Massive Haemorrhage Policy

CP307

Document Control

Document Title:	**Massive Haemorrhage Policy**
Reference No:	CP307
Document Purpose:	This policy aims to ensure a consistent approach to patient safety and service delivery in massive haemorrhage situations through the provision of the massive haemorrhage protocol (MHP). The MHP has been designed to help facilitate the procurement of appropriate quantities of blood and blood components in a timely, structured and organised manner and should be adapted to specific clinical areas as appropriate. Furthermore, it intends to complement current resuscitation guidelines and provide clear guidance to clinical staff managing patients with massive blood loss
First Published:	July 2012
Current Version Published:	5TH October 2022
Review Date:	5TH October 2025
Version:	V6
Ratification Committee(s):	CEPPD
Lead Director:	Dr A Saleh, (Chairman Hospital Transfusion Committee)
Date EIA Completed:	October 2022
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Consultation Process	Hospital Transfusion Team Hospital Transfusion Committee Circulated to Medical Directors for comment
Key words (to aid intranet searching)	Massive, haemorrhage, 307

Document Title:	**Massive Haemorrhage Policy**
Target Audience *(delete as appropriate)*	All staff

Version Control

Date	**Version**	**Author**	**Revision description** *(Provide a brief outline of the changes made to the document)*
July 2012	1	Hospital Transfusion Committee	NPSA Rapid response Report 017 (October 2010)
March 2013	2	Hospital Transfusion Committee	Full Review Undertaken
October 2014	3	Hospital Transfusion Committee	Full Review Undertaken
July 2018	4	Hospital Transfusion Committee	Full review undertaken and updated
June 2019	5	Hospital Transfusion Committee	Update

Contents

1. Summary

Massive Haemorrhage (MH) is a major source of morbidity and mortality in acute patient care and expert opinions advocate the early use of blood components in the resuscitation of patients with massive blood loss. Successful transfusion support to acutely haemorrhaging patients requires prompt, appropriate action and good communication. These clinical situations are relatively uncommon, and involve a large number of medical, nursing, laboratory and support staff.

Definition of Massive Haemorrhage:

(British Committee for Standards in Haematology (BCSH), 2015).

- A 50% blood loss within a 3 hour period

Or

- Blood loss ≥ 150mls per minute.

Or

- One blood volume replacement in a 24 hour period

A realistic clinically based definition is bleeding which leads to a systolic blood pressure of less than 90 mm Hg or a heart rate of more than 110 beats per minute.

The activation of the massive haemorrhage protocol must also be considered in actual or impending haemorrhagic shock situations in actively bleeding patients, including any patient who is in severe shock or who may require any of the following:

- The transfusion of > 10 units of red cells
- More than 4 units of red cells in 1 hour
- Replenishment of 50% of their estimated blood volume in 3-4 hours.

Indications for transfusion are dependent on individual circumstances and clinical presentation. Blood loss may be underestimated if concealed and in young fit people. Blood replacement must be guided by clinical estimation of blood loss in conjunction with the patient's response to volume replacement (BCSH, 2015)

The MH protocol must only be activated in the event of a massive haemorrhage and must not be used to expedite the delivery of blood components outside this scenario.
Inappropriate activation of the MH plan may place other patients at risk by depriving them of essential blood products. If red cells only are required refer to the Urgent Blood Transfusion Requests Policy CP217

2. Purpose, Legal Requirements and Background

2.1 This policy aims to ensure a consistent approach to patient safety and service delivery in massive haemorrhage situations through the provision of the massive haemorrhage protocol (MHP).

The MHP has been designed to help facilitate the procurement of appropriate quantities of blood and blood components in a timely, structured and organised manner and should be adapted to specific clinical areas as appropriate. Furthermore, it intends to complement current resuscitation guidelines and provide clear guidance to clinical staff managing patients with massive blood loss.

2.2 All staff members (clinical, laboratory and ancillary support staff) are responsible for following this policy as directed during the management of massive haemorrhage.

The Hospital Transfusion Team (HTT) are responsible for monitoring the impact of the policy and providing a summary report to the Hospital Transfusion Committee (HTC). The HTC are responsible for reviewing the summary report and making additional recommendations as required

2.3 It includes the following principles and aims to focus on the appropriate use of blood components for the resuscitation of patients experiencing massive haemorrhage.

2.4 This procedure must only be activated in the event of a massive haemorrhage and must not be used to expedite the delivery of blood components outside this scenario. Inappropriate activation of the MH plan may place other patients at risk by depriving them of essential blood products. If red cells only are required refer to the Urgent Blood Transfusion Requests Policy CP217

The decision to activate the massive haemorrhage protocol must be made by a Consultant or Registrar, however the Transfusion Laboratory can be contacted by a staff member on their behalf

Inappropriate activation of the MH plan may lead to a service charge to the individual clinical area. This will reflect the time taken by Lab staff to provide the products and cover the cost of any wastage

2.5 The request to activate the protocol must be made to the Transfusion Laboratory by telephoning:

HRI: Ext. 607731 or MAJAX line (607823) **CHH:** Ext 761358

2.6 The Transfusion Laboratory must be informed of patients with massive haemorrhage at the earliest opportunity

2.7 In order to trigger the massive haemorrhage protocol or inform the transfusion laboratory of a pending major trauma, staff must use the phrase “I want to trigger the massive haemorrhage protocol”. Subsequent communications between the clinical areas and laboratory must indicate “this call relates to the massive haemorrhage protocol in [current location]”

2.8 A multi-disciplinary approach is fundamental to the continuity of care and effective communication when managing patients during massive haemorrhage. If appropriate, the Clinical Haematology team should be made aware of the activation of the Massive Haemorrhage policy by the clinical co-ordinator responsible for the initiation of the policy. Clinical teams dealing with massive haemorrhage must nominate a specific co-ordinator who will be responsible for liaising directly with the Transfusion Laboratory and support services for the duration of the haemorrhage

2.9 Transfusion laboratory staff will follow a pre-defined procedure which maintains the supply of blood components aimed at restoring circulating blood volume and preventing dilutional coagulopathy by the use of massive haemorrhage packs.

Massive haemorrhage packs contain red blood cells and fresh frozen plasma (FFP) ± platelets and cryoprecipitate. Once the massive haemorrhage policy is activated, the laboratory will continue to send MH packs until the 'stand down' is notified to them i.e. continuous despatch of MH packs.

2.10 All blood storage units within the Trust contain 2 units of Group O Rh D negative blood for immediate use by clinicians if the patient's condition precludes waiting for laboratory issued blood components.

3. Responsibilities, Accountabilities and Duties

As stated in section 4 of this policy.

4. Policy/Procedure/Guideline* Details

4.1 Activating the massive haemorrhage procedure

When informing the transfusion laboratory of a pending major trauma or when triggering the MHP, staff must provide the following:

- The patient's name, date of birth and unique identification number if known. If not known provide the ED number and gender of the patient. For neonates and paediatric patients an estimated body weight will also be required (to ensure the selection of the correct component volumes to be delivered).

- Patients who are "unknown" or who have no historical group and save sample on the Laboratory Information System will require a second sample to be taken for confirmation of blood group before group specific components will be issued. This will be co-ordinated between the Transfusion Laboratory and the nominated coordinator on the clinical area. This process will not delay the issue of components to the patient.

- The location and site of the patient (i.e. Delivery Suite, HRI or Cardiac Theatre, CHH)

- The bleep number and/or the contact number for the co-ordinator should also be provided at the time of activation

- It is the responsibility of the clinical co-ordinator to immediately inform the Transfusion Laboratory if the clinical location of the patient changes to ensure the delivery of blood components to the correct area.

- A correctly labelled group and save sample, coagulation screen, BCP and FBC to avoid unnecessary delays in the provision of blood components

- Wherever possible, a group and save sample must be taken and forwarded to the transfusion laboratory prior to the administration of any emergency O Rh D negative blood.

- The contact name and extension number of the nominated coordinator

- The number of units of Group O Rh D negative blood used

4.2 Therapeutic goals and considerations in the management of massive haemorrhage:

4.2.1: **Coagulation problems**:

Haemostatic deficiencies during massive haemorrhage must be guided by laboratory results and where available by near patient testing (TEG/ROTEM) however it must be led by regular clinical review of the patien

4.2.2 Pharmacological management:

Tranexamic acid should be considered in patients where fibrinolysis is identified. The CRASH-2 study (CRASH Collaborators 2010) indicated a significant reduction in death (5.3%) in patients with massive haemorrhage secondary to trauma who were administered Tranexamic acid ≤ 1 hour of injury.

However, there is not enough evidence to support the routine use of antifibrinolytics in the management of massive haemorrhage; the administration must therefore be based on the clinician's decision

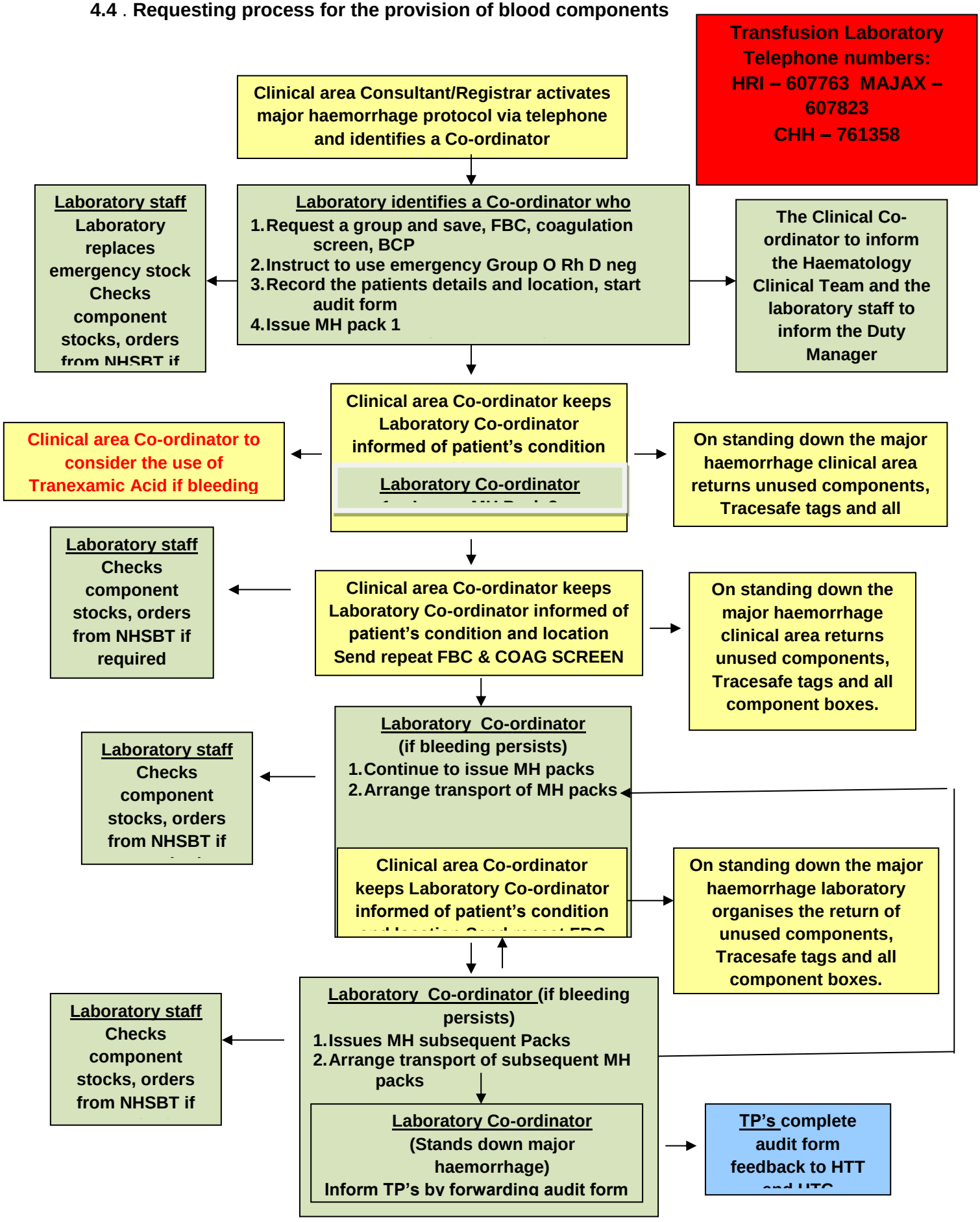
4.3 Non pharmacological options:

4.3.1 Radiographically aided arterial embolisation is becoming more common in the management of massive haemorrhage.

However, appropriateness of radiological intervention needs to be assessed in each individual case by the clinician and after discussion with the interventional radiology team.

4.3.2 The use of cell salvage is beneficial at reducing the need for the demand for blood components as well as ensuring that blood is readily available and should be considered where appropriate.

4.4 . Requesting process for the provision of blood components



4.5 . **Paediatric Massive Haemorrhage (0 – 16 years)**

4.5.1 There is little research available to support clinical protocols in the management of paediatric massive haemorrhage; in many cases paediatric management has been gathered from adult guidelines as the overarching principles remain the same. The aggressive and proactive treatment of hypothermia, acidosis and coagulopathy is vital in children with major trauma to counteract Acute Coagulopathy of Trauma Shock (ACoTs).

4.5.2 Definition of paediatric massive haemorrhage is defined by any of:

- Loss of one blood volume (80ml/kg) within a 24 hour period
- 50% blood volume loss (40ml/kg) within 3 hours or,
- A rate of blood loss of 2-3ml/kg per minutes or
- Signs of continuing shock flowing 40ml/kg crystalloid and/or colloid resuscitation for acute haemorrhage

Wherever possible, a Consultant (ED or Paediatric or Paediatric Anaesthetist) must be involved in the management of paediatric massive haemorrhage.

4.6 In the active management of paediatric massive haemorrhage the following local principles apply:

- Positive patient identification remains an integral part of the transfusion process.
- Consider the use of the emergency O Rh D Negative (2 adult units available in blood storage units) in situations where the clinical situation warrants immediate transfusion.
- The activation process (Section 5.1) of the massive haemorrhage protocol is the same as for adult patients however; in addition, clinical staff need to provide the Transfusion Laboratory with the age and estimated weight of the patient to guide in the selection of appropriate components
- “Rolling” paediatric massive haemorrhage packs will be supplied until “stand down” is called by the clinical area concerned (section 7.5)
- Counteract the risk of hypothermia through the use of blood warmers, overhead heaters etc.
- In trauma patients consider the use of Tranexamic acid (15mg/kg – up to 1g), ideally within an hour of admission.
- In ongoing bleeding the use of Calcium Gluconate and Vitamin K should also be considered.
- The mechanism of blood supply remain the same (see section 8)

4.7 . Blood Component Supply

On triggering the massive haemorrhage protocol, the Transfusion Laboratory staff will prepare and issue the first massive haemorrhage pack.

4.8 Massive haemorrhage pack 1

The Transfusion Laboratory will automatically issue massive haemorrhage pack 1 with pre thawed FFP or initiate thawing Octaplas LG as appropriate for age of patient.

- See appendix 1 for adults and appendix 2 for neonates and paediatrics

4.9 Emergency Department (ED) BSU

The Emergency Department have a BSU in the department which is solely for the purpose of storing the contents of Massive haemorrhage pack 1.

ED staff must follow the required procedure to activate a Massive haemorrhage plan identified in section 2.1. Once activated, the Transfusion Laboratory will automatically prepare massive haemorrhage pack 2 and subsequent packs until the massive haemorrhage activation is stepped down

4.10 ED staff may remove the contents of this BSU for a massive haemorrhage activation but must not replace any contents into the BSU any once removed; this will be the responsibility of the Transfusion Laboratory staff

ED staff must follow the required procedure regarding the completion of administration of completion of blood and blood components as identified in section 5.6

4.11 Massive haemorrhage pack 2

The Transfusion Laboratory will automatically prepare massive haemorrhage pack 2 on issue of pack 1.

- See appendix 1 and for adults and appendix 2 for neonates and paediatrics).
- If the patients' blood group is unknown then massive haemorrhage pack 2 will be the same as massive haemorrhage pack 1 with the addition of freshly thawed FFP or Octaplas LG as appropriate.

4.12 Massive haemorrhage pack 3 (and subsequent packs)

The Transfusion Laboratory will automatically prepare Massive Haemorrhage Pack 3 on issue of pack 2.

- See appendix 1 for adults and appendix 2 for neonates and paediatrics).
- If the patients' blood group is unknown then massive haemorrhage pack 3 will consist of 4 units Group O Rh D Negative red cells, 4 units of freshly thawed FFP, 1 unit of A (HT neg) platelets and 2 units A cryoprecipitate.

4.13 The delivery of Massive Haemorrhage Packs:

4.13.1 The Transfusion Laboratory will arrange delivery of Massive Haemorrhage packs. At HRI they will be delivered by Pathology Support Officer. At CHH they will be delivered by Laboratory staff or Bloodfast drivers.

4.13.2 The massive haemorrhage pack will be clearly labelled and packaged to comply with the requirements of the Blood Safety and Quality Regulations 2005 (as amended).

Whilst these components are packed separately, it is imperative that all components are used to correct the coagulopathy as quickly as possible. Please note, the labelling will include clear information about the box contents. DO NOT open the boxes to simply check the contents as this affects that viability of the blood components – only open at the point when the contents are to be used.

4.13.3 A member of clinical staff will be required to confirm the date and time the blood components were received in the clinical area using the documentation attached to the massive haemorrhage packs. Massive Haemorrhage packs must remain sealed until such time as the components are required for use.

4.13.4 The Transfusion Laboratory will prepare and send subsequent massive haemorrhage packs until "stand down" is called.

4.13.5 Clinical staff must obtain a repeat coagulation screen, biochemical profile and full blood count and forward to the Laboratory urgently.

4.13.6 Place all the tags from the used components in the **massive haemorrhage envelope** and the details completed on the reverse which should be returned to Transfusion to confirm the fate of unit.

4.14 Use of Blood Components During Massive Haemorrhage Activation – the transfusion of the following components must be completed within the timescales provided following the breaking of the security seal of the temporary temperature controlled storage boxes. The security seal must not be broken until the contents of the pack are to be used

4.14.1 Red blood cells

Transfusion of red blood cells must be completed within 4 hours of breaking the security seal

If once removed from temperature controlled storage boxes the red cells are no longer required they must be returned to a blood storage unit (not the box) within 30 mins. A register slip must be completed. If 30 min is exceeded the unit should be returned to the transfusion department.

4.14.2 Frozen plasma components

Transfusion of FFP must be completed within 4 hours of breaking the security seal.

If once removed from temperature controlled storage box the FFP is no longer required they must be returned to a transfusion department

4.14.3 Cryoprecipitate

Cryoprecipitate must to be used within a 4 hour period following thawing. Once removed from its storage location review the time thawed written on the bag. Cryoprecipitate must be used within 4 hours of this time regardless of how long it has been in a temperature controlled storage box. If any units are removed but not required they should be returned immediately to the Transfusion department.

4.14.4 Platelets

Platelets must not remain un-agitated for more than 8 hours in a single period. Therefore transfusion of platelets must be completed within 8 hours of the temperature controlled storage box being packed.

If platelets are removed from temperature controlled storage and no longer required they must be returned immediately to the Transfusion department

4.15.5. Octaplas

Transfusion of Octaplas must be completed with 8 hours of breaking the security seal

If any units are removed but not required they must be returned immediately to the Transfusion department.

4.16 Standing down

4.16.1 It is the responsibility of the co-ordinator in the clinical area to inform the Transfusion Laboratory when massive haemorrhage packs are no longer required and they wish to

"stand down". The timely manner of this "stand down" is essential to avoid wastage and the ongoing transport of components when no longer required.

4.16.2 The coordinator for the massive transfusion must ensure all unused blood components are returned to the Transfusion Laboratory and return the completed Massive Haemorrhage envelopes to confirm the fate of units.

4.17.3 At "stand down" of the massive haemorrhage procedure the clinical area co-ordinator is responsible for ensuring that all documentation is complete; this includes ensuring the laboratory are informed of the total number of emergency O Rh D negative red cells transfused. All the used Tracesafe tags are completed and returned to the laboratory along with all the blood component boxes (including any wasted components, not transfused).

4.17.4 The Transfusion Practitioner team audit each Massive Haemorrhage activation by reviewing the patients' notes and if appropriate through discussion with the clinical staff involved.

4.18 . Mechanisms of blood supply

4.18.1 The care and monitoring of patients in whom a transfusion is anticipated or administered is covered by existing transfusion policy (CP-113)
The principles of correct patient identification and robust, complete documentation of the transfusion process remain essential throughout all stages of blood component administration.

4.18.2 The Trusts regulatory requirement to the Blood Safety and Quality Regulations 2005 (as amended) remains unchanged in emergency situations and thus a full audit trail i.e. traceability of the whole transfusion process must be confirmed, maintained and retained for 30 years.

4.18.3 Cold chain maintenance is a prerequisite under European Law and unless packaged by the laboratory blood components should not be transferred with patients between hospital trusts. The Transfusion Laboratory will make decisions about the integrity of the cold chain after the "stand down" has occurred.

5. Process for Monitoring Compliance

5.1 The monitoring of compliance with and the effectiveness of this policy will be reported to the Hospital Transfusion Committee (HTC) on a quarterly basis. This will be undertaken by the Transfusion Practitioners on behalf of the Hospital Transfusion Team (HTT) through a detailed post-massive haemorrhage clinical audit programme.

5.2 The Transfusion Practitioners will complete the massive haemorrhage audit form which will be reviewed on a monthly basis by the HTT. The findings will be presented to the HTC on a 6 monthly basis. The basis of the audit is to ensure that Trust policy is applied appropriately and effectively. It will also provide a forum of feedback on lessons learnt to the Healthcare Groups where the haemorrhage occurred.

5.3 The audit programme will support the identification of any failures in the procedure which resulted in the delay or problems in the provision of blood components. These will be reported locally via the HTT and HTC with onward reporting to the Medicines and Healthcare products Regulatory Agency (MHRA) and the Serious Hazards of Transfusion Scheme (SHOT) via SABRE

6. References

1. Blood Safety and Quality Regulations Statutory Instrument 2005 (as amended) no 50
2. British Committee for Standards in Haematology (2006) Guideline for the management of massive blood loss

3. British Committee for Standards in Haematology (2015) Guideline on the Administration Blood Components

4. National Patient Safety Agency (2010) Rapid Response Report 017 'The transfusion of blood and blood components in an emergency. NPSA 2010

5. Rossaint R et al (2010) Management of bleeding following major trauma: an updated European Guideline Critical Care 2010, 14

6. Serious Hazards of Transfusion (SHOT) Annual Report 2010

7. Shakur, H. et al. (2010). Effects of tranexamic acid on death, vascular occlusive events, and blood transfusion in trauma patients with significant haemorrhage (CRASH-2): a randomised, placebo-controlled trial. The Lancet [available] http://download.thelancet.com/flatcontentassets/pdfs/S014067361160278X.pdf

8. Sihler K.C. and Napolitano L.M. (2009) Massive Transfusion: New Insights CHEST 2009 136 p1654 - 1667

9. Steering group of NW RTC Massive Haemorrhage Guidelines Group (2011) Toolkit for the Management of Massive Haemorrhage [available]

    a. http://www.transfusionguidelines.org.uk/docs/pdfs/rtc-nw_edu_mh_toolkit.pdf

10. Thomson, AJ. Ramsay, JE; Rich, D. (2011) Antepartum Haemorrhage Green top Guideline No. 63 1st Ed. Royal College of Obstetricians and Gynaecologists, November 2011

11. United Kingdom Blood Services (2013) Handbook of Transfusion Medicine 5th Edition HMSO: London

12. The Association of Anaesthetics of Great Britain and Ireland (2010) Blood Transfusion and the Anaesthetist Management of Massive Haemorrhage. AAGBI Safety Guideline. Anaesthesia 2010, 65: 1153-1161

Hull & East Yorkshire Hospitals NHS Trust Corporate Policies and Guidelines:

CP.No: 19 Correct identification of patients and service users
CP.No: 26 Drug policy
CP.No: 217 Urgent blood transfusion requests policy
Guideline No: 20 The use of fresh frozen plasma
Guideline No: 27 The use of blood products in the Neonatal Unit
Guideline No: 26 Administration of platelets
Guideline No: 42 Red blood cell transfusion
Guideline No: 195 Management of adverse reactions to blood products
Guideline No: 10 Use of Intra-operative cell salvage

7. Equality Impact Assessments (EIA)

As part of its development this document and its impact on equality has been analysed and no detriment identified.

8. Appendices

NB: *Titles of any appendices to be included in the below table. Include hyperlinks to aid viewing of the document. Authors may wish to use the following appendices below*.

Appendix number	Description
Appendix 1	Massive haemorrhage packs – adults
Appendix 2	Massive haemorrhage packs for neonates and paediatrics
Appendix 3	Definitions/Glossary
Appendix 4	Monitoring table

Appendix 1 – Massive Haemorrhage Pack – Adults

Blood Group Status	MH pack 1 *	MH pack 2 *	MH pack 3 and *subsequent
Blood group unknown or unconfirmed	4 x O neg RBC** 4 x Group A pre thawed FFP* 1 x A (HT neg) PLT	4 x O neg RBC** 4 x A FFP or Octaplas* 1 x A (HT neg) PLT	4 x O Rh D neg RBC** 4 x A FFP or Octaplas* 1 x A (HT neg) PLT 2 x A Cryo (All components will be group specific once patients' blood group is confirmed)
Confirmation blood group sample received and not tested	4 x O neg RBC** 4 x Group A pre-thawed FFP 1 x A (HT neg) PLT	4 x group specific RBC 4 x group specific FFP 1 x group specific PLT	4 x group specific RBC 4 x group specific FFP 1 x group specific PLT 2 x group specific Cryo
Current confirmed blood group	4 x group specific RBC 4 x Group A pre-thawed FFP 1 x A (HT neg) PLT	4 x group specific RBC 4 x group specific FFP 1 x group specific PLT	4 x group specific RBC 4 x group specific FFP 1 x group specific PLT 2 x group specific Cryo

**All recipients born after 1 January 1996 will receive Octaplas, MB Cryo and apheresis platelets. Group specific components will be issued in accordance with the trusts "two sample rule".*
*** O positive RBC may be sent depending on age and gender of patient.*

Appendix 2 – Massive haemorrhage packs for neonates and paediatrics

Table 1 Massive Haemorrhage pack 1

Weight	Red cells (K- CMV- if <4 months and available)*	FFP*	Platelets (CMV- if <4 months and available)
<5kg	2 x O Rh D negative paediatric units (80-100ml)	1 AB OctaplasLG (200ml)	1x paediatric unit of platelets (50ml) **or** 1 adult A (HT Neg) apheresis platelet (200ml)
5-10.9kg	1 x adult O Neg CDE neg K neg	1 AB OctaplasLG (200ml)	2 x paediatric unit of platelets (100ml) **or** 1 adult A (HT Neg) apheresis platelet (200ml)
11-20kg	2 x adult O Neg CDE neg K neg	2 AB OctaplasLG (400ml)	1 adult A (HT Neg) apheresis platelet (200ml)
>20kg	4 x adult O Neg CDE neg K neg	4 AB OctaplasLG (800ml)	1 adult A (HT Neg) apheresis platelet (200ml)

Table 2 Massive Haemorrhage pack 2 and subsequent packs

Weight	Red cells (K- CMV- if <4 months and available)*	FFP*	Platelets (CMV- if <4 months and available)	Cryoprecipitate*
<5kg	2 x O Rh D negative paediatric units (80-100ml)	1 x OctaplasLG	1 x paediatric unit of platelets **or** 1 adult apheresis platelet	1 single MB donor unit (40ml)
5-10.9kg	1 x O Rh D negative, CDE neg, K neg, adult unit	1 x OctaplasLG	2 x paediatric unit of platelets **or** 1 adult apheresis platelet	2 single MB donor units (80ml)
11-20kg	2 x O Rh D negative, CDE neg, K neg, adult unit adult units	2 x OctaplasLG	1 adult apheresis platelet (200ml)	1 adult pack (MB pooled, 200ml)
>20kg	4 x O Rh D negative, CDE neg, K neg, adult unit adult units	4 x OctaplasLG	1 adult apheresis platelet (200ml)	2 adult packs (MB pooled) (400mls total)

Appendix 3 – Glossary of Abbreviations

GLOSSARY OF ABBREVIATIONS

- ABC Assessment of Blood Consumption
- APH Antepartum haemorrhage
- APTT Activated Partial Thromboplastin Time
- BCP Biochemical profile
- BCSH British Committee for Standards in Haematology
- BP Blood pressure
- Ca^{2+} Ionised calcium
- CDE-/neg CDE antigen negative
- CHH Castle Hill Hospital
- CMV -/neg Cytomegalovirus negative
- CP Corporate Policy
- Cryo Cryoprecipitate
- CVP Central Venous pressure
- DIC Disseminated Intravascular Coagulopathy
- ED Emergency Department
- FBC Full Blood Count
- FFP Fresh Frozen Plasma
- GI Gastrointestinal
- GIT Gastrointestinal Tract
- G&S Group and Save
- HRI Hull Royal Infirmary
- HTC Hospital Transfusion Committee
- HT neg Haemolysin titre negative
- HTT Hospital Transfusion Team
- K-/neg Kell antigen negative
- MHP Massive haemorrhage pack
- MHRA Medicines and Healthcare products Regulatory Agency
- NHSBT NHS Blood and Transplant
- NPSA National Patient Safety Agency
- PLT Platelets
- PPH Postpartum haemorrhage
- PT Prothrombin time
- RBC Red Blood Cells
- ROTEM Thromboelastogram
- SABRE Serious Adverse Blood Reactions and Events
- SHOT Serious Hazards of Transfusion
- TEG Thromboelastogram
- MBFFP Methylene blue treated Fresh frozen plasma
- SDFFP Solvent/detergent treated plasma

Appendix 4- Monitoring table

What key element(s) need(s) monitoring as per local approved policy or guidance?	Who will lead on this aspect of monitoring? Name the lead and what is the role of the multidisciplinary team or others if any.	What tool will be used to monitor/check/ observe/asses/ inspect/ authenticate that everything is working according to this key element from the approved policy?	How often is the need to monitor each element? How often is the need to complete a report? How often is the need to share the report?	Who or what committee will the completed report go to. How will each report be interrogated to identify the required actions and how thoroughly should this be documented in e.g. meeting minutes.	Which committee, department or lead will undertake subsequent recommendations and action planning for any or all deficiencies and recommendations within reasonable timeframes?	How will system or practice changes be implemented the lessons learned and how will these be shared.
Element to be monitored	**Lead**	**Tool**	**Frequency**	**Reporting arrangements**	**Acting on recommendations and Lead(s)**	**Change in practice and lessons to be shared**

All aspects of the policy	**Transfusion Practitioners**	**Massive haemorrhage clinical audit tool**	**All massive haemorrhages which trigger the use of MHP's will be audited by the HTT and findings presented monthly to the HTT. A summary report will be presented to HTC 3 monthly.**	**The HTC will interrogate the report to identify deficiencies in the system and act upon them.**	**Required actions will be identified via the HTC minutes and action tracker and completed in a specified timeframe.**	**Required changes to practice will be identified and actioned within a specific time frame by The HTC. A lead member of the HTC will be identified to take each change forward where appropriate. Lessons will be shared with all the relevant stakeholders.**