**MASSIVE HEMORRHAGE PROTOCOL (MHP) CHECKLIST**

<table>
<thead>
<tr>
<th>TIME &amp; PACK</th>
<th>ACTION</th>
<th>INITIALS</th>
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**ACTIVATION & PACK 1 (date dd__/mo__/yr__ time__/__)**

- MHP Lead RN: _________________________
- Call to hospital locating (ext. - - - - ) to activate **CODE TRANSFUSION**
- Provide patient number, name, sex, age, body weight in kg (if < 13 years of age), location, and information regarding patient use of antiplatelet or anticoagulants to blood bank at ext. - - - -
- Anti-platelets □ Yes; Anticoagulant □ Yes, drug name: __________________________
- □ Ensure identification band is affixed to patient
- □ Obtain group and screen sample
- □ Obtain baseline blood work
- **Tranexamic acid**: Consider administering 30 mg/kg iv bolus tranexamic acid (maximum dose 2 g) over 20 minutes and an iv/io infusion of 10 mg/kg/hour  
  *Hold if: more than 3 hours from injury/onset of hemorrhage or given pre-hospital or pre-activation or patient has a gastrointestinal hemorrhage*
- **Hypothermia prevention**:  
  □ Measure and document patient temperature  
  □ Obtain blood warmer for all infusions  
  □ If patient temperature less than 36°C start active warming
- **Initiate transfer out**: Notify if required:  
  □ CritiCall - 1-800-668-4357 □ EMS □ Ornge
- **Obtain 1st MHP pack (if not obtained before activation)**:  
  Pack arrival time (__/__/__)
  □ □ □ □ 4 units Red Cells (RBCs) [# units dependent on the patient’s body weight (kg); 20 ml/Kg per dose, unless laboratory results direct otherwise]

  *Use Rh-negative blood only for females  
  Avoid additional boluses or infusions of crystalloid except on physician order*
- **Platelets (if available)**: If platelet count below 50 x10⁹/L or patient on an antiplatelet drug, transfuse 10 mL/kg of pooled platelets
- **Fibrinogen**: If fibrinogen less than 1.5 g/L, administer 50 mg/kg fibrinogen concentrate (max dose 4 g if > 30 kg; max dose 2 g if < 30 kg) over 5 min by iv push
- **Calcium**: 20 mg/kg (minimum 1 g) Calcium Chloride or 60 mg/kg (maximum 3 g) Calcium Gluconate iv push after pack 1 or ionized calcium <1.15 mmol/L
- **Anticoagulant reversal**:  
  □ If Warfarin: PCC 15 IU/kg (for INR <3 or if INR unknown) or PCC 30 IU/kg (for INR > 3) iv over 10 minutes AND Vitamin K 1- 10 mg (neonate to adolescent) iv over 10 min
If Xa inhibitors (e.g., apixaban, rivaroxaban), Dabigatran, or Heparins: consultation with hematologist recommended

**PACK 2** (Arrival time __ / __)

- Obtain hour one blood work
- Review last set of blood work to ensure at target: Hemoglobin greater than 80 g/L, INR less than 1.8, fibrinogen greater than 1.5 g/L, platelets greater than 50x10⁹/L, blood glucose > 4 mmol/L, ionized calcium ≥ 1.15 mmol/L & potassium < 5.8 mmol/L
- Measure and document patient temperature
- If patient temperature less than 36°C start active warming

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**Obtain 2⁰ MHP pack (if needed):**

Transfusions based on laboratory measures where feasible
- 4 units Red Blood Cells [# units dependent on the patient’s body weight (kg); 20 ml/Kg per dose, unless laboratory results direct otherwise]
- Prothrombin Complex Concentrate 25 IU/kg (round to closest 500 IU) max 2000 IU
- Fibrinogen concentrate 50 mg/kg (max dose 4 g if > 30 kg; max dose 2 g if < 30 kg) over 5 min by iv push
- Platelets (if available): if platelet count < 50 x10⁹/L, 10 mL/kg of pooled platelets

**Anticoagulant reversal (only if ongoing hemorrhage):**
- If Xa inhibitors (second dose): consultation with hematologist recommended
- Calcium: 20 mg/kg (max 1 g) Calcium Chloride or 60 mg/kg (max 3 g) Calcium Gluconate iv push after pack 2 or ionized calcium <1.15 mmol/L

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**PACK 3** (Arrival time __ / __)

- Obtain hour 2 blood work
- Review last set of blood work to ensure at target including blood glucose > 4 mmol/L, ionized calcium ≥ 1.15 mmol/L & potassium < 5.8 mmol/L
- Measure and document patient temperature
- If patient temperature less than 36°C start active warming

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**Obtain 3⁰ MHP pack (if needed):**

Transfusions based on laboratory measures where feasible
- 4 Units Red Blood Cells [# units dependent on the patient’s body weight (kg); 20 ml/Kg per dose, unless laboratory results direct otherwise]
- Prothrombin Complex Concentrate 25 IU/kg (round to closest 500 IU) max 2000 IU
- Fibrinogen concentrate 50 mg/kg (max dose 4 g if > 30 kg; max dose 2 g if < 30 kg) over 5 min by iv push
- Platelets (if available): if platelet count < 50 x10⁹/L, 10 mL/kg of pooled platelets
- Calcium: 20 mg/kg (max 1 g) Calcium Chloride or 60 mg/kg (max 3 g) Calcium Gluconate iv push after pack 3 or ionized calcium <1.15 mmol/L
### HANDOVER SBAR TOOL FOR HANDOVER TO THE TRANSPORT TEAM

(\text{Time } _{-} / {_} {_)}

<table>
<thead>
<tr>
<th>S: SITUATION (Relay the following)</th>
<th>HANOVER NOTES</th>
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<tbody>
<tr>
<td>□ Patient age, sex, weight</td>
<td></td>
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<tr>
<td>□ Patient estimated blood volume (70 ml/kg) _________ L</td>
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<tr>
<td>□ Context (trauma ± TBI, surgery, or other)</td>
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<tr>
<th>B: BACKGROUND (Relay the following)</th>
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<tbody>
<tr>
<td>□ TXA administration</td>
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<tr>
<td>____ grams</td>
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<tr>
<td>□ Total volume (ml-unless specified) of blood products</td>
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<tr>
<td>_____ RBC</td>
<td></td>
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<tr>
<td>_____ PLTs</td>
<td></td>
</tr>
<tr>
<td>_____ g Fibrinogen</td>
<td></td>
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<tr>
<td>_____ IU PCC</td>
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<tr>
<td>□ Total (L) crystalloid and/or colloid and urine output</td>
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<tr>
<td>_______ L of non-blood product fluid; ______ L of urine output</td>
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<tr>
<td>□ IV / IO access and need for vasopressors</td>
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<tr>
<td>□ For trauma, external/internal bleeding ± TBI management</td>
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<tr>
<td>□ Consultant(s) involved (e.g., surgery, radiology or gastroenterology)</td>
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<tr>
<td>□ Complications (hypothermia, coagulopathy, acidosis or arrhythmias)</td>
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<tr>
<th>A: ASSESSMENT (Relay the following)</th>
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<tbody>
<tr>
<td>□ Hemodynamic status (stable or unstable, vitals and temperature)</td>
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<tr>
<td>□ Blood products prepared for transport</td>
<td></td>
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<tr>
<td>□ Critical labs (specify) and latest blood work results</td>
<td></td>
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<tr>
<td>Hgb _____ PLT _____ INR _____ Fibrinogen _____ Lactate _____ Calcium</td>
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<tr>
<th>R: RECOMMENDATION (Consider the following)</th>
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<tr>
<td>□ Consider need for additional blood products during transport</td>
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<tr>
<td>□ Consider need for drug re-dosing during transport</td>
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### TERMINATION (time _{-} / {_} {_)}

- Once either hemorrhage control is obtained and patient is hemodynamically stable
- Call blood bank and the hematology laboratories to terminate the protocol or patient has been transferred to tertiary centre for definitive hemorrhage control
- Check list
  - Measure and document patient temperature
  - Return all unused blood products in appropriate storage containers
  - Complete this form and place in patient chart
  - Complete handover SBAR tool below with transport team

- Once either hemorrhage control is obtained and patient is hemodynamically stable
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