Title: Haematological Management of Major Haemorrhage In Adults

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Guideline to be followed by (target staff): Health care professionals who may have to manage a patient with major blood loss**.**

To be read in conjunction with the following documents:

Blood Transfusion Policy for Administration of Blood and Blood Products and the Management of Transfused Patients **PATH/GL/03**
Blood Transfusion: Samples/Request Documentation for Blood Transfusion Policy **PATH-GL-02**
Guideline for the Use of Red Blood Cells in Adults **PATHOLOGY/GL/09**
Guideline for Prescribing and Administration of Prothrombin Complex Concentrate (PCC) in Adults for Emergency Reversal of Warfarin **PATHOLOGY/GL/22**
Obstetric Haemorrhage **MIDW/GL/125**
Training and Assessment requirements for Blood Transfusion **PATHOLOGY/GL/15**
Treatment of Patients Refusing Blood and Blood Components Policy **PATHOLOGY/GL/04**
Fresh Frozen plasma and Cryoprecipitate indication guidance **PATHOLOGY/ GL/24**
Platelet Indication Guidance **PATHOLOGY /GL/25**
Paediatric Blood Transfusion Guideline Administration of Blood and Blood Products and the Management of Transfused Patients **PATHOLOGY/GL20**

CQC Fundamental standards:
Regulation 9 – person centred care
Regulation 11 – Need for consent
Regulation 12 – Safe care and treatment
Regulation 17 – Good governance

Disclaimer

Since every patient's history is different, and even the most exhaustive sources of information cannot cover every possible eventuality, you should be aware that all information is provided in this document on the basis that the healthcare professionals responsible for patient care will retain full and sole responsibility for decisions relating to patient care; the document is intended to supplement, not substitute for, the expertise and judgment of physicians, pharmacists or other healthcare professionals and should not be taken as an indication of suitability of a particular treatment for a particular individual.

The ultimate responsibility for the use of the guideline, dosage of drugs and correct following of instructions as well as the interpretation of the published material **lies solely with you** as the medical practitioner.

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Guideline Statement

To provide health care professionals with clear guidance of the management of major haemorrhage or blood loss as summarised in Appendix 1 is Major Haemorrhage Action Card - Major Haemorrhage Protocol Process – Clinical Area for all staff involved in caring for a patient suffering massive blood loss, except massive obstetric haemorrhage.

- Provides the user with clear details of the Massive Blood Loss / Major haemorrhage Procedure at MKUH.
- Guidance on Initial clinical response to major blood loss.
- Guidance for transfusion laboratory response to massive blood loss referral.

This policy does not address the specific problems associated with major obstetrics haemorrhage.

There is a separate policy for haemorrhage relating to obstetrics MIDW/GL/125 obstetric haemorrhage

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In all cases individual patient circumstances may dictate an alternative approach

Executive Summary

The document is based on national guidelines (British Committee for Standards in Haematology, 2015; National Institute for Health and Care Excellence, 2016; North West Regional Transfusion Committee incorporating North Wales. Major Haemorrhage Guidelines Group, 2013a)
It takes into account the Rapid Response Report NPSA/2010/017 to enable the rapid provision and transport of blood and blood products

Successful treatment involves:

- Prompt action
- Good communication
- Involvement from senior clinicians with the necessary expertise

Early recognition of major blood loss and immediate effective interventions are vital to avoid hypovolemic shock and its consequences. One such action is the rapid provision of blood and blood components, for which effective communication between all personnel involved in the provision and transportation of blood is key.

Abbreviations

BMS	Bio Medical Scientist
IO	Intraosseous Access
MHA	Major Haemorrhage Activation Group
MHP	Major Haemorrhage Protocol
NHSBT	NHS Blood and Transplant Services
PCC	Prothrombin Complex Concentrate
TIC	Trauma Induced Coagulopathy

Definitions

Massive blood loss defined as

- Loss of more than one blood volume within 24 hours (around 70ml/kg or >5 litres in a 70kg adult)
- A loss of 50% of total blood volume in under 3 hours
- Bleeding in excess of 150ml/minute in adults
- As a practical clinical definition, bleeding which leads to:
  - A systolic blood pressure of less than 90mm/Hg
  - A heart rate of more than 110 beats per minute in adults

Based on National Institute for Health and Care Excellence (2015) *Blood transfusion*. *Terms used in this guideline. Major haemorrhage*)
https://www.nice.org.uk/guidance/ng24/chapter/Recommendations

Trauma Induced Coagulopathy (TIC):

- The intrinsic dysregulation of the blood coagulation system during haemorrhagic shock that contributes to blood loss. TIC is caused by severe anatomical tissue injury and tissue hypo perfusion from blood loss.

  Intraosseous Access (IO): provides a non-collapsible entry into the systemic venous system

1.0 Roles and Responsibilities

All staff involved in the transfusion process must have untaken transfusion training and competency assessment relevant to their role. See PATH/GL/15 Training and Assessment requirements for Blood Transfusion

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Lead Consultant Haematology

- Responsible for ensuring clinical activities remain current

Hospital Transfusion Committee (HTC)

- Are responsible for the implementation and monitoring compliance of the policy. Investigating any delays or problems in the provision of blood in an emergency and ensure delays are reported.

Directorate Managers/Clinical Directors/Heads of Department/Line Managers

- Ensuring staff in all relevant clinical areas are aware of this policy and understand and comply with its content. Ensuring staff training records are up to date.

Medical Staff

- Activating the Major Haemorrhage Protocol (MHP)by the most senior clinician present
- Contacting via bleep the Blood transfusion laboratory to discuss requirements
- Allocation of roles e.g. communication with Blood Bank and support service
- Run regular drills.

Matrons/Ward Managers-

- Familiarisation with MHP supported by training and regular drills.

Nursing Staff

- Contacting via bleep the Blood transfusion laboratory to discuss requirements
- Collection of emergency O Blood form any Blood Fridge if required before MHP box is received
- Arranging for the return of any unused components to Blood Bank
- Ensuring all documentation is completed

Blood Transfusion Laboratory Staff

- Make emergency blood available for collection
- Liaise with nominated person in the clinical area

Porters (see appendix 7)

- Collection of Major Haemorrhage Pack 1 (MHP1) from the blood issue room
- Delivery of MHP1 to clinical area
- Urgent delivery of pathology samples to Blood Bank
- Collection and delivery of Major Haemorrhage Pack 2 (MHP 2) as instructed by the clinical area or the Blood Bank
- Return of any blood products not required to Blood Issue Room and contacting the Lab to inform them

2.0 Implementation and dissemination of document

Activation of major haemorrhage will be included in all induction training and mandatory updates.
The policy will be available on the Trust Intranet.
Regular MHP scenarios are run

3.0 Processes and procedures for the Management of Major Haemorrhage

3.1 Activation/ Communication

Note: Group O Emergency blood is available at the following locations and may be used whilst waiting for MHP Box 1 to arrive

Pathology blood fridge -	4 O RhD Negative & 4 O RhD Positive
Phase 1 Theatre blood fridge –	4 O RhD Negative
Phase 2 Theatre blood fridge –	2 O RhD Negative

Major Haemorrhage Action Cards are available with a summary of procedures (See appendix 1 and 3)

The Major Haemorrhage protocol is activated by a staff on the instruction of the most senior clinician present via 2222 and stating clearly Major Haemorrhage and location and by that same staff member immediately dialling Ext 85774 the Blood Bank MHP. Blood Bank are also contactable via bleep 1412

The person activating must provide the following information –

1. MRN of patient (if known)
2. Gender of patient
2. If emergency O blood has been used from any of the blood fridges
3. If a sample is on its way

Switchboard alerts the Major Haemorrhage Contact Group by fast bleep. (Appendix 2)

Blood samples required:

Blood group and save / antibody screening (note group specific blood cannot be issued until two independently collected samples have been processed by the laboratory)

Baseline haematology, **FBC, PT, APTT, Fibrinogen, U/E, LFT, bone profile**.

When severe blood loss occurs, it is not uncommon for the vascular system to collapse and venous collection for blood samples may become unattainable.
Note: pathology samples collected via intraosseous access (IO) cannot be processed by the laboratory.

Sample details must include:

Forename, surname, age, sex (this will guide selection of most appropriate blood products) and MRN. The MRN or unique identifier is critical for patient safety and essential and particularly where >1 patient is being managed.

3.2 Therapeutic goals:

These are:

- Maintenance of tissue perfusion and oxygenation by restoration of blood volume and haemoglobin
- Arrest of bleeding by treating any traumatic, surgical or obstetric source
- Judicious use of blood component therapy to correct coagulopathy

For Summary Template Guideline outlining goals and procedures see Appendix 4

3.3. Volume resuscitation

- Red cell transfusion is likely to be required when 30% to 40% blood volume is lost; whilst over 40% blood volume loss is immediately life-threatening. During uncontrolled haemorrhage, avoid

clear fluids for volume resuscitation unless there's profound hypotension and no imminent availability of blood products. In major haemorrhage, haemostatic resuscitation should be instituted as in section 3.4.

- IV fluid resuscitation in patients with active bleeding see NICE guideline CG174 *Intravenous fluid therapy in adults in hospital* (National Institute for Health and Care Excellence, 2013; Last updated May 2017).

- Hypothermia increases the risk of end organ failure and coagulopathy and may be prevented by pre-warming of resuscitation fluids, patient warming devices such as warm air blankets and the use of temperature controlled blood warmers.

- Haemoglobin and haematocrit levels should be measured frequently, but in the knowledge that the haemoglobin level is a poor indicator of blood loss in the acute situation

3.4 Blood Component Therapy

For adult patients with active bleeding, start with a fixed –ratio protocol for blood products and change to a protocol guided by laboratory coagulation results at the earliest opportunity**.**

Until Laboratory results are available: Give FFP:RBCs in at least a 1:2 ratio (for trauma give FFP:RBCs in a 1:1 ratio)
It is important to establish if the patient is receiving anticoagulant or antiplatelet medication and seek advice from consultant haematologist.
See section 4.0 below

3.4.1 Red cells

An optimum target Haemoglobin (Hb) in the management of bleeding is not established.
(Hunt et al. on behalf of the British Committee for Standards in Haematology, 2015)

The Massive Haemorrhage Toolkit (v3, 2013) produced by the Major Haemorrhage Guidelines Group of the North West Regional Transfusion Committee incorporating North Wales (available from the JPAC website) specifies, for major trauma, transfusion goals in patients actively bleeding of Hb 80-100g/L (>100g/L if actively bleeding)

- Emergency O Red Blood Cells

In an extreme situation it may be necessary to use Group O uncrossmatched red cells (emergency O Blood) if the blood group is unknown.
Until group known use O RhD Neg units in females less than 50 years and consider O RhD Pos in males.
Females of reproductive age (i.e. under 50 years) whose blood group is unknown must be given group O RhD negative red cells in order to avoid sensitisation and the risk of haemolytic disease of the new born in subsequent pregnancy.

- Provision of red blood cells for a named patient in an emergency

NOTE – in these cases the blood will be labelled with the patient's details which must be checked against the patient's wristband details.

Below is a summary of the time scales for the issue and availability of red cells. This will depend on samples being current, valid or historical.

Current – the sample requires processing
Valid – sample processed and suitable for issue of blood
Historic – a sample processed and valid for issue of blood but >7 days old.

Historical sample i.e. processed more than 7 days ago	**Valid** sample (i.e. processed within the last 7 days or 72 hours if previously transfused/pregnant in last 3 months	**Current** sample/samples not yet processed	Group compatible	Electronic issue
		X	45 mins	45 mins
X		X	35 mins	45 mins
	X	X		35 mins
X	X			5 mins

- Patients with antibodies

  In a patient with known or found to have red cell antibodies the risk of a haemolytic transfusion reaction will need to be assessed against the risk of withholding transfusion until compatible blood can be provided.

  NOTE: Group O neg red cells may not be suitable for patients with certain red cell antibodies. Check with blood bank in these cases.

3.4.2 Platelets

- MKUH hold one adult dose platelets for issue in an emergency
  Any further platelets required will need to be ordered by 'Blue Light' from our supply centre at Oxford NHSBT.
  Note: This can take approximately 2 hours from initial request

- It is acceptable to use ABO incompatible platelets negative for high titre agglutinins in the management of patients with major haemorrhage (Estcourt et al 2017). RhD negative platelets should be used for females less than 50 years of age with unknown group.

- A practical guideline for the haematological management of major haemorrhage makes the following recommendation:
  In Major Haemorrhage aim to keep platelets >50 x 10^9/l and suggest platelets should be requested if there is on-going bleeding and the platelet count has fallen below 100 x 10^9/l

(Hunt et al. on behalf of the British Committee for Standards in Haematology, 2015, p.794 https://doi.org/10.1111/bjh.13580))

- Empirical platelet transfusion may be required when platelet function is abnormal such as is found after cardiopulmonary by-pass, in patients with renal dysfunction or secondary to anti-platelet therapy.

- A platelet count of 50 x 10^9/l may be anticipated when approximately two blood volumes have been replaced by fluid or red cell concentrates but there is marked individual variation.

- In assessing the requirement for platelets, frequent measurements of the patient platelet count are necessary, and it may be necessary to request further platelets at levels above the desired target in order to ensure their availability when needed.

3.4.3 Fresh frozen plasma (FFP) and Cryoprecipitate

Clotting screen (including Fibrinogen) and platelet count should be tested regularly (including before and after resuscitation) every 30-60minutes depending on the severity of the haemorrhage to guide and ensure appropriate use of haemostatic components.

Trauma induced coagulopathy on the initial sample requires urgent communication to the clinical team as this will require prompt action.

- Fresh Frozen Plasma should be a part of initial resuscitation in major haemorrhage (in at least a ratio1:2 ratio with red cells) until results are available from the coagulation screen.
- Once Bleeding is under control further FFP should be guided by abnormalities in laboratory tests with a transfusion trigger of PT and /or APTT >1.5 times normal for a standard dose e.g. 15-20 ml/kg
- If laboratory results are not available, and bleeding continues, further FFP may be transfused in at least a 1:2 ratio with red cells, prior to moving on to blood product use guided by laboratory results.
- In trauma the suggested ratio is 1:1(until bleeding is under control)
- The use of FFP should not delay fibrinogen supplementation if it is required.
- Fresh frozen plasma, once thawed, may be stored at 4^0C for up to 120 hours
- Fibrinogen supplementation should be given if fibrinogen levels fall below 1.5g/l. (below 2.0g/l for obstetric cases)
- Cryoprecipitate is the standard source of fibrinogen in the UK and 2 packs will increase fibrinogen in an adult by approximately 1g/l.

3.5 Major Haemorrhage Packs

All MHP packs will have collection record attached which must be completed by the laboratory, porters and clinical staff as appropriate (Appendix 8)

- **MHP Pack 1 (available on activation) consists of:**

4 units of red blood cells. NOTE- these may be emergency O blood or group compatible and named for the specific patient or fully x-matched and named for the specific patient.

This is to be collected by a porter with appropriate training. Further blood products will be available for collection from the blood issue room by staff trained and competent to do so.

If haemorrhage continues after **MHP 1**(4 Red Cells) send repeat samples FBC, CS including fibrinogen, U+E, Ca^{2+} and request **MHP 2** for collection. (Available within 25 minutes from request received)

If emergency O blood been transfused before receipt of MHP Box 1 FFP or platelets may be required sooner

- **MHP Pack 2 consists of**

4 units of red cell. NOTE- these may be emergency O blood or group compatible and named for the specific patient or fully x-matched and named for the specific patient)
4 FFP
1-unit platelets

Once **MHP 2** administered repeat bloods: FBC, PT, APTT, fibrinogen, U+E, to guide further blood component use.

A ratio of at least 1 FFP:2 RBC is recommended in early resuscitation of major haemorrhage (in major trauma clinicians may consider aiming for a ratio of 1 FFP:1 RBC). Platelets and cryoprecipitate must be considered if active bleeding persists after initial resuscitation. Appropriate aliquots to be transfused are as follows:

- RBCs 20 ml/kg aliquots (maximum four adult units), O D-negative or ABO and D-specific (ideally, cross-matched)
- FFP in 20 ml/kg aliquots (maximum four adult units)
- Platelets in 15–20 ml/kg aliquots (maximum one adult therapeutic dose) to be considered after every 40ml/kg RBCs
- Cryoprecipitate 10 ml/kg (maximum two pools)

For children the recommended component ratios should be pragmatically given on a volume basis rather than as units. Initial immediate transfusion of 20 ml/kg RBCs should be given (up to four adult units), O D-negative or ABO and D-specific.
For further information please refer to Paediatric Blood Transfusion Guideline Administration of Blood and Blood Products and the Management of Transfused Patients PATH**/**GL/20 and BSH Guidelines on transfusion for fetuses, neonates, and older children (2016).

4.0 Anticoagulant reversal

Rapidly reverse anticoagulant in patients who have major trauma with haemorrhage.
Consult a haematologist immediately for advice on adults who have active bleeding and need reversal of any anticoagulant using bleep 1163 Monday to Friday 9.00 to 17.00 and through switchboard at all other times

• **Vitamin K antagonist (Warfarin):** Use **IV phytomenadione 5mg** and **Prothrombin complex concentrate (PCC)** immediately in adults with major trauma who have active bleeding (Guideline for Prescribing and Administration of Prothrombin Concentrate Complex PATHOLOGY/GL/22)

Note: PCC currently available at MKUH is Octaplex ™

• **Unfractionated heparin (UFH):** Stop UFH infusion. Protamine sulphate 1mg per 100units UFH will fully reverse UFH. The dose should be calculated from the quantity of UFH

administered in the 2 hours prior to reversal. Maximum recommended dose is 50mg. Protamine should be given IV at a rate slower then 5mg/min (i.e. 50mg over 10 minutes) to minimize risk of adverse reactions.

• **Low molecular weight heparin (LMWH):** Management depends on timing of last dose of LMWH.
  - Within 8 hours of last dose of LMWH: protamine sulphate 1mg per 100units of LMWH. If ineffective, consider a further dose of protamine sulphate 0.5mg per 100units of LMWH.
  - Greater than 8 hours from last LMWH dose: protamine sulphate 0.5mg per 100units of LWMH.
  - Consider rFVIIa if there is continued life-threatening bleeding despite protamine sulphate and the time frame suggests there is residual effect from the LMWH contributing to bleeding

Protamine should be given IV at a rate slower than 5mg/min (i.e. 50mg over 10 minutes) to minimize risk of adverse reactions. Maximum 50mg per dose.

• **Dabigatran reversal:** Use Idarucizumab, available in the pharmacy emergency cupboard (PEC), obtained via the pharmacist on call. Administer Idarucizumab 5g IV (given as two 2.5g doses by slow bolus).

• **Apixaban/Rivaroxaban/Edoxaban:** There is currently no antidote available. Prothrombin Complex Concentrate (PCC) or FEIBA may be advised, depending on the clinical history, particularly the thrombotic risk. Give approximately 50 units/kg of PCC or FEIBA (rounded to the nearest vial). This is available from blood bank.

(See Guideline on the Management of Bleeding, Emergency Surgery and Overdose in Adult Inpatients on Direct Oral Anticoagulants (DOACs))

5.0 Pharmacological Agents

5.1 Tranexamic Acid

Adult trauma patients with, or at risk of, major haemorrhage, in whom antifibrinolytics are not contraindicated, should be given Tranexamic Acid as soon as possible after injury

- 1g tranexamic acid IV bolus over 10 minutes within 3 hours of injury followed by 1g IV infusion over 8 hours
- The use of Tranexamic Acid should be considered in non-traumatic major bleeding
- The routine use of aprotinin is not recommended.

6.0 Thromboprophylaxis after major bleed

- Trauma patients have a high rate of hospital acquired venous thrombosis (VTE)
- Current Thromboprophylaxis protocols reduce the rate of VTE and should be applied (National Institute for Health and Care Excellence, 2018)
- Thromboprophylaxis should be given after major haemorrhage and should be started as soon as possible after bleeding ceases.

7.0 Stand Down

When the major haemorrhage has subsided, the clinical coordinator must ensure that:

- The laboratory is informed
- Any unused components are returned to the blood Issue room and blood bank staff informed
- All documentation is completed including traceability tags and audit proforma

8.0 Complications of Massive Transfusions

- Trauma induced coagulopathy (TIC): (see definition) on the initial sample requires urgent communication to the clinical team as this will require prompt action.

- Disseminated Intravascular Coagulation (DIC) in acute bleeding is rare outside obstetric practice.

- The clinical sign of DIC is micro vascular oozing.

- A DIC-like syndrome can result from the activation of the coagulation cascade secondary to tissue trauma resulting in excessive consumption of platelets and coagulation factors

- Hypothermia may induce coagulopathy therefore patient and blood should be warmed

- Transfusion Associated Circulatory Overload (TACO) is defined as acute or worsening pulmonary oedema within 6 hours of transfusion. Inadequate monitoring during transfusion is a common feature in reported cases.

- Transfusion of large volumes of red cells and other intravenous fluids that contain no coagulation factors or platelets causes dilution coagulopathy.

- Toxic effects from citrates, changes in electrolytes and plasma pH

9.0 Traceability

Accurate documentation of blood components given is necessary in order to enable audit of outcome and satisfy legal requirements for full traceability (*The Blood Safety and Quality Regulations 2005* SI 2005/50) Therefore, it is necessary for the laboratory to know who any emergency O blood has been used for. Minimum details required are name, date of birth and MRN of the patient receiving the blood and date and time the units were given. **An addressograph label is acceptable if placed on the blue portion of the traceability tag.**

10.0 Statement of evidence/references

References

Alikhan, R. on behalf of the British Society for Haematology Haemostasis and Thrombosis Taskforce (2019) *Addendum 2018: Guideline on the management of bleeding in patients on antithrombotic agents. Direct oral thrombin inhibitor – dabigatran.* [Online]. Available from: https://b-s-h.org.uk/media/16887/addendum-2018-dabigatran-idarucizumab-raz.pdf [Accessed 6 July 2020]

British Committee for Standards in Haematology, Milkins, C., Berryman, J., Cantwell, C. et al. (2012b) Guidelines for pre-transfusion compatibility procedures in blood transfusion laboratories. [Online]. *British Journal of Haematology*, version of record online, 6 December 2012; issue online 22 January 2013, 23(1): 3-35. Available from: https://doi.org/10.1111/j.1365-3148.2012.01199.x; Linked from: https://b-s-

h.org.uk/guidelines/guidelines/pre-transfusion-compatibility-procedures-in-blood-transfusion-laboratories/ [Accessed 6 July 2020]

British Society for Haematology (2017) *Addendum to Pre-Transfusion Compatibility Procedures in Blood Transfusion Laboratories. Managing patients who are being treated with targeted therapeutic monoclonal antibodies.* [Online]. V2 27/3/17. Available from: https://b-s-h.org.uk/media/15725/monoclonal-antibodies-addendum.pdf [Accessed 6 July 2020]

CRASH-2 trial collaborators, Shakur, H., Roberts, I., Bautista, R. 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. *Lancet*. Jul 3;376(9734):23-32. doi: 10.1016/S0140-6736(10)60835-5. Epub 2010 Jun 14.

Fragmin 18,000 IU/0.72ml solution for injection. Pfizer Limited. Summary of product characteristics available from www.medicines.org.uk. Last updated 17/4/2020. [Accessed 29 July 2020]

General Medical Council [2020] *Prescribing unlicensed medicines.* [Online]. Available from: https://www.gmc-uk.org/ethical-guidance/ethical-guidance-for-doctors/prescribing-and-managing-medicines-and-devices/prescribing-unlicensed-medicines [Accessed 6 July 2020]

Heparin calcium 25,000 I.U./ml solution for injection or concentrate for solution for infusion (PL 29831/0104). Wockhardt UK Ltd. Summary of product characteristics from www.medicines.org.uk. Last updated 8/10/2018. [Accessed 29 July 2020]

Hunt, B.J., Allard, S., Keeling, D. et al. on behalf of the British Committee for Standards in Haematology (2015) A practical guideline for the haematological management of major haemorrhage. [Online]. *British Journal of Haematology*, version of record online, 6 July 2015; issue online 2 September 2015, 170(6): 788-803. Available from: https://doi.org/10.1111/bjh.13580; Linked from: https://b-s-h.org.uk/guidelines/guidelines/haematological-management-of-major-haemorrhage/ [Accessed 6 July 2020]

Joint United Kingdom (UK) Blood Transfusion and Tissue Transplantation Services Professional Advisory Committee (JPAC) (2014) *Transfusion handbook*. *7.3: Transfusion management of major haemorrhage.* [Online]. 5th ed., web version. Available from: https://www.transfusionguidelines.org/transfusion-handbook/7-effective-transfusion-in-surgery-and-critical-care/7-3-transfusion-management-of-major-haemorrhage [Accessed 6 July 2020]

Joint United Kingdom (UK) Blood Transfusion and Tissue Transplantation Services Professional Advisory Committee (JPAC) (2014) *Transfusion handbook*. [Online]. 5th ed., web version. Available from: https://www.transfusionguidelines.org/transfusion-handbook [Accessed 6 July 2020]

Klein, A.A., Arnold, P., Bingham, R.M. et al. (2016) AAGBI guidelines: the use of blood components and their alternatives 2016. [Online]. *Anaesthesia*, version of record online 8 April 2016; issue online 13 June 2016, 71(7): 829-842. Available from: https://doi.org/10.1111/anae.13489; Linked from: https://anaesthetists.org/Home/Resources-publications/Guidelines/Blood-components-and-their-alternatives [Accessed 6 July 2020]

Makris, M., Veen, J.J., Tait, C.R. et al. on behalf of the British Committee for Standards in Haematology (2012) Guideline on the management of bleeding in patients on antithrombotic agents. [Online]. *Br J Haematol,* version of record online, 1 November 2012; issue online 11 December 2012, 160(1): 35-46. Available from: https://doi.org/10.1111/bjh.12107; Linked from: https://b-s-h.org.uk/guidelines/guidelines/management-of-bleeding-in-patients-on-antithrombotic-agents/ [Accessed 6 July 2020]

Narayan, S. (ed.), Poles, D. et al. on behalf of the Serious Hazards of Transfusion (SHOT) Steering Group (2019) *Annual SHOT Report 2018.* [Online]. Manchester: SHOT. Available from: https://www.shotuk.org/wp-content/uploads/myimages/SHOT-Report-2018_Web_Version.pdf [Accessed 6 July 2020]

Narayan, S. (ed.), Poles, D. et al. on behalf of the Serious Hazards of Transfusion (SHOT) Steering Group (2020) *Annual SHOT Report 2019.* [Online]. Manchester: SHOT. Available from: https://www.shotuk.org/wp-content/uploads/myimages/SHOT-REPORT-2019-Final-Bookmarked.pdf [Accessed 8 July 2020]

National Clinical Guideline Centre (2016) *Major trauma: assessment and initial management. Major trauma: assessment and management of major trauma. NICE Guideline NG39: Methods, evidence and recommendations.* [Online]. Available from: https://www.nice.org.uk/guidance/ng39/evidence/full-guideline-pdf-2308122833 [Accessed 6 July 2020]

National Institute for Health and Care Excellence (2010; Last updated March 2018) *Venous thromboembolism in adults: reducing the risk in hospital.* [Quality standard QS3]. [Online]. Available from: https://www.nice.org.uk/guidance/qs3 [Accessed 6 July 2020]

National Institute for Health and Care Excellence (2012) *Significant haemorrhage following trauma: tranexamic acid.* [Evidence summary ESUOM1]. [Online]. Available from: https://www.nice.org.uk/advice/esuom1/chapter/Key-points-from-the-evidence [Accessed 6 July 2020]

National Institute for Health and Care Excellence (2013; Last updated May 2017) *Intravenous fluid therapy in adults in hospital.* [Clinical guideline CG174]. [Online]. Available from: https://www.nice.org.uk/guidance/cg174 [Accessed 6 July 2020]

National Institute for Health and Care Excellence (2015) *Blood transfusion*. [NICE guideline NG24]. [Online]. Available from: https://www.nice.org.uk/guidance/NG24 [Accessed 6 July 2020]

National Institute for Health and Care Excellence (2016a) *Blood transfusion*. [Quality standard QS138]. [Online]. Available from: https://www.nice.org.uk/guidance/QS138 [Accessed 6 July 2020]

National Institute for Health and Care Excellence (2016b) *Major trauma: assessment and initial management.* [NICE guideline NG39]. Available from: https://www.nice.org.uk/guidance/ng39 [Accessed 6 July 2020]

National Institute for Health and Care Excellence (2018; Last updated August 2019) *Venous thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism.* [NICE guideline NG89]. [Online]. Available from: https://www.nice.org.uk/guidance/ng89 [Accessed 6 July 2020]

National Patient Safety Agency (2010) *The transfusion of blood and blood components in an emergency.* [Rapid Response Report NPSA/2010/RRR017]. [Online]. [s.l.]: NPSA. Available from: https://webarchive.nationalarchives.gov.uk/20171030124300/http://www.nrls.npsa.nhs.uk/resources/?entryid45=83659&p=6 [Accessed 6 July 2020]

New, H.V., Berryman, J., Bolton-Maggs, P.H.B. et al., on behalf of the British Committee for Standards in Haematology (2016) Guidelines on transfusion for fetuses, neonates and older children. [Online]. *Br J Haematol*, version of record online, 11 November 2016; issue online 25 November 2016, 175(5): 784-828. Available from: https://doi.org/10.1111/bjh.14233; Linked from: https://b-s-h.org.uk/guidelines/guidelines/transfusion-for-fetuses-neonates-and-older-children/ [Accessed 8 July 2020]

Norfolk, D. (ed.) (2013) *Handbook of transfusion medicine*. 5th ed. Norwich: TSO.

North West Regional Transfusion Committee incorporating North Wales. Major Haemorrhage Guidelines Group (2013a) *Massive haemorrhage toolkit.* [Online]. v3, 2013. Available from: https://www.transfusionguidelines.org/uk-transfusion-committees/regional-transfusion-committees/north-west/policies/massive-haemorrhage-toolkit [Accessed 6 July 2020]

Pendry, K., Birchall, J. Allard, S.; British Society for Haematology (2017) *Addendum March 2017: Haematological management of major haemorrhage.* [Online]. Available from: https://b-s-

h.org.uk/media/15687/change-in-major-haemorrhage-guideline-march-2017-word-version-2.pdf [Accessed 6 July 2020]

Phytomenadione. Joint Formulary Committee (2019) *British National Formulary (BNF).* [Online]. London: BMJ Group and Pharmaceutical Press. Available from: https://bnf.nice.org.uk/drug/phytomenadione.html [Accessed 29 July 2020]

Protamine. Joint Formulary Committee (2019) *British National Formulary (BNF).* [Online]. London: BMJ Group and Pharmaceutical Press. Available from: https://bnf.nice.org.uk/drug/protamine-sulfate.html#indicationsAndDoses [Accessed 29 July 2020]

Prosulf 10mg/ml solution for injection. Wockhardt UK Ltd. Summary of product characteristics available from www.medicines.org.uk. Last updated 9/5/2018. [Accessed 29 July 2020]

Tranexamic acid (Last update: 26-Apr-2017) In: Joint Formulary Committee (2019) *British National Formulary (BNF).* [Online]. London: BMJ Group and Pharmaceutical Press. Last updated 09-Jun-2020. Available from: https://www.medicinescomplete.com/#/content/bnf/_725845071 [Accessed 7 July 2020]

Legislation

Note re: links to legislation.gov.uk website. Versions may be revised, annotated or original as enacted. A 'List of all changes' made by subsequent legislation affecting the statute or statutory instrument may be viewed by opening the statute or statutory instrument on the legislation.gov.uk website and clicking the 'More Resources' tab.

References for the EU Blood Directive (Directive 2002/98/EC) and the Blood Safety and Quality Regulations 2005 (SI 2005/50) which implemented the EU Blood Directive in UK law are provided below. Changes affecting SI 2005 No. 50 are listed at http://www.legislation.gov.uk/changes/affected/uksi/2005/50. Additional directives to implement the EU Blood Directive have been made by the Commission, namely, Commission Directives 2004/33/EC, 2005/61/EC, 2005/62/EC, 2009/135/EC, 2011/38/EU, 2014/110/EU and 2016/1214 (Explanatory memorandum to SI 2019/4 http://www.legislation.gov.uk/uksi/2019/4/pdfs/uksiem_20190004_en.pdf, (pp.1-2) and see Department of Health and Social Care online guidance (31 January 2020) at https://www.gov.uk/guidance/quality-and-safety-of-human-blood-and-blood-products)

The Blood Safety and Quality (Amendment) (EU Exit) Regulations 2019. SI 2019/4. [Online]. Available from: http://www.legislation.gov.uk/uksi/2019/4/contents/made [Accessed 8 July 2020]
Explanatory memorandum http://www.legislation.gov.uk/uksi/2019/4/pdfs/uksiem_20190004_en.pdf

The Blood Safety and Quality Regulations 2005. SI 2005/50. [Online]. Available from: http://www.legislation.gov.uk/uksi/2005/50/contents [Accessed 8 July 2020]

Directive 2002/98/EC of the European Parliament and of the Council of 27 January 2003 setting standards of quality and safety for the collection, testing, processing, storage and distribution of human blood and blood components and amending Directive 2001/83/EC. [Online]. Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02002L0098-20090807 [Accessed 8 July 2020]

11.0 Governance

11.1 Document review history

Version number	Review date	Reviewed by	Changes made
7	December 2015		To transfer to new Trust template. Change title of Document
8.			• New MHP Flow charts

			• Changes to activation process and communication between clinical area and Blood Bank. • Increase number of O neg emergency blood held in theatres
8.1	October 2020	HTC	Pathology samples collected via intraosseous access (IO) cannot be processed by the laboratory.
8.2	February 2021	HTT	• Appendix 4 template guideline reviewed, and local information added. • Appendix 5 audit proforma question clarified. • Section 3 MHP packs referenced Paeds Transfusion Guideline PATH/GL/20

11.2 Consultation History

Stakeholders Name/Board	Area of Expertise	Date Sent	Date Received	Comments	Endorsed Yes/No
	Consultant Emergency Department	March 2020	March 2020	Activation process to include how to contact Blood Bank and how to return unused products	Yes
	Consultant Obs&Gynae	March 2020	April 2020	None	

	Medical Director	March 2020	April 2020	None	
	Consultant Orthopaedics Surgery	March 2020	April 2020	None	
	Consultant Anesthesia	March 2020	April 2020	None	
	Deputy Clinical Lead, Department of Emergency Medicine	June 2020	June2020	Justification for activation included for audit purposes	Yes
	Consultant in Anaesthesia and Intensive Care Medicine	June 2020	June2020	**Contents of MHP box to be adjusted according to O Neg used , encourage the use of emergency O neg blood . Platelet trigger <50**	Yes
	Consultant Haematologist	June 2020	June 2020	Section 4.0 Anticoagulant Reversal, Platelet trigger <50	Yes
	Consultant Emergency Medicine	June 2020	June 2020	None	
	Consultant	June 2020	June 2020	Please check document contents with Gynae Team	Yes
	Consultant Foot &Ankle Lower Limb	June 2020	June 2020	None	
	Consultant Emergency Department	June 2020	June 2020	None	
	Consultant Transfusion Lead	June 2020	June 2020	Platelet trigger<50	Yes
	Switchboard Manager	June 2020	June 2020	Confirmation of contact details for MHP activation	Yes
	Consultant Anaesthesia & Critical Care Medicine	June 2020	June2020	Check AAGBI advice for uncontrolled haemorrhage	Yes
	Support Services manager	June 2020	June2020	No changes for porter staff at present	Yes

Hospital Transfusion Committee	Blood Transfusion	June 2020	June 2020	None	
Tina Worth	Head of Risk and Clinical Governance	June 2020	June 2020	Correct formatting	Yes
	Library and eLearning services manager	June 2020	July 2020	Check References	Yes
	Consultant Obs&Gynae	June 2020	June 2020	Availability of ICS?	
	Consultant General Surgeon	June 2020	July 2020	None	
	Consultant Colorectal Surgeon	June 2020	July 2020	None	
	Consultant General Surgeon	June 2020	July 2020	None	
	ENT Consultant	June 2020	July 2020	None	
Pathology CIG	Pathology	July 2020	July 2020	None	
	Principal Pharmacist	July 2020	July 2020	Information for patients who are receiving UH/LMWH. changed vitamin K --> phytomenadione 5mg IV	Yes

11.3 Audit and monitoring

Audit/Monitoring Criteria	Tool	Audit Lead	Frequency of Audit	Responsible Committee/Board
Activation monitored by use of questionnaire to assess adverse events,	Audit proforma Appendix 5&6	Transfusion Practitioner	When activated	Hospital Transfusion Committee Quarterly Report

timeliness of blood component support, patient outcome and component wastage				
Traceability documentation completed for all blood components issued	Traceability Audit	Transfusion Practitioner	Ongoing	Hospital Transfusion Committee Quarterly Report

11.4 Equality Impact Assessment

As part of its development, this Guideline and its impact on equality has been reviewed. The purpose of the assessment is to minimise and if possible remove any disproportionate impact on the grounds of race, gender, disability, age, sexual orientation, religion or belief, pregnancy and maternity, gender reassignment or marriage and civil partnership. No detriment was identified. Equality Impact assessments will show any future actions required to overcome any identified barriers or discriminatory practice.

Equality Impact Assessment			
Division	Core Clinical	Department	Pathology
Person completing the EqIA		Contact No.	
Others involved:		Date of assessment:	09/07/20
Existing policy/service	Existing Policy	New policy/service	

Will patients, carers, the public or staff be affected by the policy/service?	Yes
If staff, how many/which groups will be affected?	All staff involved in the activation o Major haemorrhage and administration of blood components

Protected characteristic	Any impact?	Comments
Age	NO	Positive impact as the policy aims to recognise diversity, promote inclusion and fair treatment for patients and staff
Disability	NO	
Gender reassignment	NO	
Marriage and civil partnership	NO	
Pregnancy and maternity	NO	
Race	NO	
Religion or belief	NO	
Sex	NO	
Sexual orientation	NO	

What consultation method(s) have you carried out?			
Face to face and Teams meetings			
How are the changes/amendments to the policies/services communicated?			
Meetings , MHP scenarios ,teaching sessions			
What future actions need to be taken to overcome any barriers or discrimination?			
What?	Who will lead this?	Date of completion	Resources needed

Review date of EqIA			

Appendix 1

Major Haemorrhage Activation Card Clinical Area

Your nearest emergency blood is in

.....

MAJOR HAEMORRHAGE PROTOCOL PROCESS - CLINICAL AREA
Activate when ongoing severe bleeding /clinical shock

Activation	Bleep 2222 to activate and immediately ring blood bank on 85774 (MHP phone) to supply your contact details and the information below Blood Bank are also contactable on Bleep 1412
Information Required	Supply the following information (if available) 1 Patient identification 2 Location of patient 3 Reason for activation 4 Has emergency O blood been collected and/or transfused from any fridge? If so, is FFP required now? Are platelets required now? 5 Has a Group and Save/x-match sample been sent?

Administer Tranexamic Acid – especially in trauma and ideally within 3 hours. Give 1 g IV bolus over 10 minutes followed by 1G IV infusion over 8 hours

Immediately send	Crossmatch sample x 2 (* ideally different sites time gapped) FBC, CS including fibrinogen, Biochemistry sample for U+E and Ca^{2+}

Blood	**Emergency O blood from any blood fridge in either theatre or the blood issue room is available at any time** MHP BOX 1 - 4 units of emergency group O red cells, group compatible or electronically issued against patient sample) and delivered by a porter. - The MHP box may contain blood labelled specifically for your patient and may not be emergency group O red cells - The MHP box is sealed with a small yellow cable tie – cut to access
Named Clinical Coordinator	Will request MHP Box 2 (4 RBC, 4 FFP, 1 PLATELET) and any further products required and will regularly liaise with Blood Bank Note - Cryoprecipitate should be requested if fibrinogen <1.5g/l or <2.0g/l for obstetric haemorrhage
Repeat samples	FBC and CS hourly until stable Further decisions on the issue of blood products will depend on the ongoing clinical situation and results

AIM FOR:
Platelets >50 x 10^9/l, INR < 1.5, Fibrinogen >1.5g/l (>2.0g/l in obstetric haemorrhage)
Inform Blood Bank when standing down.
Complete audit form – return to Transfusion Practitioners via Blood Bank

Appendix 2 Contact List for Major Haemorrhage Activation Group (updated June 2020)

Blood Bank BMS	Ext 85776
Blood Bank BMS urgent out of hours	Bleep 1412
Haematologist on call	Via Switchboard
Emergency Department (ED) Resus	Ext 85945/87953. Bleep 1714 (ED consultant baton bleep)
ED Tracker (Majors)	Ext 85914
Head of Nursing ED	Ext 85926 Bleep 1021
Labour Ward (LW) Coordinator (24/7)	Bleep 1440
LW Coordinator (9-5 Mon to Fri)	Bleep 1967
Theatre Phase 1	Bleep 1327
Theatre Phase 2	Bleep 1788
Endoscopy	Ext 86463 or Ext 87293
Duty Hospital Manager	Bleep 1222
Obstetrics &Gynaecology Consultant Baton	Bleep 1323
Support Team	Bleep 1480

Support Team ED	Bleep 1486
Medical Bleep Holders	Bleeps 1612/1613/1614
Anaesthetics	Bleeps 1627
Vascular Team On call	Via surgical registrar bleep 1557
Transfusion Practitioner	Bleep 1644

Appendix 3 Major Haemorrhage Protocol Process Laboratory Area

MAJOR HAEMORRHAGE PROTOCOL PROCESS – LABORATORY AREA	
Activation	The Major Haemorrhage call will be activated through the 2222 bleep and an immediate call to you on 85774 (MHP phone) or bleeped with further information and details of your contact person
Request information	Coordinator should supply the following information (if available) 1 Patient identification 2 Location of patient 3 Reason for activation 4 If the emergency O blood from any fridge has been taken/ transfused . If so, ask if FFP or platelets required 5 If a G&S sample has been sent 6. Advise clinical area where emergency O blood is held
Action	Prepare sealed MHP Box 1 – 4 units of emergency O RBC (Rh(D) Positive or Negative dependent on age and gender of patient If details not known or patient not yet admitted issue O Rh(D) Negative. Complete the appropriate documentation. Take to issue room for collection by porter NOTE – if a valid group and save is already available in lab named patient blood may be issued and sent in the box. Make clinical area aware the blood is labelled for the patient
Further actions as requested by clinical area	Prepare sealed MHP Box 2 – 4 units of emergency O RBC (Rh(D) Positive or Negative dependent on age and gender of patient As for MHP box 1, a valid group and save will allow issue of blood on a named patient basis (If current group is available and historic group on record – patient specific blood can be issued) 4 units thawed FFP (group AB if patient's blood group unknown) 1 unit platelets (emergency A positive or other suitable platelets as available) Take to issue room for collection by porter
If major haemorrhage continues	Issue products as requested by clinicians and guided by lab results. Cryoprecipitate will be required if fibrinogen < 1.5g/l or < 2.0g/l in obstetric haemorrhage
REMEMBER	Be aware of stock levels and place emergency order with NHSBT at earliest opportunity Inform haematology consultant of the activation at the earliest opportunity Do not hold up provision of RBC while waiting for FFP or Cryoprecipitate to thaw Replace any emergency O blood which you were informed had been taken from any fridge Complete audit form for Transfusion Practitioners

Appendix 4 Acute Massive Blood Loss – a template guideline

	Procedure	Comments

Goal		
Contact key personnel	• Consultant clinician in charge • Duty consultant anaesthetist • Blood transfusion biomedical scientist • Duty consultant haematologist	• A named senior person must take responsibility for communication and documentation
Restore circulating volume	• 2 wide bore cannula • Give adequate (warm)crystalloid,or colloid • Maintain BP • Measure urine output • Consider centra venous line ,arterial line	• It is essential that samples are sent to the blood bank as soon as possible • Consider Intra-osseous access if peripheral IV access fails. Note :samples from IO site cannot be tested in Haematology or Blood Bank • Keep patient warm • Blood loss is often underestimated- use pressure bags
Activate MHP Protocol and initiate transfusion	• Activate Via 2222 stating Major Haemorrhage and contact blood bank on Ext 85774 or Bleep 1412 • Group O Rh D negative or O Rh D positive (males and women >51years or of no childbearing potential)until ABO and Rh D groups known ABO group specific • when blood group known, fully compatible blood time permitting • Use a blood warmer	• O neg is immediately available in both theatre fridges Phase 1 Theatre fridge holds 4 O Neg an available for use by Theatre and A/E . Phase 2 fridge holds 2 O Neg. • Blood Issue room has 4 O neg and 4 O Pos emergency units • Porters will deliver MHP Packs 1 and 2 • Crossmatched blood is available within 45 minutes is suitable samples have been sent.
Arrest bleeding	• Early surgical or obstetric intervention • Interventional radiology (if stable)	
Request laboratory investigations	• FBC, PT, APTT, Thrombin time, Fibrinogen (Clauss method); blood bank sample & biochemical profile, blood gases • Ensure correct sample identification • Repeat tests after blood component infusion	• Results may be affected by colloid infusion. • Ensure correct patient identification • May need to give components before results available

Rapidly reverse anticoagulant in patients who have major trauma with haemorrhage.	• Vitamin K antagonist (Warfarin) Use IV Vitamin K 5mg and Prothrombin complex concentrate (PCC)	• Consult a haematologist immediately for advice • See Guideline on the Management of Bleeding, Emergency Surgery and Overdose in Adult Inpatients on Direct Oral Anticoagulants (DOACs)
Maintain Hb >8 g/dl	Continue with MHP RBC packs or group specific / crossmatched blood if available	
Maintain platelet count >50 x 10^9/l	• Allow for delivery time from blood centre (minimum 60 mins) • Platelet support after 1-1.5 blood volume replacement and continued resuscitation.	• Allows margin of safety to ensure platelet count >50 x 10^9/l. Order when platelet count <100x10^9/l and there is ongoing active haemorrhage • Keep platelet count >100 x 10^9/l if multiple or CNS trauma or if platelet function abnormal
Maintain PT & APTT <1.5 x mean control	• FFP should be used early during massive blood transfusion • Give FFP 15-20 ml/kg (four units for an adult) further FFP guided by tests • FFP may be transfused in at least a 1:2 ratio with red cells • In trauma the suggested ratio is 1:1(until bleeding is under control) • Available within 30-40 minutes.	• Aim for PT/APTT > 1.5 x the control.
Maintain Fibrinogen >1.5 g/l	• Give cryoprecipitate (two packs of pooled cryoprecipitate for an adult therapeutic dose) • Available within 30-340minutes.	• Cryoprecipitate replaces fibrinogen and Factor 8 • Fibrinogen <0.5 g/l is strongly associated with microvascular bleeding • Aim for fibrinogen .1.5g/l (2.0g/l in obstetrics) Note: the blood bank will issue suitable FFP Cryoprecipitate and platelets which will not necessarily be the same group as the patient .
Consider use Antifibrinolytic drugs	• Tranexamic acid use as soon as possible in patients with active or suspected active bleeding • 1g Tranexamic acid IV bolus over 10 minutes within 3 hours of	• If uncontrollable bleeding • The use of Tranexamic acid should be considered

	injury followed by 1g IV infusion over 8 hours	in non-traumatic major bleeding Maximum benefit from tranexamic acid if given within the first hour after injury. Do not give more than 3 hours after injury Ig TXA iv over 10 minutes followed by 1g TXA iv over 8 hours
Repeat Blood Tests	If continued oozing repeat FBC and CS every 4 hours or after every 5 units of RBC transfused Serum Calcium and Potassium	• Hypocalcaemia and hyperkalaemia can occur with hyperthermia and acidosis
Suspect DIC	Treat underlying cause (shock, hypothermia, acidosis)	

Appendix 5: Audit proforma Part A (for laboratory staff)

FOR THE MANAGEMENT OF PATIENTS WITH MASSIVE BLOOD LOSS FOR USE BY LABORATORY STAFF

The Rapid Response Report issued by the National Patient Safety Agency (21 October 2010) outlined the importance of the urgent provision of blood for life threatening haemorrhages. Milton Keynes Hospital NHS Foundation Trust

provides a "MASSIVE Blood Loss Protocol" which is implemented in the event of a patient presenting with massive blood loss. This audit will aim to examine these events and assess the efficacy of current protocols.

DATE …….. TIME……..

NOMINATED COORDINATOR FOR COMMUNICATION WITH LAB:

NAME……:……. Ext NO:…….. BLEEP NO: ……

LOCATION OF MH:…… LEAD CLINICIAN:……

PATIENT DETAILS: MRN:…… SURNAME:……..FORENAME:……

PATIENT DOB/AGE:…….. GENDER: Male / Female / Unknown

CLINICAL DETAILS……..

NAME OF BMS COMPLETING THIS FORM:……..

HAVE EMERGENCY GROUP O UNITS BEEN TAKEN FROM ANY FRIDGE **BY THE CLINICAL STAFF?**

Y☐ N☐

WAS THE BLOOD IN MHP BOX 1	**WAS THE BLOOD IN MHP BOX 2**
O Neg/O Pos EI /Group compatible	O Neg/O Pos EI /Group compatible

No. OF PRODUCTS PROVIDED: EMERGENCY O RBC……..EI OR GROUP COMPATIBLE……..

FFP…….. PLTS…….. CRYO……

OTHER PRODUCTS REQUESTED eg Octaplex…….

TOTAL UNITS WASTED: RBC…… FFP…… PLTS……. CRYO……..

WAS THERE A VALID GROUP AND SAVE SAMPLE ALREADY IN LAB? .....

IF NOT TIME SAMPLE RECEIVED …….

TIME 2nd SAMPLE RECEIVED …….

TIME INFORMED TO STAND DOWN……..

Stick unit number labels of any emergency blood to the back of this form and leave for the Transfusion Practitioners

Appendix 6: Audit Proforma Part B (to be completed by clinical team)

AUDIT PROFORMA FOR THE MANAGEMENT OF PATIENTS PRESENTING WITH MASSIVE BLOOD LOSS FOR USE BY CLINICAL STAFF

The Rapid Response Report issued by the National Patient Safety Agency (21 October 2010) outlined the importance of the urgent provision of blood for life threatening haemorrhages. Milton Keynes Hospital NHS Foundation Trust provides a "Massive Blood Loss Protocol" which is implemented in the event of a patient presenting with massive blood loss. This audit will aim to examine these events and assess the efficacy of current protocols.

PATIENT ID NUMBER:
CLINICIAN:
LOCATION:
DATE:……TIME……

CLINICAL DETAILS:……..

ESTIMATED BLOOD LOSS……..litres

UNCONTROLED BLEEDING or CONTROLED BLEEDING (please delete as appropriate)

PATIENT ON ANTICOAGULANT? Y ☐ N ☐ DETAILS…….

WAS TRANEXAMIC ACID GIVEN? Y ☐ N ☐ DOSE……

WAS THE ON CALL HAEMATOLOGY CONSULTANT CONTACTED? Y ☐ N ☐ TIME……..

RESUSCITATION FLUIDS GIVEN
a)……/……..ml
b)……/……..ml
c)……/…….ml

BLOOD USAGE:

TIME 1st UNIT STARTED: RBC……..FFP……PLT……CRYO……..

TOTAL NO. TRANSFUSED RBC……..FFP……PLT……..CRYO…….

WHERE THERE ANY DELAYS IN BLOOD COMPONENT PROVISION? Y☐ N☐
If yes, please specify
……
……

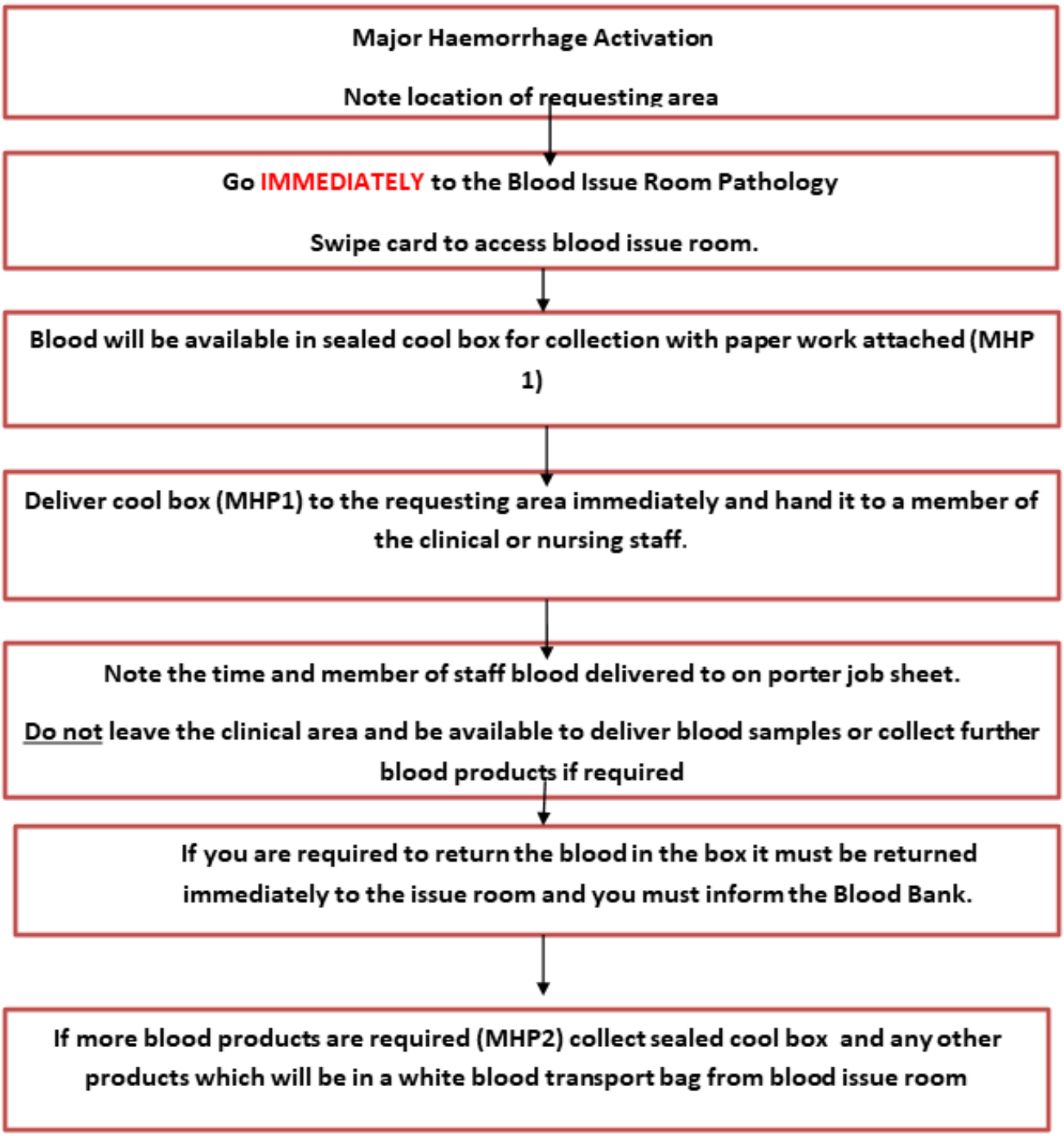
TIME LABORATORY INFORMED TO STAND DOWN ……

PATIENT OUTCOME:

This space has been left blank for other comments/ information you feel may be appropriate:

Please return to Transfusion Practitioners via Blood Bank so that this information audit can be fed back to the Hospital Transfusion Committee.

Appendix 7: Porters Activation Card



Appendix 8 MHP Collection Record

MHP Box 1 or MHP Box 2 Collection

For delivery to ……

Number of Units: Blood ☐

FFP ☐

Platelets ☐

Cryo ☐

Name	Date	Time
Boxed up & sealed by (BMS):		
Box collected by (Porter):		
Box received on ward by (clinical staff):		
Box opened by (clinical team)		
Box returned to blood issue room by		
Box received by BMS		

Any unused units MUST be returned to Blood Bank issue room ASAP and Blood Bank BMS MUST be informed. Use the phone provided and contact details are displayed next to Bloodtrack kiosk.

Fate of issued products:

Product	No. Used	No. suitable for return to stock	No. wasted
RBC			
FFP			
Platelet			
Cryo			

Please attach log sheet to audit form and leave for Transfusion Practitioners