Massive Haemorrhage

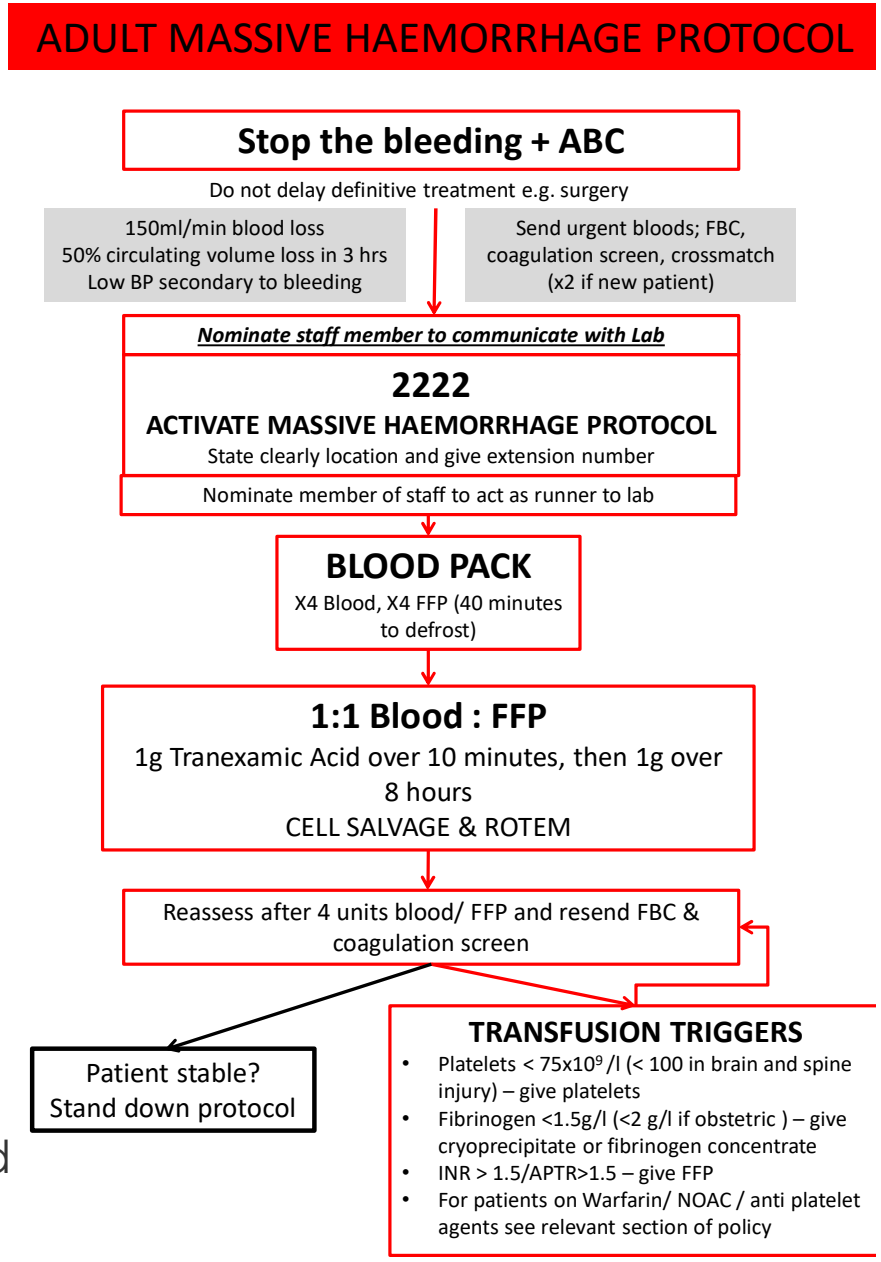
B Ferguson

What is Massive Haemorrhage (MH)?

- Difficult to apply rules as to how much blood loss defines a major haemorrhage.
- Easier to define how the patient's condition is responding to the blood loss.
- Clinicians commonly use a heart rate of 110 or more per minute and a falling blood pressure to 90 mmHg or less as meaning the patient is becoming shocked due to blood loss.
- However, there is no requirement to wait until heart rate rises or blood pressure falls before acting.

Massive Haemorrhage Protocols

- In 2010 the National Patient Safety Agency highlighted a recurring theme of delays in blood provision in emergencies. From 2010, each hospital had to have a local MH protocol
- 'All medical, nursing, laboratory and support staff must know where to find the protocol and have their knowledge supported by training and drills'
- New Major Haemorrhage Guideline in 2015 from the BCSH emphasise that laboratory staff should not wait for haematology consultant approval prior to releasing blood and blood components



Communication between the Transfusion Laboratory and the Clinical team

- Emphasised in the BCSH guideline and in last months' SHOT Bites Nov 2016: Massive Haemorrhage-delays
- The number of reports of delays causing harm has increased each year, out of 25 deaths from transfusion in the 2016 SHOT report, 9 were from delay, often during major haemorrhage and due to difficulties in communication
- The team leader in the clinical area should appoint a specific clinical member to co-ordinate communication with Transfusion Laboratory staff
- Depending on the number of staff working in the TL, a named team leader should be appointed for transfusion and this person should either take responsibility for communicating with the clinical team or appoint someone else to do this

What will the clinical team need from the lab?

- Good communication
- Rapid response
- Advice on component type, timings, availability
- Blood Components
  - Red cells
  - Fresh Frozen Plasma
  - Platelets
  - Cryoprecipitate

Red Blood Cells

- Oxygen carrying capacity

Rheological effect, axial flow

Fresh Frozen Plasma (FFP)

- Contains coagulation factors, fibrinolytic factors and proteins important for oncotic pressure
- Advised to be used as part of the initial resuscitation in massive haemorrhage in a 1:1 ratio with RBC until coagulation results are available
- Once bleeding under control further FFP should be guided by abnormalities in coagulation laboratory tests, with a trigger of PT and/or APPT of more than 1.5 times normal or abnormal TEG or ROTEM trace

Cryoprecipitate

- Fibrinogen is one of the clotting factors vital for clot formation and is one of the first clotting factor to fall to critical levels in massive haemorrhage.
- Cryoprecipitate has 5 times more fibrinogen per unit than FFP
- A normal range of fibrinogen is between 1.5 to 4 g/l. If fibrinogen falls below 1.5g/l during a MH OR (2 g/l in an obstetric haemorrhage) then it should be replaced with cryoprecipitate
- A typical adult dose is 2 units of pooled cryoprecipitate; this generally raises fibrinogen by 1g/l

Platelets

- Low platelet levels are considered a late event in massive haemorrhage, seen only after a loss of at least 1.5 blood volumes
- The BCSH Guidelines (2015) suggest that if you need to order platelets from the Blood Transfusion Centre, that you order them when the platelet count falls below 100 $x10^9$ and give them when the platelet count falls below $50x10^9$
- Early use of platelets 'should be considered' in trauma patients

Major Haemorrhage call to Obstetric Theatres

11:23 am Monday Morning

You are alerted that there is a massive haemorrhage in maternity. Post Partum patient is bleeding heavily.

Requests 4 units of blood and 4 units of FFP

The doctor is very impatient

- What techniques can you use to ensure you get the information you need?
  - Acknowledge that it is important to get the blood products to the patient as quickly as possible so the doctor knows you appreciate the urgency of the situation and that things are probably quite scary his/her end
  - ‘ I can hear/tell that this patient needs blood as quickly as possible. To do this I will need the following information’

DON’T PANIC!!

What information do you need from the doctor?

- Patient Identification details
- Where the patient is and what the diagnosis is
- Who is the named clinical link for this MH and which phone number should you use

Emergency XM **Red cells** □	**Major Haemorrhage** **4 Red cells** □ **2 FFP** □	**Trauma Code Red** **Pack in blood box:** **2 O Red cells** □ **4 Emergency A FFP/MB** □
Location	**Lead Clinician**	**Pre no**
Surname	**Forename**	**Hospital No**
Request no	**DOB**	**Test Required**
Prev XM date / G&S date	**Products Required** Circle below; Irradiated- Y N CMV- Y N Washed- Y N HEV - Y N	**Diagnosis**
Group & AB Result	**Lead BMS**	**Date & Time of Call**

Products Required	**RBC**	**FFP**	**PLTS**	**CRYO**	**Octaplex**

	BMS initials	**Date & Time**	**Person informed**
Units Available Phoned			
EXAB Positive Phoned			
ID Performed If applicable			
Recall Initiated if applicable			
FFP Ready Phoned if applicable			
PLTs Ready Phoned if applicable			
Others Products Ready Phoned if applicable			

What you may be able to tell the doctor.....

- Tell doctor where emergency O negative blood can be found
- Look on computer to see whether there is a valid sample, if not how many samples needed
  - If sample valid for e issue, tell them that blood can be available within 5 minutes
- If samples needed tell them to take as soon as possible and hand deliver to blood transfusion
- Ask whether they would like group specific blood or fully crossed matched blood and give approximate time lines.
- FFP will be available in 40 minutes as has to defrost
- The availability of platelets if they ask and if you are in a hospital that needs to order platelets
  - Do you always have emergency platelets available
- Inform the doctor you will phone him/her when the blood is ready or if e issue ask them to send someone straight away

What are your next actions?

- Review computer system for special requirements (irradiated, HEV neg, antigen negative)
- What will you do if the patient does have special requirements and there are no suitable units in stock?
  - Issue best match; this is a life saving event
  - Need to flag up to consultant haematologist
- If no historic blood group what group red cells are you going to issue when you get the first sample result?
- Does the patient need vCJD risk reduced FFP?
  - If born after 1st January 1996 then needs MB treated/SD treated
  - Do you start to defrost group AB or A before you get the first sample?
- Communicate with other lab colleagues (haematology, chemistry)

For Concessionary release of blood components

Date & time request initiated	_____ _____:_____ **BMS involved** _____
Concession managed during;	CORE HOURS OUT OF HOURS
Reason for Concession release	☐ Release of Rh D Positive Red cell units for an Rh D Negative female of child bearing potential **THERE IS A RISK THAT SUCH RED CELLS WILL CAUSE PRODUCTION OF ANTI-D WHICH CAN CAUSE HDFN IN FUTURE PREGNANCIES.** ☐ Provision of antigen positive Red cells for a patient with clinically significant atypical antibody(s) **THERE IS A VERY SMALL RISK THAT THESE RED CELLS WILL CAUSE THE PATIENT TO SUFFER A DELAYED TRANSFUSION REACTION.** ☐ Provision of Incompatible Red cells to a patient with AIHA without exclusion of alloantibodies **THERE IS A VERY SMALL RISK THAT THESE RED CELLS WILL CAUSE THE PATIENT TO SUFFER A DELAYED TRANSFUSION REACTION.** ☐ Provison of Blood component which does not have the required 'SPECIAL REQUIREMENTS' for the patient (i.e. not CMV-,HEV-, irradiated) **THERE IS A VERY SMALL RISK THAT SUCH BLOOD COMPONENTS WILL RESULT IN THE PATIENT DEVELOPING A CMV/HEV INFECTION OR GVH.** ☐ Other (please state);
Risk to patient if concession not made	
Patient affected by concession	Full Name: DOB: Hospital/NHS Number:
Name of Consultant agreed to accept patient risk?	Concession approved by Consultant:_____ Date: Time:
Does concession require DATIX report? If it does what is the DATIX No.	Y / N DWI-
Concession audtied by Senior BT staff	Name Date: Time:
Checked by QA Manager	Date: Time:

CONCESSION ONLY SUITABLE FOR THE ABOVE NAMED PATIENT

The clinical team ask for 4 more units of both blood and FFP. The patient is still bleeding and oozing from multiple sites

- Agree to issue the products
- Ask if they have sent samples for urgent clotting or using ROTEM/TEG – Why are we asking this?
- What products could now be required
  - Cryoprecipitate (for fibrinogen)
  - Platelets (may need to be ordered)
  - More blood may be needed
- Consultant Haematologist may need to be informed

And finally stand down……

- How do you feel? Can be very positive but it can be quite traumatic, acknowledge your feelings!!
- The Hospital Transfusion Team will review MH calls
- ‘There was a massive GI bleed this morning when I was on call and blood transfusion was fantastic! They couldn`t have been more helpful and the blood products arrived quickly’. Lead anaesthetist this week