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Pathology and Laboratory Medicine

# Essentials of an MHP

GHEST 2021

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# Questions

Are you aware of the Provincial Massive Hemorrhage Protocol (MHP)?

- Yes
- No



**Ontario  
MHP**

**Provincial Massive Hemorrhage Toolkit**



**ORBCoN**  
Ontario Regional Blood Coordinating Network

Inspiring and facilitating best transfusion practices in Ontario.



**Ontario's Top 10 Recommendations for Massive Hemorrhage Protocol**

-  All hospitals shall have a protocol to guide the management of a massively bleeding patient
-  The protocol shall be called "The Massive Hemorrhage Protocol"
-  Participating team members should have access to formal training and drills
-  The protocol should specify how the lead clinician at the bedside is designated
-  Tranexamic acid (TXA) should be administered as soon as possible
-  All patients should receive interventions to prevent hypothermia
-  The protocol shall state the reversal strategy for commonly used oral anticoagulants
-  The transport service(s) should be promptly notified if the decision is made to transfer the patient to another hospital for definitive hemorrhage control
-  Laboratory testing should be done at baseline and at a minimum hourly until the protocol is terminated
-  The protocol shall consider the available resources at the institution

 This achieves standardization and better outcomes for patients

For more information on the provincial MHP visit [www.transfusionontario.org](http://www.transfusionontario.org)

# Questions

An MHP in Transfusion Medicine (TM) Laboratory is a standard approach to issuing blood products to a bleeding patient. It outlines how to handle a crisis situation in a systematic manner so that uninterrupted care can be provided.

Does your lab have an MHP?

- Yes
- No

# Objectives

- Simulate an MHP using applicable Transfusion Medicine standards and following Provincial MHP as guidelines
- Discuss MHP changes at LHSC
- Reflections on recent LHSC Code Orange

# SIMULATION

## Scenario

You are the only MLT working in a Community hospital on the night shift. Your duties include phlebotomy as well as core lab including TM testing.



You receive a phone call from your labour and delivery (L&D) department that a STAT group and screen and CBC is required on a patient in active labour. You have grabbed all your necessary supplies, when L&D calls again requesting 2u uncrossmatched blood on the patient that you are to be drawing the GS and CBC.

# What do you do?

- a) Rush to L&D to get bloodwork drawn and assess the situation if uncrossmatched blood is warranted
- b) Rush to L&D with phlebotomy cart and 2u uncrossmatched blood
- c) Rush to L&D with phlebotomy cart and 2u uncrossmatched blood in a temperature controlled container

# Discussion

Ideally, not knowing the full extent of the situation, when multiple units are requested blood is packed into a validated transport container to maintain temperature and avoid wastage of the units should they not be required



WHAT IF?!?!

What happens if the caller indicates the units will be infused immediately and they cannot wait for a container to be packed?

# SIMULATION

The RN who is calling provides the patient name and HRN. The RN indicates they will have the physician signature for uncrossed blood when you arrive to draw the blood work.



When you look up the patient information you note that this is a Female, Age 28 with a historical blood group of A Positive

# What blood products do you choose for the 2 units of uncrossmatched?

- a) Group O Negative, Irradiated
- b) Group O Positive, Kell (K) negative
- c) Group O Positive
- d) Group O Negative
- e) Group O Negative, K negative
- f) Group O Positive, Irradiated

# Discussion

The patient does not have a current group and screen tested yet, so group specific units are an inappropriate choice.

The patients age and gender of Female, age 28 falls into of providing O Negative and K Negative units to people of child bearing potential.

Child bearing potential in most institutions in Ontario is females <45 years old.

# SIMULATION



You arrive with 2u uncrossmatched RBC's in cooler and you note that it is chaos, blood is everywhere and you quickly deduce that the patient is experiencing a massive hemorrhage.



The physician orders you to bring more blood...



You ask if the massive hemorrhage protocol (MHP) will be initiated, and the answer is YES



In your MHP, nursing takes over collecting blood samples and a runner is assigned to deliver blood work to the lab and bring blood products back to bedside

# What products are usually in the first MHP pack as suggested by the provincial MHP?

- a) 4 units RBC
- b) 4 units RBC, 4 Units Plasma
- c) 4 units RBC, 4 Units Plasma, 1 dose platelet
- d) 4 units RBC, 2000IU PCC, 4 g Fibrinogen Concentrate

# Discussion

Provincial MHP suggests 4 units RBC is in the first pack.

Your hospital might have a different ratio of products based on your stock and typical patient requirements.

# SIMULATION



Your routine daily stock is 8u of O Negative RBC's

Your hospital MHP contains 4u of RBC's for the first pack

Earlier in the day, two separate inpatients, who are group O Negative, required transfusion. This leaves you with only 4 O Negative units on the shelf

One of the remaining 4 O Negative units does not have Kell typing on it.

# Which units do you provide for pack #1?

- a) 4 O Negative; 3 K negative, 1 K typing not provided
- b) 3 O Negative, 1 O Positive; all 4 units K negative
- c) Wait for Group and Screen, quickly confirm group as A positive and provide 4 A Positive; K negative units
- d) 4 O Positive, K negative units



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# Discussion

With the initialization of an MHP, the Provincial recommendations are that blood products should be at bedside within 10 minutes of protocol activation.

Why is Rh positive blood an acceptable option?

Historical information indicates that the patient is Rh Positive, while blood group has not yet been confirmed, the chances of this being the wrong patient or previously tested wrong and actually being Rh Negative are low (approx 15%).

# Discussion

Why is K positive blood an acceptable option?

For routine transfusions, we have the responsibility to avoid antibody formation by providing K negative blood to people of child bearing potential.

In urgent situations, this might not be something we have complete control over.

# SIMULATION

The lab work has arrived and first pack gone out the door. Some of your next steps could be;

Contact L&D and find out if next pack is required

Call for back up

➤ Test lab work and begin preparing next pack



Your next MHP pack includes 4 RBC and 4 Plasma. According to the provincial MHP recommendations, obstetrical patients should also receive what other product early in the protocol?

- a) Fibrinogen Concentrate
- b) Prothrombin Complex Concentrate
- c) Factor 7
- d) Albumin
- e) Cryoprecipitate



# Discussion

## Fibrinogen Concentrate

- 4g adult standardized dose
- Reconstituted
- Virally inactivated
- Larger volume
- Room temperature/refrigerated product



## Cryoprecipitate

- Frozen
- 10u adult dose, Fibrinogen level dependant on donors levels
- Pooled
- Small volume



# Can we use anything other than AB plasma?

AB plasma has been used for decades for patients with unknown blood groups to avoid transfusing ABO incompatible plasma.

New studies have shown that using group A plasma is a safe alternative

- Common practice in USA hospitals
- Didn't Dr. Zeller tell us at GHEST a few years ago that we should be doing this?

Why haven't we all made the switch?

# Use of Group A plasma in Unknown Blood groups

In May 2021 – LHSC made the switch to using group A plasma for MHP's with unknown blood groups

First hospital in Ontario to make this switch that we are aware of.

One of the very few hospitals in Canada to be using group A plasma for unknown MHP's.

# Why did LHSC make the switch?

4152u of plasma transfused

463u of plasma or 38.6u /month discarded due to ward waste, or thawed but not used before outdate

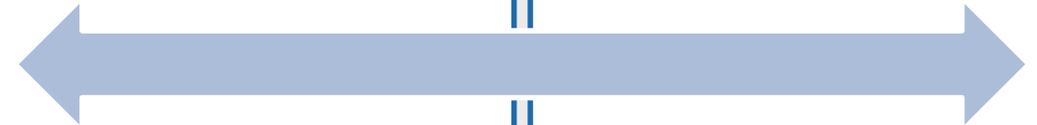
633u transfused were group AB plasma



369U of AB plasma given to group A or O patients.



Thought that this was mainly due to trauma / MHP patients with unknown blood groups



# Questions we asked

- 🔥 Trauma physicians requesting thawed plasma to improve TAT of plasma reaching patient. Are we really that slow?
  - Average time to thaw is about 18 minutes, we could be 2 packs behind in plasma in larger MHP's.
- 🔥 How do we balance the discard of thawed but not used and out of group transfusions of AB plasma if we start keeping thawed plasma on hand?
  - Based on previous years data, we were already beyond our comfort level
- 🔥 What about those trauma's that only use 1-2 packs?
  - We looked at historical data from the previous 5 years and found that the majority of our MHP's turned out to be group A or O
  - Giving group O blood and A plasma is still compatible

# Questions we asked

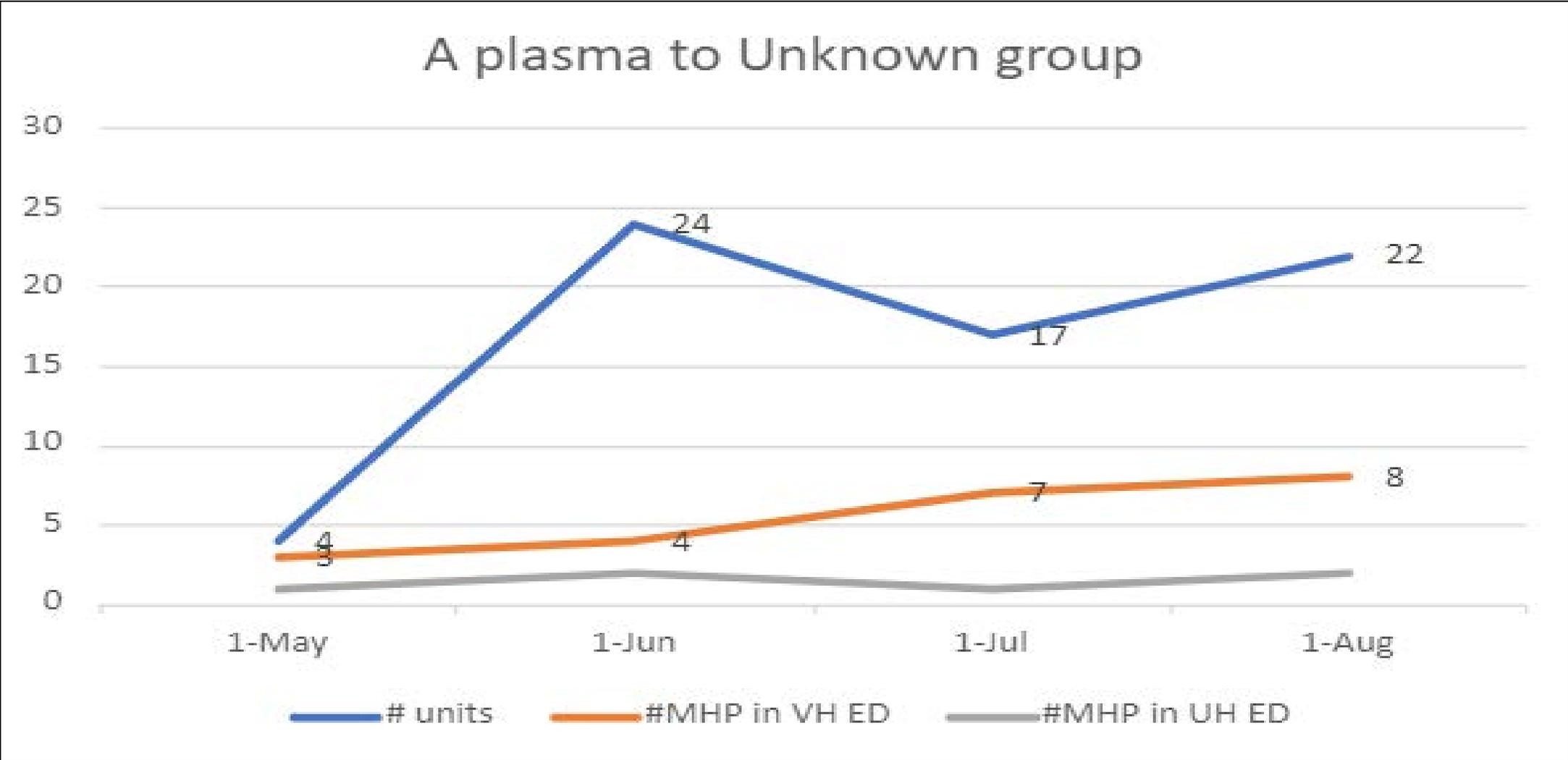
## 🔥 Do we need patient safety measures should we transfuse incompatible plasma?

- Policy for physician notification and testing for hemolytic reaction when incompatible plasma is transfused

## 🔥 What impact will there be on blood supply by stocking thawed group A plasma?

- 2020- Approx 6.1 MHP in our AED/Trauma per month
- 5 day outdate of thawed plasma @ 30-31 days/ month = hypothesized very minimal wastage of plasma
- Ability to transfer thawed plasma nearing outdate for use in cardiac, transplant, gen surg at other campus
- We will see our use of out of group A plasma go up, but stock levels of group A plasma are better than AB
- Monitoring of quality metrics – discards, volume of out of group transfusions, number of patients transfused group A with unknown blood group, number of MHP's ordered, AB plasma utilization.

# Where are we now....

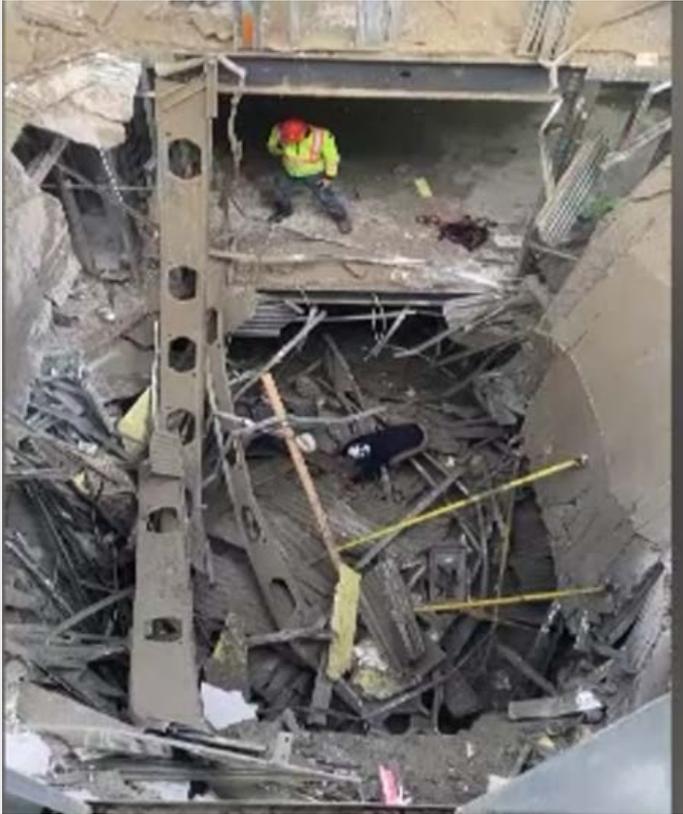


# Code ORANGE – External Disaster

December 11, 2020



Courtesy of CP24



Courtesy of CTV News London

# Trauma team in the field



Courtesy of CTV News London

# Reflections

Nothing major on the TM side happened that day

We had products ready for 2 packs for 2 MHP's with additional product ordered from CBS.

- ? How can we communicate better with our ED about what is happening so we can serve them better- Who is the point communication person, who's responsible
- ? Should we be involved in hospital wide Exercise Code Orange
- ? Is our TM Code Orange policy sufficient
- ? Should we run an internal training exercise

# References

- ❑ Provincial Massive Hemorrhage Protocol. Provincial Massive Hemorrhage Toolkit. ORBCoN. Version 1, July 2020
- ❑ CSA National Standards of Canada Z902:20
- ❑ Preserving the Supply of Type O Rh(D) Negative Red Blood Cells by Re-defining the Maximum Age at which Ontario Women are Considered to be of Child-bearing Potential. ORBCoN, October 28, 2018
- ❑ NATIONAL ADVISORY COMMITTEE (NAC) ON BLOOD AND BLOOD PRODUCTS POSITION PAPER: UTILIZATION AND INVENTORY MANAGEMENT OF GROUP O RH(D)- NEGATIVE RED CELLS. March 9, 2017