



**FIRST60**

PREHOSPITAL, TRAUMA,  
RESUSCITATION SCIENCES

ORBCoN MHP 2.0 Symposium (03-26-2025)

# Prehospital Transfusion x Ontario Trauma System

Brodie Nolan, MD MSc  
Transport Medicine Physician, Ornge  
Emergency Physician + Trauma Team Leader, St. Michael's Hospital  
Clinician Scientist, FIRST60: Prehospital, Trauma, Resuscitation Sciences



# Faculty Disclosure

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- **Speaker disclosure**
  - Currently receive research funds from: Veteran Affairs Canada, Canadian Blood Services, Octapharma, CIHR, Zoll Foundation, Laerdal Foundation





# Objectives

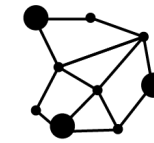
1. Review Ontario trauma system
2. Discuss role of Ornge and the blood on board program
3. Brief overview of the SWiFT Canada study
4. Future priorities



## The tyranny of distance

- 40% of patients do not have access to a trauma centre within 60 minutes by land
- 15% were not within 60 minutes by air transport

- 1 Hotel Dieu Grace Hospital, Windsor
- 2 London Health Sciences Centre
- 3 Hamilton Health Sciences
- 4 St. Michael's Hospital, Toronto
- 5 Sunnybrook & Women's College Hospital, Toronto
- 6 Kingston General Hospital
- 7 The Ottawa Hospital
- 8 Sudbury Regional Hospital
- 9 Thunder Bay Regional Hospital



- a. Patient does not follow commands
- b. SBP <90mmHg



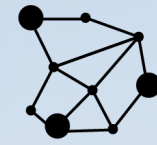
Field triage of patients injured by a traumatic mechanism or show evidence of trauma with transport time to LTH or regionally designated equivalent hospital estimated to be <30 minutes\*.

# Air Ambulance Utilization Standard (AAUS)

If more than 30 minutes drive, land paramedics to request an air ambulance (Ornge)

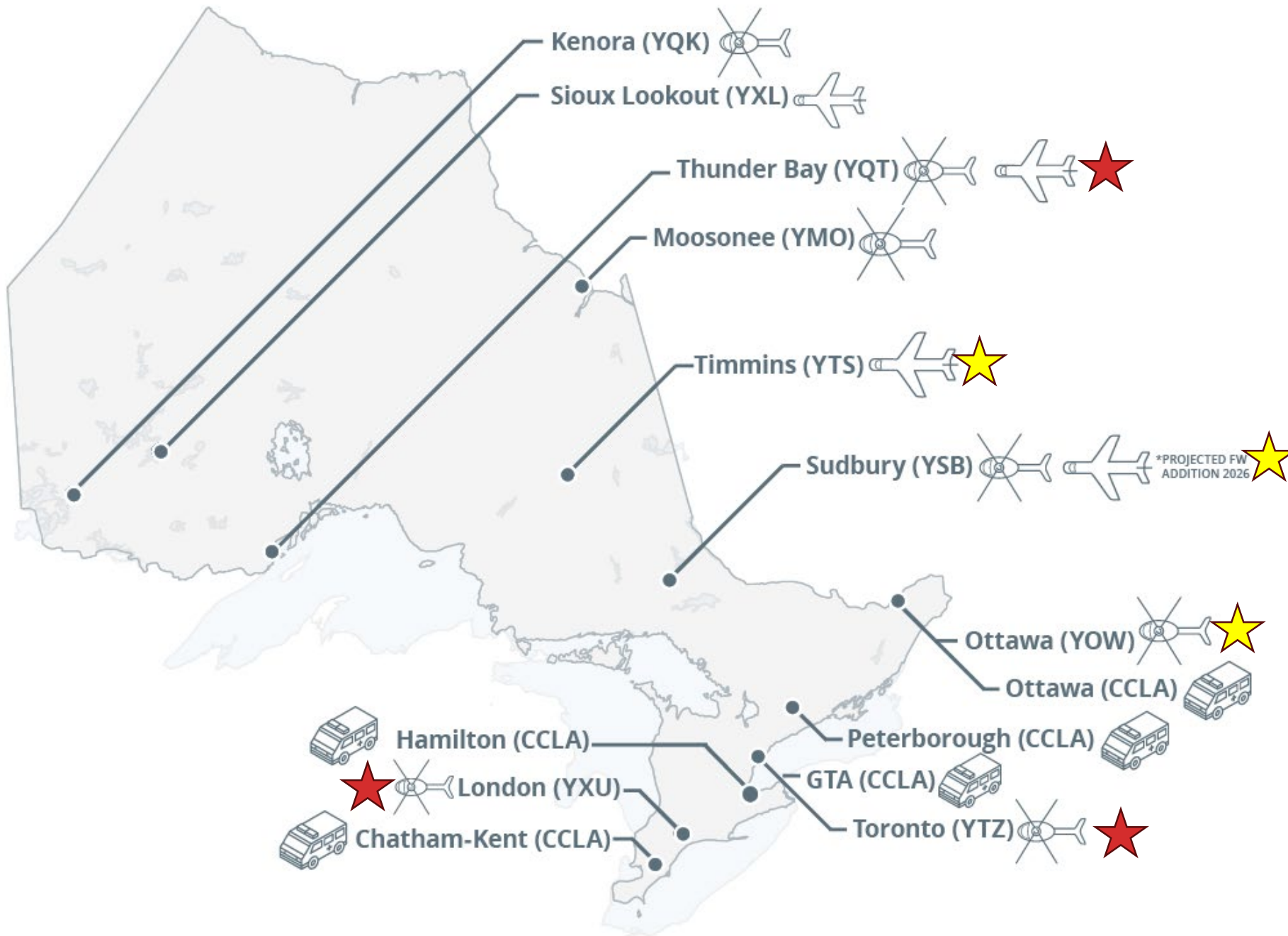
Transport directly to LTH or regionally designated equivalent hospital\*\*

- 1. Risk of injury/death increases after age 55
- 2. SBP <110 may represent shock after age 65
- b. Anticoagulation and bleeding disorders
- c. Burns
  - i. With trauma mechanism: triage to LTH or regionally designated equivalent hospital
- d. Pregnancy ≥20 weeks



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## Blood-on-board Logistics

2 units of RBC only (except SWiFT)

Coolers prepared and delivered to Ornge bases by sponsoring transfusion medicine lab (SHSC/TBRHSC/LHSC)

Delivered 3x/week and PRN with use

Always +1 extra cooler at base

Internal temperature monitoring

Program goal <1% wastage: meeting this target at both sites





### **799 (Toronto: 2 rotor-wing)**

- ~50-60 patients per year
- Mostly adult trauma

### **790/797 (Thunder bay: 1 rotor-wing and 2 fixed-wing)**

- ~50 patients per year
- 50% trauma, 25% GI bleeds, 25% obstetrical

### **792 (London: 1 rotor-wing)**

- Anticipate 30-50 patients per year
- Mostly adult trauma





## Orange Medical Directives for Transfusion

The following are indications for transfusion in the pre-hospital setting:

- Hemorrhagic shock (MAP < 65) with active, ongoing, and significant bleeding
- Hb < 70 g/L with evidence of circulatory compromise
- TMP judgement

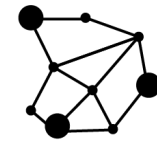
If the patient meets criteria, Advanced Care Flight Paramedic Crews will contact the Transport Medicine Physician (TMP) for orders, Critical Care Paramedic crews can initiate and then retopatch with the TMP for orders

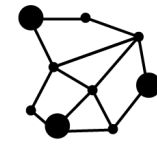
The TMP will order the transfusion

Consent will be obtained if possible



# Study of Whole blood in Frontline Trauma: **SWIFT Canada**





1 to 1 to 1



## Whole Blood Donor Selection

- Male
  - Contains plasma so only male donors to reduce the risk of transfusion-related acute lung injury
- Group O
  - Only for initial resuscitation before blood group known
  - Contains group O RBCs that are universally compatible
- Low-titre anti-A1/B only
  - Contains O plasma with anti-A and anti-B antibodies
  - Only donors with anti-A1 and anti-B titres <1:128
  - Theoretically reduces risk of hemolytic reaction in non-O recipients
  - Labelled “Low Anti-A/B”
- Where possible Rh-D negative
  - To ensure WB is also available for patients of childbearing potential

## SWiFT Canada Study at a Glance



- Multi-centre, randomized, unblinded, parallel controlled trial patients transported by Ornge 799 (Toronto rotor-wing asset)
- Intervention: 2u WB (group O Rh-D neg)
- Control: 2u RBC + 2u plasma
- **Primary Outcome: Multiple metrics assessing feasibility of prehospital transfusion study within the Canadian environment**
- **Secondary Outcome: Death or massive hemorrhage at 24 hours**
- Sample size: **50 patients – LAUNCHED IN DEC 16 2024**

### **Participant Inclusion Criteria**

- Patient who has suffered a traumatic injury
- Attended by participating Ornge paramedics
- Requires prehospital blood transfusion to treat major traumatic hemorrhage

### **Participant Exclusion Criteria**

- Pediatric (age <16 or transported to pediatric trauma centre [if age unknown])
- No intravenous or intraosseous access (should be assessed prior to opening box)
- Knowledge that patient will object to being given blood transfusion for any reasons
- Blood already administered on-scene, prior to arrival of the participating Ornge crew



# Screened & Enrolled by Ornge

**12** in **3** mos

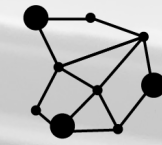
Eligible Enrolment

**10** / **50**



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## SWiFT Canada Take Aways

Whole blood is available in civilian environment (clinical trials only)

Ornge may request blood to go with patients

Likely to see expansion of blood components/products in the Ontario prehospital environment beyond RBC

**Pre-Arrival**

**Team Briefing**

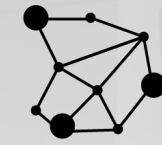
1. **What do we KNOW?**  
(e.g. vitals, mechanism)

2. **What are our anticipated PRIORITIES?**

3. **What do we NEED?**  
(e.g. blood, equipment)



# Future Priorities



Planning for a pan-Canadian prehospital transfusion RCT

Exploring the role of freeze dried plasma in Canadian prehospital environment

Standardization and evaluation of Canadian prehospital MHP  
(upcoming Canadian Prehospital Transfusion Summit – June 2025)

Role of fibrinogen concentrate in Canadian prehospital environment



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[brodie.nolan@unityhealth.to](mailto:brodie.nolan@unityhealth.to)

Questions

