

MHPs in small rural hospitals: challenges and successes

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Faculty Disclosure

*In compliance with CPD policy,
Temerty Faculty of Medicine
requires the following disclosures
to the session audience*

- This program has received no financial external support
- I have no conflicts of interest



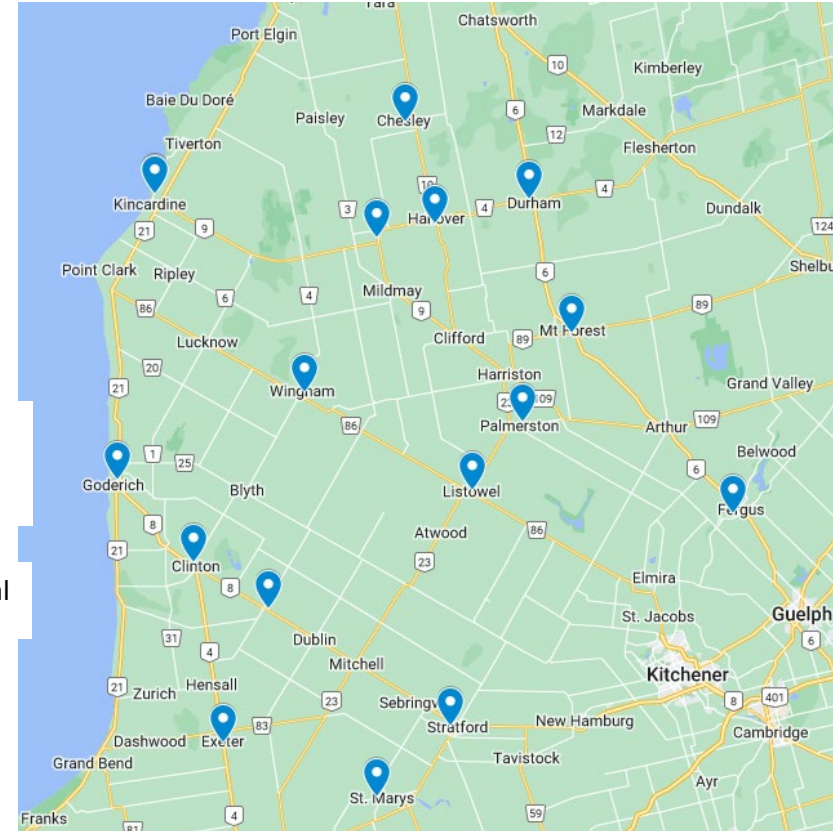
Objectives

- Discuss barriers to implementation and/or successes of implementing the Ontario MHP from the perspective of a 'small hospital'



InterHospital Laboratory Program

- **Huron Perth Health Care Alliance**
 - Stratford Hospital Site – Regional Hub Lab
 - St. Marys Hospital Site
- **Huron Health System**
 - Clinton Hospital Site
 - Seaforth Hospital Site
- **Hanover & District Hospital**
- **Listowel Wingham Hospitals Alliance**
 - Listowel Memorial Hospital
 - Wingham & District Hospital
- **Groves Memorial Community Hospital**
- **North Wellington Health Corporation**
 - Louise Marshall Hospital
 - Palmerston & District Hospital
- **South Bruce Grey Health Centre**
 - Chesley Hospital Site
 - Durham Hospital Site
 - Kincardine Hospital Site
 - Walkerton Hospital Site
- Alexandra Marine & General Hospital
- South Huron Hospital



InterHospital Laboratory Program

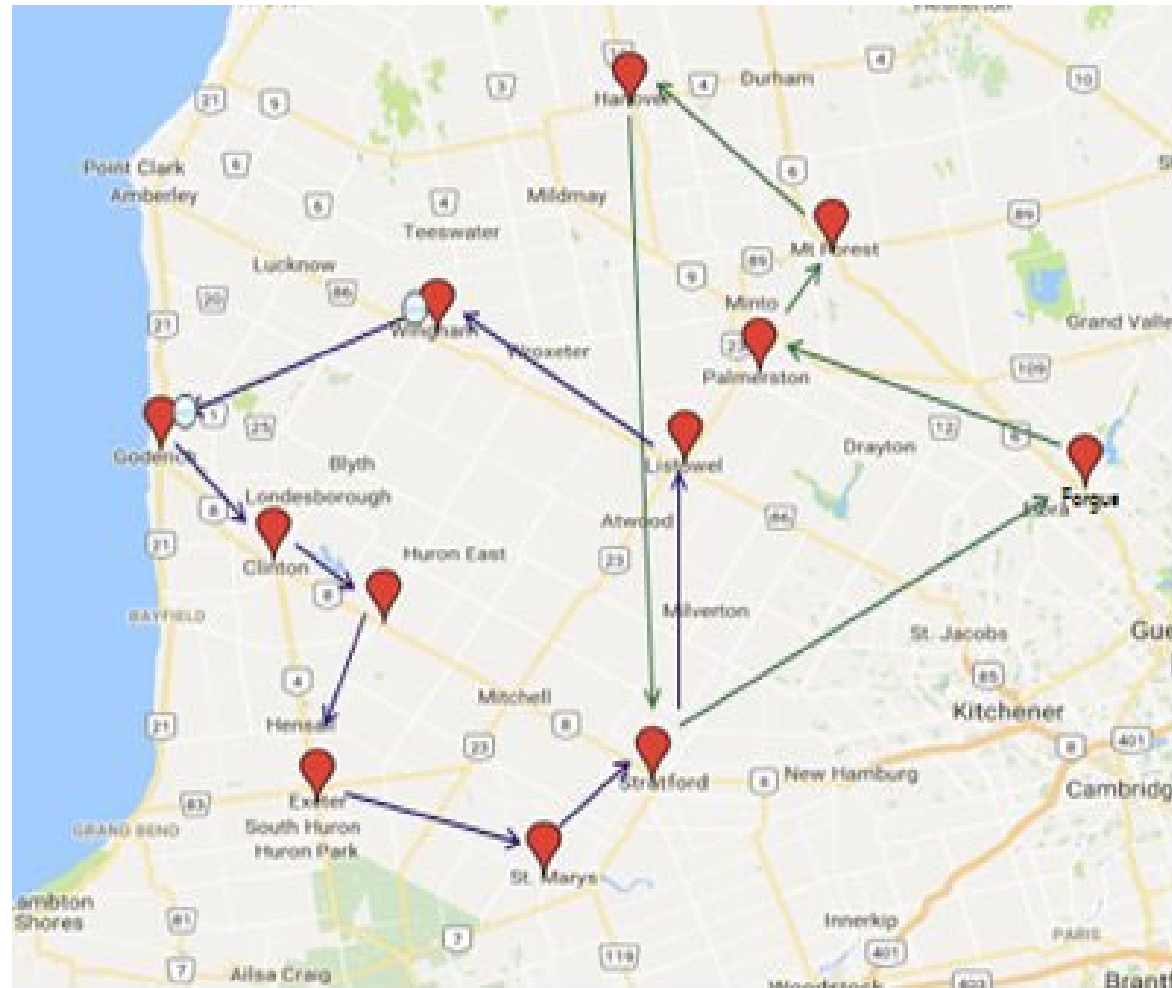
Number of Hospitals	16
Number of Beds	499
Number of Physicians	200
Number of Regional Staff	4 (3.5 FTE)
Number of CEOs	6
Number of Pathologists	9 (incl. Lab Dir)
Number of Technical Directors	6
Total Laboratory Staff (FTE)	128.2
Total Laboratory Tests	2,074,524
Population Served	331,000

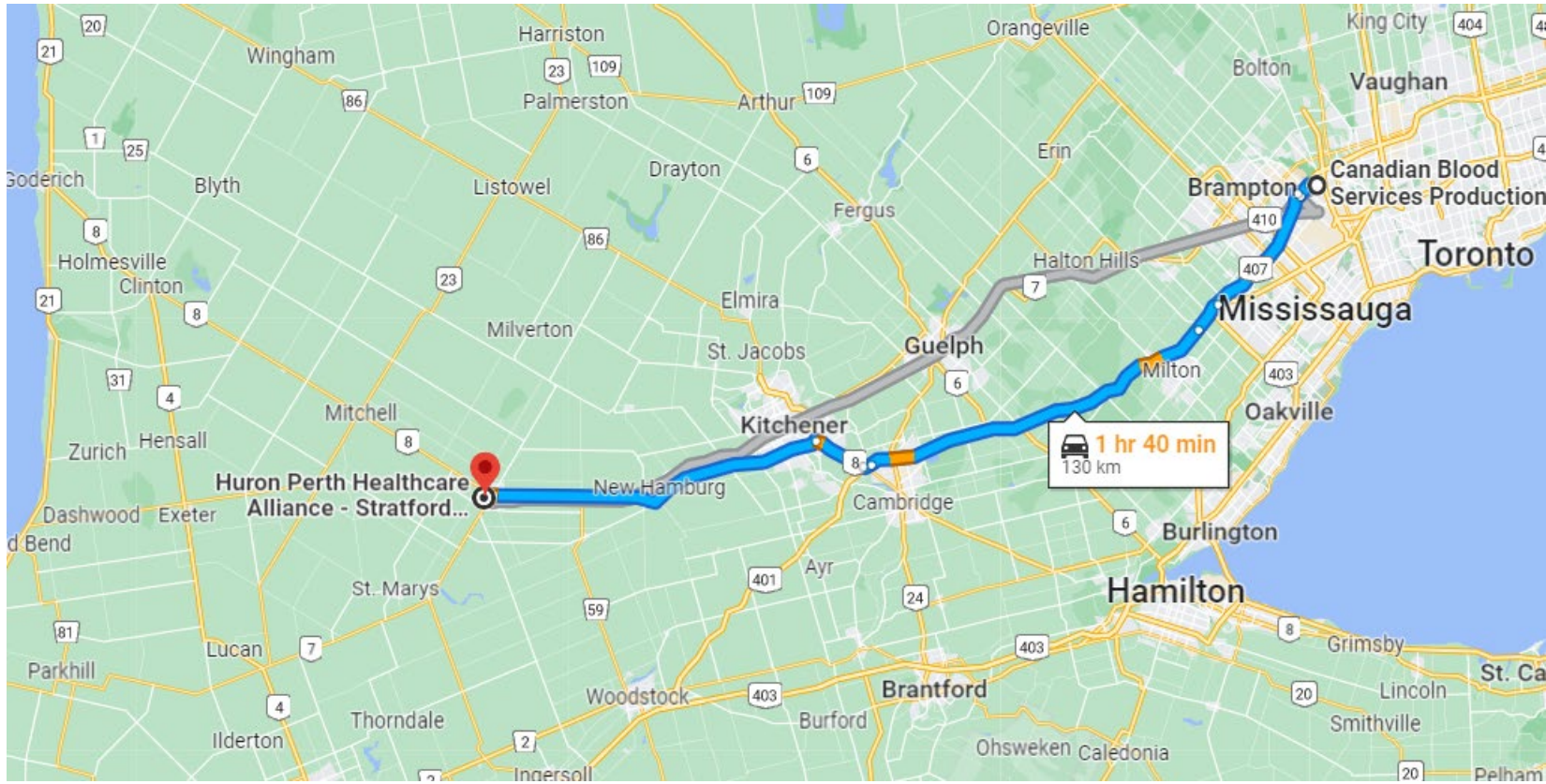


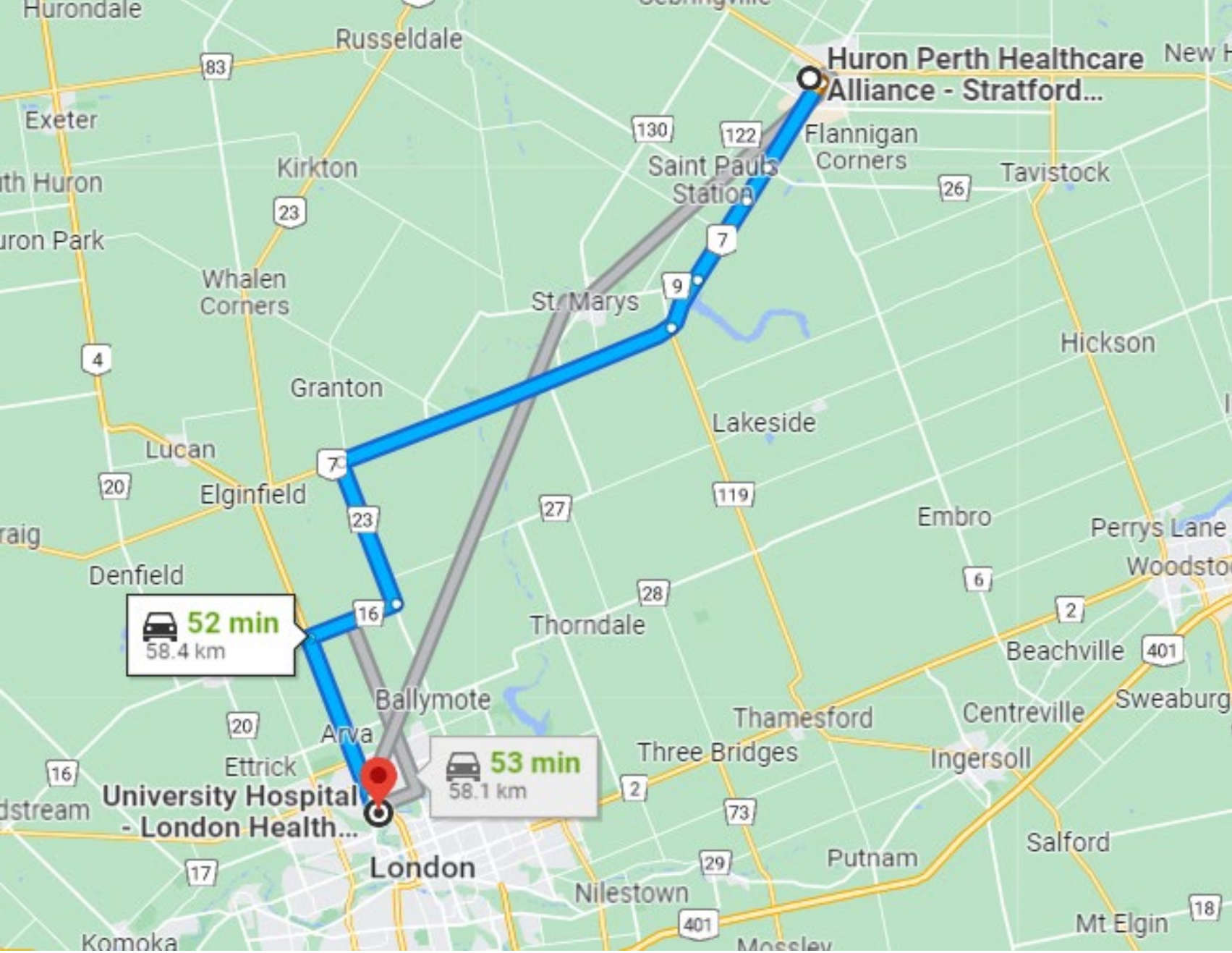
Inter Hospital Laboratory Program

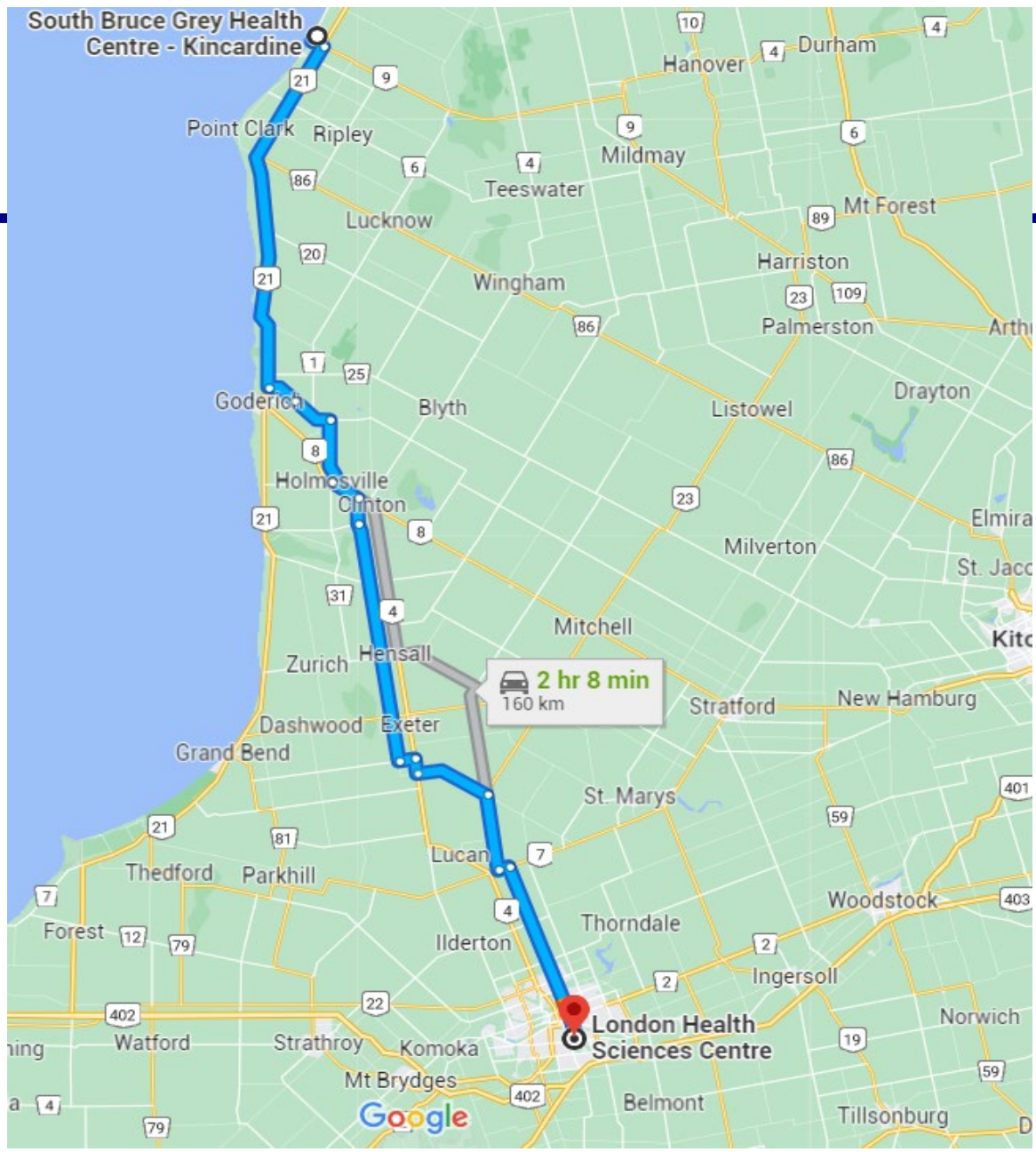
~20,000 km²

- No trauma centers









**CHECKLIST FOR ONTARIO HOSPITALS TO GUIDE
MASSIVE HEMORRHAGE PROTOCOL IMPLEMENTATION**

Element	Date Completed	Name & Signature
Review Ontario MHP toolkit and checklist		
Identify gaps between current hospital MHP (if exists) and Ontario MHP toolkit and checklist		
Meet with MHP hospital steering committee (or hospital transfusion committee) to discuss gaps and eliminate gaps or development of a new draft hospital MHP		
Draft of revised/new hospital MHP protocol reviewed by the Transfusion Committee for compliance within the hospital's capabilities		
Circulate draft MHP protocol to hospital stakeholders for consultation		
MHP approved by Transfusion Committee (or equivalent) as conforming with provincial MHP within the hospital's capabilities		
MHP approved by Medical Advisory Committee (and/or other committees as required by hospital policy)		
Identify items required for implementation of the MHP (e.g., coolers, phones)		
Identify any validations required for implementation (e.g., coolers, platelet bags, electronic order sets)		
Set up "Code Transfusion" with hospital administration, communications/switchboard (this may include editing of lanyard cards and other lists of Codes)		
Communicate existence and content of MHP with local land and air Emergency Medical Services (EMS) provider and dispatch centres, clarify their role		

SOUTH BRUCE GREY HEALTH CENTRE - KINCARDINE TEMPORARY EMERGENCY DEPARTMENT CLOSURE

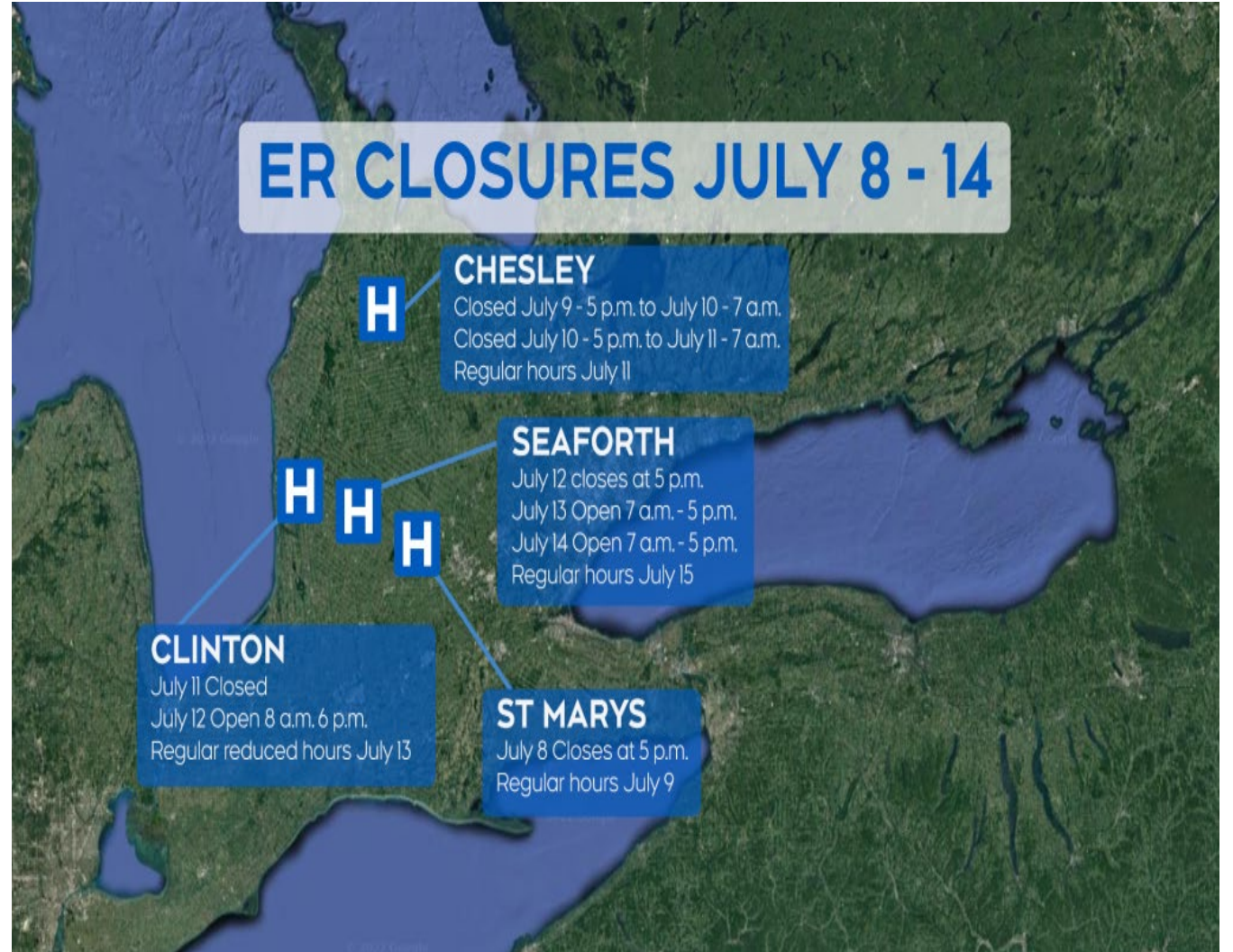


Staffing shortages at small-town Ontario hospitals still shutting some ERs

'We're dealing with probably the worst staffing crisis we've experienced in decades,' hospital head says



Rebecca Zandbergen · CBC News · Posted: Jul 19, 2023 11:51 AM EDT | Last Updated: July 19



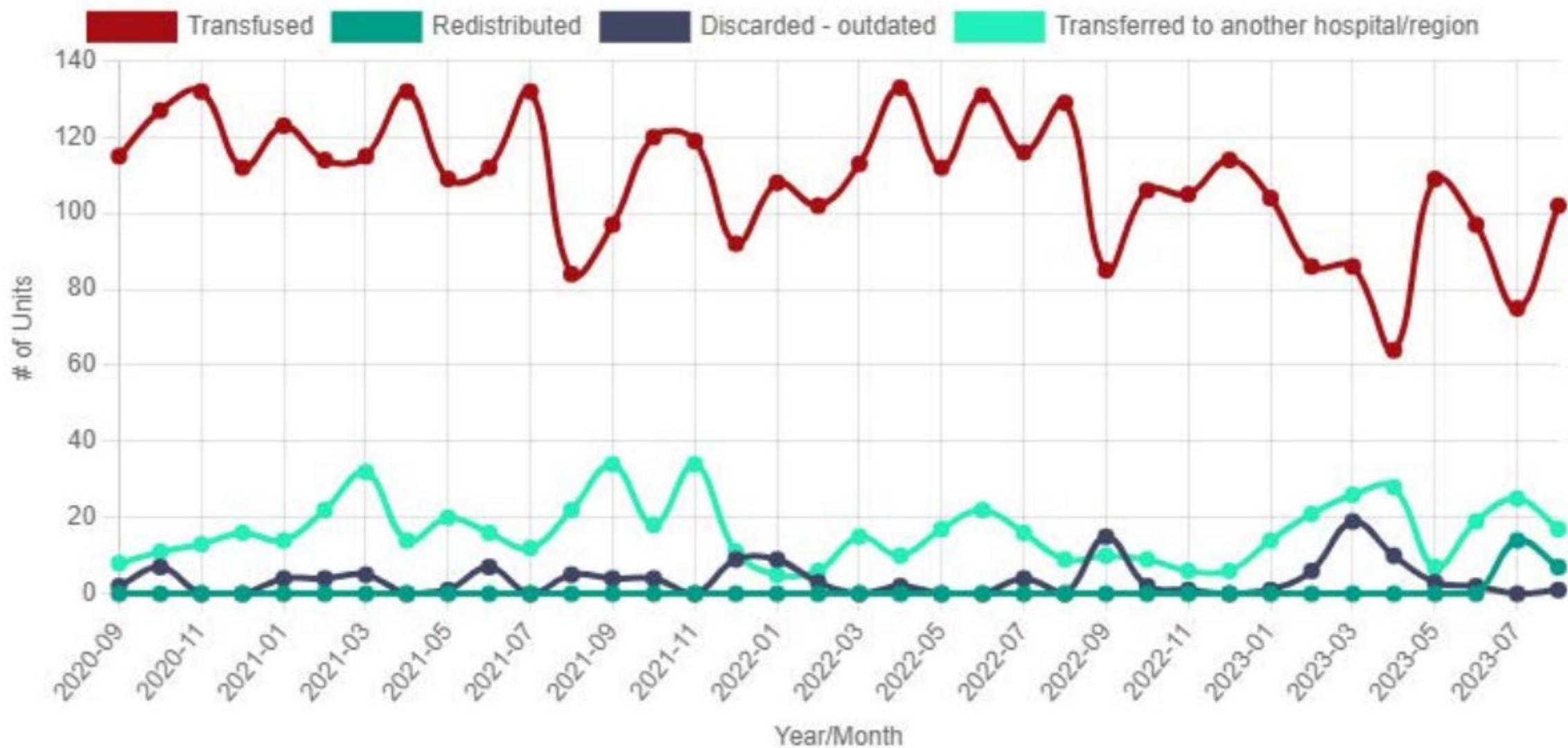
Inventory management



IHLP Site	Green Phase Red Cell Volumes					Amber Phase Red Cell Volumes					Red Phase Red Cell Volumes					Typical Volumes of Products		
	O Pos	O Neg	A Pos	A Neg	Total	O Pos	O Neg	A Pos	A Neg	Total	O Pos	O Neg	A Pos	A Neg	Total	FP	PCC	FC
Exeter	2	2			4	2	2			4	2	2			4	0	6	4
Goderich	4	4	4	1	13	4	2	2	1	9	2	2	0	0	4	0	7	8
Hanover	4	4	3	2	13	4	2	2	0	8	2	2		0	4	4	10	4
HPHA - Clinton	2	2			4	2	2			4	2	2			4		6	4
HPHA - Seaforth	2	2			4	2	2			4	2	2			4		6	4
HPHA - St. Marys	2	2			4	2	2			4	2	2			4		6	4
HPHA - Stratford	12	12	8	6	38	10	10	6	4	30	8	8	6	2	24	14	10	6
LWHA - Listowel	4	4		2	10	4	2		2	8	2	2		0	4		8	8
LWHA - Wingham	4	4		2	10	4	2		1	7	2	2		0	4		8	8
SBGHC - Chesley		2			2		2			2		2			2		4	4
SBGHC - Durham		2			2		2			2		2			2		4	4
SBGHC - Kincardine	4	4		1	10	3	4			7	3	4			7	0	6	4
SBGHC - Walkerton	4	4		1	10	3	4			7	3	4			7	2	8	8
WHCA - Fergus	6	6	4	2	18	6	4	2		12	4	4		2	10	6	6	5
WHCA - Mt. Forest	4	4		2	10	4	4		2	10	4	4		0	8	4	6	5
WHCA - Palmerston		4			4		2			2		2			2		12	5
IHLP Totals:	54	62	19	19	156	50	48	12	10	120	38	46	6	4	94	30	113	85

Huron Perth Healthcare Alliance - Stratford General Hospital Site

Red Blood Cells, Transfused, Redistributed, Discarded - outdated, Transferred to another hospital/region



Infrastructure







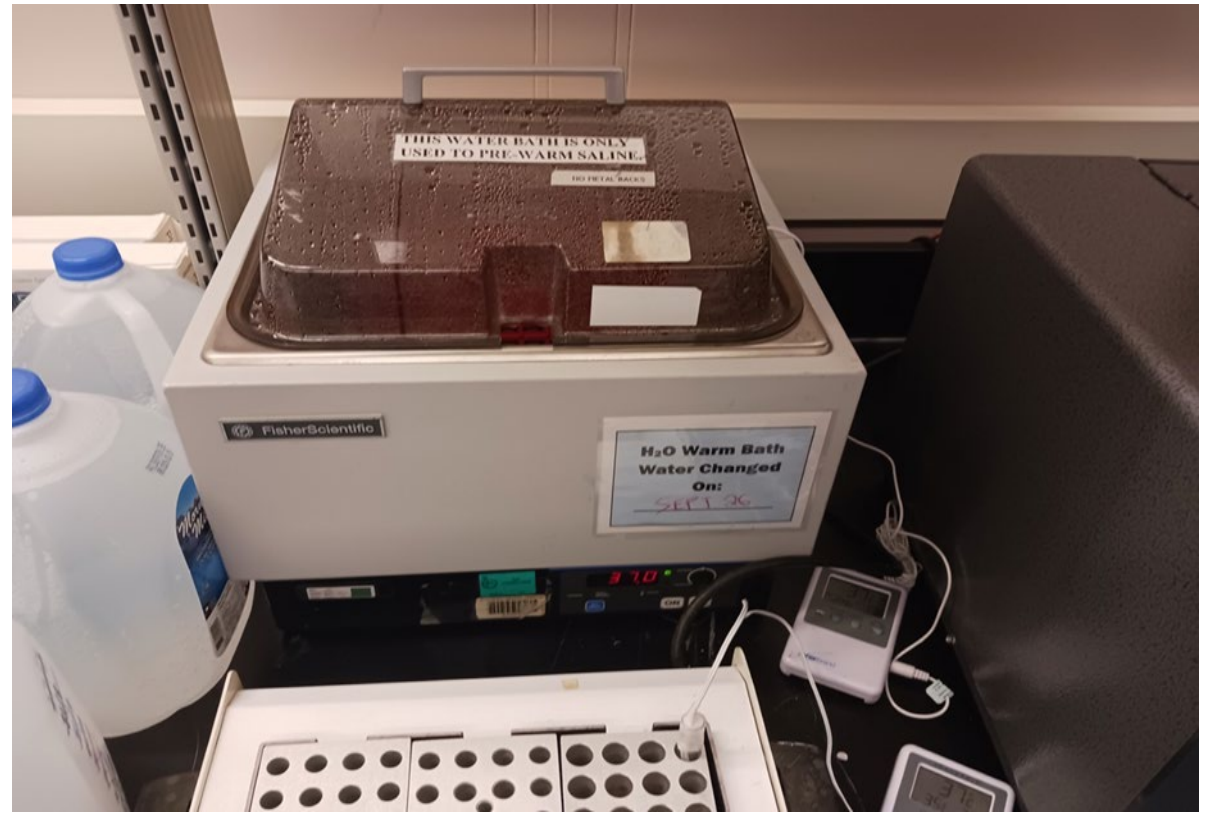
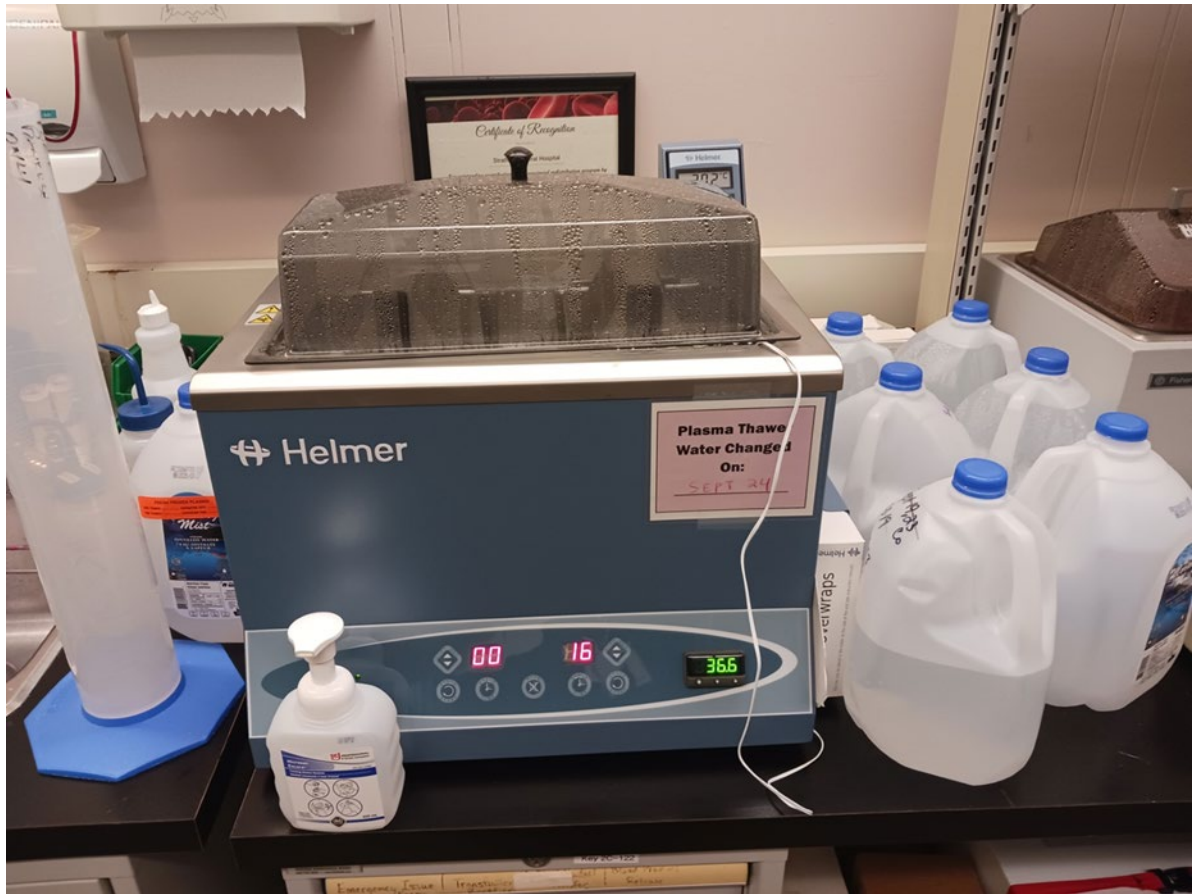


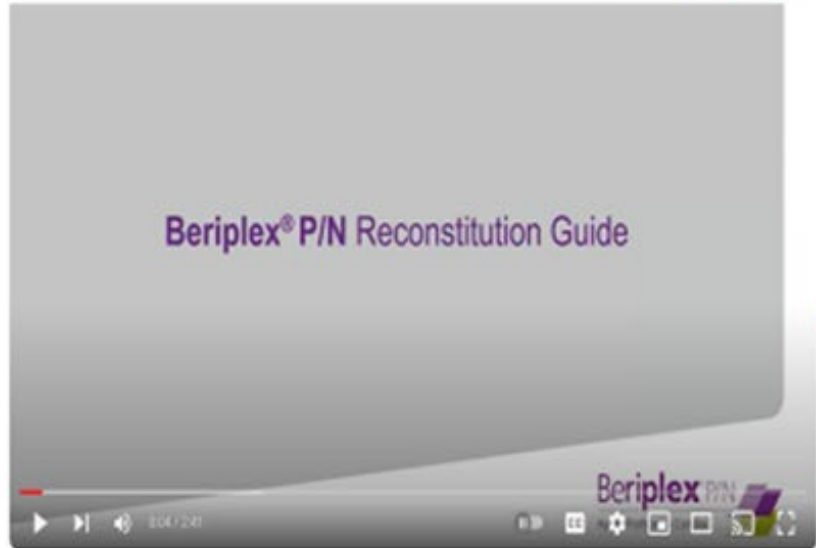
FFP vs. PCCs

At institutions lacking sufficient resources to issue plasma (e.g., no thawing device or no plasma stocked in inventory), Prothrombin Complex Concentrates (PCC) 2000 IU can be substituted for coagulation factor replacement.



	FFP	PCCs
Time to availability	~ 30 minutes	~20 minutes
Preparation requirements	Thawing (MLTs) -Needs plasma thawer or water bath	Reconstitution (Nursing) -Needs appropriate nursing training
Volume:	~1000mLs	40-80mLs
Donor requirements:	AB donors	No specific donor requirements
Staffing requirements:	Requires MLTs on site	Usually done by nursing





Most plasma transfused is unnecessary

Study	Country	Number of infusions	Patient type	Percent unnecessary
ORBCON audit (report) audit 2015	Canada	329	All patients	52%
Shih et al <u>Vox Sang</u> 2015	Canada	111	ICU	45%
Tinmouth et al <u>Transfusion</u> 2013	Canada	559	All patients	29%
Stanworth et al. <u>Crit Care</u> 2011	UK	366	ICU	43%*
Stanworth et al <u>Transfusion</u> 2011	UK	3648	All patients (included kids)	58%*
Palo et al. <u>Transfusion</u> 2006	Finland	11590	All patients	66%*

Ⓒ Indications for Plasma

To determine if plasma is indicated for abnormal coagulation test results, the cause of the elevation must be determined (i.e., liver disease vs. warfarin effect vs. single factor deficiency). See *Bloody Easy Coagulation Simplified, Second Edition*⁶⁸ for details. The reasons for this are as follows:

- There are numerous replacement options and the correct one must be selected for the patient (i.e., Plasma vs. Prothrombin Complex Concentrates (PCC) vs. single factor concentrate).
- Warfarin effect and vitamin K deficiency can often be managed with intravenous/oral vitamin K alone.
- Patients with liver disease have preserved thrombin generation despite elevated INR levels and often do not need correction of the abnormality before procedures.
- Patients with isolated high PTT (and normal INR) are often best managed with strategies other than plasma.
- Patients on anticoagulants are never appropriately managed with plasma.⁶⁸

1. **Bleeding or prior to a significant operative procedure in patients INR ≥ 1.8 due to multiple factor deficiency when no coagulation factor concentrates or other alternative therapies are available.**⁶⁹

- Repeat INR after infusion of plasma to ensure replacement is adequate.

ATTENTION

IV Vitamin K works faster than oral.

ATTENTION

Plasma is NOT indicated or effective for reversal of heparin, low molecular weight heparin, or direct oral anticoagulants

CHOOSE WISELY

Don't transfuse plasma in the following situations:

- ◆ Bleeding and INR < 1.8
- ◆ Procedure and INR < 1.8
- ◆ INR elevated but patient is not actively bleeding
- ◆ Warfarin reversal
- ◆ Heparin/LMWH reversal
- ◆ Direct oral anticoagulant reversal
- ◆ High aPTT with normal INR

COMPONENTS: Frozen Plasma

Ⓒ Indications for Plasma (cont'd)

Note: ^{70,71,72,73}

- Prothrombin complex concentrates (PCCs) should be used for urgent reversal of warfarin therapy or treatment of vitamin K deficiency in a bleeding patient OR a patient requiring an emergency invasive procedure. Vitamin K (5-10 mg i.v.) should also be given. See page 122 in this guide.
- For non-emergent reversal of warfarin or vitamin K deficiency, vitamin K alone should be used.
 - For patients without bleeding and INR > 10 due to warfarin, 2 mg of oral Vitamin K will bring INR within the therapeutic range over 24-48 hours.
 - After intravenous administration, Vitamin K effect can be detected after 2 hours and the INR should be normalized after 6-24 hours.
 - SC and IM Vitamin K is NOT recommended due to variable absorption: intravenous formulation can be used orally when required.



Pediatrics ⁷⁴

Vitamin K dose:

- INR $> 5-9$: 1 to 2 mg oral.
- INR ≥ 9 : 5 mg oral.
- Significant bleed in infants and children: 5 mg IV OR 30 mcg/kg IV.

2. **Microvascular bleeding or massive transfusion AND patient's clinical status precludes waiting 30-45 minutes for INR results.**¹⁸
3. **Thrombotic thrombocytopenic purpura.**

ATTENTION

Ratio based replacement (i.e., 2:1 RBC:FP) with FP not indicated unless the massive hemorrhage protocol has been activated



Testing

“The recommended minimum laboratory testing (where the test is available) at each blood draw should be: CBC, INR, activated partial thromboplastin time (aPTT; baseline only), fibrinogen, electrolytes, calcium (ionized), blood gas (pH and base excess) and lactate”

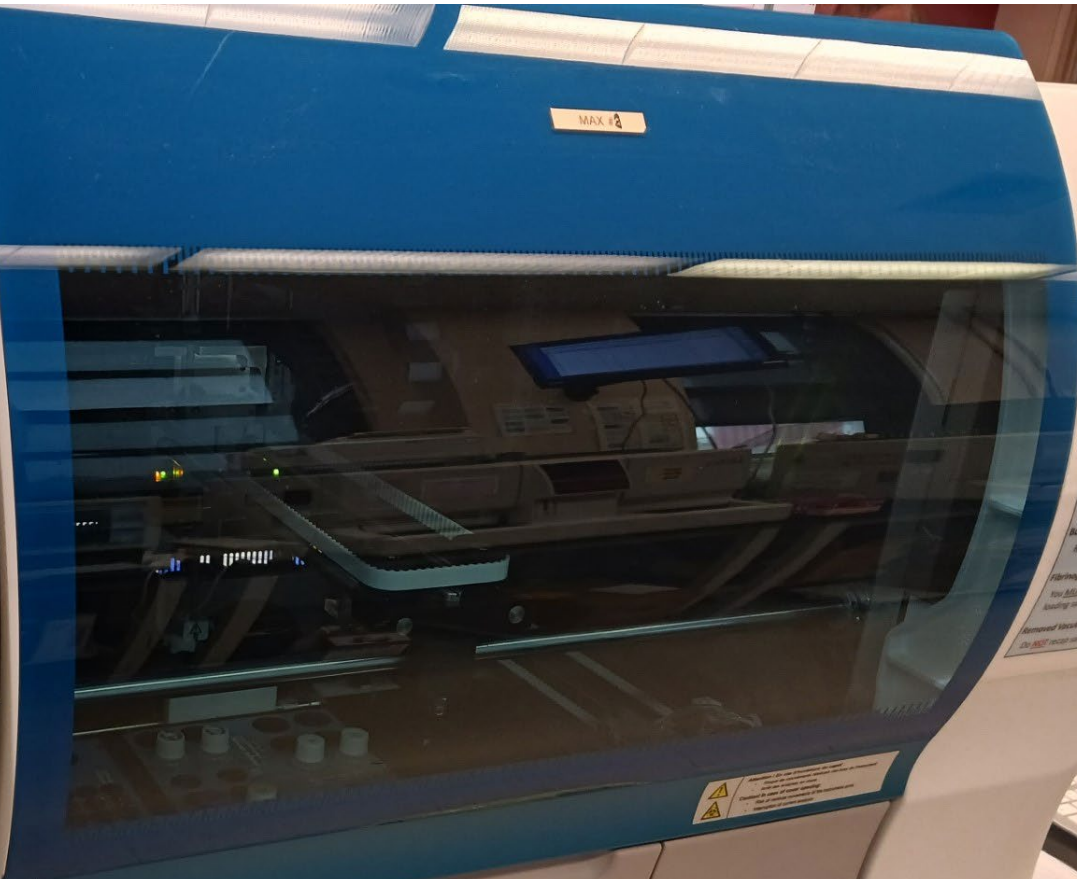
Support Hotline
Our Focus 24/7
Online
www.stago.com
9115751

STA Compact Max



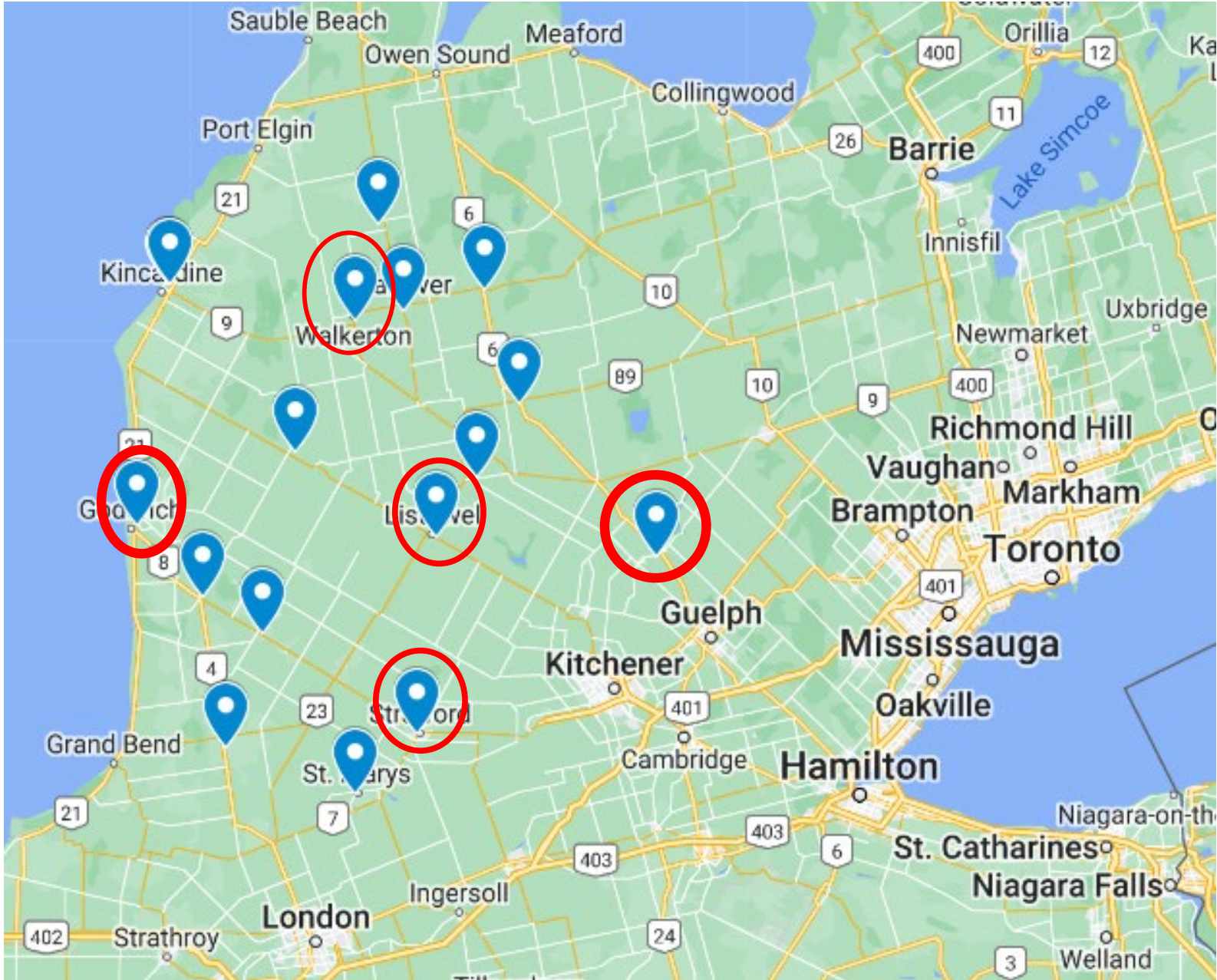
ALL Fibrinogen samples must be run **WITHOUT** a cap!!!

MAX 12



When Loading Coagulation Tubes:
✓ Is the sample filled?
✓ Is the tube filled?
✓ Is the sample filled?
✓ Are the RBCs less than 10% volume?
*If NO, notify the operator.
Bubbles present?
Remove them, do NOT recap.
Fibrinogen sample?
The **ASST** reagent cap prior to loading sample on Stago.
Removed Viscosity Cap?
Do **NOT** touch sample before loading.





Fibrinogen testing

MHP activations should be reviewed by a multidisciplinary committee for quality assurance.

- "Compliance with MHPs is poor during the resuscitation of a critically ill patient who has multiple competing priorities. Implementation of an MHP is just the first step to improving the care of massively bleeding patients; training, simulations, check-lists, audit and feedback are needed to achieve high levels of performance. At a minimum, the quality metrics listed in statement should be tracked on consecutive MHP activations by a multidisciplinary team with feedback to the frontline staff at regular intervals."



	Quality metric	Local Reporting	Provincial Reporting
Q1	The proportion of patients receiving tranexamic acid within 1 hour of protocol activation.	X	X
Q2	The proportion of patients in whom RBC transfusion is initiated within 15 minutes of protocol activation.	X	X
Q3	The proportion of patients (of patients requiring transfer for definitive care) with initiation of call for transfer within 60 minutes of protocol activation.	X	
Q4	The proportion of patients achieving a temperature $>35^{\circ}\text{C}$ at termination of the protocol.	X	
Q5	The proportion of patients with hemoglobin levels maintained between 60-110 g/L during protocol activation, excluding certain pediatric populations (e.g., neonates) that may require higher hemoglobin values.	X	
Q6	The proportion of patients transitioned to group specific RBCs and plasma within 90 minutes of arrival/onset of hemorrhage.	X	X
Q7	The proportion of patients with appropriate activation (>6 RBC units in first 24 hours; >40 ml/kg/24 hours of RBCs in pediatric patients) or before this level in patients dying due to hemorrhage within 24 hours.	X	
Q8	The proportion of patients without any blood component wastage (including plasma that is thawed and not used within the 5 day limit on another patient).	X	

A Quality Metrics data entry reporting portal is being developed using REDCap software.

Stay tuned for more info

Speaker	Registration & Coffee	0800
	Live Interactivity Learning: Poll the audience	
Dr. Andrew Petrosoniak	Welcome	0830-0835
Dr. Chantalle Grant	A look at the last five years: Results of provincial survey	0835-0855
Dr. Andrew Petrosoniak	Live Interactive Learning: Q&A	0855-0905
Key Note Address	Patient Story	0905-0925
Dr. Nicolas Crombie (UK)	Pre-hospital Services: What's happening abroad	0925-0945
Dr. Brodie Nolan	Pre-hospital Services: What's happening in Ontario	0945-1005
Dr. Andrew Petrosoniak	Live Interactive Learning: Q&A	1005-1020
	Nutrition Break	1020-1035
Dr. Heather VanderMeulen	Activation: MHP in OB Hemorrhage	1035-1055
	Live Interactivity Learning: Q & A	1055-1100
Dr. Jordan Radigan	MHP Implementation: Experience from a small hospital	1100-1120
Dr. Katerina Pavenski	MHP 2.0: Addressing potential barriers to change/gaps in recommendations and practice	1120-1140
Dr. Andrew Petrosoniak	Live Interactive Learning: Q&A	1140-1200
	Networking Lunch Break	1200-1245
Dr. Andrew Petrosoniak & Kari White	Advanced Performance Session : Clinical debrief Interactivity Group Work	1245-1400 (30 mins)
Dr. Kimmo Murto	Provincial Quality Metrics Portal: Launch and results of pilot Pediatric Perspective	1400-1420
Dr. Daniel Roque	Adults	1420-1440
Dr. Katerina Pavenski	Live Interactive Learning: Q&A	1440-1455
	Nutrition Break	1455-1505
Dr. Luis Da Luz	Top papers / new evidence: Coagulation factors in trauma resuscitation (PROCOAG trial / FIIRST2 trial)	1505-1525
Dr. Johnny Mack	Efficacy and Safety of cold-stored whole blood	1525-1545
Dr. Katerina Pavenski	Live Interactive Learning: Q&A	1545-1600
Dr. Katerina Pavenski	Closing Remarks: What's next	1600-1615



University of Toronto Transfusion Medicine Rounds – Nov 23, 2023

November 23 @ 12:00 pm – 1:00 pm

MHP Quality Metrics

Presented by: Dr. Daniel Roque and Dr. Katerina Pavenski

**WORK
IN
PROGRESS**



Thank you

