## Massive Haemorrhage

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#### 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.

#### Why does each hospital have a Massive Haemorrhage Protocol?

- 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
- In the 4 years from 2006 to 2010 there were 11 deaths directly from the delay in blood provision
- '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 Guidelines in 2015 from the BCSH emphasise that laboratory staff should not wait for haematology consultant approval prior to releasing blood and blood components

#### ADULT MASSIVE HAEMORRHAGE PROTOCOL



### Communication between the Transfusion Laboratory and the Clinical team

- Emphasised in the national guideline
- 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?

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

#### Red Blood Cells

Oxygen carrying capacity and improve haemostasis (blood clotting)



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

#### Cryoprecipitate

- Fibrinogen is one of the clotting factors vital for clot formation and it is reported that it is 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 then it should be replaced with cryoprecipitate
- A typical adult dose is 2 units of pooled cryoprecipitate; this generally raises fibrinogen by 1g/l
- In obstetrics, fibrinogen levels in pregnant women increase to 4-6 g/l at term. This means a fibrinogen level of 2-3 g/l which would be reassuring in a non-pregnant woman may mean that fibrinogen is falling and consideration should be given to replacing fibrinogen if levels fall below 2g/l in obstetric cases

#### 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<sup>9</sup> and give them when the platelet count falls below 50x10<sup>9</sup>
- Early use of platelets 'should be considered'in trauma patients

#### Massive 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 that this patient needs blood as quickly as possible. To do this I will need the following information'

## What information do you need from the doctor?

Patient Identification details

- Where the patient is and what the diagnosis is
- Have any blood samples been taken (FBC, Coag, Group and save)
- Who is the named clinical link for this MH and which phone number should you use

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

- Whether you have a valid sample, if not how many samples needed
  - Does your lab have a 2 sample policy?
- Ask whether they would like group specific blood or fully crossed matched blood
- Give approximate time lines for both (dependent on whether there is a valid sample in lab or not)
- FFP will be available in 40 minutes as has to defrost
- Tell doctor where emergency O negative blood can be found
- 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 any historic results, 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?
- Does the patient need special FFP?
  - If born after 1<sup>st</sup> January 1996 then needs MB treated
  - Do you start to defrost group AB or A before you get the first sample?
- Communicate with other lab colleagues (haematology, chemistry)

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

- What do think may be happening clinically?
  - DIC
- Are you going to ask for coagulation (including fibrinogen) and FBC at this point?
  - Yes
- Do you need to warn the haematology lab that urgent samples are coming?
- How do you tell the clinical team to deliver the samples?
- Do you defrost both FFP and cryo?
  - Cryo dependent on fibrinogen level
- Do you order the platelets and how many or wait for fbc?
  - If clinical team have requested them before results available
- Do you act to anticipate further need for blood, this is an evolving and continuing MH, may pay to get ahead and issue further units, could ask another member of staff to crossmatch and issue whilst you sort the platelets and the Cryo?
- Have the clinical team involved the Consultant Haematologist or do you need to do this?

### And finally stand down.....

- After 12 units of blood
- 4 units of FFP
- 4 units cryo
- 4 units platelets
- How do you feel, do you have a de brief?
- Do you or your managers liaise with clinical teams as to what went well and what could have gone better??
- Does your HTT audit all the MHs

#### Gotcha's! RD&E experiences

- Don't give the emergency platelets to a non-emergency patient before the replacement platelets have arrived
- Don't refuse to issue FFP because you have no coag results (or any other components/products)
- Don't go off for a tea break whilst in the middle of a crossmatch unless there is good cover and handover
- Be prepared to help the clinical staff
  - Access to locked fridge
  - Don't get cross with the clinical staff if they turn up in the lab before products are ready
- Check the blood group of the patient on the computer before selecting components, don't trust a verbal message from another person

## DON'T PANIC!!