

Massive Transfusion Protocol—Adult

Identify the Bleeding Patient

Actual or anticipated 4U RBC's transfused in < 4 h & ongoing bleeding; hemodynamically unstable

6U of RBC's transfused in < 24h & ongoing bleeding; hemodynamically unstable

Manage the Bleeding Patient
Surgery, Endoscopy, Angiographic Embolization

ABC Score for **Trauma Patients** (2 or more criteria met = MTP):
Penetrating trauma, ED SBP 90mmHg or less, ED HR 120bpm or greater, Positive FAST

Initiate the MTP

Physician Orders the MTP (1:1:1 ratio)
6 u of RBC, 6 u FFP, 1 pool platelets
(Divided into 3 boxes from Transfusion Medicine (TM))

Clinical Team:
- Call TM to alert staff of MTP
- Med Lab Assistant (MLA) to draw blood and deliver boxes.

10 min. for TM to prepare box 1

FFP takes 15 min to thaw

Lab will Repeat and order blood work Not OE by unit. Monitor hemostasis q30min.

BOX #1
1 unit platelets
2u RBC

BOX #2
2u AB Plasma
4u RBC

BOX #3
4u Plasma
(group specific)

The **MLA** brings each box to the clinical area & returns to TM to pick up the next box when available.
Boxes color coded for each patient

Clinical Team

- ✓ Ensure blood transfusion **consent** is signed.
- ✓ Give **Platelets FIRST** in a separate blood line (Do not infuse through the Rapid Infuser).
- ✓ Give RBC's until FFP arrives, then start a **1:1 ratio of RBCs & FFP** through the Rapid Infuser.
- ✓ Keep blood products in the MTP box until ready to use.

Give Cross-matched units as soon as available.

✓ Determine if a **2nd Set** is needed or if the patient has stabilized, **COMMUNICATE** this to TM. Boxes can be customized based on the patient's repeat labs.

Need To Stop MTP?
Notify TM & return any unused blood products ASAP.

Initial Interventions & Considerations:

- establish 2 large bore IV's, consider IO or CVAD
- Minimize crystalloid Infusions
- Ensure a Trauma Panel is ordered (blood work takes approx. 45 min to complete)
- Use a Rapid Infuser and Fluid Warmer for RBC's and FFP (**DO NOT PRESSURE INFUSE OR WARM PLATELETS**). Give platelets first, free flowing at room temperature. Platelets are kept on the side of the box. Blood products are stable for 24 hours in the sealed box.
- O(-) is the universal donor for Females <45yrs and Males <18 yrs. O(+) is the Universal donor for Females >45yrs and Males >18yrs. The universal donor for FFP is AB. Any platelet type can be given but Rh specific is preferred.
- Continuous monitoring and documentation of Intake/Output including vital signs and temperature q15min.
- For Emergency Trauma patients, document all Transfusions on the Trauma Nursing Resuscitation Record.
- Return any unused blood products to Transfusion Medicine ASAP. Platelets will be discarded if unused and not returned within **60min**. from leaving TM (Platelets should be given first with any MTP activation).

General Guidelines

- Consider Tranexamic Acid (TXA) for bleeding Trauma patients if their injury occurred within the last 3 hours. Give a 1g bolus of TXA in 100ml of NS over 10min (600ml/hr) followed by 1g 8h infusion (mix 1g in 250ml of NS and infuse at 32ml/hr) - See Drug Monograph for current administration guidelines.
- Prevent/reverse acidosis.
- Correct Hypocalcaemia: Ca Gluconate 1g IV slowly.
- Check Fibrinogen level: if <1.5 –2 g/L give 1 cryo pool (10u = adult dose). Cryoprecipitate takes approx. 45 min for TM to prepare. Note 4 units of FFP and 10 units of cryo contain comparable fibrinogen levels.
- Continue to **COMMUNICATE** with TM what blood products are needed (the MTP pack can be customized to the patients need and lab results) and the patient's anticipated disposition (transfer, admission, discharge,)

General Guidelines for lab based Blood component replacements in adults

RBC_ aim for hgb>100 in bleeding coagulopathic patient **Dose**_ HGB ≥ 70 is sufficient in most stable non bleeding patients.

FFP_ in INR greater than 1.5 **Dose** give 2 units of FP

Platelets—if less than 100,000 or projected to be soon less than 100,00. **Dose** give 1 dose of platelets should drip freely and not be transfused using warmer or pressure infuser

Cryoprecipitate_ Fibrinogen less than 1.5 –2 or evidence of microvascular bleeding. **Dose** give 1 Cryo pool (10 U) **note** 4U FP equals to 10U Cryo

Riastap_ Fibrinogen less than 1.5 –2 or evidence of microvascular bleeding. **Dose** is 2 units.

Reversal Agents & Other Considerations

- **Pradaxa Reversal: Praxbind 5g IV & Octaplex (PCC): 25-50units/kg or up to 3000 units—need INR level. No reversal for Eliquis and Xarelto—: PCC (procoagulant agent) may or may not be effective .**
- **Heparin Reversal: Protamine 1mg IV per 100U of heparin.**
- **Warfarin Reversal: Prothrombin Complex 1500IU & Vitamin K 10mg.**
- **Refer to Guideline Direct Oral Anticoagulant Agents, Document # HCS-115-01 and Prothrombin Complex Concentrate**

TM –Transfusion medicine, RBC_Red Blood Cell, MTP-Massive Transfusion protocol, FFP_ Fresh Frozen Plasma MLA_ Medical Lab Technologist