

Massive Haemorrhage SOP

LUHFT Trust Wide Document

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Lead Executive Senior Manager	Dr Rebekka Konig, chair of Hospital Transfusion Committee
Approving Committee/ Group	Hospital Transfusion Committee – trust wide
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Associated Policy	Further detail / documents can be found at section 2
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Is an EIA Needed?	No x	No further action needed
	Yes	Please access / complete and return a full EIA

Version	Page	Changes Made	Date
1		New document	20 th March 2023

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Document Summary Sheet

Massive Haemorrhage SOP

The objectives of this document are to

- Assist clinicians in the **identification** of a massive haemorrhage and ensure a rapid and appropriate response to this.
- Explain the trust procedure to ensure **channels of communication** between clinical areas and the blood banks are established.
- Ensure **blood components reach patients** in a quick and effective way

This document is valid across the whole of Liverpool University Hospitals NHS Foundation Trust. Where variations in practice exist between the **Royal University and Broadgreen Hospitals** and **Aintree University Hospital**, these are highlighted in the text/ flowcharts.

In all cases, the following applies:

<p>Early recognition</p>	<p>Subjective assessment Clinical concern based on signs, e.g.:</p> <ul style="list-style-type: none"> • HR>systolic BP • visible bleeding • BP<90 with high clinical suspicion of bleeding due to history or mechanism <p>Objective assessment:</p> <ul style="list-style-type: none"> • 20% blood loss in <1 hr • 50% blood loss in <3 hrs • Bleeding >150ml/min 				
<p>Call for help</p>	<p>Traumatic bleed (e.g. code red trauma, surgical bleed)</p> <ul style="list-style-type: none"> • Establish team leader and roles • Activate the massive haemorrhage protocol (MHP) if required <p>Non-traumatic bleed</p> <ul style="list-style-type: none"> • Establish team leader and roles • Escalate via parent team • Consider need for MHP activation and anaesthetic/ critical care input 				
<p>Activate the Major Haemorrhage Protocol</p>	<table border="1"> <tbody> <tr> <td data-bbox="518 1722 946 1812"> <p>Aintree University Hospital</p> </td> <td data-bbox="946 1722 1445 1812"> <ul style="list-style-type: none"> • Ext 4567 • Bleep 3372 </td> </tr> <tr> <td data-bbox="518 1812 946 1895"> <p>Royal University Hospital and Broadgreen Hospital</p> </td> <td data-bbox="946 1812 1445 1895"> <ul style="list-style-type: none"> • Dial 2222 </td> </tr> </tbody> </table>	<p>Aintree University Hospital</p>	<ul style="list-style-type: none"> • Ext 4567 • Bleep 3372 	<p>Royal University Hospital and Broadgreen Hospital</p>	<ul style="list-style-type: none"> • Dial 2222
<p>Aintree University Hospital</p>	<ul style="list-style-type: none"> • Ext 4567 • Bleep 3372 				
<p>Royal University Hospital and Broadgreen Hospital</p>	<ul style="list-style-type: none"> • Dial 2222 				

- In all cases the area requiring blood needs to arrange collection of blood and blood components

General response:

- Control bleeding
- Wide bore venous access
- If possible, the following blood tests should be send urgently before transfusion:
 - group and save x2
 - Full blood count
 - Coagulation incl fibrinogen
 - U+Es
 - venous gas
 - ROTEM should be performed if clinicians trained in interpretation are available (blue top coag tube filled to mark)

Information required by the blood bank:

- Urgency
- Patient details – full name, DOB, gender, RQ number if known, gender and temporary number if unkown.
- Location of patient
- Contact number and name of person liasing with blood bank

Time to blood component availability:

- Immediate: 0 negative blood, FFP/ Octoplas in **Aintree University Hospital** if prethawed not depleted. Fibrinogen concentrate is available at all sites.
- 15 minutes: group specific blood.
- 35 minutes: full cross match.
- 30 minutes: frozen products such as FFP and cryoprecipitate if no prethawed available and at Royal University and Broadgreen Hospitals

Traumatic/ surgical bleed? -> continue page 5 and 6

Atraumatic bleed -> continue page 5 and 7

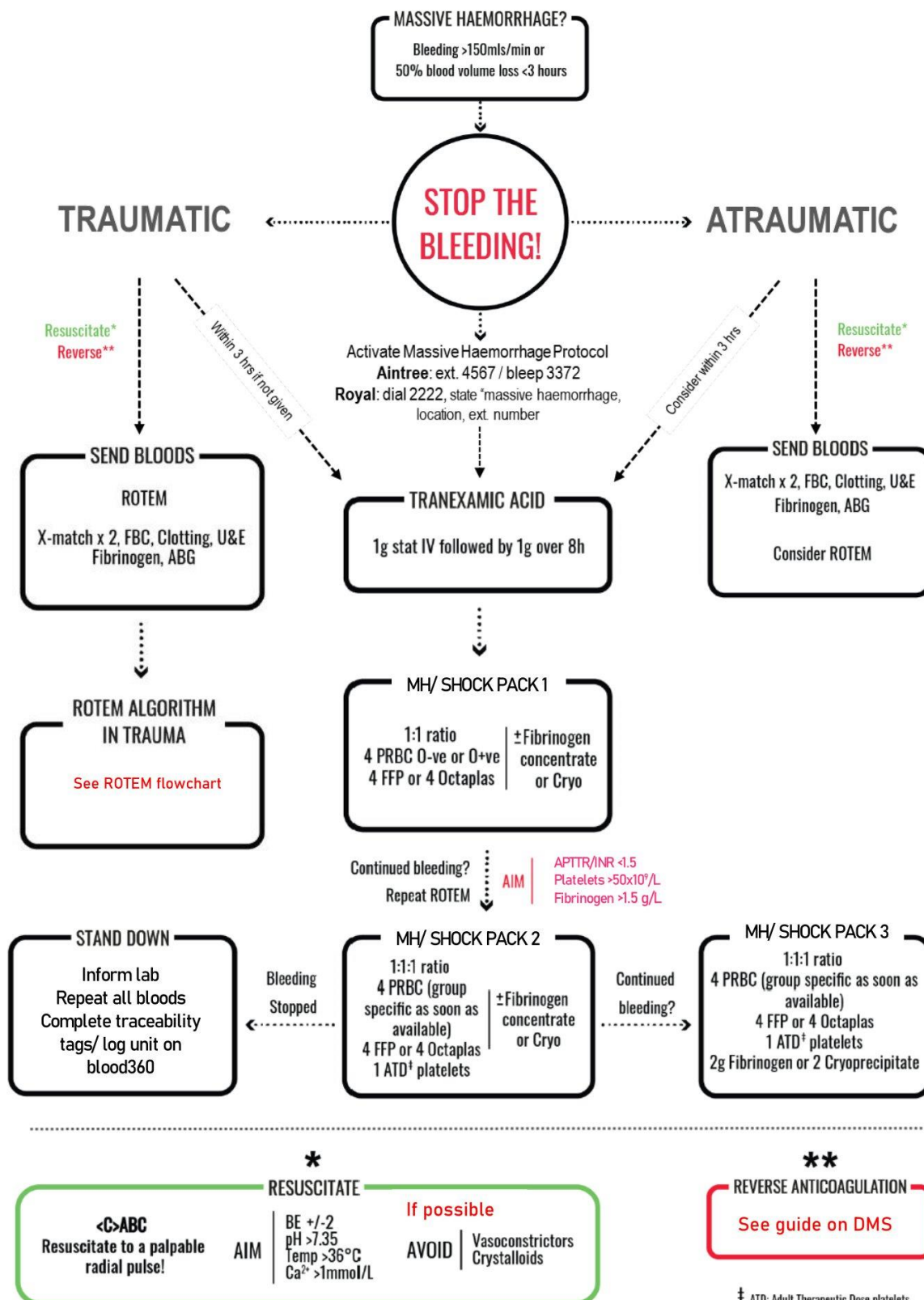
ROTEM guide -> see page 8

Seven steps to success -> page 9

1.0 Associated Trust Policy

Please refer to 'Clinical Guideline for Management of Massive Haemorrhage' on DMS for more details

2.0 Flow chart(s)



MAJOR HAEMORRHAGE? MAJOR TRAUMA? THEN...

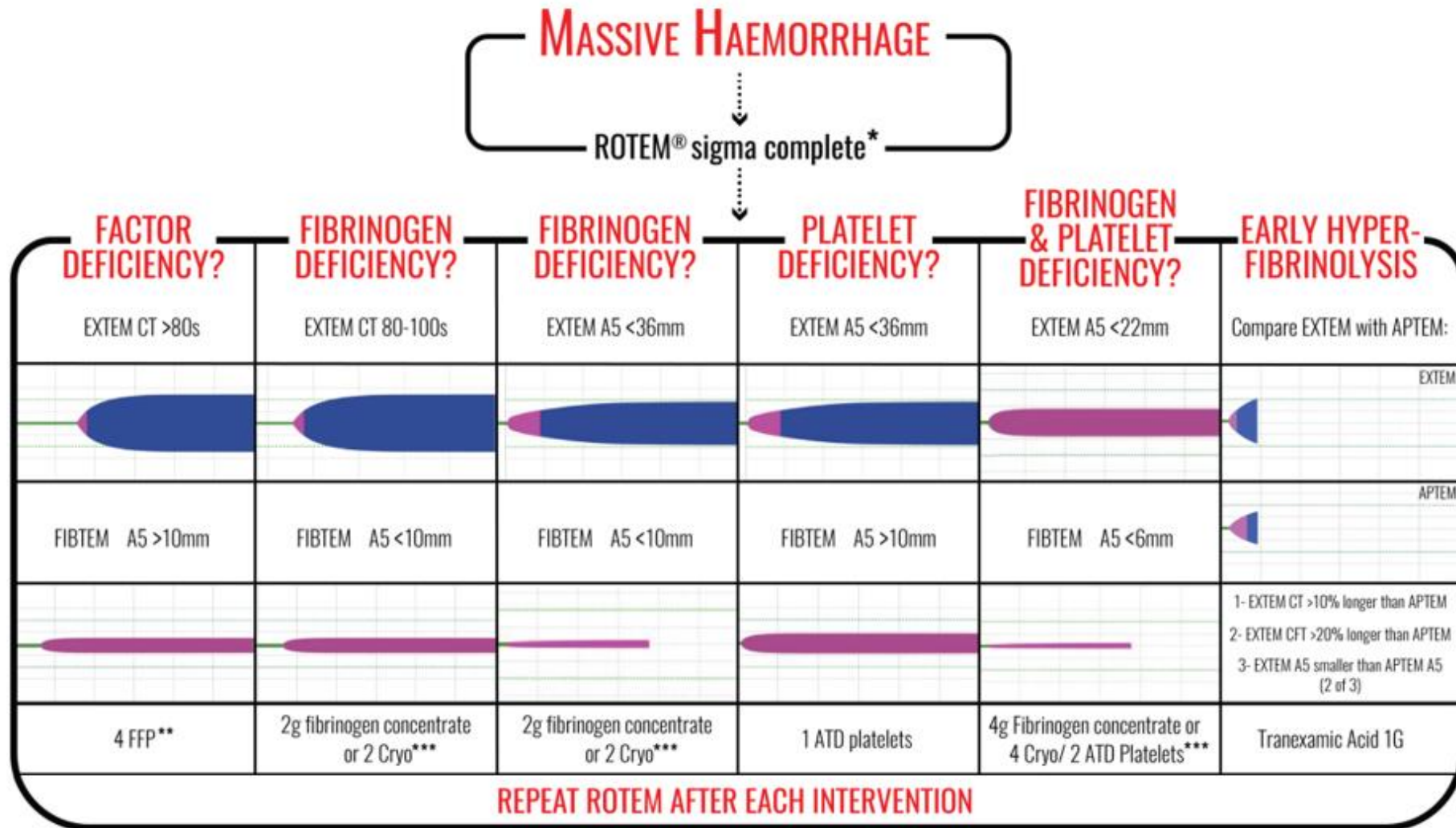
T R A U M A T I C	TRANEXAMIC ACID	<p>If not given pre-hospital, administer within 3 hours of trauma:</p> <ul style="list-style-type: none"> • 1 g IV bolus, followed by • 1g IV infusion over 8 hours
	RESUSCITATION	<ul style="list-style-type: none"> • Activate Major Haemorrhage Protocol • Transfusion Ratio 1:1 • ROTEM for tailored transfusion <p style="color: red; font-weight: bold;">CODE RED*</p>
	AVOID HYPOTHERMIA	<ul style="list-style-type: none"> • Target temperature > 36°C • Remove wet clothing and sheets
	UNSTABLE? DAMAGE CONTROL SURGERY	<p>If unstable and coagulopathic, hypothermic or acidotic, perform damage control surgery</p>
	METABOLIC	<ul style="list-style-type: none"> • Perform regular blood gas analysis • Base excess guides resuscitation /aim +/-2 • If BE/ lactate worsening consider stopping surgery, splint and transfer to ICU.
	AVOID VASOCONSTRICTORS	<ul style="list-style-type: none"> • Inappropriate use of vasoconstrictors doubles mortality • However, use may be required in cases of spinal cord or traumatic brain injury
	TEST CLOTTING	<ul style="list-style-type: none"> • Send lab coagulation tests • Use AUH ROTEM algorithm to guide transfusion • Repeat after each intervention
	IMAGING	<p style="color: red; font-weight: bold;">Consider</p> <ul style="list-style-type: none"> • CT- especially in most unstable patients • Interventional radiology
	CALCIUM	<ul style="list-style-type: none"> • Maintain ionised Ca²⁺ >1.0mmol/L • Administer 10mls of 10% Calcium Chloride over 10 minutes after first 2 units PRBC/ repeat every 2-4 units, as required

* **CODE RED** For polytrauma with TBI or spinal injuries: Aim MAP 80-90mmHg. If this will exacerbate bleeding, use permissive hypotension.

MAJOR HAEMORRHAGE? NON-TRAUMATIC? THEN...

A	ASK FOR HELP	<ul style="list-style-type: none"> •MET Call •Consultant in charge of patient should be informed •Allocate team roles •Senior clinician experienced in managing haemorrhage should be team leader
T	TRANEXAMIC ACID	<ul style="list-style-type: none"> •1g IV bolus for post op bleeds/obstetric haemorrhage •Repeat dose if further evidence of fibrinolysis •No longer indicated in GI bleed
R	RESUSCITATION	<ul style="list-style-type: none"> •Activate Major Haemorrhage Protocol •Transfusion Ratio 1:1 •Avoid Crystalloid use •Wide bore cannulae x 2 •Resuscitate to a palpable radial pulse •If patient confused, aim systolic 80-90 mmHg •Stop bleeding- OGD/Sengstaken/surgical referral
A	AVOID HYPOTHERMIA	<ul style="list-style-type: none"> •Target temperature >36°C •Remove wet clothing and sheets •Warm blood products/fluids •Use warming blankets/mattress
U	UNSTABLE?	<ul style="list-style-type: none"> •Unstable, coagulopathic, hypothermic or acidotic- •Transfer to site suitable for resuscitation and where measures to stop bleeding are in place e.g. theatre, IR, ICU
M	METABOLIC	<ul style="list-style-type: none"> •Perform regular blood gas analysis •Base excess/ Lactate guides resuscitation •Transfer to HDU/ICU post resuscitation and control of bleeding
A	AVOID VASOCONSTRICTORS	<ul style="list-style-type: none"> •Inappropriate use of vasoconstrictors doubles mortality •Use should be restricted to cases where other causes of hypotension are present e.g. sepsis
T	TEST CLOTTING	<ul style="list-style-type: none"> •Check clotting regularly •Follow trust reversal of anticoagulation guideline if patient anticoagulated or on antiplatelets •Aim platelets >100x10⁹/L •Aim INR &APTT <1.5, Fibrinogen >2.0g/L •Consider ROTEM if available
I	IMAGING	<p>Consider</p> <ul style="list-style-type: none"> •CT with contrast: especially if patient unstable and cause of bleeding unknown •Interventional Radiology
C	CALCIUM	<ul style="list-style-type: none"> •Maintain ionized Ca²⁺ >1.0mmol/L •Administer 10mls of 10% Calcium Chloride over 10 minutes after first 2 units PRBC/ repeat every 2-4 units, as required

Author: Dr B.Altemimi | balsam.altemimi@aintree.nhs.uk | 2019



* ROTEM® sigma complete + hep if heparin use suspected (If INTEM CT >208s is corrected on HEPTM CT - give Protamine. If not corrected, consult haematology ? Intrinsic factor deficiency)

** Octaplas if born after 01/01/1996

*** Aim FIBTEM A5 >10mm

Seven Steps for Successful Coordination in Massive Haemorrhage

1. **Recognise trigger and activate pathway for management of massive haemorrhage; assemble the emergency response team**

Aintree: Phone lab on 4567/ bleep 3372 and phone 2222 to request Medical Emergency Team (MET).

Call consultant responsible for care of patient (if out-of-hours: on call cons)

RLBUHT: phone 2222 and state 'Massive Haemorrhage' followed by location and extension

Call consultant responsible for care of patient (if out-of-hours: on call cons)

2 Allocate team roles

- I. Team leader
 - II. Communication lead– dedicated person for communication with other teams, especially the transfusion laboratory and support services.
 - III. Sample taker / investigation organiser / documenter
 - IV. Transporter – AUH - HCA, or other transfusion-trained member of team from clinical area
RLBUHT – Porter or ward staff
3. **Complete request forms / take blood samples, label samples correctly / recheck labelling**

U+E, FBC, Crossmatch, PT, APTT, Fibrinogen, ABG, Calcium, lactate, ROTEM if applicable

4. **Request blood / blood components. Team leader should decide on use of:**

- I. Emergency O Neg (immediate)
- II. Group specific 20 mins from receipt of sample
- III. Full Crossmatch 45 mins from receipt of sample

Communication lead to contact laboratory: and inform the BMS of the following:

- a. Your name, location and ext number
- b. **'this relates to the massive haemorrhage situation'**

- c. The patient's details: ideally surname, forename, hospital number, DOB (if unknown patient: the hospital number and the unknown person number) and gender.
- d. Whether O Neg/O Pos (gender and approximate age needed) will be required and how many units or
- e. Order **massive haemorrhage/ shock** pack(s)
- f. Contact lab if blood has been transferred with patient from another Trust (transferred blood must be sent in a box to the laboratory at AUH prior to use) or patient is being transferred to another Trust

5. The clinical / laboratory interface

- I. Communication lead to arrange for transport of samples / request form to the laboratory
- II. BMS to ring communication lead with results of urgent investigations
- III. BMS to ring communication lead when blood / blood components are ready

Communication lead to arrange to collect blood and blood components from the laboratory
(Aintree: RN, HCA, ODP only/ RLBUHT: RN, HCA, ODP, porters)

6. **Communicate stand down of pathway** and let lab know which products have been used.

7. Ensure documentation is complete.

- I. Clinical area: monitoring of vital signs, timings of blood samples and **communications (lab and cons haematologist)**, transfusion documentation in PENS, complete traceability documentation.
- II. Laboratory: keep record of communications / telephone requests in patient laboratory record.

4.0 Role and responsibility

Role	Responsibility
Team Leader	Allocate team roles
Communications Lead	Dedicated person for communication with other teams , especially the transfusion Laboratory and Support Services
Sample Taker	Investigation organiser , documenter
AUH Transporter	HCA or other transfusion trained member of team from clinical area
Royal and Broadgreen hospitals Transporter	Porter or Ward staff

Appendix One. Document control

Part 1			
Must be fully completed by the Author before submission for approval			
Name of lead author:	Rebekka Konig		
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Consultation:			
Name/s of person or group	State which care group/ corporate services/ staff groups the person or group represents	Date	Response: FU/ FNU / NR
Anaesthetic departments	AUH and RLBUHs	2022	FU
Hospital Transfusion Committee	Trust wide	2022/23	FU
ITU and A+E departments	AUH and RLBUHs	2022	FU
Communication plan: State below how the practice in this document will be rolled out across the organisation and embedded in practice.			
This document is a short version of the MHP used in Aintree. It is already in use. Once on DMS, an email will be sent out through divisional leads to alert staff to the new protocol. Also attendance at link nurse meeting at Royal site to introduce protocol			
Part 2			
Approval date:	20/03/2023		
Method of document approval	Formal Committee decision Yes	Chairperson's approval Yes	
Name of Approving Committee	Hospital Transfusion Committee		
Chairperson Name/Role	Rebekka Konig, consultant anaesthetist		
If there are minor changes please state. Do not amend the approving committee / Chair			
Part 3			
Documents Superseded	<ul style="list-style-type: none"> Massive Haemorrhage Guidelines – AUH Management of Massive Haemorrhage Appendix 4 of EQMS 5 EQMS 9373 V2 		
Keywords	MHP, massive haemorrhage, haemorrhage, transfusion, major bleed, major haemorrhage		
Document review	The author or a nominated person will start the review of the document within three years or earlier should a change in legislation, best practice or other change in circumstance dictate.		
Target Audience	Trust wide		

Appendix Two. Abbreviations and Definitions

- Blood pressure (BP)
- Date of birth (DOB)
- Fresh frozen plasma (FFP)
- Heart rate (HR)
- Hour (hr)
- Massive haemorrhage protocol (MHP)
- Urea and Electrolytes (U+Es)
- Packed red blood cells (PRBC)
- Rotational thromboelastometry (ROTEM)

