

# Blood Shortage Management: A Shared National, Provincial and Local Responsibility

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Wendy Owens ART, B Comm

# Disclosures

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- No financial conflicts to disclose



# Learning Objectives

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1. Explain the key elements of the national plan for management of blood shortages
2. Describe the key elements of provincial and hospital contingency plans for managing blood shortages
3. Apply the principles of rationing red cells for massively bleeding patients during a critical red cell shortage
4. Identify lessons learned from recent blood shortages and exercises



# Case Scenario

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- Canada is currently in a Red Phase of a red blood cell (RBC) shortage
- Multiple patients present to your hospital and your RBC stocks are critically low, with enough likely to support one of these patients only
- Which of the following patients will be transfused as part of their therapy?...



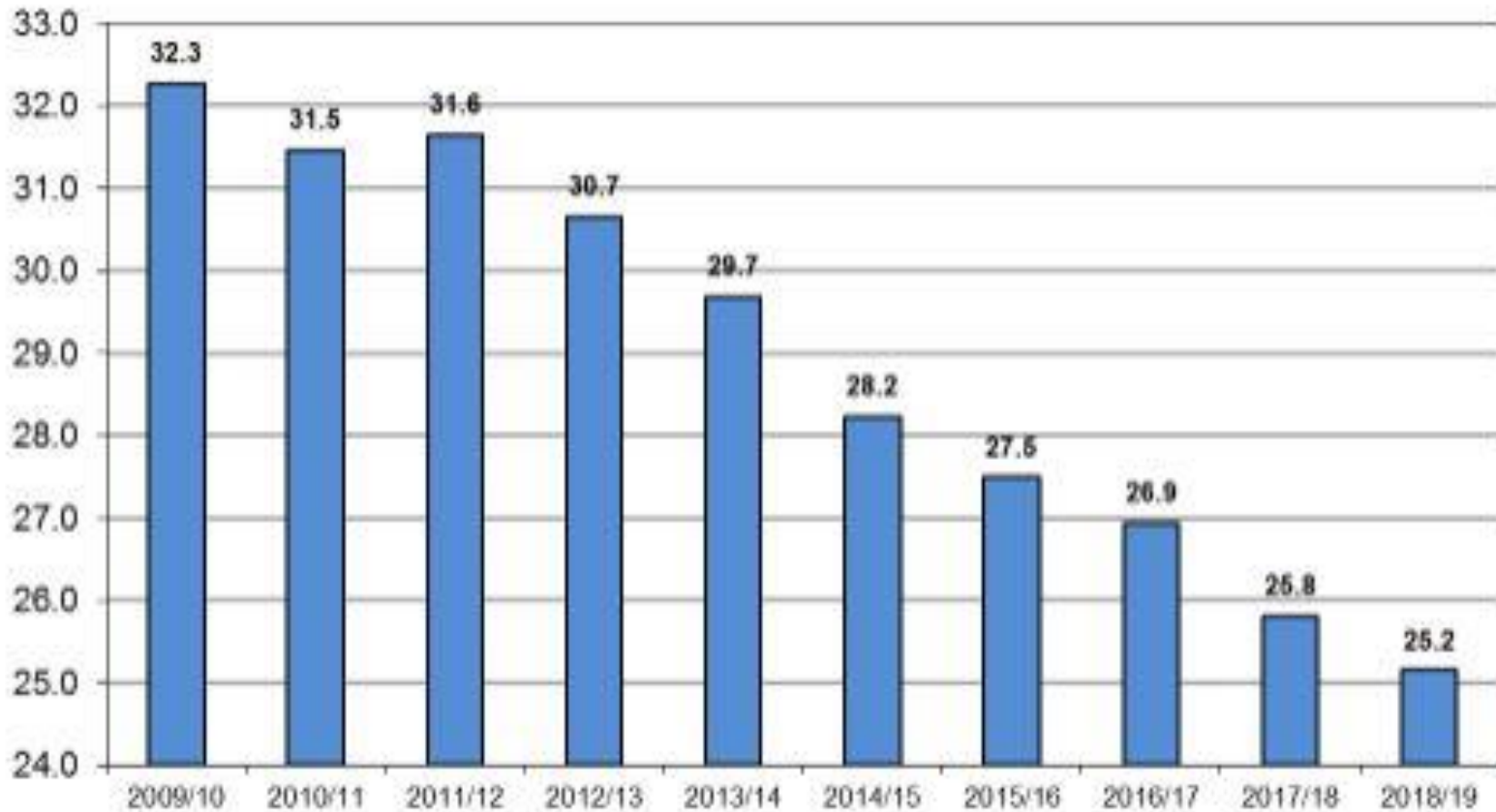
# Case Scenario

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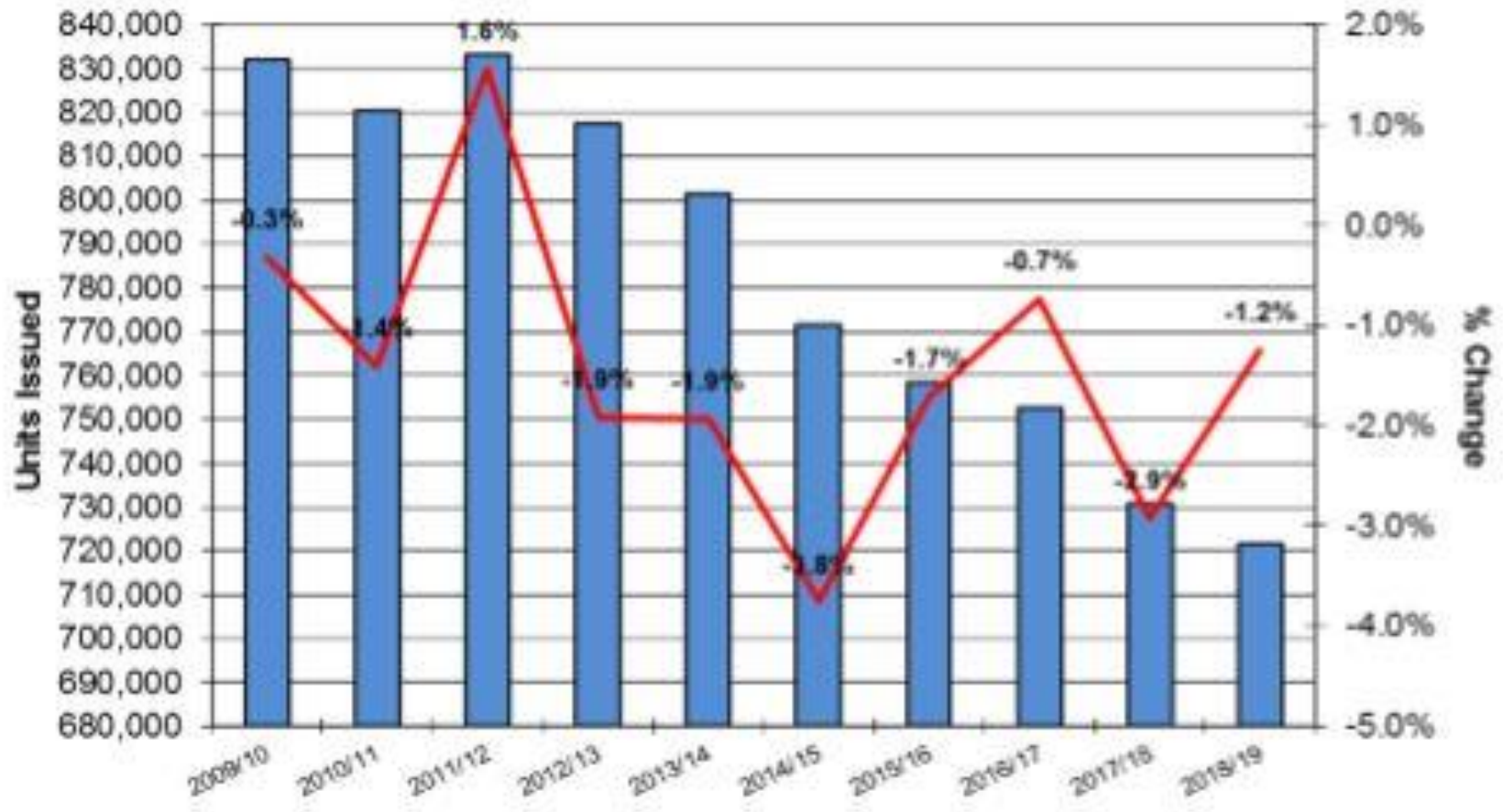
1. Transfusion dependent aplastic anemia patient age 12. PLT 17 and Hb 76
2. Male staff member age 56 with ruptured AAA found without pulse or BP in hospital parking lot
3. Female pedestrian age 25 struck by car, unconscious, bleeding 100 mL/min from head wound, partial amputation of leg, distended abdomen suggestive of internal bleeding
4. Male age 63 on the organ transplant waiting list for 5 years, deceased donor organ available



# Red Cell Issues in Canada (CBS)



# RBC Demand Growth





# Blood Shortage - Causes

Event	↑ Demand	↓ Supply
Natural disaster (fire, flood, winter storm)	√	√
Man-made disaster (industrial accident)	√	√
Pandemic outbreak	?	√
Power outage		√
Mass casualty/trauma, one massive transfusion	√	
Inventory stockpiling	√	√
Manufacturing failure/delay		√
Labour disruption		√
Transportation disruption		√
seasonal	√	√



# The National Plan

THE NATIONAL PLAN FOR MANAGEMENT  
OF SHORTAGES OF LABILE BLOOD  
COMPONENTS

NATIONAL ADVISORY COMMITTEE ON  
BLOOD & BLOOD PRODUCTS  
&  
CANADIAN BLOOD SERVICES



National Advisory Committee  
on Blood and Blood Products

Comité consultatif national sur  
le sang et les produits sanguins



Canadian Blood Services  
*it's in you to give*

2015 October 7



# Purpose of the National Plan

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- To maximize the effectiveness of a national response to any crisis which impacts the adequacy of the blood supply in Canada
- To provide a framework for provinces/territories, and hospitals/regional health authorities to create their own plans to ensure consistent and equitable allocation of scarce blood resources
- To recommend a proactive approach to inventory management
- The Plan applies to blood components however, the principles could be applied to blood products also



# The National Plan

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- Assumes:
  - all efforts to increase the available supply have been exceeded
  - allocation of available scarce supply is based on ethical principles
  - Legal liability concerns are acknowledged
  - all areas served by CBS affected about equally
  - close collaboration between jurisdictions and with Héma-Québec



# The National Plan

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## Structure:

### 1. Inventory levels defined by 'Phases'

- **Green phase** is optimum
- **Green phase advisory** was introduced in 2014 to indicate that blood stocks are less than optimum but not yet Amber and recovery is anticipated within a relatively short time period
- **Amber phase** implies supply is insufficient to continue with routine practices and hospitals will need to reduce blood use
- **Red phase** implies blood inventory is critically low and insufficient to support use for even non-elective indications and may need to be preserved for life-threatening need only

### 2. Key Participant Roles and Responsibilities

- CBS
- CBS P/T BLC and Ministries of Health
- National Advisory Committee
- Hospitals/Regional Health Authorities



# Inventory Levels

RBC Inventory level	CBS Days on Hand	CBS # Units on hand
<b>Green</b> Phase (minimal decrease to optimal)	> 72 hours	> 8,322
<b>Amber</b> Phase (serious)	48-72 hours	5,548-8,322
<b>Red</b> Phase (critical)	< 48 hours	< 5,548

Platelet Inventory Level	% of National Daily Requirement (# of doses)
<b>Green</b> Phase (minimal decrease to optimal)	80 – 100% (> 259)
<b>Amber</b> Phase (serious)	25-79%, recovery NOT expected within 12-24 hours (81-259)
<b>Red</b> Phase (critical)	< 25%, recovery NOT expected within 12-24 hours (< 81)



# National Emergency Blood Management Committee (NEBMC)

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- Chaired by the Chair of National Advisory Committee on Blood and Blood Products (NAC), currently Dr. Jennifer Fesser of Charlottetown, PEI
- CBS Supply Chain and Medical, Government relations and Communications representatives
- All NAC members (see [www.nacblood.ca](http://www.nacblood.ca))
- All provincial/territorial blood representatives (P/T)
- Two patient representatives: past or present recipient and a representative from a national patient society
- Ex-officio: Québec Ministry, Héma-Québec, Health Canada



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# **GUIDELINES FOR USE BY PHASE**



**Table 1: Guideline for the use of RBC transfusions in children and adults in shortage situations**

<b>Green Phase</b>	<b>Amber Phase</b>	<b>Red Phase</b>
<b>Major Hemorrhage</b>	<b>Major Hemorrhage</b>	<b>Major Hemorrhage</b>
Follow your hospital/RHA guidelines	Follow your hospital/RHA guidelines	Follow your hospital/RHA guidelines Follow triage/rationing allocation framework if instructed by NEBMC <sup>1</sup>
<b>Surgery/Obstetrics</b>	<b>Surgery/Obstetrics</b>	<b>Surgery/Obstetrics</b>
Follow your hospital/RHA guidelines	Urgent <sup>2</sup> and emergency <sup>3</sup> surgery in consultation with H/RBEMC. Peri/post partum hemorrhage.  For all situations, the minimal number of units to stabilize patient should be used.	Emergency situations in consultation with H/RBEMC Follow triage/rationing allocation framework if instructed by NEBMC <sup>1</sup>
<b>Non-Surgical Anemias <sup>4</sup></b>	<b>Non-Surgical Anemias <sup>4</sup></b>	<b>Non-Surgical Anemias <sup>4</sup></b>
Follow your hospital/RHA guidelines	All requests for RBC transfusion in patients with a Hb level > 70 g/L must be reviewed by designated medical personnel.  For patients with hypoproliferative anemias, single unit transfusion should be provided if significant symptoms associated with anemia but reassessment of severity of symptoms after each unit is required.	All requests for RBC transfusion in patients with a Hb level > 60 g/L must be reviewed by designated medical personnel.  For patients with hypoproliferative anemias, single unit transfusion should be provided if significant symptoms associated with anemia but reassessment of severity of symptoms after each unit is required.

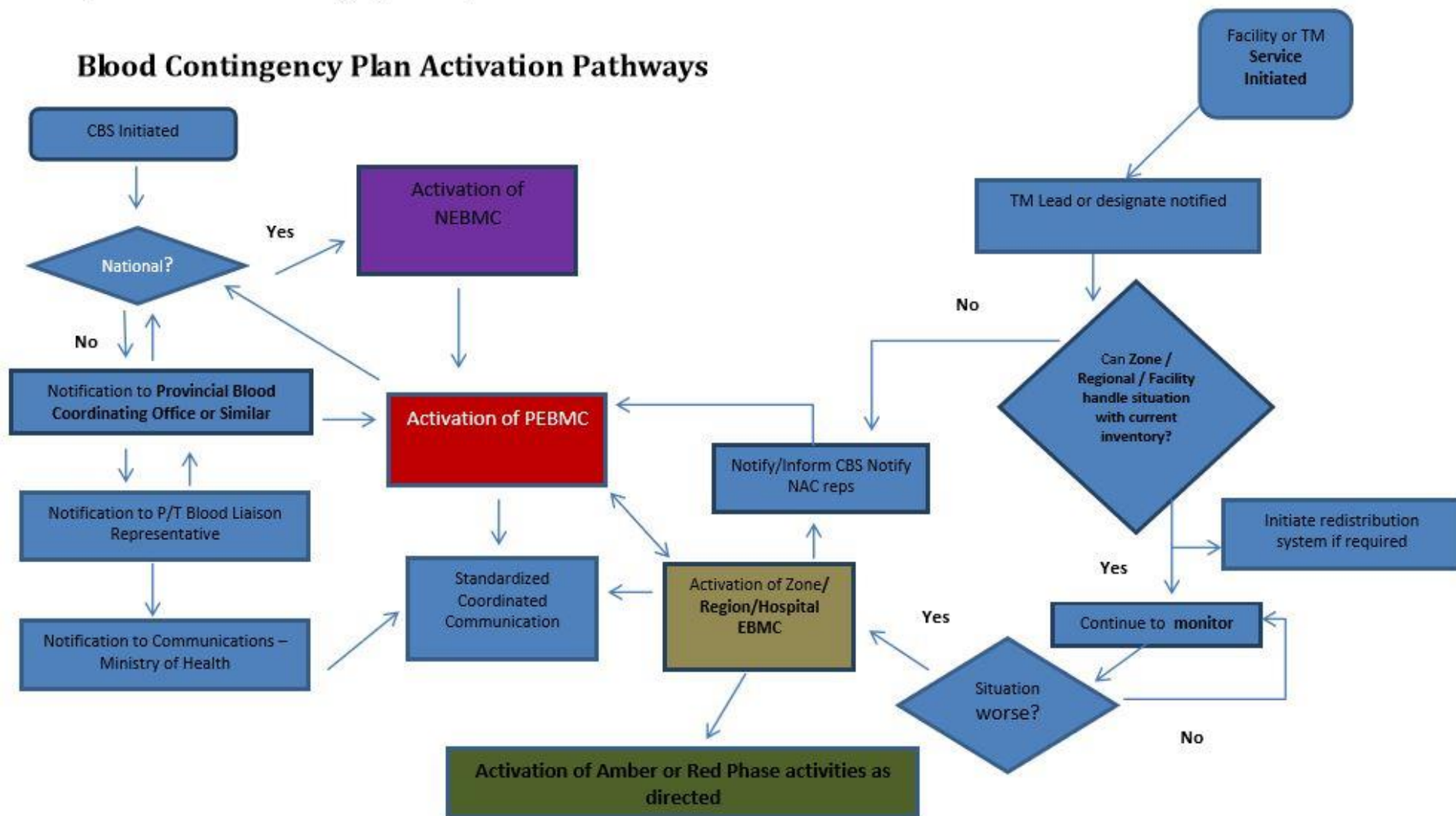
**Table 2: Guideline for the use of platelet transfusions in children and adults in shortage situations**

<b>Green Phase</b>	<b>Amber Phase</b>	<b>Red Phase</b>
<b>Major Hemorrhage</b> Immune thrombocytopenia and life- or limb-threatening bleeding maintain PC $>10 \times 10^9/L$ . For head trauma or CNS bleeding maintain a PC $>100 \times 10^9/L$ . Other significant bleeding, or acute promyelocytic leukemia at acute presentation, maintain a PC $>50 \times 10^9/L$ .	<b>Major Hemorrhage</b> For head trauma or CNS bleeding maintain a PC $>80 \times 10^9/L$ .	<b>Major Hemorrhage</b> Same as Amber phase
<b>Invasive procedures/ surgery</b> For non-surgical invasive procedures maintain a PC $>20 \times 10^9/L$ (central venous catheter insertion, paracentesis, thoracentesis) For lumbar maintain a PC $>50 \times 10^9/L$ For CNS surgery maintain a PC $>100 \times 10^9/L$	<b>Invasive procedures/ surgery</b> Urgent <sup>1</sup> and emergency <sup>2</sup> surgery in consultation with H/RBEMC  In presence of active bleeding or surgical procedure maintain a PC $>50 \times 10^9/L$ or if CNS trauma/surgery a PC $>80 \times 10^9/L$  For non-surgical invasive procedures (other than bone marrow aspiration or biopsy) maintain a PC $>10 \times 10^9/L$ with image guidance.  For lumbar puncture, maintain a PC $>20 \times 10^9/L$	<b>Invasive procedures/ surgery</b> Emergency surgery in consultation with H/RBEMC  All requests for platelet transfusion must be reviewed by designated medical personnel
<b>Bone marrow failure/ hematopoietic stem cell transplantation/ chemotherapy</b> Adhere to a maximum threshold PC of $10 \times 10^9/L$ for prophylactic platelet transfusions.	<b>Bone marrow failure/ hematopoietic stem cell transplantation/ chemotherapy</b> Adhere to a maximum threshold PC of $10 \times 10^9/L$ <del>for prophylactic platelet transfusions</del> , consider lowering this threshold for routine prophylactic transfusions to $5 \times 10^9/L$ . Transfuse patients undergoing autologous stem cell transplant only if symptoms of bleeding. All requests for a platelet transfusion in non-bleeding patients with a PC $>10 \times 10^9/L$ must be reviewed by designated medical personnel. Split PC doses and use half doses in non-bleeding patients if necessary.	<b>Bone marrow failure/ hematopoietic stem cell transplantation/ chemotherapy</b> Eliminate all prophylactic transfusions.  All requests for platelet transfusions in non-bleeding patients must be reviewed by designated medical personnel

## APPENDIX C EXAMPLE ONLY

Adapted from Alberta Blood Contingency Plan – September 2014 version

### Blood Contingency Plan Activation Pathways



# Provincial/Territorial Emergency Blood Management Committees

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- Minister of Health to establish this committee with a responsibility to:
  - Develop a jurisdictional plan for the management of blood shortages consistent with the National Plan
  - Act as a conduit of communication between NEBMC and hospitals
  - Manage non-adherence to requests to reduce blood use



# Hospital Emergency Blood Management Committees

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- Senior or executive management representation
- Medical Director of Transfusion Service
- Multidisciplinary physician representation
- Nursing
- Transfusion Service manager, safety officer
- Risk manager, Communications...



# Responsibilities of Hospitals

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- Develop Emergency Blood Management Plan
- Communication plan: who is to be notified and how
  - Physicians, nurses, administration, technologists, risk management, public relations, and their delegates
- Plan for stepwise reduction in blood use
  - Including deferral/cancellation of surgery/transfusion
- Documentation of decisions
- Redistribution plans with area hospitals
- Plan for managed Recovery Phase



Phase	Inventory Level	Hospital Action
Green	Normal	<ul style="list-style-type: none"> <li>• Practice good blood management, develop plan</li> </ul>
Amber	Reduction of inventory by up to 50%	<ul style="list-style-type: none"> <li>• Reduce inventory held by 50%</li> <li>• Initiate internal communication</li> <li>• Emergency blood management committee (EBMC) meets</li> <li>• Triage blood requests</li> <li>• Review elective OR cases, consider deferral</li> </ul>
Red	Shortage is severe and anticipated to be prolonged	<ul style="list-style-type: none"> <li>• Reduce inventory to critical levels</li> <li>• Initiate heightened internal communication</li> <li>• EBMC meets and initiate plan for reduction of blood use</li> <li>• Blood issued only for life threatening need</li> </ul>
Recovery	Supplier inventory improves	<ul style="list-style-type: none"> <li>• Ensure return to normal operations occurs at a gradual and controlled pace</li> </ul>





# Green Phase is a busy time at hospitals...

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1. Establish functioning Transfusion Committee, EBMC, Triage Team for Red Phase of a red cell shortage
2. Implement transfusion guidelines, monitor adherence to them, and scrutinize out-of-guideline orders
3. Establish blood conservation strategies
4. Establish inventory management policies, including inventory levels for all phases of a blood shortage
5. Minimize wastage of blood components/products
6. Report inventory levels and disposition data to CBS
  - ideally this is done regularly and by ABO/Rh
7. Develop appropriate redistribution mechanisms
8. Run or participate in simulation exercises. Review and revise plan as required



# So is Recovery Phase...

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1. Blood inventory levels are increasing, and are expected to remain at levels that allow for the resumption of transfusion
2. **Slowly** increase inventory, resume surgery/transfusion, and replenish emergency inventory to affected sites
3. This is the phase that has the **highest risk** for conflicting messages
4. A rapid increase in demand may shift the situation back into shortage



# Inventory Management

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- Web-based reporting to CBS of hospital inventory and disposition data has been available since May 12, 2014
- Hospitals are asked to report by ABO/Rh where applicable
- The minimum data elements required to calculate the Inventory Index:
  - Average daily red cell demand (ADRD) can be determined by hospital, by province, by CBS nationally (annually divide by 365 days)
  - Red cell demand = transfused + outdated + wasted
  - Actual inventory

**Inventory Index = Inventory (on a given day) ÷ ADRD**

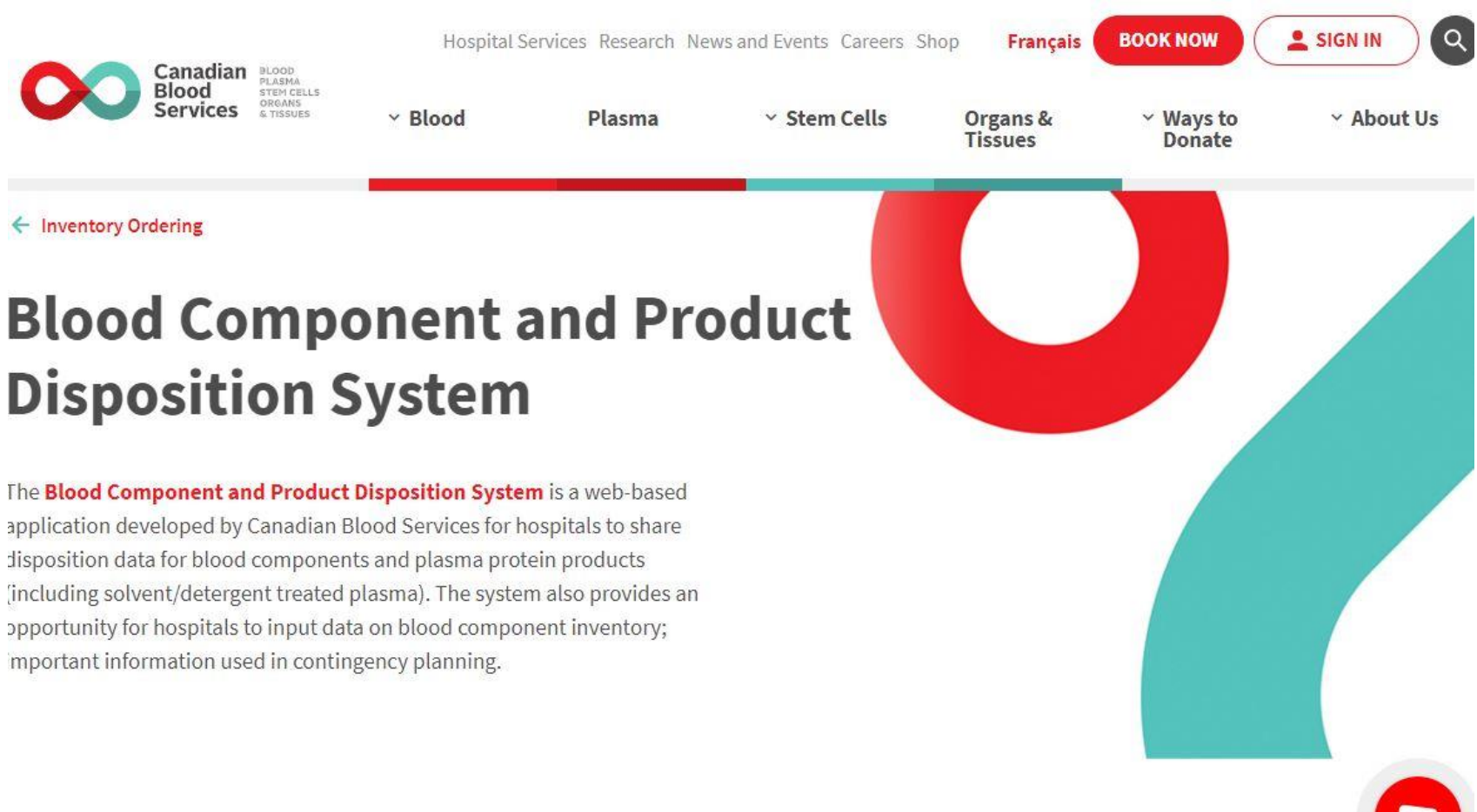


# Inventory Index Calculation

Calculation step	Example
Hospital totals all RBC transfused, outdated and wasted for the past 12 months = average yearly RBC demand	3650
Hospital divides by 365 to calculate average daily RBC demand (ADRD)	$3650/365=10$ ADRD=10
Hospital notes average total inventory	90 units
Inventory Index = Inventory/ADRD	$90/10=9$ Hospital Inventory Index=9



# Inventory Reporting at [www.blood.ca](http://www.blood.ca)



The screenshot shows the Canadian Blood Services website. The header includes the logo, navigation links (Hospital Services, Research, News and Events, Careers, Shop), a language toggle for 'Français', a 'BOOK NOW' button, a 'SIGN IN' button, and a search icon. A secondary navigation bar lists 'Blood', 'Plasma', 'Stem Cells', 'Organs & Tissues', 'Ways to Donate', and 'About Us'. The 'Inventory Ordering' link is highlighted in the left sidebar. The main content area features the title 'Blood Component and Product Disposition System' and a descriptive paragraph. A large red and teal graphic is on the right side of the page.

Canadian Blood Services  
BLOOD PLASMA STEM CELLS ORGANS & TISSUES

Hospital Services Research News and Events Careers Shop

Français BOOK NOW SIGN IN

▼ Blood Plasma ▼ Stem Cells Organs & Tissues ▼ Ways to Donate ▼ About Us

← Inventory Ordering

## Blood Component and Product Disposition System

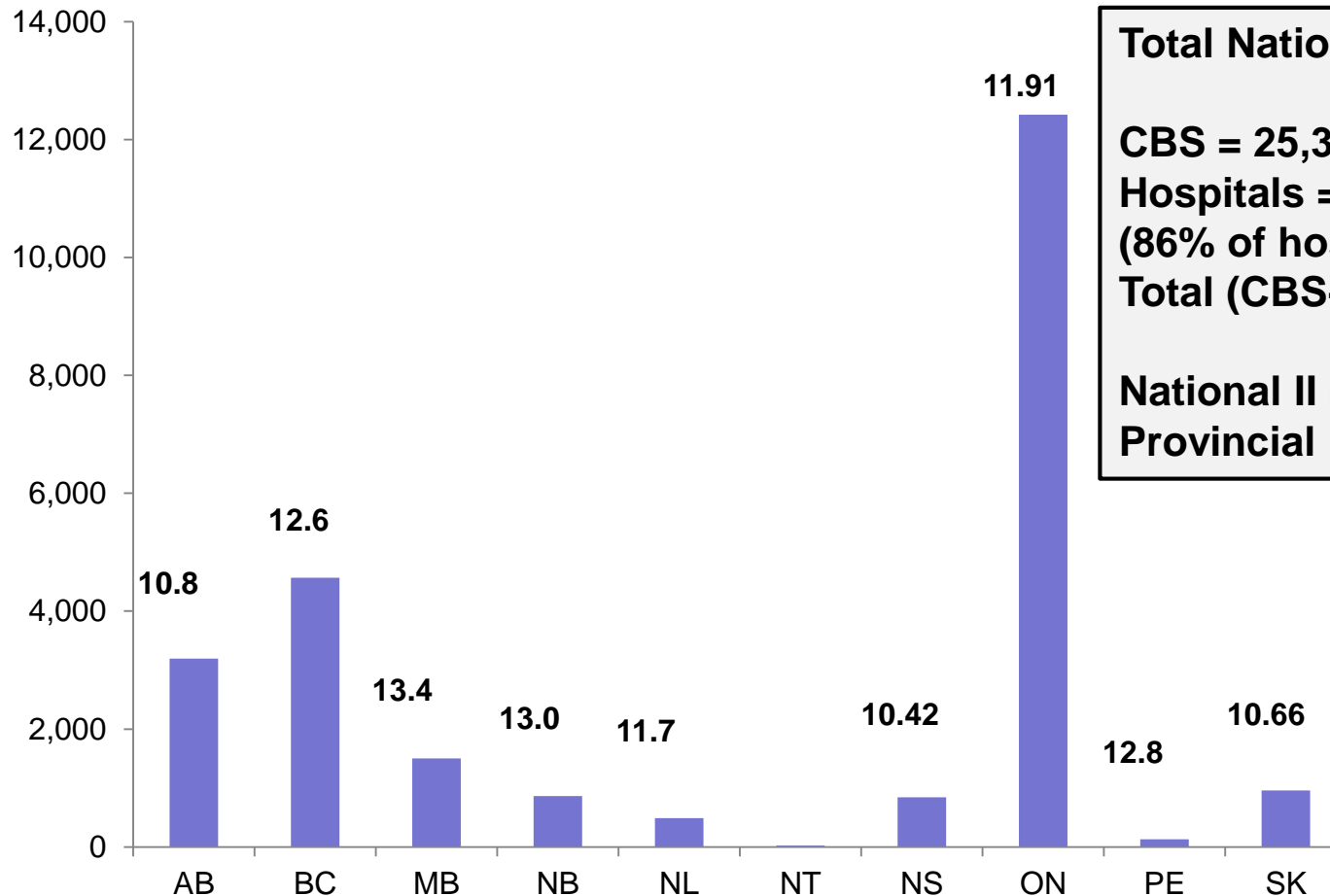
The **Blood Component and Product Disposition System** is a web-based application developed by Canadian Blood Services for hospitals to share disposition data for blood components and plasma protein products (including solvent/detergent treated plasma). The system also provides an opportunity for hospitals to input data on blood component inventory; important information used in contingency planning.





# National and Provincial Inventory Index

## 7 Jan 2015



### Total National Inventory RBC

**CBS = 25,372 U**

**Hospitals = 24,994 U**

**(86% of hospitals reporting)**

**Total (CBS+hosp) = 50,366**

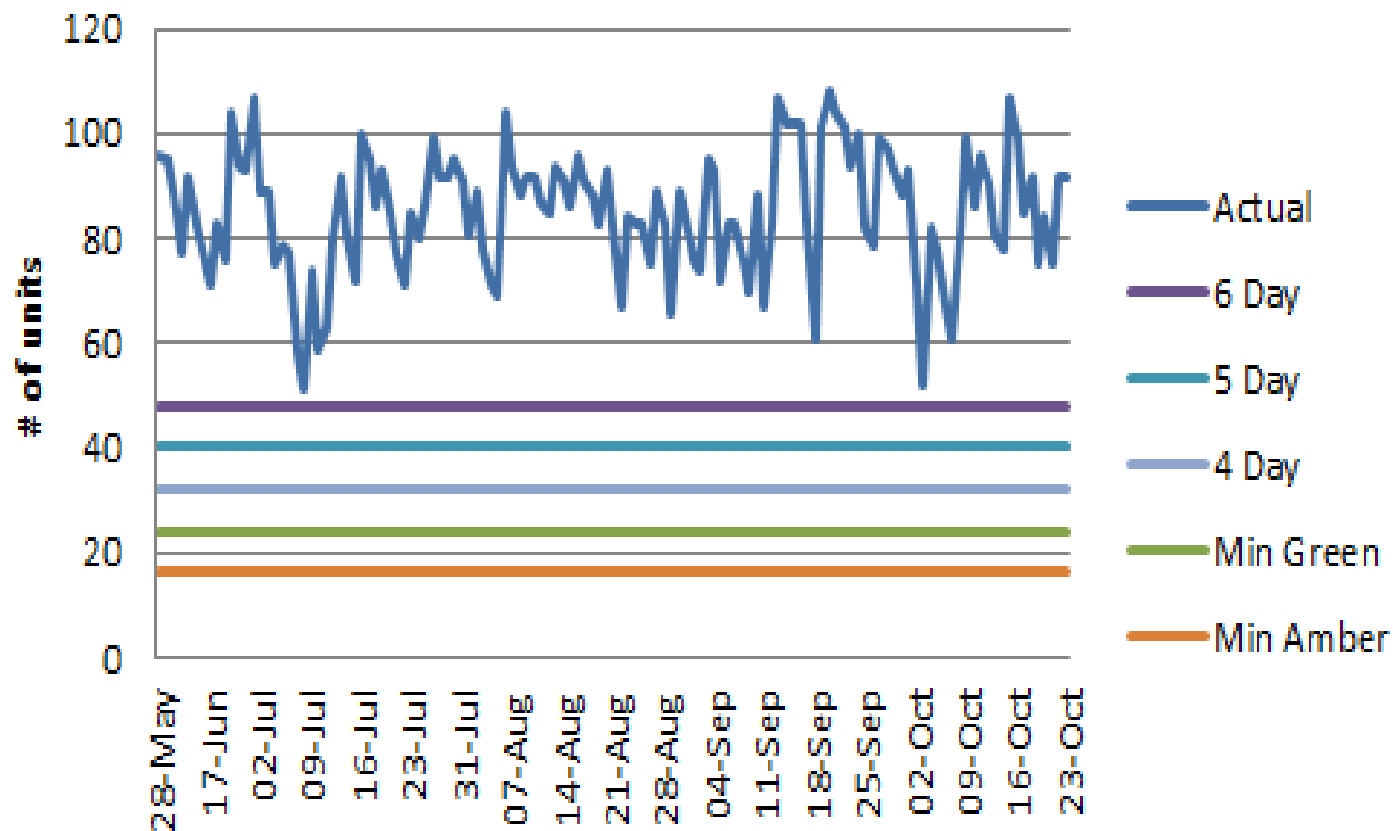
**National II = 11.88**

**Provincial II = 10.42 to 13.4**



# Example Hospital

## RBC Total Inventory



Apr-June 2014  
ADRD 8.03  
Inventory Index  
11.58

The inventory lines may move. "Lean" Inventory Index is 6-8.



# National Hospital Inventory Index and Phases of a RBC Shortage

The following table provided by CBS is an example of how the Inventory Index might represent actual hospital inventory and a corresponding inventory phase. The calculations are based on actual 2015-2016 hospital disposition data and a calculated ADRD of 2056 red cell units.

**Calculated ADRD = 2056 red cell units**

National Number Units - Hospitals	Inventory Index	Phase — <i>not yet determined, presented for consideration and reference only</i>
25,000	12.16	Green
20,000	9.73	Green
19,000	9.24	Green
18,000	8.75	Green
17,000	8.27	Green
16,000	7.78	Green Advisory
15,000	7.30	Green Advisory
14,000	6.81	Amber
10,000	4.86	Red
5,000	2.43	Red

# “Red Line” Inventory in Rural Sites

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- Needs discussion at hospital and provincial levels
- Balance risk between holding inventory ‘just in case’ at rural sites with denying blood to a patient in another site due to lack of inventory



# “Red Line” Inventory in Rural Sites

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For example, in 73 Ontario small hospitals

	O positive RBC	O negative RBC
Green phase	404	303
Red phase	163	147

Some other groups are also stocked in 21 hospitals in the central and southwest regions of the province.

Small = fewer than 100 beds



# National Emergency Framework

For treating massively bleeding  
patients in a Red Phase blood  
shortage



National Advisory Committee  
on Blood and Blood Products

Comité consultatif national sur  
le sang et les produits sanguins

**Emergency framework for rationing of blood  
for massively  
bleeding patients during a red phase of a  
blood shortage**

Working group on emergency disposition of blood during a  
red phase blood  
shortage

**2012-04-14**

**Approved by CBS  
Provincial/Territorial Blood  
Liaison Committee January  
2012**

[www.nacblood.ca](http://www.nacblood.ca)



# Purposes of the Emergency Framework

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- To guide health care professionals in triaging patients requiring massive transfusion during a red phase blood shortage
  - when demand for blood greatly exceeds supply
  - when all other measures to increase the blood supply have been exhausted
- To standardize care across jurisdictions
- To allow for fair and just distribution of blood
- Massive transfusion: one blood volume/24 hr, half blood volume/3 hr,  $\geq 4\text{U RBC/1 hr}$





# Triage Tool – General Exclusion Criteria

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- Severe burns with
  - Age > 60 yrs, or > 60% body surface affected, or
  - Inhalation injury requiring mechanical ventilation
- Cardiac arrest
- Advanced progressive baseline cognitive impairment
- Metastatic cancer with life expectancy < 6 mo.
- Immunocompromised, advanced and irreversible
- Acute neurological condition, severe and irreversible
- End-stage organ failure (with certain criteria)



# Specific Exclusion Criteria

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- Trauma
- Ruptured AAA
- ECMO/VAD
- Organ transplantation
- Gastroenterology
- Obstetrics
- Other massively bleeding patients



# Specific Exclusion Criteria - Trauma

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1. Non-survivable brain injury
2. GCS=3 with irreversible hypotension and fixed and dilated pupils
3. After brain death, for organ transplantation
4. Penetrating cranial trauma and GCS=3, non-reversible
5. Penetrating cranial trauma and GCS<8, non-reversible, with hypotension and severe thoracoabdominal trauma



# Specific Exclusion Criteria - Trauma

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6. Blunt trauma and GCS=3, non-reversible
7. Blunt trauma with loss of vital signs pre-hospitalization
8. Transcranial gunshot injury
9. Age >65 with severe brain injury, profound shock, severe thoracic or abdominal trauma
10. Age >75 and moderate brain injury and GCS <12 and profound shock and thoracoabdominal injury



# Specific Exclusion Criteria

## Ruptured AAA

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1. Pre-operative cardiac arrest
2. Systolic blood pressure <70 mmHg unresponsive to fluids, with loss of consciousness
3. Do not meet criteria for emergent vascular repair



# Specific Exclusion Criteria

## Organ Transplantation

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- Deceased donor recovery should proceed, but without transfusion of the deceased donor in the process of stabilization
- Deceased donor transplantation should proceed with informed consent regarding increased risk from restriction of transfusion or possible unavailability of blood
- Living donor transplantation should be deferred



# Specific Exclusion Criteria

## Obstetrics and Other

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- Transfusion should not be withheld from bleeding obstetrical patients
- Other patients not included in the above exclusion criteria: do not transfuse if the Triage Team believes the mortality rate to exceed 80%



# Supplemental Inclusion Criteria and Re-evaluation of Transfused Patients

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1. Youngest first
2. Highest likelihood of hemostatic control
3. First-come first-served

Then, re-evaluate according to assessment criteria  
for triaged patients:

1. Every 24 hours
2. Every 10 units of RBC, or as determined by  
NEBMC



# How do I deal with this??

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...what is the risk of liability?...



# Legal Considerations

## National Plan

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- The National Plan recognizes the potential for legal activity on behalf of patients denied blood
- It is recommended that the Plan undergo legal/risk management review at participating institutions
- It is hoped that the existence of the Plan will assist hospitals and physicians to make the most appropriate medical (and hence legal) decisions



# Legal Considerations

## Emergency Framework/Triage Tool

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- There is an altered standard of care during a Red Phase, when access is limited by supply
- Patients must have access to all other available therapies short of transfusion
- Providers who use the Triage Tool competently and in good faith should not be found negligent for decisions dictated by it
- Careful record-keeping of decisions will be of paramount importance (use of triage forms)



# Documentation of Decisions

## Documentation of Blood Orders (non-surgery) During a Blood Shortage

**Instructions for completion:** Record all orders, indicate if order was filled, reduced or deferred. Use the comment field to note any remarkable events including blood group substitutions if ABO/Rh type specific blood is not available. Use new page each day.

CBS Notification Phase:    ☐ Green Advisory    ☐ Amber    ☐ Red    ☐ Recovery

Blood Component: \_\_\_\_\_

Date of notification of blood shortage received: \_\_\_\_\_

Patient name/ID & location	Products ordered	Time	Products issued	Relevant laboratory results (e.g. hgb, plt)	Comments - alternative therapy or adverse events



# Validation of Emergency Framework

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- Done as part of the 2013 National Plan validation exercise
- Study sites:
  - Royal Columbian Hospital, BC
  - Sunnybrook Health Sciences Centre, ON
  - Alberta Health Services – Edmonton, AB
- Nov 14-18 2013 all patients in whom a massive hemorrhage was identified evaluated for:
  - fulfillment of triage stopping criteria for the particular clinical situation
  - total number of RBC units transfused
  - survival outcomes



# Results and Conclusions

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- Only one of six met 'stopping' criteria
- Of the two ruptured AAA neither met stopping criteria, they used 8 and 29 units of RBC and both died within 24 hours
- Simulation exercises of longer duration are needed
- Maybe the ruptured AAA stopping criteria can be revised



# Lessons Learned

From actual events and simulation  
exercises

# Lessons from Simulation Exercises

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- Several provinces have completed simulation exercises
- Some common themes in the reports
  - Communication roll-out
  - Maintenance of up-to-date contact lists
  - Definition of optimal inventory
  - Staff training on the hospital EBMP
  - Processes for recovery phase
  - Who will triage orders, and be clear on the guidelines
  - Documentation of transfusion deferrals
  - Timely reporting of inventory levels to CBS



# Ontario Exercises Improvement

Recommendation	2010 %	2014 %	2018 %	Comments
Hospital plans should be finalized		92	94	
Staff should be trained on blood shortage plans		57	82	
Processes for redistribution should be in place		58	79	
A hospital committee should be in place to manage blood shortages		65	66	Some smaller hospitals don't have a separate committee but use an existing committee such as the Transfusion Committee
Hospitals should report their inventory to CBS when requested	64	47	86	
Deferral of any transfusion/surgery should be documented	3	63	85	



# Lessons from a “Near Miss”

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## Ontario 2014-2015

- Ontario Public Service Employees Union in strike position January 2015, affecting Ottawa and Brampton CBS sites (collection, processing, delivery affected)
- Situation lasted from 24 Dec 2014 to 29 Jan 2015
- Ontario EBMC met several times
- CBS held multiple teleconferences with hospitals
- Hospitals were asked to increase inventories of RBC, frozen products and plasma protein products



# Lessons from a “Near Miss”

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## Ontario 2014-2015

- Issues:
  - Use of ‘hub’ hospitals for redistribution of inventory, associated costs
  - What to do about platelets?
    - Revise the guideline ? Splitting doses?
  - Role of CBS in equitable distribution of inventory
  - Hospital reporting of inventory to CBS is critical
  - Level of engagement was very high
  - Resulted in a ‘spike’ in products discarded due to outdating in January/February 2015





# Cryoprecipitate shortage 2018/19

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- 2018-12-27 NEBMC meets to discuss situation
- 2018-12-28 OEBMC meets to discuss
- Hospitals informed of Green Advisory phase for cryo (Ontario technically in Amber phase)
- Ontario uses 80% of cryo produced



# Cryoprecipitate shortage 2018/19

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- Large academic centres in Ontario all agree to switch to FC as a replacement for cryo
- Allowed CBS to move to recovery phase
- Allowed recovery to be planned
- Ended 2019-02-01



# Lessons Learned

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- Communication plan worked
- Collaboration resulted in solution and recovery
- Use of new Ministry web-based tool recently tested in blood shortage simulation exercise
- Where alternative products are available, hospitals should be ready to implement



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# Back to the Case Scenario



# Case Scenario

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- Canada is currently in a Red Phase of a red blood cell (RBC) shortage
- Multiple patients present to your hospital and your RBC stocks are critically low, with enough likely to support one of these patients only
- Which of the following patients will be transfused as part of their therapy?...



# Case Scenario

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1. Transfusion dependent aplastic anemia patient age 12. PLT 17 and Hb 76
2. Male staff member age 56 with ruptured AAA found without pulse or BP in hospital parking lot
3. Female pedestrian age 25 struck by car, unconscious, bleeding 100 mL/min from head wound, partial amputation of leg, distended abdomen suggestive of internal bleeding
4. Male age 63 on the organ transplant waiting list for 5 years, deceased donor organ available



# Case Scenario

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1. Transfusion dependent aplastic anemia patient  
age 12. PLT 17 and Hb 76

2.

3.

1. Hb > 70 g/L

4.



# Case Scenario

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1. Transfusion dependent aplastic anemia patient age 12. PLT 17 and Hb 76
2. Male staff member age 56 with ruptured AAA found without pulse or BP in hospital parking lot
3. Female pedestrian age 25 struck by car

4. **2. Ruptured AAA with  
preoperative cardiac arrest**



# Case Scenario

## 3. Meets trauma criteria for receipt of RBC: transfuse and re-assess

3. Female pedestrian age 25 struck by car, unconscious, bleeding 100 mL/min from head wound, partial amputation of leg, distended abdomen suggestive of internal bleeding
4. Male age 63 on the organ transplant waiting list for 5 years, deceased donor organ available



# Case Scenario

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**4. Deceased donor organ harvested without transfusion of donor; transplant may proceed but without RBC transfusion, informed consent to state this**

4. Male age 63 on the organ transplant waiting list for 5 years, deceased donor organ available



# Thanks to

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- Allison Collins, Chair, Ontario Contingency Planning Working Group
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- Dr. Taher Rad, University of Calgary
- Tracy Cameron, ORBCoN

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# Questions?

