Appendix K - Major Haemorrhage Protocol

PATIENT MEETS CRITERIA FOR MAJOR HAEMORRHAGE PROTOCOL

Organisation: Most senior clinician to declare 'Major Haemorrhage'

Member of staff responsible for communication activates Major Haemorrhage Protocol using x2222 Stating 'Major Haemorrhage, location **xxxx'**

Member of staff responsible for communication also contacts transfusion laboratory to confirm they are aware, giving contact number and further details as needed

Dedicated porter is automatically activated by the switchboard cascade folling the 2222 call.

Resuscitation: <C>ABCDE approach

Identify and arrest bleeding: direct pressure, tourniquets, surgery, embolisation

Damage Control Resuscitation (DCR): prevent, halt and reverse hypothermia, acidosis and coagulopathy

MEDICAL INTERVENTIONS

Tranexamic Acid
1 g over 10 mins
then
Tranexamic Acid Infusion
1 g over 8 hrs
(within 3 hrs of injury for trauma)

Early consideration of cell salvage

HAEMATOLOGICAL GOALS

Hb 70-100 g/L
INR < 1.5 → FFP 15 mL/kg
Fibrinogen > 1.5 g/L → 2 pools cryoprecipitate
Platelets > 75x10^{9} /L → 1 adult unit platelets
Ionised Ca^{2+} > 1 mmol/L → 10mL 10% calcium chloride
K^{+} < 5.5 mmol/L →10 IU insulin in 50 mls 50% glucose

NBT Transfusion: x35630 (0800 - 2200) bleep 9433 (all other times or when busy)

LABORATORY SUPPORT *

Shock Pack 1: 4 RBC & 4 FFP

** → **Shock Pack 2: 4 RBC, 4 FFP & 1 Plts**

*** →

TAKE BASELINE BLOOD SAMPLES

* FBC, U&E, Ca^{2+}, clotting screen, fibrinogen ABG/VBG, ROTEM
X-match: 2 samples, minimum 4U PRBC's
** Consider early platelets and fibrinogen
*** Ongoing shock pack requirements guided by ROTEM & clinical picture
Consider 1:1:1 ratio (shock pack 2) if ROTEM unavailable and haemorrhage ongoing
Recheck all bloods and ROTEM at least hourly

PHYSIOLOGICAL GOALS

Permissive hypotension
SBP 90-100 mmHg **OR** SBP > 100 mmHg in TBI
1st hour only **OR** definitive haemorrhage control
Lactate < 2 mmol/L
Base excess > -4 mmol/L

Stand down protocol at earliest opportunity i.e as soon as massive transfusion no longer required

Debrief whole team

Complete audit form for by Specialty and Trust Transfusion Committee

Appendix L - Intra-Operative Cell Salvage

The use of intra-operative cell salvage provides an alternative to allogenic blood transfusion and avoids the morbidity associated with the immunological complications of their use. In addition to clinical benefit, its use may also represent a cost-saving alternative to allogenic blood products[10,11].

Indications for intra-operative cell salvage include[10,11];

- Anticipated blood loss of > 20% of the patient's estimated blood volume
- Patients with increased risk factors for bleeding or a pre-existing anaemia
- Patients who are difficult or cannot be cross-matched (e.g. rare blood types or multiple antibodies)
- Major haemorrhage
- Patients who do not accept allogenic blood transfusions but are accepting of cell-salvaged blood

Cell salvage should not be used where substances that are not licensed for intravenous use enter the surgical field. These include iodine, topical clotting agents and orthopaedic cement[10]. Cell salvage may be resumed once these have been washed away[21].

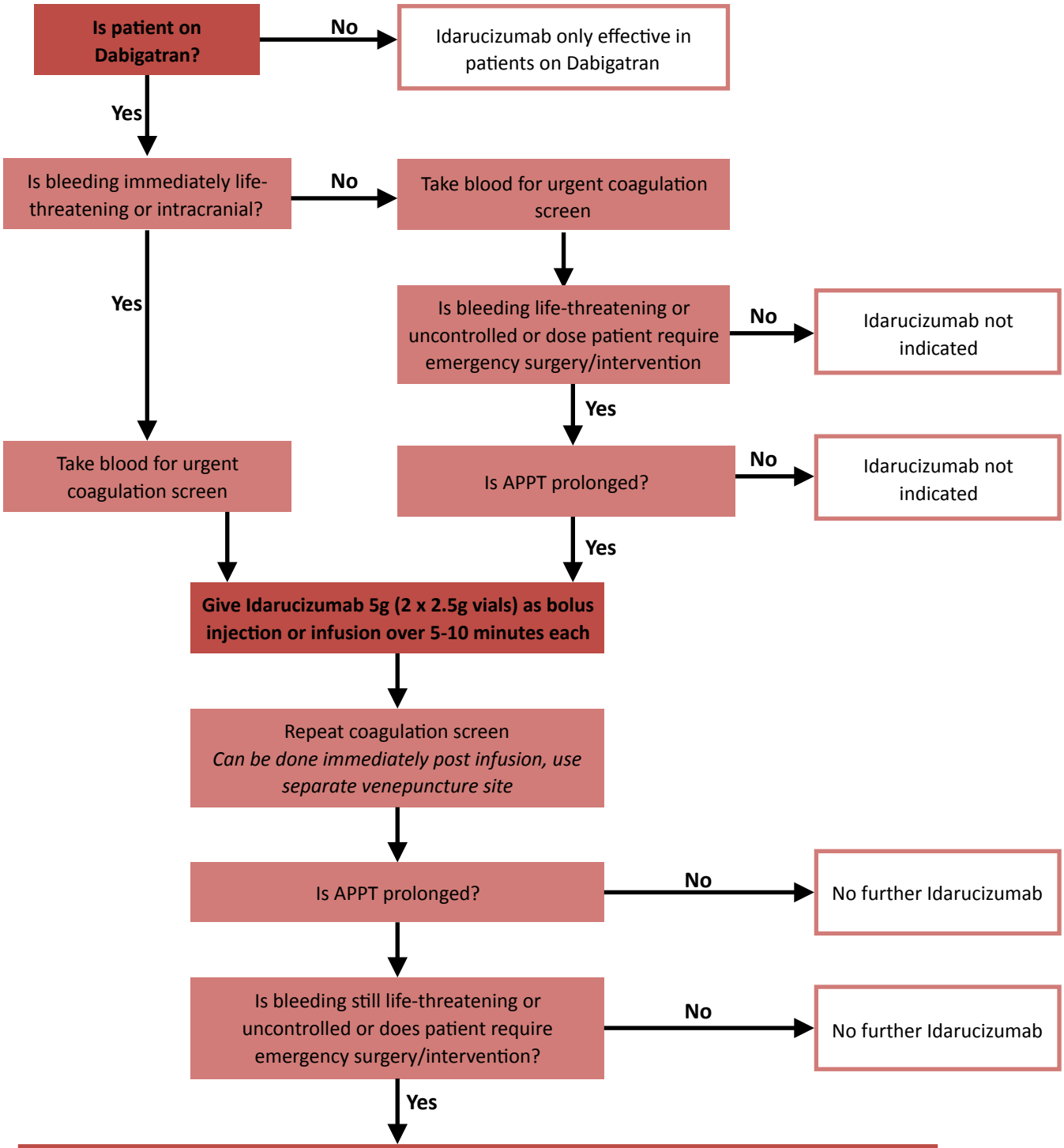
When the use of cell salvage is proposed in surgery for malignancy or infection, an explanation should be given to the patient of the potential risks and benefits and specific consent should be obtained[22]. NICE guidance recommends its use in radical prostatectomies and cystectomies. If used in these cases an infusion set with leucodepletion filter is recommended[22].

Cell salvage is not recommended for routine use during caesarean section. However, in the context of a blood management strategy in women where anticipated blood loss is very likely to be significantly higher than average, there may be a role for its use. Amniotic fluid should preferably not be aspirated into the collection reservoir, but should be removed by separate suction prior to starting cell salvage. This may require the use of two suction devices during caesarean section[21].

With regards to cell salvage in perforated bowel surgery, the European Society of Anaesthesia suggests its use is not contraindicated provided the surgical field is evacuated of soiled abdominal fluid, additional cell washing occurs and broad-spectrum antibiotics are used[21]. The UK Cell Salvage Action group recommends bowel contents are not aspirated into the system as there is a potential for bacteraemia[22].

Current guidance from the Association of Anaesthetists of Great Britain and Ireland states that intra-operative cell salvage in the clinical situations described above should be made by the clinicians caring for the patient, taking into account the latest evidence and having considered the risks and benefits for each individual patient[10].

Appendix M - Idarucizumab (Praxbind®) reversal for dabigatran



Discuss with on-call Haematologist:

Administration of a second 5g dose of Idarucizumab may be considered in the following situations:

- Recurrence of clinically relevant bleeding together with prolonged clotting times, or
- If potential rebleeding would be life-threatening and prolonged clotting times are observed, or
- Patient requires a second emergency surgery / urgent procedure and has prolonged clotting times

Jason Kendall on behalf of the Thrombosis Committee (February 2016 version 2)

Appendix N - Major Haemorrhage Audit Forms

North Bristol NHS Trust ED Adult Major Haemorrhage Audit Form

Date:……..Consultant: ……..

Patient Name:	
DOB:	**Hospital No.:**

Diagnosis / reason for bleed (circle or tick as appropriate) **Major Trauma Upper GI bleed AAA** **Other:…….**
Comorbidities:
Definitive Treatment Planned (circle or tick as appropriate) **Surgery Angiographic Embolisation Endoscopic Control** **ITU for ongoing resus**

Please identify interventions performed:

Correction of hypothermia	**YES / NO**
Correction of acidosis	**YES / NO**
Heparin reversal	**YES / NO**
Warfarin reversal	**YES / NO**
Use of tranexamic acid	**YES / NO**
Other (please specify)	**YES / NO**

	Clinical Area to Complete					*Lab to Complete*
Blood Products	**No. of Units Requested**	**Units Used**	**Units Returned to Laboratory**	**Units in ED Fridge**	**Units transferred to other clinical area**	**Units Wasted**
		Please enter number even if 0				
Packed Red Cells						
FFP						
Platelets						
Cryoprecipitate						
Other						

Results prior to and post transfusion:

	Prior to haemorrhage	**Post haemorrhage (no further need for transfusion in immediate future)**
Haemoglobin		
Platelets		
PT/APTT		
Fibrinogen		
pH		
Temperature		

Please identify how you found communication with the Transfusion laboratory:

GOOD / SATISFACTORY / POOR

If poor please state problem(s)

Please list any other problems encountered in the implementation of this Guideline:

Corrective actions should be agreed and documented here prior to Transfusion Committee review:

Signed:…….

Please leave this completed form in the MH Audit tray in R1, or on Simon Odum's Desk in the Consultant Offices.

For review by relevant specialty then copy to Trust Transfusion Committee via Tim Wreford-Bush, Transfusion Laboratory Manager.

Please could Trauma Team Nurse document Outcome at 24 hours below

North Bristol NHS Trust Theatre Adult Major Haemorrhage Audit Form

Date:……..Location: ……..

Consultant: ……..

Patient Name:	
DOB:	**Hospital No.:**

Diagnosis / reason for bleed (circle or tick as appropriate) **Major Trauma Upper GI bleed AAA Other: …….**
Comorbidities:
Previous Treatment in ED / Ward (Packed Red Cells, FFP, Platelets, Cryoprecipitate, Other):

Please identify interventions performed:

Surgery	**YES / NO**
Angiographic embolisation	**YES / NO**
Endoscopic control	**YES / NO**
Correction of hypothermia	**YES / NO**
Correction of acidosis	**YES / NO**
Heparin reversal	**YES / NO**
Warfarin reversal	**YES / NO**
Use of tranexamic acid	**YES / NO**
Use of ROTEM	**YES / NO**
Other (please specify)	**YES / NO**

	Clinical Area to Complete				*Lab to Complete*
Blood Products	**Units Transferred From Other Clinical Area**	**No. of Additional Units Requested In Theatre**	**Units Used**	**Units Returned to Lab**	**Units Wasted**
			Please enter number even if 0		
Packed Red Cells					
FFP					
Platelets					
Cryoprecipitate					
Other					
Red Cell Salvage					

Results prior to and post transfusion:

	Prior to haemorrhage	**Post haemorrhage (no further need for transfusion in immediate future)**
Haemoglobin		
Platelets		
PT/APTT		
Fibrinogen		
pH		
Temperature		

Outcome at 24 hours:

Please identify how you found communication with the Transfusion laboratory:

GOOD / SATISFACTORY / POOR

If poor, please state problem(s)

Please list any other problems encountered in the implementation of this Guideline:
Corrective actions should be agreed and documented here prior to Transfusion Committee review:

Signed:…….

Please return completed form to Dr Amit Goswami, Consultant Anaesthetist

For review by relevant specialty then copy to Trust Transfusion Committee via Tim Wreford-Bush, Transfusion Laboratory Manager.