

Figure 1b Example of a transfusion management guideline for major haemorrhage

Objective	Action	Notes	Page ref.
Control the bleeding	Early intervention – surgical, endoscopic, radiological	Upper GI tract procedures Interventional radiology	32
Restore circulating volume In patients with major vessel or cardiac injury, it may be appropriate to restrict volume replacement after discussion with surgical team	Insert wide-bore peripheral cannulae Give adequate volumes of crystalloid/blood Aim to maintain normal blood pressure and urine output > 30 ml/hr in adults (or 0.5 ml/kg/hour)	Blood loss is often underestimated Refer to local guidelines for the resuscitation of trauma patients and for red cell transfusion Monitor arterial pressure and CVP if unstable	28
Avoid exacerbating coagulation problems	Keep the patient warm		28
Use laboratory data to guide management	<i>Request laboratory investigations</i> FBC, PT, APTT, fibrinogen, blood bank sample, biochemical profile, blood gases Repeat FBC, PT, APTT, fibrinogen every 4 hrs, or after 1/3 blood volume replacement, or after infusion of FFP	Colloid solutions can prolong clotting times Take samples early FFP and platelets may be required before results are available	28
Have blood components available when needed	<i>Request red cells</i> Pack volumes range from 180 to 350 ml	RhD positive blood may be used for male or post-menopausal female in emergency Use blood warmer Consider cell salvage	16
	<i>Platelets needed?</i> Anticipate platelet count < 50 × 10 ⁹ /l after 1.5–2 × blood volume replacement <i>Dose:</i> 10 ml/kg body weight for a neonate or small child; otherwise one 'adult therapeutic dose' (one pack)	Target platelet count: > 100 × 10 ⁹ /l for multiple/CNS trauma > 75 × 10 ⁹ /l for other situations	29
	<i>FFP needed?</i> Anticipate coagulation factor deficiency after blood loss of 1–1.5 × blood volume Aim for PT and APTT < 1.5 × mean control and fibrinogen > 1.0 g/l Allow for 30 minutes thawing time <i>Dose:</i> 12–15 ml/kg body weight = 1 litre or 4 units for an adult	PT and APTT > 1.5 × mean control correlates with increased surgical bleeding May need to use FFP before laboratory results are available – take sample for PT, APTT, fibrinogen before FFP transfused	29
	<i>Cryoprecipitate needed?</i> To replace fibrinogen and FVIII Aim for fibrinogen > 1.0 g/l Allow for 30 minutes thawing time <i>Dose:</i> 2 × 5 donation pools for mid-sized adult	Fibrinogen < 0.5 strongly associated with microvascular bleeding Low fibrinogen prolongs all clotting times (PT and APTT)	29
Recognise and act on complications	Suspect DIC Treat underlying cause	Shock, hypothermia and acidosis increase the risk of haemostatic problems, and are associated with worse outcomes	29
Manage intractable non-surgical bleeding	Consider the use of recombinant factor VIIa	Obtain and use according to local protocol NovoSeven® is not licensed for this indication	30