Intention: The success of running a Massive Hemorrhage Protocol (MHP) is dependent on the collaborative work of a multi-disciplinary team. The Job Action Checklists below are designed as educational tools to help guide staff training and ensure an understanding of individual roles and responsibilities during an MHP. Due to the dynamic clinical situation and differences in staff available at hospital patient care units during a MHP Activation (CODE TRANSFUSION), it is understood that roles of individuals participating in the MHP may vary in comparison to the job actions listed.

CODE TRANSFUSION

Physician Lead

Job Action Checklist

√	ACTIONS
	START OF CODE
	Determine patient meets activation criteria for MHP activation. Inform clinical team that you are the team lead and declare "Activate a CODE TRANSFUSION"
	Assign a Team Contact and ensure that the CODE TRANSFUSION activation is called to Switchboard at 3-2-1 by the Team Contact.
	Order blood work at initiation of code: - Group & Screen to enable group specific blood issue (ask Team Contact to confirm with TML if another sample needed); - Draw CBC, INR, PTT, Fibrinogen, Ionized calcium, Lactate, Electrolytes and ABG
	Tranexamic Acid administration – confirm what patient has received prior to presentation. Ensure patient receives a total dose of Tranexamic Acid 2 grams IV within 3 hours of trauma or injury (except GI bleeding): - 1 gram IV bolus in 100 mL NS over 10 minutes plus 1 gram infusion over 8 h, or - 1 gram IV bolus in 100 mL NS over 10 minutes, then repeat in 1 hour, or - 2 grams IV bolus in 100mL NS over 20 minutes.
	Consider: cell saver device, blood warmer, Bair Hugger warmer, warm blankets, increase temperature in operating/procedure room, contact operating room, interventional radiology or endoscopy if required
	DURING CODE
	Order blood work q1h: CBC, INR, Fibrinogen, Ionized Calcium, Lactate, Electrolytes and ABG

	If RBC transfusion rate of 4 units/hr or more, component therapy can be administered in the ratios listed in the table below. ***Platelets should be ordered as needed.***

Box 1	RBC 4, FP 4 If Obstetric: FC 4 grams
Box 2	RBC 4, FP 2, FC 4 grams (if not given in Box 1)
Subsequent Packs	Goal directed therapy based on results; if box contents not specified, contents of Box 1 & 2 will alternate

*RBC=Red Blood Cells; FP=Frozen Plasma; FC=Fibrinogen Concentrate

	Aim to maintain blood physiology with lab guidance: ☐Hemoglobin greater than 80g/L ☐Platelets greater than 75 x 10^9/L ☐INR less than 1.8 ☐Fibrinogen greater than 1.5g/L in non-obstetrical patients ☐Fibrinogen greater than 2.0g/L in obstetrical patients ☐Ionized calcium greater than 1.15 mmol/L ☐Base deficit less than 3 mmol/L ☐Temperature between 36-37.5 degrees Celsius
	Instruct a Health Care Professional when and how fast to infuse each blood product
	Permissive hypotension – Consider maintaining systolic BP 70-90 mmHg in the case of penetrating torso trauma, except if associated traumatic brain injury
	Consider cell salvage for intraoperative patient
	Avoid starches (VOLUVEN and similar colloid products) where possible (increases bleeding risk) and intravenous albumin
	END OF CODE
	Inform Lead Nurse when code is completed
	Cease component therapy once bleeding under control
	Assess the need for follow-up blood work
	Complete transfusion administration records for patient chart
	Conduct Code Transfusion debrief

NOTES:

No role for Recombinant Factor VIIa
No role for PCC/Beriplex®/Octaplex® (except for warfarin reversal or direct oral anticoagulants (DOACs) [Factor Xa inhibitors])

CODE TRANSFUSION

Perfusion

Job Action Checklist

√	ACTIONS
	START OF CODE
	Bring Point of Care (ABG, TEG) analyzers, if possible
	Introduce themselves and offer to help and may become Team Contact with TML
	Seek out the MRP/MHP Lead and ask for the patient history and clinical treatment to date
	Inquire if Group/Screen has been sent and follow-up with TML to ensure sample received
	Participate in patient clinical care, including vital signs check and helping with line management
	Procure a blood sample for ABG/TEG analysis if POC analyzers available
	Identify if MHP box(es) is/are available at the bedside
	DURING CODE
	Manage Point of Care ABG & TEG analyzers, if available, and ensure regular patient sample analysis
	May administer blood transfusions and drug recommendations based on ABG and TEG results as per the MRP
	May run a Rapid Infuser or Rapid Ranger
	May assist with blood component identification checks and plasma protein product reconstitution
	May provide cell salvage in operating rooms (if field/blood not contaminated)
	May serve as Team Contact, including communication with TML
	Ensure blood samples sent regularly/consistently to lab
	Ensure MHP coolers arrive from the TML and are organized
	Move with the patient to hospital locations as dictated by clinical need, thereby providing continuity of care
	END OF CODE
	Notify TML re: discontinuation of MHP
	Ensure all blood or coolers are accounted for and returned to TML or are checked and available for transfusion to patient after MHP discontinuation

	Finish processing Cell Salvaged blood. Provide patient labels with volumes for blood bag and Transfusion Record of cell salvaged blood.
	Communicate before leaving scene with MRP and care team re: patient status.
	Remove all Point of Care (ABG, TEG) instruments from scene.

NOTES:

CODE TRANSFUSION

Porter

Job Action Checklist

√	ACTIONS
	START OF CODE
	Porter is to be identified by the Team Contact. NOTE: The Porter role may vary depending on the hospital unit of MHP activation and may include any available individual such as: - Blood Porter (RUH only, available 0800-1600h, 7 days a week) - Unit Clerk, Unit Support Worker, Care Aide - Nurse (RN or LPN) - Paramedic - Medical Student or Resident - Anesthesia Assistant
	Obtain Blood Product and Component Pick-up Slip (Form #102930) with patient identifiers from the Team Contact and collect MHP Box 1 from Transfusion Medicine Laboratory (TML)
	Deliver MHP Box 1 to patient care area STAT, make Lead Physician aware box has arrived
	DURING CODE
	Pick up blood products as requested (a Blood Product and Component Pick-up Slip is required for every MHP Box pickup).
	Deliver MHP boxes to patient area STAT, make the Lead Physician aware the MHP box has arrived.
	Transport equipment to patient care area as requested.
	Take direction from the Team Contact, as indicated.
	Return coolers when empty.
	END OF CODE
	Return coolers and unused blood products to TML.
	Transport patient and return borrowed equipment as indicated.
	Await instructions from Lead Nurse to resume regular activities.

NOTES:

CODE TRANSFUSION

Team Contact

Job Action Checklist

Note: Role may be performed by any Healthcare Provider, who is most commonly a Nurse or Clinical Perfusion, but may include a Resident or Anesthesia Assistant

√	ACTIONS
	START OF CODE
	Confirm Team Contact assignment with the MRP and inform the clinical team that you are the MHP Team Contact. NOTE: If at any time there is a switch in the MHP Team Contact personnel, the Lead Physician must be made aware.
	Call 321, state Code Transfusion, Hospital Site [RUH, JPCH, SCH, SPH], Unit and Room Number. Ask the Switchboard Operator to be connected to the Transfusion Medicine Lab (TML) and stay on the line.
	Provide TML Technologist with patient's name, HSN, DOB (or approximate age), sex, diagnosis, and any known anticoagulant (e.g. patient on warfarin, DOACS) or antiplatelet medications
	Ensure Unit RN Lead assigns Nurse(s): one as the assigned Code Nurse to care for the patient, one as the Charting/Recording Nurse to document the code, and others as required
	Identify a Porter and provide direction to the Porter throughout entire code
	Ensure Blood Product Request Form (Form #103220) is completed with patient identifiers and faxed to the TML at the beginning of the MHP
	Contact operating room, interventional radiology or endoscopy, if required, as directed by the MRP
	DURING CODE
	May communicate updates to the MHP Lead Physician regarding blood product administration and total numbers thereof.
	Communicate transfusion of all blood products to the Charting/Recording Nurse to record
	Communicate to the Porter the need for the next pack – must use a Blood Product and Component Pick-up Slip (Form #102930) with patient identifiers taken by the porter to the lab for each MHP Box or blood product pick-up
	The pneumatic tube system is NOT to be used during a Code Transfusion, all samples MUST be sent via the Porter
	Ensure blood work is drawn q30 min as per protocol and communicate results to Lead Physician
	Ensure Porter is sent for next MHP Box with a Blood Product and Component Pick-up Slip (Form #102930) before running out of blood

	END OF CODE
	Call the TML when code is discontinued by the Lead Physician (JPCH/RUH – 2179, SPH – 5168, SCH – 8204)
	Return all unused blood products to the Transfusion Medicine Lab as they were provided
	Complete incident report on the Safety Reporting System (ext 1600) for any protocol deviations

NOTES:

"Massive Hemorrhage Protocol (MHP) Team Contact Checklist" found on Forms on Demand may be used as an adjunct to this document.

Clinical Perfusion may take over the role of Team Contact from another healthcare provider, should this be agreed upon by the bedside team.

In terms of hemostasis for the bleeding patient, there is:

- No role for Recombinant Factor VIIa
- No role for PCC/Beriplex®/Octaplex® (except for warfarin reversal or direct oral anticoagulants (DOACs) [Factor Xa inhibitors])

CODE TRANSFUSION

Assigned Code Nurse

Job Action Checklist

√	ACTIONS
	START OF CODE
	Prepare blood warmer if available and/or blood tubing
	Give Tranexamic Acid as ordered, if not already given
	DURING CODE
	Maintain blood products as sent by Transfusion Medicine (i.e. keep RBCs and plasma in cooler(s) with cooler closed at all times. Maintain platelets and plasma protein products outside of cooler)
	Collect and label q30min blood work
	The pneumatic tube system is **NOT** to be used during a Code Transfusion, all samples **MUST** be sent via the Porter
	Only transfuse blood products as instructed by Lead Physician
	Check product for any defects prior to hanging
	Continuously (or intermittently q15-60mins) monitor patient's temperature and inform Lead Physician if drops below 36.0˚C
	Measure temperature displayed on fluid warmer hourly and communicate to charting nurse **Note anesthesia is responsible for monitoring temperature on the fluid warmer during the Code Transfusion in the Operating Room*
	END OF CODE
	Assist Charting Nurse with ensuring accurate transfusion documentation is complete.

NOTES:

CODE TRANSFUSION

Charting/Recording Nurse

Job Action Checklist

√	ACTIONS
	START OF CODE
	Chronologically record events until termination of code including order and timing of blood products
	DURING CODE
	Document the following details: - Number of blood components or products transfused on Transfusion Record. - Temperature displayed on the fluid warmer, at least hourly (include time and temperature on the Transfusion Record) - Medications given on the MAR. - Interventions in the Nursing Notes. - Vital Signs at required intervals, per protocol.
	Complete blood component/product checks with another approved care provider prior to transfusion • Visual inspection performed • Patient ID • Lot #/Product # • Expiry date/time
	END OF CODE
	Ensure all documentation is completed prior to patient transfer

NOTES:

CODE TRANSFUSION

Transfusion Medicine

Job Action Checklist

√	ACTIONS
	START OF CODE
	Receive call from Switchboard connecting patient care unit caller. Obtain patient name, MRN, age, sex, diagnosis and activating MRP from person calling in the CODE TRANSFUSION.
	Assign one Transfusion Medicine Technologist as communication lead.
	Determine blood group of red cells required and prepare and issue first MHP box.
	Prepare 4 grams of Fibrinogen if Obstetrical bleed, or if requested by ward.
	Notify ward MHP Box 1 (4 RBC, 4 FP) is ready for pick-up.
	Call Hematology lab to communicate patient name and HSN.
	Prepare and issue MHP Box 2 (4 RBC, 2 FP).
	Notify ward Box 2 is ready
	Prepare PLT if requested by the ward or if platelet count under 75 x 109/L
	Prepare PCC if requested by ward. Patient must be on warfarin and INR greater than 1.5. If patient is on DOAC (factor Xa inhibitors) consult TMP.
	DURING CODE
	Keep 1 box ahead at all times; see chart below. Box 1 – 4 RBC, 4 FFP; 4 grams FC (if Obstetrical bleed) Box 2 – 4 RBC, 2 FFP; 4 grams FC (if non-Obstetrical bleed) Subsequent Packs – Alternate MHP Box 1 and 2 *RBC=Red Blood Cells; FP=Frozen Plasma; FC=Fibrinogen Concentrate
	Follow up with the ward if no blood has been requested within one hour to determine if code should be terminated.
	END OF CODE
	Products returned must be assessed for acceptability back into inventory
	Complete Code Transfusion debrief form

NOTES:

Fibrinogen Concentrate issued may be RiaSTAP or Fibryga, depending on stock.
Issue of rFVIIa requires TMP discussion and approval; it is not routinely used in the context of an MHP.

CODE TRANSFUSION
Hematology Lab
Job Action Checklist

√	ACTIONS
	START OF CODE
	Receive CODE TRANSFUSION page (contains patient room number and unit phone number); Transfusion Medicine Lab will call Hematology with patient identification details.
	Prepare instruments and centrifuge for STAT samples
	Contact front-end specimen receiving to provide them with the patient name and HSN to ensure samples are delivered to lab benches STAT.
	DURING CODE
	STAT processing of laboratory tests with results relayed immediately to Lead Nurses/Team Contact provided ☐Call bedside team to alert them of Hematology and Coagulation results available on printer (including normal results to assist with preventing unnecessary transfusions) ☐Call all critical laboratory results for all other measures ☐If the first result from the fibrinogen cannot be immediately released, call the bedside to alert them of a possibility of a critically low level. ☐ Immediately report Platelet results of 75 or less to Transfusion Medicine at ext 2179 (regardless of hospital MHP site).
	END OF CODE
	Receive CODE TRANSFUSION ALL CLEAR page; an overhead announcement will also be made.
	STAT processing of end of resuscitation laboratory tests with results relayed immediately to MHP Team Contact at the bedside.

NOTES:

CODE TRANSFUSION
Switchboard/Telecommunications
Job Action Checklist

√	ACTIONS
	START OF CODE
	Receive CODE TRANSFUSION notification from caller. Record the following information: ○ Location - Hospital, Ward/Unit, Room ○ Unit/Ward Phone number
	Transfer the caller to the Transfusion Medicine Lab at ext. 2179 (regardless of hospital site of MHP Activation).
	Announce CODE TRANSFUSION with unit/ward number area overhead.
	Send out text page to CODE TRANSFUSION group including CODE TRANSFUSION, Unit Number and phone number the unit/ward.
	DURING CODE
	No action required
	END OF CODE
	If call is received to cancel the code instruct caller to notify the Transfusion Medicine Lab directly at ext. 2179 to advise them of the cancellation or discontinuation.
	Receive call from Transfusion Medicine reporting CODE TRANSFUSION discontinuation.
	Complete overhead CODE TRANSFUSION ALL CLEAR announcement and CODE TRANSFUSION group text page.

NOTES:

CODE TRANSFUSION group page includes:

- Clinical Perfusionist on-call
- Hematology Technologist pager (MHP hospital site specific)
- Transfusion Medicine Technologist pager (MHP hospital site specific)
- Transfusion Medicine Physician on-call – Staff only