Thrombocytopenia secondary to peripheral consumption (not ITP) Maintain ~ 20 x10^9/L

3. Massive blood loss Maintain ~ >75 x 10 ^9/L

4. Cardiopulmonary bypass <50 x 10 ^9/L

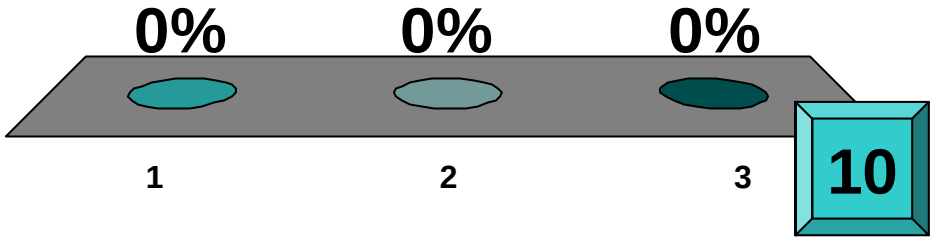
When shouldn’t we issue platelets

- Thrombotic thrombocytopenic purpura (TTP)
- Heparin induced thrombocytopenia (HIT)

Platelets – Case Study 1

Patient present in A&E confused, fever and purpura. He also has a low platelet count of 48, and the doctor want to prescribe 1 unit of platelets.
Is this an appropriate request?

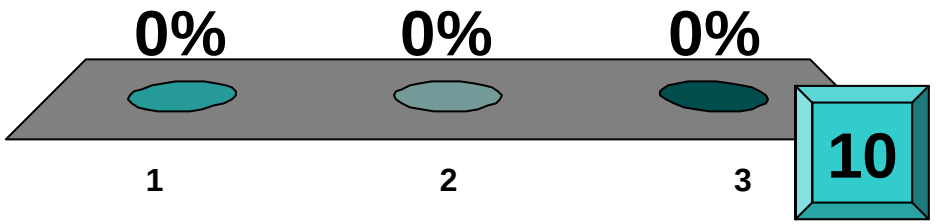
1. Yes
2. No
3. More info



Platelets – Case Study 1 (more info)

No obvious evidence of bleeding, but the blood film shows evidence of schistocytes, fragments, with a slight increase in creatinine level and a very high LDH.

1. Yes
2. No
3. Refer



Platelets – Case Study 1 answer

This patient's diagnosis is Thrombotic Thrombocytopenic Purpura.

The issue of platelets is not appropriate and should be referred to Haem SpR or Consultant.

Platelets – Case Study 1 explanation

What causes TTP?

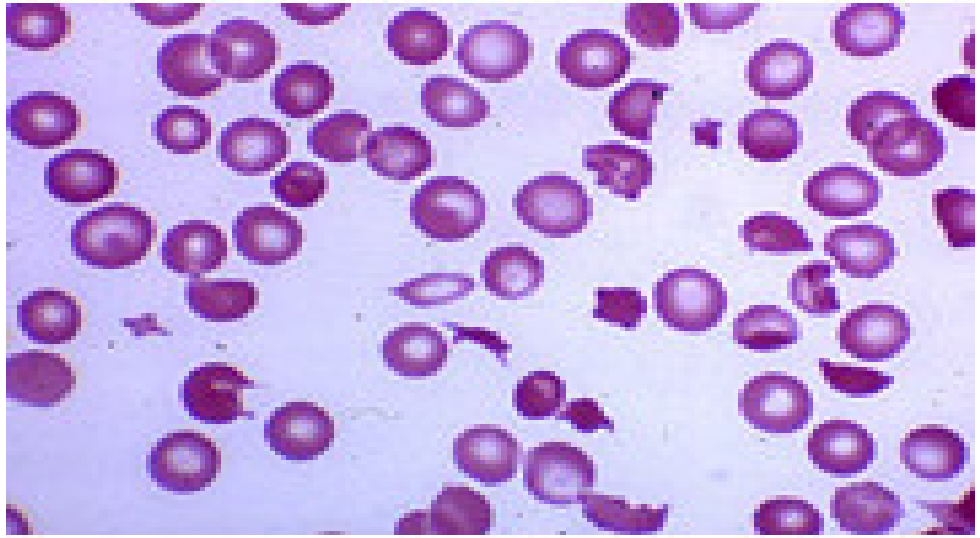
In TTP, vWF is synthesised normally, but its subsequent break down (cleavage) is defective.

Most adult-onset TTP appears to be secondary to the development of an antibody that inhibits ADAMTS13 activity.

[vWF binds Platelets and endothelial cells in haemostasis.]

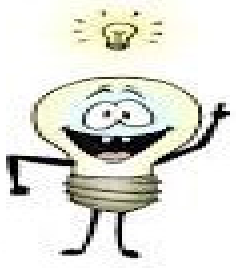
Blood fim of a patient with TTP

Thanks to accessmedicine.net



Learning Point

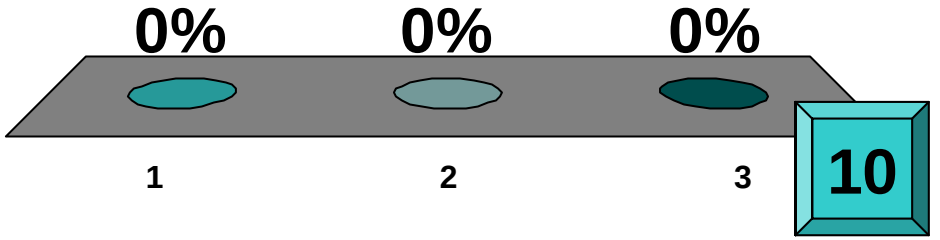
Unexplained low platelets should always have a blood film review before issue of platelets to ensure the platelet count is valid (clumps) and to exclude TTP.



Platelets – Case Study 2

Patient admitted for CABG: request for 1 unit of platelets to cover surgery. Patient is on aspirin and clopidegrel, with a platelet count of 160.
Is this an appropriate request?

1. Yes
2. No
3. Refer



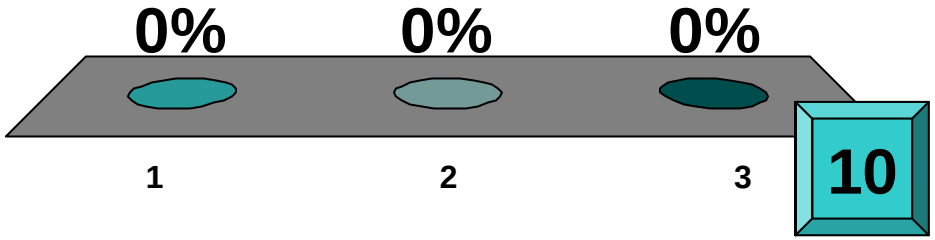
LoPAG reminder

You may want to remind the requestor that you have a reservation period for the issue of platelets and any changes to surgery time should be communicated to the Blood Transfusion Laboratory.

Platelets – Case Study 3

A 4 year old child presents to A&E with Hb of 9.3 g/dl
Platelet count of 23.
Doctor want to prescribe 1 unit of platelets. Is this an appropriate request?

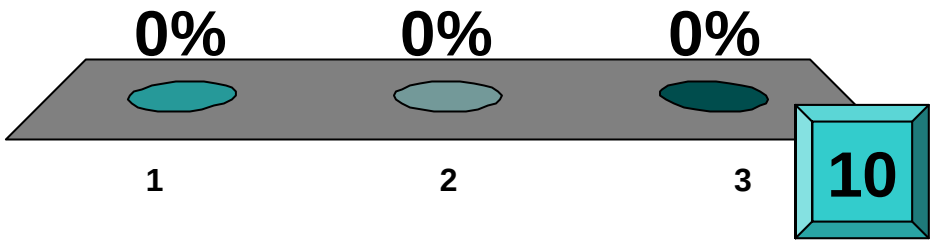
1. Yes
2. No
3. Refer



Platelets – Case Study 3 (more info)

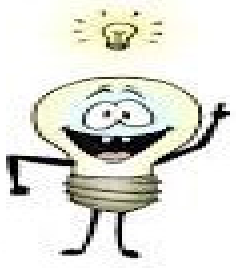
Patient has been diagnosed as having A.L.L. and is being treated at a children's hospital. Child is not bleeding but feeling unwell.

1. Issue the platelets
2. Do not issue the Platelets
3. Refer to Haematology SpR/Consultant



Reminder

Phone transfusion laboratory at the treating hospital to check group, antibody status and any special requirements.

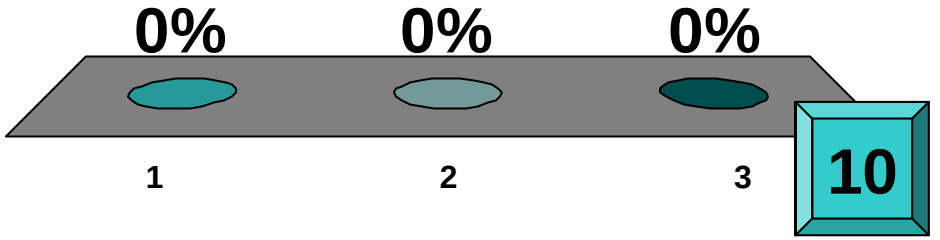


Major Haemorrhage Case

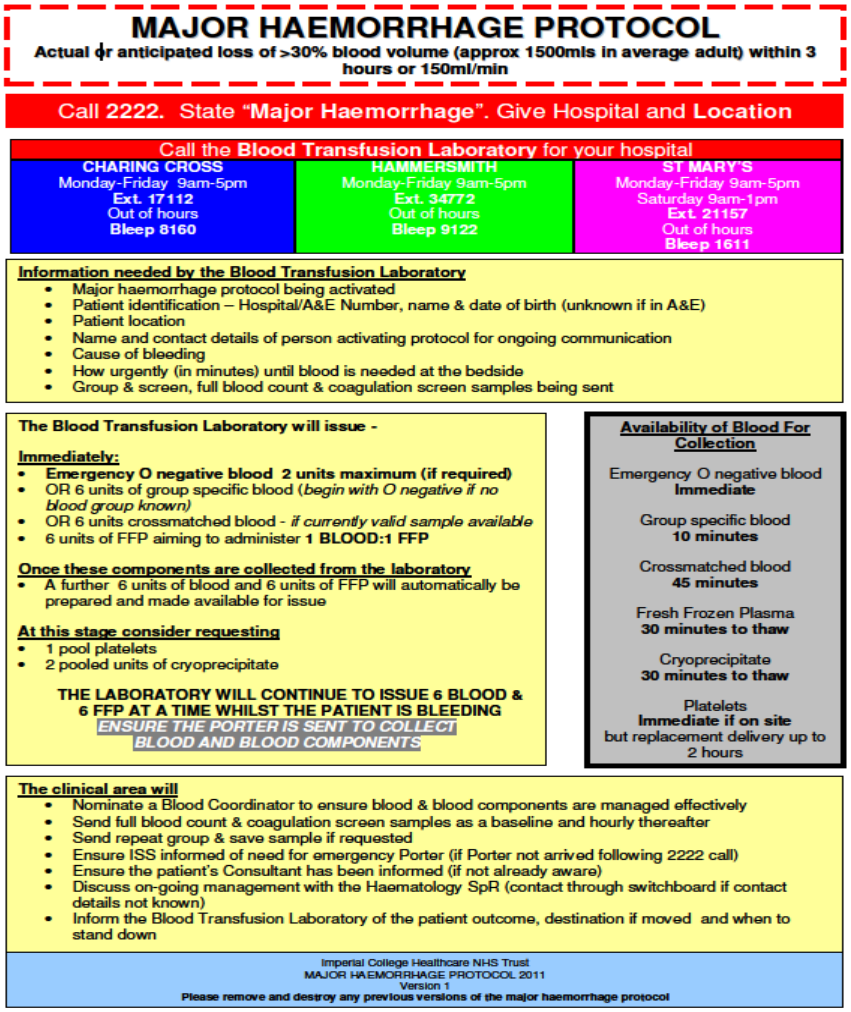
Major Haemorrhage – Case Study 1

Dr activates the major haemorrhage protocol and requests 8 units of red cells for a GI bleed on the ward. There is a valid G&S in the laboratory

1. Issue the red cells
2. Discuss whether FFP and platelets are required also
3. Refer to Haematology SpR/Consultant



Major Haemorrhage Protocol



MAJOR HAEMORRHAGE PROTOCOL

Actual or anticipated loss of >30% blood volume (approx 1500mls in average adult) within 3 hours or 150ml/min

Call 2222. State "**Major Haemorrhage**". Give Hospital and **Location**

Call the **Blood Transfusion Laboratory** for your hospital

CHARING CROSS	HAMMERSMITH	ST MARY'S
Monday-Friday 9am-5pm **Ext. 17112** Out of hours **Bleep 8160**	Monday-Friday 9am-5pm **Ext. 34772** Out of hours **Bleep 9122**	Monday-Friday 9am-5pm Saturday 9am-1pm **Ext. 21157** Out of hours **Bleep 1611**

Information needed by the Blood Transfusion Laboratory

- Major haemorrhage protocol being activated
- Patient identification – Hospital/A&E Number, name & date of birth (unknown if in A&E)
- Patient location
- Name and contact details of person activating protocol for ongoing communication
- Cause of bleeding
- How urgently (in minutes) until blood is needed at the bedside
- Group & screen, full blood count & coagulation screen samples being sent

The Blood Transfusion Laboratory will issue -

Immediately:

- **Emergency O negative blood 2 units maximum (if required)**
- OR 6 units of group specific blood (*begin with O negative if no blood group known)*
- OR 6 units crossmatched blood - *if currently valid sample available*
- 6 units of FFP aiming to administer **1 BLOOD:1 FFP**

Once these components are collected from the laboratory

- A further 6 units of blood and 6 units of FFP will automatically be prepared and made available for issue

At this stage consider requesting

- 1 pool platelets
- 2 pooled units of cryoprecipitate

THE LABORATORY WILL CONTINUE TO ISSUE 6 BLOOD & 6 FFP AT A TIME WHILST THE PATIENT IS BLEEDING

ENSURE THE PORTER IS SENT TO COLLECT BLOOD AND BLOOD COMPONENTS

Availability of Blood For Collection

Emergency O negative blood
Immediate

Group specific blood
10 minutes

Crossmatched blood
45 minutes

Fresh Frozen Plasma
30 minutes to thaw

Cryoprecipitate
30 minutes to thaw

Platelets
Immediate if on site
but replacement delivery up to 2 hours

The clinical area will

- Nominate a Blood Coordinator to ensure blood & blood components are managed effectively
- Send full blood count & coagulation screen samples as a baseline and hourly thereafter
- Send repeat group & save sample if requested
- Ensure ISS informed of need for emergency Porter (if Porter not arrived following 2222 call)
- Ensure the patient's Consultant has been informed (if not already aware)
- Discuss on-going management with the Haematology SpR (contact through switchboard if contact details not known)
- Inform the Blood Transfusion Laboratory of the patient outcome, destination if moved and when to stand down

Imperial College Healthcare NHS Trust
MAJOR HAEMORRHAGE PROTOCOL 2011
Version 1
Please remove and destroy any previous versions of the major haemorrhage protocol

That’s the end of the case studies!

THE NEXT STEP ON THE JOURNEY

- It’s in your hands
- Reflect upon today and ask yourself
  - Have the scenarios we went through today supported your professional confidence and knowledge?
  - What will you do differently after today?


THANK
YOU