Puget Sound Blood Center
blood services | medicine | research

Adult Bleeding Emergency Guidelines for King County Hospitals

This document has been prepared by the Puget Sound Blood Center Transfusion Safety and Patient Blood Management Department to provide information necessary to obtain the appropriate blood components for possible emergent administration in adults. The document provides guidelines for facilitating timely and adequate replacement of massive/rapid blood loss with appropriate blood components. Guidelines are written to assist with reducing the incidence of intractable coagulopathy, turn-around-time of component delivery, wastage of components, and unnecessary ordering; all the while ensuring the correct patient receives the correct blood component, in the correct amount, expedited in the safest and most efficient way.

GENERAL GUIDELINES:

- Any member of the patient care team may make the verbal inquiry regarding whether it is appropriate to initiate the bleeding emergency protocol. However, a Licensed Independent Provider (LIP) must order all blood components.

- A "Massive Transfusion Pack" is the highest priority of orders at the Puget Sound Blood Center.

- In a life-threatening emergency, the priority is to get blood components to the patient as quickly as possible. When a Massive Transfusion Protocol is activated and a Massive Transfusion Pack is ordered, stock uncrossmatched Group O Negative (or Rh Positive if patient meets requirements per hospital lab policy) Red Blood Cells (RBC) will be issued unless type specific crossmatched units are immediately available.

- The hospital laboratory stores stock uncrossmatched Group O Red Blood Cells. It is recommended that in order to preserve community blood supply, both O positive and O negative uncrossmatched units are available and supported by a policy consistent with the following PSBC recommendation:
    - O positive – Males greater than or equal to 18 years old and females greater than or equal to 50 years old.
    - O negative – Males less than 18 years old, and females less than 50 years old.

- Additional stock uncrossmatched Group O Red Blood Cell units are available to hospital from the Puget Sound Blood Center (PSBC) upon request.

- Regulations require the completion of Stock Uncrossmatched Blood Justification (SUBJ)/Uncrossmatched Blood Justification (UBJ) forms documentation with patient identification and unit number information when uncrossmatched units are released from the hospital lab. Whether units are transfused or not, the ordering LIP must sign the form

justifying release of uncrossmatched units; ideally the signature will be obtained by the conclusion of the event.

- While it is important to ensure that the correct blood be administered to the correct individual, in a life-threatening bleeding emergency, blood product delivery should never be delayed due to the absence of a pre-transfusion compatibility sample or electronic order form. Universal blood products (stock uncrossmatched O RBCs and AB plasma) should be issued after verification of patient name and medical record number (MRN).

- Anticipate immediate transfusion of all blood components on arrival. Plan to use a rapid infuser with a warmer to transfuse red blood cells and plasma to prevent worsening hypothermia. Warmers should not be used when transfusing platelets or cryoprecipitate. If a rapid infuser is not available, a standard fluid warmer may be considered if the desired rate of red blood cell and plasma does not exceed the maximum rate (typically 999mL/hr) the warmer and standard IV pump combination can accommodate.

- Consider the addition of adjunct therapies to MTP policies/protocols such as the use of Tranexamic Acid in trauma (CRASH-2 Trial). Other medical therapies may be appropriate based on clinical situation. PSBC medical consultation recommended (see below).

- Consultation with PSBC on call physician (206-292-6525 –option 3) is strongly recommended.

RESPONSIBILITIES:

Puget Sound Blood Center

- Perform pre-transfusion testing and secondary processing on blood components as ordered by provider
- Issue blood component to hospital laboratory
- Conduct Suspected Transfusion Reaction work-up/follow-up
- Provide 24 hr/day transfusion related consultation

Ordering LIP

- Evaluate patient for potential transfusion-related therapies
- Order and evaluate laboratory testing
- Conduct informed consent for administration of blood components (as able in a bleeding emergency)
- Order blood component and provide administration/transfusion instructions
- Evaluate and manage patients experiencing a possible transfusion reaction

Hospital Laboratory

- Collect and/or verify compatibility sample for acceptability
- Process order for testing
- Store blood components

- Issue blood components

Transfusionist

- Assess patient prior to transfusion (per defined *Transfusion Assessment*)
- Provide patient education including the signs and symptoms of a transfusion reaction
- Complete request for blood components delivery
- Perform two person verification of blood component at time of administration
- At the time of transfusion of uncrossmatched units, transfusion reports may not have patient specific information, and will require clinical staff to add the patient's name, hospital number, and unit number (if applicable)
- At minimum, the verification process prior to administration of a group O uncrossmatched unit should include verification that the unit is labeled as Group O uncrossmatched
- Administer blood component
- Monitor and evaluate patient during and after transfusion
- Document transfusion and patient's tolerance of the transfusion in the patient's medical record

All personnel who administer blood components must be trained to identify transfusion recipients and components, and to closely observe patients during and for a period of time after blood administration for signs and symptoms of a transfusion reaction.

SUGGESTED SUPPLEMENTAL POLICIES /PROCEDURES and EQUIPMENT:

- Emergency Hemorrhage Panel (see appendix)
- Massive Transfusion Kit
- Massive Transfusion Labels to distinguish MTP labs as priority
- Gender/Age based Rh group O Policy (see supplemental materials)
- MTP Documentation Flow sheet
- Rapid Transfuser/Fluid Warmer

ASSEMBLE EQUIPMENT AND SUPPLIES: Certain preparations should be conducted prior to starting a blood transfusion. These preparation steps are described here.

Standard Pre-Transfusion Specimen Equipment

- ✓ 7 mL EDTA (lavender or pink top) blood specimen tube
- ✓ Blood specimen requisition ("Request for Blood and Blood Components" form)
- ✓ Biohazard bag
- ✓ Pre-printed patient label

Massive Transfusion Equipment

- ✓ Two warm air convection blankets (example: Bair Huggers) if available
- ✓ Rapid Transfuser with warmer (example: Ranger, Belmont or Level 1) if available

- ✓ Rapid Transfuser administration tubing (if using rapid transfuser)
- ✓ Fluid warmer administration tubing (if using a warmer without a rapid infuser)
- ✓ Standard IV Pump (approved my manufacturer for the administration of blood components)
- ✓ Blood Administration Tubing Set with 170-260 micron filter (Y-set for multiple units, straight set (if available) for single use). Follow manufacturer's instructions to determine maximum number of units approved for Y-Set. A new set should always be used with each platelet transfusion. All blood component tubing expires 4 hours after the initiation of the first unit.

- ✓ MTP Kit

    - MTP policy
    - Laminated MTP algorithm
    - Documentation flow sheet
    - Role cards (see supplemental materials)
    - Red MTP Facilitator Vest
    - PSBC Request for Blood Requisition
        - "Is the patient bleeding?" box checked "Yes"
        - "Bleeding Emergency - Massive Transfusion Protocol initiated" written on the form
    - Five Lab Packets:
        - Five manual/downtime hospital lab orders forms
            - pre-completed with hemorrhage panel, iCal, Mg, ABG selected, indicate priority "STAT", comments "bleeding emergency."
        - Pre-Transfusion Compatibility Sample (type and crossmatch)
            - Tube must be labeled with Name, MRN, Date & Time of collection, and Phlebotomist ID and information on the specimen label must match the requisition information exactly to avoid sample rejection.
        - Five specimen(hospital specific) tube kits for serial collection of:
            - Emergency Hemorrhage Panel
            - iCal
            - Mag
            - ABG
        - 5 biohazard bags
        - 5 "MTP" labels (to be placed on outside of biohazard bag)

ACTIVATION OF MASSIVE TRANSFUSION PROTOCOL (SEE APPENDIX D)

Staff Roles

MTP Activator

1. Obtain MTP Kit
2. Assume role of, or designate "MTP Facilitator"
3. Assign MTP Staff roles and distribute MTP role cards

MTP Facilitator

1. Call hospital laboratory and state: "*We are activating the MTP protocol in location_____ room number_____. I am requesting a Massive Transfusion Pack, for patient _____, _____, MRN # _____ in bed _____ per Dr. _____. I am the MTP Facilitator, my name is _____and my contact number is _____."*
2. Apply red vest (from MTP kit)
3. Assume responsibility for communicating/facilitating all blood orders with hospital laboratory and updating laboratory if patient location should change
4. Assume responsibility for receiving and communicating all lab results
5. Anticipate a consultative call from PSBC physician. If not received or additional consultation needed, call 206-292-6525 (option 3) and provide patient information and provide a call back number, and indicate MTP protocol in progress.

Assisting RN/Anesthesiologist(s) (2-3 staff)

Lab Monitoring

1. Collect a pre-transfusion compatibility sample (type and crossmatch). This should be collected before any blood components are transfused if possible. If a hold sample was previously collected convert to Type and Screen or Type and Crossmatch
2. Collect baseline ABG, Magnesium, iCal, and Hemorrhage Panel at baseline and every 30 minutes until patient stabilized

Blood Preparation and Administration

1. Monitor patient vital signs and communicate results to recorder
2. Insert 2nd peripheral line (if a second line is not currently available; at least 2 IV lines are needed in a massive transfusion)
3. Infuse all products per protocol and LIP orders after initial lab draw
4. Use rapid infusion device with warmer per protocol (if available)
5. Apply Bair hugger (if available). If Bair hugger unavailable, use warm blankets.

Runner

1. Obtain standard equipment and massive transfusion equipment
2. Obtain the Rapid Infusion device (e.g. Ranger, Level I, Belmont) if available
3. Obtain fluid warmer (if not using rapid infuser)
4. Utilize pneumatic tube system or hand deliver (per hospital policy) all specimens to the lab and indicate that specimens are for an MTP patient
5. Communicate with the MTP Facilitator RN what samples have been delivered to the lab
6. Utilize pneumatic tube system or pick up (per hospital policy) additional blood components from the hospital blood bank lab and deliver them to the Facilitating RN

Recorder

1. Facilitate lab orders (baseline and every 30 minutes-see appendix)

2. Facilitate component and administration orders for blood components (inquire about the ratio and priority/order for transfusion of components)
3. Using the MTP flow sheet, track what specimens were sent to the lab, the time the specimen was drawn and the results (lab flow section)
4. Using the MTP flow sheet, record volume of IV fluids and blood components [unit numbers, kind of component] infused
5. Record vital signs as reported by Primary RN
6. Document suspected transfusion reactions if applicable both on the flow sheet and the PSBC Suspected Transfusion Reaction (STR) Report. Facilitate collection of transfusion reaction labs if a STR is noted.
7. Ensure Stock Uncrossmatched Blood Justification (SUBJ)/Uncrossmatched Blood Justification (UBJ) form (order Provider's signature), Transfusion Reports (two signatures), and Documentation Flow sheet are completed.
8. Ensure transfusion reports of all transfused units are completed with patient name, MRN, unit numbers (if applicable), and signatures of transfusionist and 2nd verifier.

HANDOFFS

Provide receiving RN with the following information:

1. Kinds of components transfused
2. Status of current transfusions
3. Components available for transfusion
    a. Location of components
    b. Status of administration orders
4. Current outstanding transfusion orders
5. Any suspected transfusion reactions
6. Important laboratory results [indicating response or need for further transfusion]

FOLLOW UP RECOMMENDATIONS

1. After a massive transfusion event, ensure MTP kit is re-stocked and returned to designated location.
2. Debrief:
    a. After the event the staff involved will meet to evaluate the emergency and the response to it
    b. Discussion will include what went well in addition to the lessons learned
    c. Periodic protocol review is needed to ensure current practices are supported by the policy
    d. Optimal use of the protocol involves teamwork between many professionals at a time of high stress
3. Quality Improvement Teams and Transfusion Committee review

APPENDIX D: MASSIVE TRANSFUSION PROTOCOL ALGORITHM

APPENDIX E: MTP Role Cards

APPENDIX F: Image - MTP Vest

APPENDIX G: MTP Lab Specimen Labels

APPENDIX H: Gender/Age based Rh group O Guide

Appendix I: MTP Documentation Flow sheet (front)
Appendix J: MTP Documentation Flow sheet (back)

References

- Standards for Blood Banks and Transfusion Services. Bethesda, MD: AABB current edition.
- AABB Technical Manual 17th edition, AABB, Bethesda, MD 20814
- PSBC Blood Administration Guidelines for King County Hospitals. Seattle, WA 2013.
- AABB Guidelines for Massive Transfusion, AABB, Bethesda, MD 20814

- Shakur H, Roberts I, Bautista R, Caballero J, et.al. Effects of tranexamic acid on death, vascular occlusive events, and blood transfusion in trauma patients with significant haemorrhage (CRASH-2): a randomised, placebo-controlled trial, Lancet 2010 Jul; 367(9734): 23-32.

Additional information may be obtained:

- CTL Lead or Puget Sound Blood Center Transfusion Service Physician on call 24 hours per day/7 days per week. Phone: 206-292-6525 (option 3)
- Puget Sound Blood Center Transfusion Safety and Patient Blood Management Department; Monday – Friday from 8:00 a.m. to 5:00 p.m. Phone: 206-292-1840
- Hospital Laboratory

www.psbc.org**Current Version Date:** 11/6/2013	**Author:** Melanie Jorgenson, Chief Transfusion Safety Officer
Previous Version Dates: None	**Approved by:** Dr. Yanyun Wu, Chief Medical Officer

APPENDIX A: GLOSSARY OF TERMS ASSOCIATED WITH BLOOD TRANSFUSION

Term	Description
EHP **Emergency Hemorrhage Panel**	Lab values that assist in the treatment and monitoring during bleeding emergencies Lab results in an EHP should be available in less than 30 minutes. PSBC is available to consult in developing a process to meet this expectation. Hct/Hgb Platelet count PT/INR Fibrinogen
Additional MTP Labs	Ionized Calcium Magnesium ABG Type and Crossmatch (one time)
MTP **Massive Transfusion Protocol**	Activated when: • blood loss > (greater than) 2 liters in a 2 hour period, or > (greater than) 3 liters overall • transfusion of 8-10 units of RBC's within a 2 hour period is anticipated • replacement of 50% of circulating blood volume in 1-3 hours • Persistent hypotension or tachycardia and active bleeding
MTP **Massive Transfusion Pack**	Blood Components requested with the activation of a Massive Transfusion Protocol Includes: o 6 (six) units Red Blood Cells Uncrossmatched Type O (if type specific units are not immediately available) - Rh will depend on gender/age (per Gender/Age based Rh group O Policy) ABO Compatible Crossmatched(if valid sample available and compatible units available). If no sample, Group O Un-crossmatched RBC units will be issued. Efforts should be made to collect a 7ml EDTA sample prior to the transfusion of un-crossmatched units to facilitate a retrospective crossmatch

	o 4 (four) units Plasma "Universal Type" Plasma (AB) will be issued if type specific not immediately available. o 1 (one) Apheresis Platelet o 1 (one) Cryoprecipitate Pool (6 units/pool)
Massive Transfusion Triggers & Goals	Initial transfusions may begin empirically. Laboratory Guidelines for initiations of transfusions o Fibrinogen < 150mg/dL, or if DIC is suspected- transfuse one to two cryo pools (will need to request additional cryo pool if giving two). One cryo pool will increase fibrinogen by 45mg/dL. o Platelets < 100,000 – transfuse one apheresis platelet unit. One apheresis unit will increase platelet count by 20,000-50,000. o INR ≥ 1.6 – transfuse 4 units of plasma o Transfuse RBCs consistent with clinical condition, consult PSBC Physician on call. Goals for patient at risk for ongoing bleeding: • Core Temperature >35.9C • pH > 7.3
PSBC **Puget Sound Blood Center**	Centralized transfusion service for King County, responsible for testing, storing, and issuing ordered blood components.
Transfusion Reaction	Any adverse event which occurs during or following a blood component transfusion.

APPENDIX C: Emergency Blood Component Order Classifications (non – Hemosafe hospitals)

NOTE: Additional information about blood components is available on the Puget Sound Blood Center website ***www.psbc.org***

Component				
Emergency Red Blood Cells (RBC)	**Emergency** o Call hospital laboratory and request Stock Uncrossmatched Group O RBCs or ABO type specific Emergency Uncrossmatched RBCs. o The provider will be required to follow-up with a completed/signed "Uncrossmatched Blood Justification" form (PSBC form #99-32060 or 99-32061)	**Stock Uncrossmatched RBCs** o Hospital Laboratory stores Stock Uncrossmatched Group O Red Blood Cells for use in a life threatening emergency o A 7 mL EDTA (lavender or pink top) blood specimen MUST be collected from the patient BEFORE transfusion, if possible. This specimen will be used to perform the required "Retrospective Crossmatch" to confirm transfused units were, in fact, compatible for the patient.	**Emergency Uncrossmatched RBCs** o For unstable patients with urgent need for blood, ABO/Rh type specific RBCs issued by PSBC **within 30-45 minutes** of receipt of specimen or phone order—before the completion of the Antibody Screen and crossmatch. Typically follows stock uncrossmatched units, if crossmatched units are not yet available. o A 7 mL EDTA (pink or purple top) blood specimen is needed unless a previous specimen was collected within the last 3 days. o The Antibody Screen and crossmatch will be completed within 60 minutes of issue (may take longer if patient has antibodies). o PSBC will notify hospital laboratory immediately if an incompatibility is discovered (and compatible RBCs will be issued).	**Emergency Crossmatched RBCs** o For stable patients with an urgent need for blood. RBCs are issued by PSBC fully crossmatch compatible **within 1 hour** of receipt of order if no red cell antibodies found upon screening o A 7 mL EDTA (pink or purple top) blood specimen is needed unless a previous specimen was collected within the last 3 days.
Emergency Plasma (Thawed Plasma or Fresh Frozen Plasma/FFP)	**"Universal Type" Plasma (Group AB)** o Bleeding emergencies o Emergency coagulopathy reversal in Intracranial hemorrhage, if 4 Factor PCCs contraindicated or	**Emergency ABO Compatible Plasma** o An existing patient blood type on file at Puget Sound Blood Center. o The expected turn-around-time if issued from PSBC is **20-45 minutes** of request receipt by PSBC.		

	unavailable. o When it is determined that there is *no patient blood type on file at Puget Sound Blood Center.* o The expected turn-around-time if issued from PSBC is **20-45 minutes** of request receipt by PSBC. **Note: Group AB plasma is obtained from blood group AB donors, whose blood type is the rarest and represent the lowest percentage of donation. This product is <u>never</u> to be requested for routine transfusion.**			
Emergency Platelets	**Emergency – "*Type Compatible*" Platelets:** o Pooled platelets or platelets collected from a single donor by apheresis that are indicated for: • Bleeding emergencies or pending emergency invasive procedures *with the intent to transfuse immediately*	**Emergency – "*Universal Type" (Group A or AB)* Platelets** o Pooled platelets or platelets collected from a single donor by Apheresis that are indicated for: • Extreme bleeding emergencies or pending emergency invasive procedures *with the intent to transfuse immediately* • When it is determined there is *<u>no patient blood type on file</u>* at Puget Sound Blood Center. o The expected turn-around-time of an Apheresis platelet if issued from PSBC is **20-45 minutes** of request		

	• Where there is an existing patient blood type on file at Puget Sound Blood Center. The expected turn-around-time if issued from PSBC is **within 1 hour** of request by PSBC.	receipt by PSBC. Turnaround time for pooled platelets is longer and should not be ordered for bleeding emergencies unless Apheresis platelets are unavailable.		
Emergency Cryoprecipitate	**Emergency Cryoprecipitate:** o Bleeding emergencies or pending emergency invasive procedures ***with the intent to transfuse immediately*** The expected turn-around-time if issued from PSBC is **20-30 minutes** of request receipt by PSBC.			

APPENDIX D: Massive Transfusion Protocol Algorithm

Active Bleeding (Adult)

Estimate Blood Loss/Patient Condition:

EBL > (greater than) 2 liters in a 2 hour period, or > (greater than) 3 liters overall

Anticipate transfusion of 8-10 units of RBC's within a 2 hour period

Replacement of 50% of circulating blood volume in 1-3 hours

Persistent hypotension or tachycardia and active bleeding

Activation of Massive Transfusion Protocol

MTP Activator:

- ✓ **Obtain MTP Kit**
- ✓ **Assume role of, or designate "MTP Facilitator"**
- ✓ **Assign MTP staff roles and distribute MTP role cards**

MTP Facilitator :

- ✓ **Call hospital laboratory and state:** ***"We are activating the MTP protocol in location_____ room number_____. I am requesting a Massive Transfusion Pack, for patient _____, _____, MRN # _____ in bed _____ per Dr. _____. I am the MTP Facilitator, my name is _____and my contact number is _____. All results of emergency lab orders should be communicated directly to me."***
- ✓ **Apply red vest (from MTP kit)**
- ✓ **Communicate/facilitate all blood orders with hospital lab, updating lab if patient location changes.**
- ✓ **Report lab values to LIP and Recorder**
- ✓ **Anticipate call from PSBC MD, if not received, call 206-292-6525 (option 3.)**
- ✓ **Include in conversation with PSBC POC: origin of Bleed, significant medical history (e.g. coronary artery disease, liver or renal failure, underlying disease process, severe thoracic, abdominal, pelvic or multiple long bone trauma, anticoagulation status)**

Assisting RN/ Anesthesiologist:

Lab Monitor:

- ✓ Insert 2nd peripheral line
- ✓ Collect type and crossmatch sample (should be collected before any blood component transfused if possible)
- ✓ Collect baseline ABG, Mag., iCal, and EMH and every 30 min. until patient stable.

Blood Prep. & Administration:

- ✓ Monitor patient vital signs and communicate to recorder
- ✓ Infuse all blood components per protocol and LIP orders after initial lab draw
- ✓ Utilize rapid infusion device with warmer and per protocol (if available)

Additional Staff:

Recorder:
(utilize MTP doc. flow sheet)

- ✓ Facilitate lab and blood orders
- ✓ Track specimens sent to lab (time sent and results) and record results
- ✓ Record I&O
- ✓ Record blood components and full unit number
- ✓ Ensure SUBJ/UBJ and Transfusion Reports completed

Runner:

- ✓ Obtain transfusion equipment
- ✓ Obtain rapid infusion device (if available)
- ✓ Deliver specimens to hospital lab
- ✓ Communicate with recorder when specimens have been delivered to lab
- ✓ Pick up additional blood components as needed

Important Contact Numbers:

PSBC Physician On-Call
206-292-6525 (option 3)

Hospital Laboratory:
#####

Hospital Blood Bank:
#####

Rapid Response Team:
#####

Code Blue Activation:
#####

Ordering Provider: Transfusion Guidelines

Initial transfusions may begin empirically

If No Lab Values:

- Consider transfusing all components in MTP on arrival from lab.
- If suspect DIC give 1 or 2 cryo pools

General Ratio Guidelines:

- Every 2 RBCs, give 1 Plasma
- Every 6 RBCs, give 1 Apheresis Platelet and 1 Cryo pool

Fibrinogen <150:
Transfuse 1 or 2 Pooled Cryo Unit *prioritize

INR ≥ 1.6:
Transfuse 4 Plasma units

Platelets <100,000 u/L:
Transfuse 1 Aph. Platelets

Transfuse 1-6 RBC Units consistent with clinical condition of patient

Order STAT and q30 minutes:
Emergency Hem Panel:
(includes) Hct, Platelet PT/INR, and Fibrinogen
and
Ionized Calcium
Magnesium
ABG
Type and Crossmatch
(one time only)

Goals:
Core Temp > 35.9C
pH > 7.3

APPENDIX E: MTP Role Cards

Cut & Laminate

MTP Facilitator :

- ✓ **Call hospital laboratory and state: *"We are activating the MTP protocol in location_____ room number_____. I am requesting a Massive Transfusion Pack, for patient _____, _____, MRN # _____ in bed _____ per Dr. _____. I am the MTP Facilitator, my name is _____and my contact number is _____. All results of emergency lab orders should be communicated directly to me."***
- ✓ **Apply red vest (from MTP kit)**
- ✓ **Communicate/facilitate all blood orders with hospital lab, updating lab if patient location changes.**
- ✓ **Report lab values to LIP and Recorder**
- ✓ **Anticipate call from PSBC MD, if not received, call 206-292-6525 (option 3.)**
- ✓ **Include in conversation with PSBC POC: origin of Bleed, significant medical history (e.g. coronary artery disease, liver or renal failure, underlying disease process, severe thoracic, abdominal, pelvic or multiple long bone trauma, anticoagulation status)**

Lab Monitor:

- ✓ Insert 2nd peripheral line
- ✓ Collect type and crossmatch sample (should be collected before any blood component transfused if possible)
- ✓ Collect baseline ABG, Mag., iCal, and EMH and every 30 min. until patient stable.

Recorder:

(utilize MTP doc. flow sheet)

- ✓ Facilitate lab and blood orders
- ✓ Track specimens sent to lab (time sent and results) and record results
- ✓ Record I&O
- ✓ Record blood components and full unit number
- ✓ Ensure SUBJ/UBJ and Transfusion Reports completed

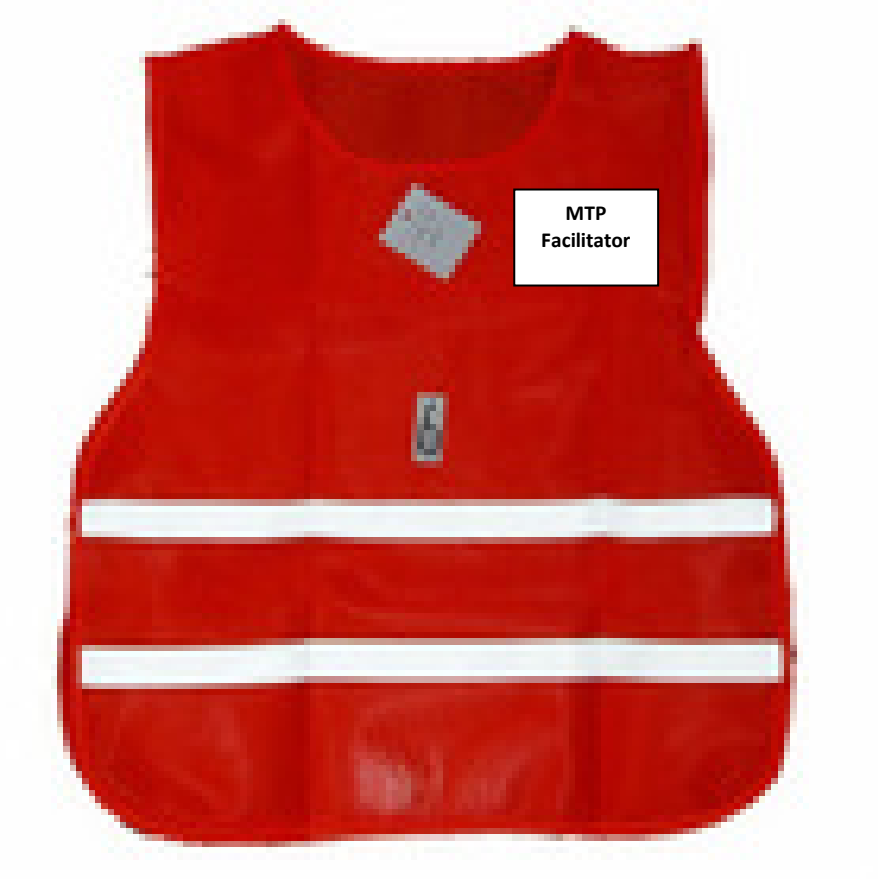
Runner:

- ✓ Obtain transfusion equipment
- ✓ Obtain rapid infusion device (if available)
- ✓ Deliver specimens to hospital lab
- ✓ Communicate with recorder when specimens have been delivered to lab
- ✓ Pick up additional blood components as needed

Blood Prep. & Administration:

- ✓ Monitor patient vital signs and communicate to recorder
- ✓ Infuse all blood components per protocol and LIP orders after initial lab draw
- ✓ Utilize rapid infusion device with warmer and per protocol (if available)

APPENDIX F: MTP Vests



APPENDIX G: MTP Lab Specimen Labels

Massive Transfusion Protocol	**Initial Draw**	**Initial Draw**
Massive Transfusion Protocol	**30 Minute Draw**	**30 Minute Draw**
Massive Transfusion Protocol	**60 Minute Draw**	**60 Minute Draw**
Massive Transfusion Protocol	**90 Minute Draw**	**90 Minute Draw**
Massive Transfusion Protocol	**120 Minute Draw**	**120 Minute Draw**

Emergency Uncrossmatched Group O RBCs

Gender and Age	RBC Blood Type
Females: less than 50 years old	O Negative
Males: less than 18 years old	O Negative
Females: 50 years or older	O Positive
Males: 18 years or older	O Positive

APPENDIX I: MTP Documentation Flow sheet (front)

Date _____

MTP PROTOCOL DOCUMENTATION FLOWSHEET

ADMINISTERED BLOOD COMPONENTS						
	UNIT # STICKER	**INDICATE ✓ COMPONENT TYPE**	**START TIME**	**STOP TIME**	**VOLUME* (mL)**	**RN/ MD INITIALS**
1		☐ **RBC** ☐ **PLASMA** ☐ **CRYO** ☐ **PLATELETS**				
2		☐ **RBC** ☐ **PLASMA** ☐ **CRYO** ☐ **PLATELETS**				
3		☐ **RBC** ☐ **PLASMA** ☐ **CRYO** ☐ **PLATELETS**				
4		☐ **RBC** ☐ **PLASMA** ☐ **CRYO** ☐ **PLATELETS**				
5		☐ **RBC** ☐ **PLASMA** ☐ **CRYO** ☐ **PLATELETS**				
6		☐ **RBC** ☐ **PLASMA** ☐ **CRYO** ☐ **PLATELETS**				
7		☐ **RBC** ☐ **PLASMA** ☐ **CRYO** ☐ **PLATELETS**				
8		☐ **RBC** ☐ **PLASMA** ☐ **CRYO** ☐ **PLATELETS**				
9		☐ **RBC** ☐ **PLASMA** ☐ **CRYO** ☐ **PLATELETS**				
10		☐ **RBC** ☐ **PLASMA** ☐ **CRYO** ☐ **PLATELETS**				

_____	_____	_____	_____
Initials	**Signature**	**Date**	**Time**
_____	_____	_____	_____
Initials	**Signature**	**Date**	**Time**
_____	_____	_____	_____
Initials	**Signature**	**Date**	**Time**

*Estimated volumes: RBC = 350mL, Plasma = 250mL, Platelets 300mL, Cryo = 120mL

Appendix J: MTP Documentation Flow Sheet (back)

Schedule	Time Collected	Time Resulted	MTP Lab Values	
Baseline			☐ Type and Crossmatch (one time only) ☐ Hct/Hgb _____ /_____ ☐ Platelet Count _____ ☐ PT/INR _____ / _____ ☐ Fibrinogen _____	☐ iCal _____ ☐ Mag _____ ☐ ABG: pH_____ PaCO2 _____ PaO2 _____ HCO3 _____ O2Sat _____ BE _____
30 Minute			☐ Hct/Hgb _____ /_____ ☐ Platelet Count _____ ☐ PT/INR _____ / _____ ☐ Fibrinogen _____	☐ iCal _____ ☐ Mag _____ ☐ ABG: pH_____ PaCO2 _____ PaO2 _____ HCO3 _____ O2Sat _____ BE _____
60 minutes			☐ Hct/Hgb _____ /_____ ☐ Platelet Count _____ ☐ PT/INR _____ / _____ ☐ Fibrinogen _____	☐ iCal _____ ☐ Mag _____ ☐ ABG: pH_____ PaCO2 _____ PaO2 _____ HCO3 _____ O2Sat _____ BE _____
90 minutes			☐ Hct/Hgb _____ /_____ ☐ Platelet Count _____ ☐ PT/INR _____ / _____ ☐ Fibrinogen _____	☐ iCal _____ ☐ Mag _____ ☐ ABG: pH_____ PaCO2 _____ PaO2 _____ HCO3 _____ O2Sat _____ BE _____
Next 30 minutes			☐ Hct/Hgb _____ /_____ ☐ Platelet Count _____ ☐ PT/INR _____ / _____ ☐ Fibrinogen _____	☐ iCal _____ ☐ Mag _____ ☐ ABG: pH_____ PaCO2 _____ PaO2 _____ HCO3 _____ O2Sat _____ BE _____