The Shrewsbury and Telford Hospital NHS
NHS Trust

# BLOOD COMPONENT MANAGEMENT OF ADULTS IN MASSIVE HAEMORRHAGE QUICK GUIDE

Supplementary to
Safe Transfusion of Blood and Blood Components TX001

TX004

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|---|---|---|
| **Lead Clinician** | : | Dr A Marsh |
| **Centre** | : | Emergency care |
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| **Comments** | : | The flowchart is also displayed in the emergency guidelines app on the Trust intranet.<br>There is a sister document for transfusion laboratory staff controlled by the pathology document management system |

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| Distribution | A&E resus, ITU and theatre may display the flowchart as a poster.<br>Please refer to the intranet version for the latest version of this policy.<br>**Any printed copies may not necessarily be the most up to date** |

| **Location of Copies** |
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| Trust intranet http://intranet/pathology/transfusion/protocols.asp |

**Control and Archive arrangements:**
Documentation control including archiving will be maintained in accordance with the Trusts mandatory guidance on policies and related documents, as stated in the Policy for the Development and Management of Organisation-Wide Documents, Gov 01, version 2, September 2011. Superseded versions will be retained automatically for a minimum of 15 years.

**Version history**

| Version | Date | Author | Status | Comment |
|---|---|---|---|---|
| 1.0 | Aug 2006 | K Cooper | Final | Signed off by HTC and Dr Powell as transfusion haematologist |
| 2.0 | Jan 2012 | K Cooper | Final | New flowchart to reflect current guidelines and supporting information updated. Also agreed by A&E & anaesthetic consultants as well as HTC |
| 3.0 | Jan 2015 | K Cooper | Final | Flowchart changed to mirror that issued by the west midlands critical care network and the policy amended accordingly – change to initial call to switchboard, use of flashcards issued to key people managing the haemorrhage which lists their actions |
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## Review and Amendment log for minor changes

| Version No | Type of Change | Date | Description of change |
|---|---|---|---|
| 2.01 | Addition of table 3 | Dec 12 | Flowchart for unanticipated blood loss in theatre added following coroners inquest |
| 2.02 | Minor change to flowchart | June 13 | Phase 1 and 2 added to flowchart to match the paediatric version and the laboratory SOP |

## Contents

## 1 Overview

This guideline is designed to assist clinical staff in the transfusion management of the haemorrhaging patient. It may also be used as an education tool as part of the management of trauma patients. This protocol is not meant to be followed in a set time frame, and is flexible in this respect. Telephone numbers, bleeps etc were correct at the time of review, but please be aware that these may change with short notice. Such changes will be altered in the policy as soon as viable.

## 2 Policy detail (guidance notes)

The information given is by no means exhaustive and is intended to assist practitioners where professional judgement is still required. Policy detail takes the form of a management guide of massive haemorrhage (section 3), followed by a flowchart which includes therapeutic goals.

Please remember each person should be assigned a role and issued the appropriate flashcard listing their duties. Part of this is only have one person communicating with the laboratory and inform them when blood components are no longer required

**Massive Haemorrhage = 150 ml/min, 50% of TBV loss in 3 hrs. Rule of thumb:**

**>4 units in first hour, or a likelihood of this** (TBV=Total blood volume 70 ml/kg in adults; 80ml/kg in paediatrics and neonates)

**Anticipate need for and order blood components early**

- FFP and Cryoprecipitate require 30 minutes to thaw.
- Platelets may need to come from a regional transfusion laboratory (Birmingham) and may not be available for over 60 minutes.

**Send repeat coagulation screens more frequently whilst bleeding continues**.

- Serial testing is essential. Samples should be sent before administration of each batch of components so that decisions can be based on a trend.
- Empirical treatment may be necessary if there is evidence of microvascular bleeding (general ooze)

**Blood Components** This protocol states FFP may be issued with the first 4 units of blood when requested by a senior medic or consultant, otherwise a Haematologist should be contacted immediately

**Platelets:** Be prepared to request platelets in advance if there is multiple trauma, head injury, abnormal platelet function (aspirin) or persistent active bleeding. (not kept as stock) – discuss with the lab as platelets will not be issued with the first batch of red cells

***Note:*** double dose of platelets have be shown to be of **NO** clinical benefit

**Cryoprecipitate:** Fibrinogen deficiency may develop when > 1 TBV replaced. *FFP may provide enough fibrinogen without the need for cryoprecipitate*

***Indication:*** Fibrinogen <1.5g/l, ***Dosage:*** 1 unit per 5-10 kg (10 units for an adult)

**If microvascular bleeding persists, discuss with on call Consultant Haematologist for advice on alternative products / additional drugs.** Please remember the biomedical scientist in blood bank needs to be kept informed in order to efficiently provide the requirements for the patient. This includes any change in patient location and contact numbers

## 3 Management of Massive Haemorrhage

### 3.1 Start Emergency Treatment.

**A. Assess Airway.**

- Check airway patency and support if required.
- Call for anaesthetics assistance if airway compromised.

**B. Assess Breathing.**

- Examine the chest and note the respiratory rate.
- Give all patients 15 litres of oxygen by facemask, unless contraindicated.

**C. Assess the Circulation.**

- Take pulse and blood pressure.
- Insert two large bore 14 gauge (Orange) cannulae.
- Take blood sample for full blood count, clotting, urea & electrolytes, lactate and clotting.
- Start resuscitation with 20mls/Kg of WARMED Hartman's solution. Repeat as necessary until blood is available.

**STOP THE BLEEDING**. By whatever means is appropriate to the patient, but including

- Direct pressure for external haemorrhage.
- Splinting of long-bone and pelvic fractures
- Give Tranexamic acid as per protocol
- Urgent endoscopy.
- Urgent surgery.
- Embolisation under radiological control
- Application of tourniquets for traumatic amputations.

**D. Monitor the Patient.**

- Monitor the patient continuously using an electronic patient monitor to provide continuous monitoring of
  - $SaO_2$
  - Heart rate
  - Non invasive blood pressure every 5 minutes in the first instance.
- Ensure a fluid balance chart is started.
- Catheterise the patient and monitor urine output hourly in the first instance.
  - Invasive monitoring with arterial and central lines should be considered, but should not delay either resuscitation.

### 3.2 Mobilise People

- The lead clinician should ensure each person is assigned a role and issue them with the appropriate flashcard listing their duties. The communication person should be the first be to identified.
  - This person immediately dials 2222 and ask switchboard to activate the massive haemorrhage protocol. Give your speciality and location. They will fast bleep a porter and blood bank
  - The communication person should then **ring** blood bank to give patient information and situation. The bleep should not be necessary as switchboard has sent the aircall message

**PRH 4305 or 4306** (Out of hours bleep 115) **RSH 3556 or 3542** (Out of hours bleep 512)

  - Inform the consultant in charge of the patient of the situation.

### 3.3 Order Blood and Blood Components

Blood and blood components should be ordered in line with the urgency of the situation. This guide recognises the need for early resuscitation with blood, FFP and platelets. It does not go as far as ordering shock packs but this option remains under consideration by the hospital transfusion committee.

**A. Immediately life threatening bleeding, blood required immediately.**

- Use 1 unit of O negative blood for initial resuscitation if patient is decompensating, and request further units of O negative from satellite fridge / blood bank if group specific blood is not ready.

O negative blood is stored at the following locations.

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|---|---|
| **PRH. Issue Fridge** | 2 units O Neg. - fridge outside blood bank. |
| **PRH Maternity Fridge** | 2 Units O Neg.+ paedi pack *which should only be used for neonates*- fridge outside labour ward theatres |
| **PRH Theatre Fridge** | 2 units O Neg. - fridge in recovery entrance |
| **RSH Theatre Fridge** | 2 units O Neg. – fridge in inner lobby to changing rooms. |
| **RSH Issue Fridge** | 2 units O Neg. – fridge outside blood bank (back up for all areas) |

**B. Urgent bleeding, blood required in 30 minutes (***Blood Bank need at least 20min from the time they receive the sample***).**

- When communicating with blood bank – request group specific red cells
- Activating this protocol will automatically request
    - 4 units of red cells (group specific blood if you request it, or eligible for electronic issue)
    - 2 units of FFP

(The dose of FFP in adults is at least 12ml/Kg and may be increased to 15ml/Kg in massive haemorrhage). FFP should be transfused at a ratio of 1 unit of FFP per 1-2 units of blood given.

**C. Bleeding, but with start of control / haemostasis**

- Still contact blood bank, but specify you DON'T want to activate the massive haemorrhage protocol
    - Request 4 units of red cells
    - If haemorrhage not under control by the start of the 3rd unit, ring blood bank and ask for the FFP, and activate the massive haemorrhage protocol
    - Even if haemostasis is obtained on/after the 3rd unit of red cells, still administer the FFP

**D. Platelets.**

We do not stock platelets and may need to order from Birmingham if we cannot use those pre-ordered for planned transfusions of haematology patients and therefore available sooner.

Platelets will automatically be issued (once available) as part of the second 'batch' of 4 red cells & FFP, if bleeding has not been controlled.

As always, close liaison with blood bank and the early involvement of a consultant haematologists is required.

**E. Other drugs and blood products.**

If Tranexamic acid, Cryoprecipitate or Recombinant factor VIIa are being considered then it is strongly advised that the case is discussed with a consultant haematologist.

**Tranexamic acid**. - This should be an early consideration in bleeding multiple trauma patients and the initial dose may have already been administered by the ambulance crew. In major trauma this should be given within three hours of the time of the trauma. Do not give if over three hours from time of trauma.

**Cryoprecipitate**. Cryoprecipitate may be indicated in ongoing haemorrhage where fibrinogen becomes depleted (<1.5g/l).

**Recombinant factor VIIa** – Novoseven. This may be indicated in ongoing micro-vascular haemorrhage that cannot be stopped by surgical intervention. (This product is now ordered via Blood Bank)

**Prothrombin Complex Concentrate –** Octaplex. This may be indicated in patients with a high INR for rapid warfarin reversal in life threatening haemorrhage. This product is ordered via blood bank and a request form is required and can be found in 'test search' in review.

**Table 1 – Flowchart for management of the haemorrhaging patient**

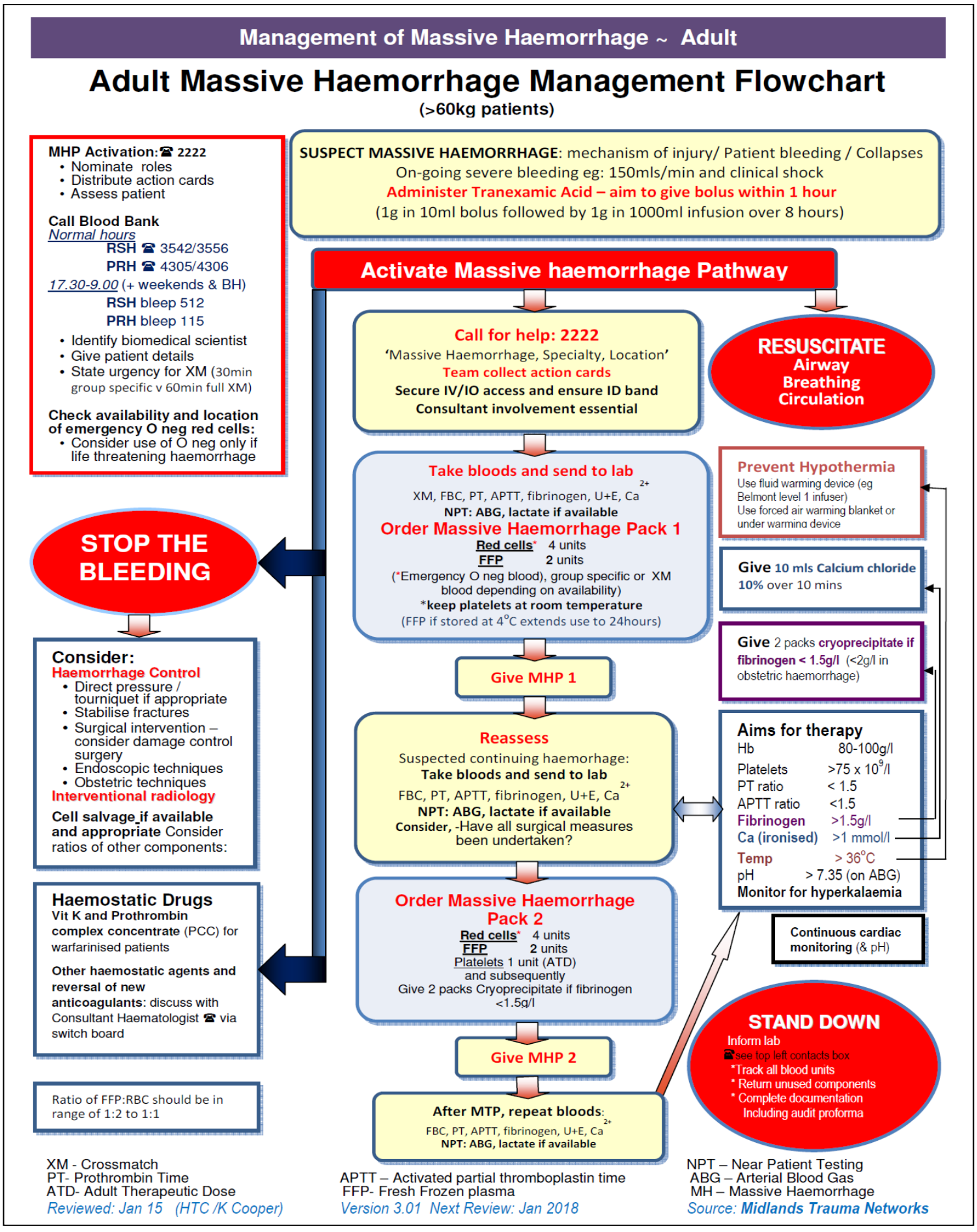

**Table 2 - Unanticipated Blood Loss in the theatre environment**

Patient discussed at Team Brief following the WHO Safer Surgery Checklist

**In the event of an "Unanticipated Blood Loss".**

The scrub practitioner/circulating practitioner or any other member of the team will **verbalise** any blood loss concerns to the theatre team.

**Surgeon and Anaesthetist alerted to unanticipated blood loss.**

- Decision agreed to begin measurement of blood loss from swabs, suction and other losses including drapes and floor
- Theatre team to agree regular interval for verbal update to surgeon and anaesthetist

**Consideration to be given for the following:**

- Blood component replacement therapy including red cells, FFP, platelets, cell salvage. Communicate with Blood Bank.
- Invasive monitoring i.e. CVC to monitor central venous pressure, Arterial Pressure monitor.
- Anaesthetist and Surgeon to consider continuing or abandoning procedure.

If haemorrhage reaches 150ml/min or 50% of TBV loss in 3 hrs. Instigate "Massive Transfusion Protocol" (table 1)

## 4 Review Date

This policy will be reviewed every 3 years unless there are significant changes at either national policy level, or locally.

## 5 Monitoring and Review Process

This guidance will be monitored by the clinical audit process. Activation of the massive transfusion protocol should be recorded via the laboratory MHP activation worksheet and reviewed quarterly via the HTC

## *6* References


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- Serious Hazards of Transfusion (SHOT) reports 2013.
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- CRASH 2 study: Tranexamic acid and trauma patients. Lancet 2011;vol 377 (9771) 1096-1101


## *7* Associated Documentation

- BBMTP - Massive Transfusion Protocol (laboratory)

***Flashcards for specific tasks***

## TEAM LEADER

- Activate the massive haemorrhage protocol (***2222, state speciality***)
- Assign roles for communication and IV resuscitation

### Ensure the following;

- Patient has IV access x 2
- Tranexamic acid has been/is administered
- Blood samples to lab (utilise porter)

### Early consideration of;

- Methods of haemorrhage control (e.g. early activation) theatre/endoscopy/radiology/cell salvage
- Temperature control & aims for therapy (monitor hyperkalaemia)

## COMMUNICATION FACILITATOR

- Ensure 2222 has been carried out
- Phone (bleep if no answer) blood bank (*numbers on reverse of this card*)
  - Give patient details
  - State urgency – (*may just require red cells initially and will phone for FFP if bleeding not under control by 3rd unit RBC* )
  - Ordering pack 1 = 4 RBC + 2 FFP
  - Order pack 2 & subsequent packs as required = 4 RBC + 2 FFP + 1 platelets
- Co-ordinate porter to collect components
- Contact consultant if not in attendance
- Contact theatre/other depts as required
- PHONE BLOOD BANK WHEN COMPONENTS NO LONGER REQUIRED

*RBC = red blood cells,*
*FFP = fresh frozen plasma*

## FLUID RESUSCITATION FACILITATOR

- Blood warmer if red cells administered >50mls/kg/hr (*e.g. >100ml/min or via a central line*)
- Fluid chart
  - Tally of components/fluid administered (as components will not arrive together as a pack)
- Make team leader aware of number components given, >10 units Red blood cells, consider 10% calcium chloride
- Return unused components to blood fridge/blood bank (*preferably within the 30 min rule*)
- Complete audit form

# MASSIVE HAEMORRHAGE PROTOCOL FLASHCARDS

## PLEASE ALLOCATE EACH OF THE 3 CARDS TO EACH PERSON CARRYING OUT THIS SPECIFIC ROLE

**PLEASE RETURN THESE CARDS TO THE DRIP STAND HANGER ON THE RESCUSCITATION TROLLEY**

To go onto the back of the communication card

*Normal hours*

**RSH** ☎ 3542/3556

**PRH** ☎ 4305/4306

*17.30-9.00* (+ weekends & BH)

**RSH** bleep 512

**PRH** bleep 115

## SWITCHBOARD will;

On receiving 2222 call;

- Put aircall message only to blood bank and porter carrying the emergency bleep, stating;
  - Massive haemorrhage (adult/paed/neonatal)
  - Location

**PLEASE RETURN THESE CARDS TO THE DRIP STAND HANGER ON THE RESCUSCITATION TROLLEY**

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