Ontario MHP

ORBCoN
Ontario Regional Blood Coordinating Network

Transfusion Medicine Boot Camp

MHP: Nursing Care in Rural Care Settings

Disclosure

- No commercial product conflicts of interest to declare.

Learning Objectives

By the end of our session, attendees should be able to:

- Recognize the importance of arranging for transfer to a higher acuity centre early in the protocol.
- List the duties and interventions which become the responsibility of the ED nurses during evening and weekend hours.
- Identify the blood products which are used to promote hemostasis in the absence of Plasma and Platelets.
- Describe the value in the resources which have been put in place to support rural staff in the absence of additional human resource supports.

Huron Perth Healthcare Alliance

- 4 geographically separated hospitals, 3 of which are rural:
  - Clinton
  - Seaforth
  - St. Marys

Staffing at rural sites:

- 2 ED nurses
- 1 ED physician (may be a locum)
- Ø RTs
- Ø Porters
- Ø lab staff on site overnight and limited on weekends (some on call)
- Ø imaging staff on site overnight and limited on weekends (on call available)

Goals of MHP Implementation

1. **Minimize under-activation** that could result in a fatal outcome or prolonged time to hemorrhage control;
2. Ensure **packed red blood cells** (PRBCs) are delivered to the patient bedside within 10 minutes of protocol activation and post-transfusion hemoglobin is maintained between 60-110 g/L;
3. Ensure patients without contraindication receive **TXA** as soon as IV access is obtained and optimally within 1 hour of injury/onset of hemorrhage. (Not universally recommended in GI Bleeds);
4. Ensure patients requiring **transfer** for definitive care have transport personnel mobilized promptly;
5. Ensure all patients have interventions to **prevent hypothermia** and achieve normothermia by the end of resuscitation (above 36°C);
6. Minimize use of **universal donor** components (O packed red blood cells);
7. Eliminate blood component **wastage**.

Question

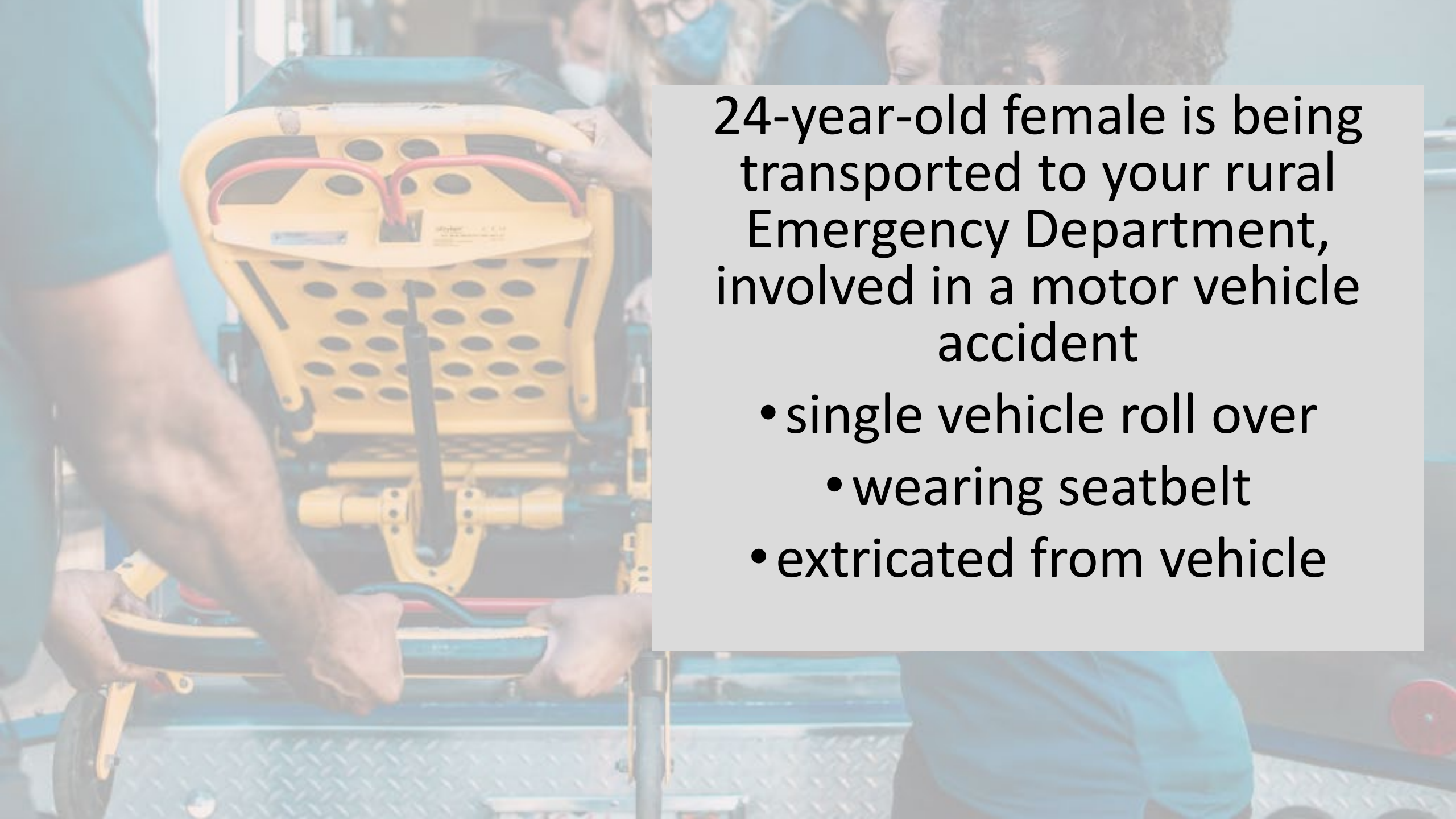
Which of the following is **NOT** one of the **7 Ts** outlined in the ORBCoN MHP Toolkit?

a. Triggering
b. Team
c. Transport
d. Testing
e. Tranexamic Acid (TXA)

The Ts of Massive Hemorrhage Protocol for Rural Sites.

- **T**riggering
- **T**eam
- ***T**ransport*
- **T**esting
- **T**xa
- **T**emperature
- **T**ransfusion
- **T**ermination

Image: freepik.com



24-year-old female is being transported to your rural Emergency Department, involved in a motor vehicle accident

- single vehicle roll over
- wearing seatbelt
- extricated from vehicle

Paramedics Report:

- ↓ LOC, moaning
- Bilateral periorbital ecchymosis
- Oxygen 60% nonrebreather (NRB) mask
- Seat belt sign (linear ecchymosis of the abdomen)
- Obvious right femur fracture
- Vital signs:
  - Temp 35.5 ^{O}C
  - HR 130/minute,
  - B/P 86/50 mmHg
  - RR 26/minute
  - O2 sats 95% on NRB

Question

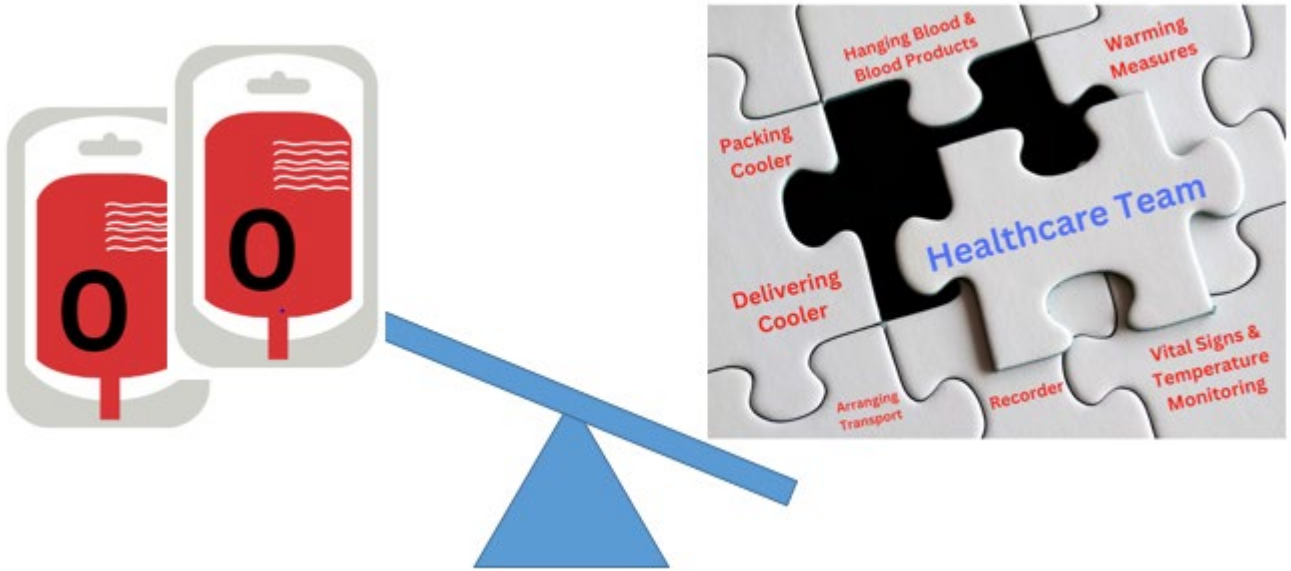
Which of the following might prompt the ED Physician to trigger a “Code Transfusion”?

a. Hemodynamic instability
b. Potential abdominal bleed
c. Potential blood loss from femur fracture
d. Any of the above

TRIGGERING
TEAM
TRANSPORT
TESTING
TXA
TEMPERATURE
TRANSFUSION
TERMINATION

On arrival Jane is transferred to an ED stretcher and the ED physician begins to assess her.

- Physician will activate the MHP when indicated.
  - They may be unfamiliar with the process, so we created Order Sets and algorithms outlining essential components
- Switchboard in Stratford is notified
  - “Code Transfusion” is called overhead



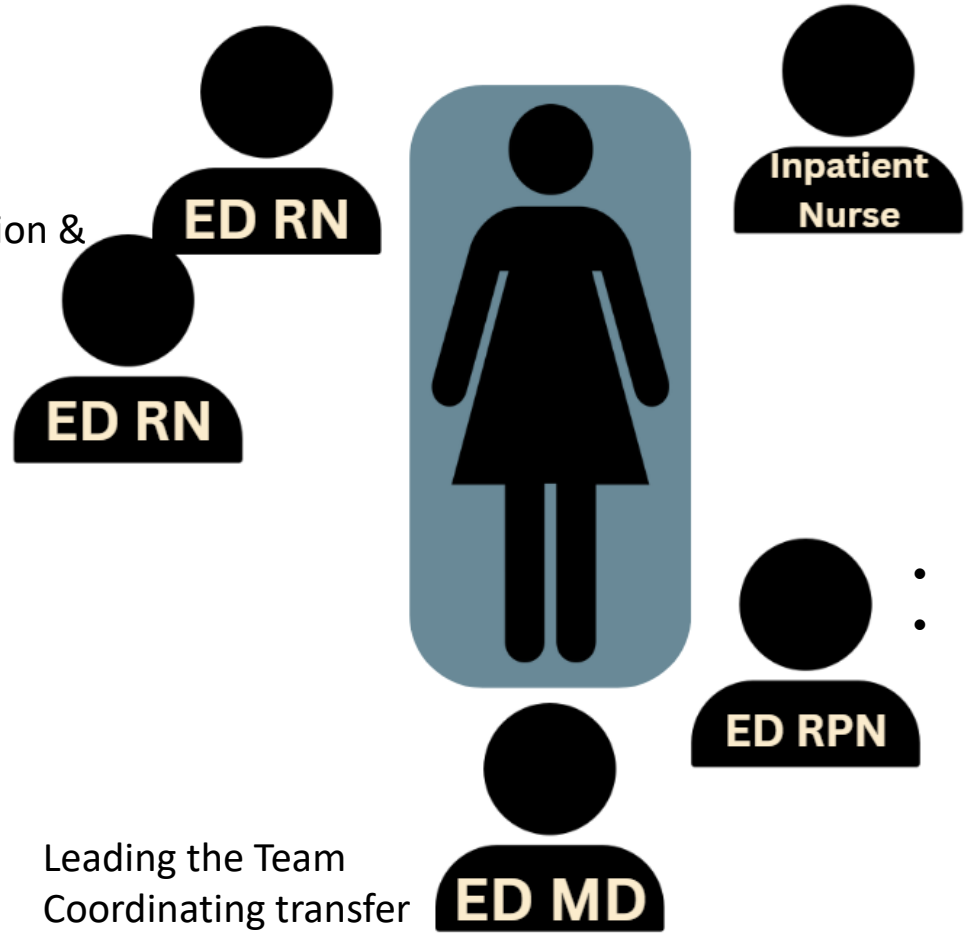
TRIGGERING
TEAM
TRANSPORT
TESTING
TXA
TEMPERATURE
TRANSFUSION
TERMINATION

Once the Code Transfusion is called, the TEAM is assembled and ready to care for Jane.

- Obtaining vascular access
- Drawing labs

- Assisting with Blood Product Reconstitution & Administration

- Administering blood *"Hot & Fast"*



- Obtaining blood from lab
- Assisting with Blood Product Reconstitution & Administration

- Vital Sign & Temperature
- Monitoring

- Leading the Team
- Coordinating transfer

Resources

HURON PERTH HEALTHCARE ALLIANCE

Allergies: ☐ NKA or: _

Weight (kg) _____ SCAN

HPHA MASS

Dr.

DIAGNOSIS:

Exsanguination re

- ☐ Local traumatic i
- ☐ GI bleed
- ☐ Obstetrical

MHP Criteria

- ☐ Shock index (HR
- ☐ ABC Score (1 pc
- ☐ More than 4 unit

STAT CONSULTS/

For hemostasis

- ☐ OB-GYN for inse
- ☐ General Surgery

For Transfer

- ☒ CritiCall 1- 800-6

VITALS/MONITORI

- ☒ HR, RR, BPQ15
- ☒ Core Temperatu
- ☒ Continuous card
- ☒ Continuous oxyg
- ☐ Intake and Outpu
- ☐ GCS Q____Hou

LINES/TUBES

- ☒ 2 IVs 20 gauge c
- ☒ Saline Lock with
- ☐ Foley catheter

RESPIRATORY:

- ☒ Oxygen to keep
- ☒ Notify MRP if oxy
- ☒ Observe tongue
- product

ADULT (13 years and o

MHP Activated at Discretion of Physician

1. Severe / uncontrolled bleeding
2. Systolic BP less than 90 mmHG
3. Heart Rate greater than 120 BPM
4. Penetrating Injury
5. Positive FAST (Focused Assessment with Sonography in Trauma)

Initiate Code Transfusion

- Press **Hotline button** to contact switchboard to announce Code Transfusion

OR

- **Dial 1111** to contact switchboard to announce Code Transfusion

Registration staff will –
* notify SGH Lab immediately of Code Transfusion.
* **after 2300** will link with Seaforth or St Marys on call lab team to assist with product delivery to CODE TRANSFUSION Site

On MRP Direction Call CritiCall to Initiate Transport Request

1 - 800 - 668 - 4357

MHP Cool

Locate CBS Transport
(Back lab, left-hand s
bench)

Grab cooler conte

Cooler #1 | **Clinton Sites c**

-2 units O Negative years.
All others receive 2 u

-2000 IU PCC (Proth Concentrate) - **4 box**

-4 g Fibrinogen Con **RiaSTAP**

Pack Blood Box

Put Octaplex and RiaSTAP boxes on bottom of box.
Place blood (wrapped in plastic bag) on top of boxes.

HURON PERTH HEALTHCARE ALLIANCE

MHP- Code Transfusion Record-Adult

Place patient label here

Date & Time:	**Time Code Transfusion Ended:**
Site & Department:	**Reason:**
Hemorrhage cause: ☐ Trauma ☐ GI Bleed ☐ Obstetrical ☐ Other:	

MD Leader:	**ED RN:**	**ICU RN:**
Recorder Name, Signature, Designation:		
Other Staff Present:		
Weight _____		

Venous/Osseous Access

Site #1: IV IO (circle one) Other : Size: _____ Site: _____	Site #2: IV IO (circle one) Other : Size: _____ Site: _____

Medication (i.e. TXA, anticoagulant reversal, Calcium)	**Dose/Route**	**Time**

Cooler	**Blood products**	**Warmed (Circle one)**	**Pressure Infuser Used**	**Time Started**	**Volume Infused**
Cooler # 1 All Sites Time Cooler Received:	☐ PRBC #1 ☐ O+ ☐ O- place unit sticker here	Y/N	Y/N		
	☐ PRBC #2 ☐ O+ ☐ O- place unit sticker here	Y/N	Y/N		
	☐ PRBC #3 ☐ O+ ☐ O- place unit sticker here	Y/N	Y/N		
	☐ PRBC #4 ☐ O+ ☐ O- place unit sticker here	Y/N	Y/N		
	☐ 2000 IU (PCC) Octaplex				
	☐ 4 g (FC) - RiaSTAP				
Cooler #2 SGH ONLY Time Cooler Received:	☐ PRBC #1 **ABO type** _____ place unit sticker here	Y/N	Y/N		
	☐ PRBC #2 **ABO type** _____ place unit sticker here	Y/N	Y/N		
	☐ PRBC #3 **ABO type** _____ place unit sticker here	Y/N	Y/N		
	☐ PRBC #4 **ABO type** _____ place unit sticker here	Y/N	Y/N		
	☐ 2000 IU (PCC) Octaplex				
Cooler #3 SGH ONLY Time Cooler Received:	☐ PRBC #1 **ABO type** _____ place unit sticker here	Y/N	Y/N		
	☐ PRBC #2 **ABO type** _____ place unit sticker here	Y/N	Y/N		
	☐ PRBC #3 **ABO type** _____ place unit sticker here	Y/N	Y/N		
	☐ PRBC #4 **ABO type** _____ place unit sticker here	Y/N	Y/N		
	☐ 2000 IU (PCC) Octaplex				
Cooler #4 SGH ONLY Time Cooler Received:	☐ PRBC #1 **ABO type** _____ place unit sticker here	Y/N	Y/N		
	☐ PRBC #2 **ABO type** _____ place unit sticker here	Y/N	Y/N		
	☐ PRBC #3 **ABO type** _____ place unit sticker here	Y/N	Y/N		
	☐ PRBC #4 **ABO type** _____ place unit sticker here	Y/N	Y/N		
	☐ 2000 IU (PCC) Octaplex				

Question

When a “Code Transfusion” is called at a rural hospital on nights or weekends, which of the following duties will the 2 or 3 ED nurses need to perform?

a. Obtaining the blood products from the lab fridge and packing the cooler.
b. Entering orders for STAT blood work and performing phlebotomy.
c. Setting up the fluid warmer and administering all blood products.
d. Arranging for transport, including making copies of the chart for the receiving facility.
e. All of the above

TRIGGERING
TEAM
TRANSPORT
TESTING
TXA
TEMPERATURE
TRANSFUSION
TERMINATION

Because we may not have access to imaging, and given the low quantity of blood products, the priority for Jane is transfer to a larger center.

CRITICALL ONTARIO

In the meantime, while transfer is being arranged, the team will attempt to target their interventions in order to stop the source of Jane's bleeding.

TRIGGERING
TEAM
TRANSPORT
TESTING
TXA
TEMPERATURE
TRANSFUSION
TERMINATION

Image: Google Images - Lotus Diagnostic Centre

MHP labs STAT, then q1 hour STAT

TRIGGERING
TEAM
TRANSPORT
TESTING
TXA
TEMPERATURE
TRANSFUSION
TERMINATION

Transfer out is being arranged, Jane's status continues to deteriorate.

- To expedite the process, keeping in mind that there may not be a unit clerk available to enter orders… IT created computerized Order Sets which allow staff to enter multiple labs at once by entering
  - MHP-ADULT or MHP-PEDS for example

- Keep in mind that specimens may have to be sent to a larger hospital (Stratford) for processing, if no lab staff are on duty at the rural sites, and the Team will likely not have any results back prior to transporting the patient.

- In other words, we're likely treating based on clinical findings only, and not diagnostic results.

TRIGGERING
TEAM
TRANSPORT
TESTING
TXA
TEMPERATURE
TRANSFUSION
TERMINATION

Every 15 minute delay in giving TXA increases mortality rate by 10% - ORBCoN Provincial Hemorrhage Toolkit

TRIGGERING
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TERMINATION

- Tranexamic acid (TXA) is an anti-fibrinolytic drug that inhibits the enzymatic breakdown of fibrin blood clots (fibrinolysis).

- Needs to be administered as soon as vascular access is obtained, within 1 hour of the onset of bleeding.

- Jane will be given as a 1 gram bolus instead of an infusion, in preparation for transport.
  - Physician IV direct over 10 minutes
  - Nurses Dilute 1 gram in 100ml NS and infuse over 10 minutes via Infusion pump

Google images: SteriMax Inc.

TRIGGERING
TEAM
TRANSPORT
TESTING
TXA
TEMPERATURE
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TERMINATION

Every 1°C drop in core temperature increases the patient's blood loss by 22% - ORBCoN Provincial Hemorrhage Toolkit

TRIGGERING
TEAM
TRANSPORT
TESTING
TXA
TEMPERATURE
TRANSFUSION
TERMINATION

- Maintain Jane's core temperature greater than 36◦C

- The rural sites do not have Level 1 rapid infusers, so to keep Jane warm we'll do the following:
  - Bear hugger
  - Ranger fluid warmer

- The only means of core temperature monitoring that we have at the rural sites is a rectal thermometer (sorry Jane)

TRIGGERING
TEAM
TRANSPORT
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TXA
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TRANSFUSION
TERMINATION

Image: Google images - NHLBI

For every one minute delay in administering blood to the patient, there is an increased risk of death by 5%. ORBCoN Provincial Hemorrhage Toolkit

TRIGGERING
TEAM
TRANSPORT
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TXA
TEMPERATURE
TRANSFUSION
TERMINATION

MHP Cooler Packing—Seaforth Lab—Adult

Version

Locate CBS Transport Box in Lab. (Back lab, left-hand side, under bench)

Go to Fridge

Seaforth's Blood Bank Fridge

Inside Seaforth's Blood Bank Fridge

Grab cooler contents from fridge:

Cooler #1	Clinton, Seaforth, St Marys Sites only

-**2 units O Negative for women under 45 years**.
All others receive 2 units of O positive

-2000 IU PCC (Prothrombin Complex Concentrate) - **4 boxes of Octaplex**

-4 g Fibrinogen Concentrate—**4 boxes of RiaSTAP**

4x 

4x 

2x

Pack Blood Box

Put Octaplex and RiaSTAP boxes on bottom of box. Place blood (wrapped in plastic bag) on top of boxes.

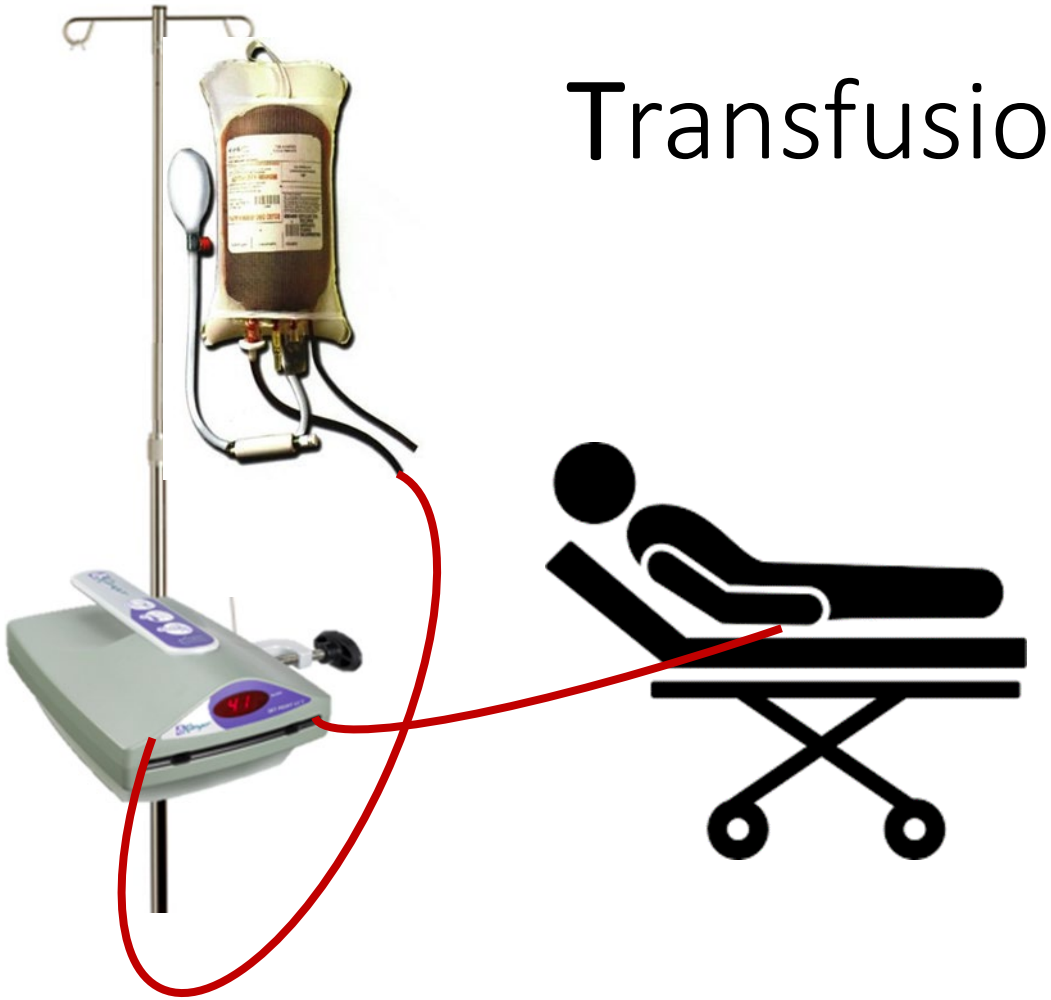
Put the **Physician Approval Form** (found in fridge with RBC units) on the top of the lid and close the container.

Buckle the black strap closed. Ziptie the buckle, leaving room to cut if access is needed.

+

Grab Octaplex & RiaSTAP reconstitution kits beside fridge

Transfusion



Remember – the Massive Hemorrhage Protocol isn't a massive transfusion protocol.

Transfusion is just one piece, and in a rural setting we're going to prioritize damage control of Jane's injuries and transferring her to a larger centre.

Transfusion

- Rural sites do not stock plasma or platelets, so what do we use to help with hemostasis?
  - **Prothrombin Complex Concentrate (PCC)** Octaplex
  - **Fibrinogen Concentrate (FC)** RiaSTAP

Google images: Sapharma

Google Images: Riastap.com

Transfus

octaplex®

Prothrombin Complex Concentrate
500 & 1000 IU Vials

Reconstitution & Use Instructions

Prepare at room temperature and on a stable surface.

Please read all steps thoroughly before proceeding.

1 Wash hands before handling vials. Disinfect the rubber stoppers.

2 Remove Mix2Vial™ cover.

3 Firmly press blue end onto water vial.

4 Remove plastic packaging.

5 Holding the powder vial on a flat surface, **FIRMLY PRESS** the transparent end onto the powder vial.

6 **MAINTAIN PRESSURE** until there is a complete transfer of water into the powder vial.

7 With both vials still attached, slowly swirl (to prevent formation of bubbles) the powder vial to ensure the product is fully dissolved to a clear or slightly opalescent solution.

8 After dilution, **UNSCREW THE TWO PARTS** of the Mix2Vial™ by holding the blue and transparent parts.

9 The transparent part must stay on the octaplex® vial, as it contains the **FILTER** (15µ).

10 Attach a plastic sterile disposable 20 mL syringe to the transparent part of Mix2Vial™.

11 Invert the system and draw the reconstituted octaplex® into the syringe.

RiaSTAP® INSTRUCTIONS FOR USE

Do not use RiaSTAP® beyond the expiration date. RiaSTAP® contains no preservative. Use aseptic technique when preparing and reconstituting RiaSTAP®.

RECONSTITUTION

STEP 1: Room Temperature

- Ensure that the diluent and RiaSTAP product vials are at **room temperature.**

STEP2: Reconstitute with Sterile Water

- RiaSTAP should be reconstituted with 50mL Sterile Water for Injection (diluent is included).

STEP 3: Remove Cap and Clean Surface

- Remove the cap from the product vial. Clean surface of the rubber stopper with alcohol and allow to dry.

STEP 4: Transfer Sterile Water into Product Vial

- Using a 50mL syringe, transfer 50mL of Sterile Water for injection into the product vial. **Aim the fluid stream down the side of the bottle** to minimize clumping.

STEP 5: Dissolve Product

- Gently swirl the product vial to ensure the product is fully dissolved. This may take 5-10 minutes. DO NOT shake the vial which causes the product to foam.

STEP 6: Follow Administration Instructions

(see right hand column of handout)

After reconstitution, the RiaSTAP® solution should be colorless and clear to slightly opalescent. Inspect visually for particulate matter and discoloration prior to administration. Do not use if the solution is cloudy or contains particulates. Discard partially used vials. Do not mix with other medications or IV admixtures.

Typical Massive Hemorrhage Protocol Dosing

Adults: 4 grams (4 vials)
Pediatric: 50mg/kg

(4 grams of Fibrinogen Concentrate = 10 units of Cryoprecipitate)

ADMINISTRATION

Note: Administer the first 2 grams once reconstituted as soon as possible.

➢ **While the first two grams are infusing, you will prepare the 3rd & 4th vials.**

1. Insert the mini-spike dispensing pin (if included in kit) into reconstituted vial.
2. Screw the syringe filter (if included in kit) onto your 50 mL syringe, then attach the other end onto the dispensing pin which is now in the vial.

3. Withdraw all 50 mL of the product into the syringe.
4. Remove the filter from the syringe and attach a red blunt tip needle.
5. Inject the 50 mL of reconstituted product into the provided empty sterile IV bag.
6. Repeat Steps 1-5 for the 2nd reconstituted vial.
7. Hang as a dedicated primary line with regular tubing, primed with the 0.9% NaCl or product.
8. **Infusion rate:**
   - **MHP:** 4 grams infuse over 10 minutes IV direct or via infusion pump.
   - **Non-MHP:** 100 mg per minute (300 mL per hour), will infuse over 40 minutes.
9. After medication infusion, flush line with 50 mL of NaCl 0.9% to ensure entire product is administered.
10. Repeat above steps for 3rd & 4th vials in a separate empty sterile IV bag.

- RiaSTAP is compatible with NaCl 0.9%
- If a subsequent dose is ordered, the same IV tubing can be used as long as the tubing was flushed with 0.9% sodium chloride.
- RiaSTAP® should be administered under the supervision of a physician.

Product Monograph available at www.cslbehring.ca

RiaSTAP Instructions for Use, HPHA, December 2023

TRIGGERING
TEAM
TRANSPORT
TESTING
TXA
TEMPERATURE
TRANSFUSION
TERMINATION

"Terminate" the MHP by calling **Switchboard** when:

- Bleeding source has been controlled
- Transfusion rate of blood and blood products has slowed
- Hemodynamic stability is achieved
- Death occurs

! MD to fill out the Consent for Blood and the Uncrossmatched Blood form

! Send copy of completed Transfusion Record to the lab

HPHA
HURON PERTH HEALTHCARE ALLIANCE

MHP- Code Transfusion Record-Adult

Place patient label here

Jane Doe, age 24

Date & Time: Friday Oct 13, 1520	**Time Code Transfusion Ended:** 1600
Site & Department: Rural ED	**Reason:** Transfer to LHSC
Hemorrhage cause: ☒ Trauma ☐ GI Bleed ☐ Obstetrical ☐ Other:	

MD Leader: Dr. Ross	**ED RN:**	**ICU RN:**
Recorder Name, Signature, Designation:		
Other Staff Present:		
Weight 82.7 kG		

Venous/Osseous Access

Site #1: IV IO (circle one) Other : Size: #18 Site: Rt AC	Site #2: IV IO (circle one) Other : Size: #18 Site: Lt FA

Medication (i.e. TXA, anticoagulant reversal, Calcium)	**Dose/Route**	**Time**
TXA	1 gram IV	1540

Cooler	**Blood products**	**Warmed (Circle one)**	**Pressure Infuser Used**	**Time Started**	**Volume Infused**
Cooler # 1 All Sites	☒ PRBC #1 ☒ O+ ☐ O- C0555 23 911640	Y/N	Y/N	1545	355mL
	☒ PRBC #2 ☒ O+ ☐ O- C0555 23 911675	Y/N	Y/N	1550	325mL
Time Cooler Received:	☐ PRBC #3 ☐ O+ ☐ O- place unit sticker here	Y/N	Y/N		
	☐ PRBC #4 ☐ O+ ☐ O- place unit sticker here	Y/N	Y/N		
	☐ 2000 IU (PCC) Octaplex				
	☐ 4 g (FC) - RiaSTAP				

TRIGGERING
TEAM
TRANSPORT
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TXA
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TRANSFUSION
TERMINATION

While Jane is being transferred to a larger center, the team at the rural site is wrapping things up.

Once the lab has all of the information required, they back-enter the blood products in their computer.

All empty blood containers and tubing are collected into a biohazard bag, in case of suspected transfusion reaction.

Question

Which of the following is **NOT** one of the **7 Ts** outlined in the ORBCoN MHP Toolkit?

a. Triggering
b. Team
c. Transport
d. Testing
e. Tranexamic Acid (TXA)

The 8 Ts of Massive Hemorrhage Protocol for Rural Sites.

- **T**riggering
- **T**eam
- ***T**ransport*
- **T**esting
- **T**xa
- **T**emperature
- **T**ransfusion
- **T**ermination

Image: freepik.com