

PEDIATRIC DOSING TABLE FOR BLOOD AND PRODUCTS

Pediatric massive hemorrhage dosing table for blood products, factor concentrates, drugs and antidotes

Product/Drug	Dose	Target	Additional Notes
Red Blood Cells (RBCs)	10-20 mL/kg up to a maximum single dose of 4 units (3 units if 30-40 kg, 2 units if 10-30 kg and 0.5-1 unit if < 10 kg) Note: 5-10 mL/kg will increase Hgb by 10 g/L and Hct by 3%, depends on rate of blood loss	Hemoglobin > 80 g/L	Certain populations (neonates, those with congenital heart or lung disease, receiving extracorporeal life support) may require higher thresholds for RBC transfusion. ^{28,125,126,127} Older RBC and irradiated units increase risk of hyperkalemia (especially infants < 2 years old). ¹²⁸ Where possible use fresher units to avoid hyperkalemia.
Frozen Plasma (FP)	10-20 mL/kg up to a maximum single dose of 4 units (3 units if 30-40 kg, 2 units if 10-30 kg and 0.5-1 unit if < 10 kg). ¹²⁹	INR < 1.8	Consider calcium gluconate 3 mg/ml of FP administered for associated hypocalcemia.
Prothrombin Complex Concentrate (PCC- Octaplex™ or Beriplex™)	25 IU/kg of PCCs (rounded to the closest 500 IU) maximum 2000 IU. For warfarin reversal: 15 IU/kg for INR < 3 (or unknown) and 30 IU/kg if INR > 3	INR < 1.8	A substitute for coagulation factor replacement when FP is unavailable. Provide fibrinogen replacement if level < 1.5 g/L. Maximum 2 doses of PCC. For warfarin reversal co-administer with IV vitamin K (see dose below).
Platelets (PLTs)	10-20 mL/kg up to a maximum single dose of one apheresis unit or pooled unit (0.5 apheresis unit or pooled unit in children < 20 Kg) ¹²⁹ Note: 5-10 ml/kg will increase count by approximately 50 – 100 x 10 ⁹ /L	PLTs > 50 x 10 ⁹ /L	Stored and transported at room temperature.
Fibrinogen Concentrate	50 mg/kg up to a maximum single dose of 4 grams (maximum 2 grams in children < 30 Kg)	Fibrinogen > 1.5 g/L	Fibrinogen Concentrate 4g equivalent to approximately 10 units of cryoprecipitate. Children who have undergone cardiopulmonary bypass may require higher fibrinogen levels (> 2 g/L).
Cryoprecipitate	1 unit/10 kg (5-10 mL/kg) ¹²⁹ up to a maximum single dose of 10 units (5 units in children < 20 kg).	Fibrinogen > 1.5 g/L	Typically ordered in units and neonatal dose is 1 unit.



Product/Drug	Dose	Target	Additional Notes
Sodium Bicarbonate	2-3 meq (mmol)/kg	pH > 7.2	Administration is controversial in MHP. Excessive dosing may cause hyponatremia; rapid administration may cause intraventricular hemorrhage in neonates.
Tranexamic acid	Regular bleeding: 10-15 mg/kg bolus load to 1 gram max followed by: <13 years 5 mg/kg/hr infusion. >= 13 years 1 gm over 8 hours If bleeding is catastrophic: < 13 years 30 mg/kg load to 2 gram max followed by 10 mg/kg/hr infusion. >= 13 years 15 mg/kg (max 1g) bolus and 15 mg/kg (max 1g) bolus repeated at 1 hour, 15 mg/kg (max 1g) bolus and repeated if ongoing bleeding at ≥ 30 min or 30 mg/kg (max 2g) single bolus.	Ensure fibrinogen > 1.5 g/L and dose within 3 hours of trauma or initiation of hemorrhage	Efficacy and safety in pediatrics in the presence of TBI is unclear.
Undiluted Calcium Chloride (CaCl ₂) or Calcium gluconate	15-20 mg/kg ²⁸ IV “push” 45-60 mg/kg IV over 5-10 mins.	Ionized calcium > 1.15 mmol/L	Bolus either in setting of MHP and unstable hemodynamics and/or hyperkalemia related arrhythmia. CaCl ₂ extravasation can cause tissue necrosis (prefer CVL access or use larger peripheral IV catheter in a more proximal site, ensure line function prior to administration). CaCl ₂ preferable with hemodynamic instability.
Magnesium (Mg)	25-50 mg/kg over 20 mins. followed by infusion 30-60 mg/kg/24 hr	Mg > 2 mmol/L	Rapid administration may cause hypotension. Typically, hypomagnesemia is encountered after 1.5-2 blood volume loss and responsible for calcium refractory cardiac arrhythmias in children. ²⁸
Vasoactive and Inotropic agents	Unknown	Unknown	The early administration of vasopressors to maintain blood pressure and limit crystalloid use in this setting is controversial. ¹³⁰
Vitamin K (only for warfarin reversal)	1 to 10 mg (neonate to adolescent) IV over 10-20 minutes	INR<1.8	Coadminister with PCC for warfarin reversal. Requires 6-8 hrs to work.



Product/Drug	Dose	Target	Additional Notes
Protamine	Call pharmacy for dosing	PTT or ACT	Administer for heparin reversal. May cause acute hypotension and/or pulmonary hypertension.
Reversal agents for DOACs: Idarucizumab (for dabigatran) Alternative nonspecific agents (FP & PCC) can counteract DOACs when specific reversal agents are unavailable. ¹³¹	Consultation with a hematologist is recommended	DOAC dependent ¹³²	Current available DOACs are either a direct thrombin inhibitor (dabigatran etexilate) or specific inhibitors of factor Xa (apixaban, betrixaban, edoxaban and rivaroxaban).

Note: ACT=activated clotting time, CVL=central venous line, DOACs= direct oral anticoagulants, DIC=disseminated intravascular coagulation, FP=frozen plasma, Hgb=hemoglobin, Hct=hematocrit, hr=hour, INR=international normalized ratio, IU = international unit, IV=intravenous, kg=kilogram, mg=milligram, ml=milliliter, meq=millequivalents, mmol=millimole, μ = micro; M = molar, prn=as required, PCC=prothrombin complex concentrate, PTT=partial thromboplastin time, RBC=red blood cell, TBI=traumatic brain injury.

