



Government of Newfoundland and Labrador  
Department of Health and Community Services  
Provincial Blood Coordinating Program

<b>EMERGENCY BLOOD MANAGEMENT PLAN</b>	<b>NLBBCP-004</b>
<b>Office of Administrative Responsibility</b>  Medical Advisor to the Provincial Blood Coordinating Program  Manager, Provincial Blood Coordinating Program	<b>Issuing Authority</b>  Dr. Christopher Sharpe  Daphne Osborne
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## Background

A blood component shortage may occur at a National, Provincial/Territorial (P/T), Zonal, or facility level. The shortage may occur due to an increase in demand or due to a decrease in supply from the National blood supplier, Canadian Blood Services (CBS). The following table, adapted from the Alberta Contingency Plan, identifies some potential causes of blood shortages and the potential impacts on supply and demand.

**Causes of Blood Contingencies\***

Event	Potential for Demand Surge	Potential for Decreased Supply
Natural disasters: e.g., hurricane (tropical cyclone), severe windstorm (tornado), winter storm, wildfire, earthquake, flood, tsunami	✓	✓
Man-made hazards: e.g., industrial accident (fire, building collapse, hazardous material spill), chemical event, biological event, radiological event, nuclear event, explosive event	✓	✓
Pandemic outbreak	Unlikely	✓
Wide-area power outage		✓
Workplace violence	✓	✓ (if at CBS or hospital)
Mass casualty/multiple trauma	✓	
Massive transfusion of one patient	✓	
Inventory stockpiling	✓ (artificial demand)	✓ (blood not where required)
Manufacturing or testing failures/delays		✓
Product contamination/recall		✓
Labour disruption		✓
Transportation disruption		✓
Seasonal influence: e.g. increase in trauma; decrease in donations	✓	✓
Changes in donor deferral criteria		✓

\*Adapted from Alberta Blood Contingency Project Final Report (Draft), November 2007

The National Advisory Committee on Blood and Blood Products (NAC), as directed by the CBS/PT Blood Liaison Committee, has developed the National Plan for Management of Shortages of Labile Blood Components (The National Plan). The National Plan provides guidance on a National response if such an event occurs and guidance around the functions of the Emergency Blood Management committee and Plan development at the Provincial/Territorial, Zonal, and/or facility levels.

The National Emergency Blood Management Committee (NEBMC) was developed to allow information sharing and input into decision making from all regions of Canada in the event of blood component shortages. The NEBMC will ensure implementation of the National Plan by developing recommendations and providing advice to the P/T Ministries of Health, Zones/hospitals, and CBS to ensure a consistent and coordinated response to any critical blood shortages in Canada. Initial discussion will involve a small core group to determine strategies and next steps for discussion by the NEBMC if it is determined that the NEBMC convene.

There are four phases of inventory availability identified in the National Plan (green, amber, red, and recovery). CBS performs an in-depth daily analysis of National Inventory to determine if there is sufficient inventory (of each component and group) to fulfill the daily national demand. As a contingency plan, it is recommended that all staff directly involved in transfusion medicine be familiar with NAC's National Plan to prepare for alerts in any phase.

Phase	Definition	CBS Inventory (days/weeks on hand)			
		RBCs	Platelets	Plasma (Type O, A, B only)	Plasma (Type AB) or Cryosupernatant Plasma or Cryoprecipitate
Green	Normal inventory levels exist and supply meets demand. Ranges from <b>ideal</b> inventory to temporary shortages which are managed between CBS and site actions.	<p><b>Ideal &gt; 4 days on hand (DOH) for O Rh positive and A Rh positive.</b></p> <p>More than 3 successive days of 3-3.5 DOH constitutes an advisory phase.</p> <p><b>Ideal &gt; 3 DOH for all Rh negative blood groups.</b></p> <p>More than 3 successive days of 2-3 DOH constitutes advisory phase.</p>	<p><b>Ideal &gt; 90% of daily national inventory (DNI).</b></p> <p>80-90% constitutes advisory phase.</p>	<p><b>&gt; 2 weeks on hand (WOH).</b></p> <p>1-2 WOH constitutes advisory phase.</p>	<p><b>Ideal &gt; 3 weeks on hand (WOH).</b></p> <p>2-3 WOH constitutes advisory phase.</p>
Amber	Levels insufficient to continue routine transfusion practices and sites required to reduce usage.		25-79% of DNI. <b>No</b> recovery expected within 12-24 hours.	3-7 days DOH.	6-14 days DOH.
Red	Inventory levels are insufficient to ensure non-elective indications are fulfilled.		< 25% of DNI. <b>No</b> recovery expected within 12-24 hours.	< 3 days DOH.	< 6 days DOH.
Recovery	Inventory levels have begun to rebound and are expected to be maintained to allow movement from red to amber to green phase.				

The information in the table above reflects the “days on hand” inventory cutoff levels for CBS but should also be reflective of hospital/site inventory levels in each of the Zones. Based on CBS assessment of inventory and consultation with the NEBMC, if the inventory is outside “normal” levels, an alert/advisory will be sent out.

It is the responsibility of each of the Provinces/Territories (P/T) Ministry of Health to develop a Provincial/Territorial plan to manage any blood component shortages (including the formation of a P/T Emergency Blood Management Committee and its terms of reference) and linking it to other P/T emergency preparedness plans. All Zones/hospitals are encouraged to follow the Provincial Plan to develop their own Emergency Blood Management Committees (EMBC) and Zonal Plans.

This document provides guidance for the Newfoundland and Labrador Emergency Blood Management Committee (NLEBMC) and provides direction to the Zones in developing plans specific to each Zone for emergency blood management. It focuses on blood component shortages but can be used in the event of a blood product shortage as well. The Emergency Blood Management Plan (EBMP) may be implemented and/or initiated by the National or Provincial EMBC, CBS, Zones, and/or even at the facility level. Each of the phases and the roles and responsibilities of various stakeholders during each phase of the plan are identified in this plan.

## Definitions

“Business as usual” (communication from CBS): A fax sent to each transfusion medicine laboratory in NL and to the Newfoundland and Labrador Provincial Blood Coordinating Program (NLPBCP) from CBS. For inventory advisories, CBS simultaneously sends out the notice by fax and email to all NL Transfusion Medicine Laboratories and to the NLPBCP.

Emergent procedures: Those medical or surgical procedures that must be done within **24 hours** to prevent death or major morbidity.

Urgent procedure: Those medical or surgical procedures likely to have major morbidity if not performed within **28 days**.

## The Committees

See Appendix A for Provincial EBMC terms of reference.

Recommendations for **NL Health Services (NLHS) Zones /Hospital Emergency Blood Management Committee** membership:

- Representative of NLHS Zone/Hospital Senior or Executive Management
- Medical Director, Blood Transfusion Service
- Chair of Transfusion Committee
- Vice President Medical Services
- Vice President Laboratory Services
- Vice President of Nursing
- Transfusion Safety Officer(s) (TSOs)
- Transfusion Service Laboratory Manager

- Zone/Hospital Risk Manager responsible for Transfusion Medicine service
- Department Head(s) of following clinical areas if applicable:
  - Internal Medicine
  - Critical Care Medicine
  - Hematology/Oncology
  - Surgery
  - Anesthesiology
  - Emergency Medicine
  - Obstetrics/Gynecology
  - Pediatrics
- Communications/Public Affairs Director
- Other members as deemed appropriate by the Zone/Hospital group

In NL, the Zonal/Hospital EBMC would be the Transfusion Committee as this group is already established with the appropriate members. It is recommended that the Transfusion Committees meet on a regular basis, at a minimum quarterly, and when it is deemed necessary during blood shortages. A simulation activity should be performed at least every three years as revisions to current processes may be required based on evaluation of the simulated activity. However, if actual activation of the EBMP should occur, this can replace a simulation exercise.

### Communications

All hospitals/sites report daily inventory levels to CBS through the CBS website ([Blood Component and Product Disposition System](#)). This enables CBS to assess TOTAL blood inventories for the country and determine if a shortage is occurring or if a potential shortage is about to occur [Submitting Daily Red Blood Cell Inventory to Canadian Blood Services](#). If a shortage is identified, CBS in consultation with the NEBMC, will determine the required course of action to ensure safe, optimal, and equitable supply of blood components/products throughout Canada.

Spokespersons are identified at each level of the EBMCs (National, Provincial, and Zonal). In times of **severe** shortages CBS consults with both the National and Provincial EBMCs to determine the allocation of inventory, taking into consideration the usual CBS customer requirements, the cause of the shortage, current inventory requirements, and prep work done by the hospitals/Zones (such as development and implementation of the Zone and/or Facility Plan). Communication plan(s) can be found at [The National Plan for Management of Shortage of Labile Blood Components](#) (page 31-34; 65-84).

### Zones/Site Impact and Actions

The inventory shortage phase and the unique requirements of specific sites in the Zones determines the actions required to minimize the impact on the Health Care services provided and to ensure safe, equitable care for all patients. In severe shortages,

implementation of a triage protocol may be required. Zone/site protocols should include an ethical framework to manage allocation of available blood inventory. The National Plan Synopsis provides a collaborative approach based on derived ethical principles that can be found in the [Emergency framework for rationing of blood for massively bleeding patients during a red phase of a blood shortage](#).

An overview of the communication pathways, and impact and actions required at each of the varying levels has been included in the following table and Contingency template checklists are included in the appendices (F, G, H, and I).

Green Advisory Phase			
Inventory Supply Level	Canadian Blood Services	NLPBCP	Zone/Hospital Impact and Actions
<p>Normal blood component/product inventory levels are able to meet demand.</p> <p>Includes range of inventory levels from ideal inventory to periodic temporary shortages.</p>	<ul style="list-style-type: none"> <li>Communicate through “business as usual” means any temporary inventory adjustments required due to a shortage of a particular component/product and/or group.</li> <li>If shortage persists (over a week), CBS will communicate with NEBMC to determine the need for any further internal actions to improve inventory before going to a public media appeal for donors.</li> </ul>	<ul style="list-style-type: none"> <li>Consult with CBS and TSOs in each of the Zones to ensure current inventory meets demand at each site.</li> <li>Provide guidance to Zones/sites in preparing to implement their respective Emergency Blood Management Plans if shortages persists or worsen.</li> </ul>	<ul style="list-style-type: none"> <li>Report hospital inventory <a href="#">Blood Component and Product Disposition System</a>.</li> <li>Normal utilization activities.</li> <li>In advisory phase blood conservation strategies shall be implemented to prevent a more serious inventory issue. These include erythropoiesis- stimulating agents, thrombo mimetics, intravenous/oral iron, antifibrinolytics, intraoperative cell salvage, interventional radiologic procedures, rapid access to endoscopy, and non-invasive surgeries.</li> </ul>



Amber Phase			
Inventory Supply Level	Canadian Blood Services	NLPBCP	Zone/Hospital Impact and Actions
<p>Short term shortage of inventory; single blood component/ group/ blood product/lot number or due to a large unexpected need for components/ products due to local/zonal disaster.</p> <p>Inventory levels are insufficient to continue with routine transfusion practice and require measures to reduce blood component usage.</p>	<ul style="list-style-type: none"> <li>• In consultation with the NEBMC, determine need to activate the different levels of a shortage.</li> <li>• Communicate information to the NLPBCP and Zones/Hospitals via Inventory Advisories or Blood Shortage Advisories.</li> <li>• Assist the NLPBCP in coordinating communication to Zones/hospitals and the public.</li> <li>• Communicate current inventory status to the Zones/hospitals.</li> <li>• In collaboration with the Zones implement the pre-established communication plan.</li> <li>• Oversee and co-ordinate all communications to the media regarding the blood supply or need to call for donors as required.</li> </ul>	<ul style="list-style-type: none"> <li>• Meet with the Provincial EBMC to determine course of action.</li> </ul> <p>Approximate timeframe of 8 hours to cascade information (including actions required at Zone/hospitals) before CBS begins discussion with external stakeholder groups, donors, and media. <ul style="list-style-type: none"> <li>• Notify senior management (via the Zone/hospital EBMC) of the need to defer elective (non-urgent, non-emergent) medical and surgical procedures which have a greater than 10% chance of requiring the affected blood component(s)/ product(s).</li> <li>• Liaise with other groups which may be impacted by</li> </ul> </p>	<ul style="list-style-type: none"> <li>• Report hospital inventory <a href="#">Blood Component and Product Disposition System</a>.</li> <li>• Communicate shortages to NLPBCP and hospital sites if order/fill rate affects normal operations.</li> <li>• Hospitals will activate Amber Phase of EBMP.</li> <li>• Reduce inventory if possible, as order fill rate will be less than 100% of “normal” request.</li> <li>• Triage <b>all</b> blood orders, reduce or delay transfusion activity where possible.</li> <li>• Implement documentation process for release or non-release of blood components.</li> <li>• For RBC and platelet transfusions follow guidelines for Amber Phase in Appendix D.</li> <li>• Any requests that do not meet pre-determined acceptance criteria</li> </ul>

<p>Continued shortage may progress to Red Phase. Improvements in inventory may progress to Recovery Phase.</p>	<ul style="list-style-type: none"> <li>Ensures that the message was relayed effectively between all parties through confirmation of receipt documentation.</li> </ul>	<p>or who may be of assistance in minimizing the impact of the shortage (i.e. Zones/hospitals, Health Emergency Management Team).</p>	<p>must be reviewed by the Blood Bank Medical Director or designate prior to issuing component/product.</p> <ul style="list-style-type: none"> <li>Defer/cancel elective surgical procedures requiring the affected blood components/products.</li> <li>Perform inter-hospital transfer when necessary to ensure reduced inventory is shared and used appropriately. <b>DO NOT</b> stockpile. <b>AVOID</b> outdating.</li> </ul>
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Red Phase			
Inventory Supply Level	Canadian Blood Services	NLPBCP	Zone/Hospital Impact and Actions
<p>Severe and/or prolonged shortage of inventory or imminent severe threat to blood supply.</p> <p>Inventory levels are insufficient to ensure that patients with non-elective indications for transfusion will receive required transfusion(s).</p>	<ul style="list-style-type: none"> <li>• In consultation with the NEBMC determines to activate the different levels of a shortage.</li> <li>• Communicate this information to the NLPBCP and the Zones/Hospitals via Inventory Advisories or Blood Shortage Advisories.</li> <li>• Consult with Zones/hospitals regarding reduction of fill rates depending on severity and projection of length of shortage.</li> <li>• Assist the NLPBCP in coordinating communication to Zones/hospitals and the public.</li> <li>• Communicate with NLPBCP and Zones regularly with updated inventory status/phase, and anticipated recovery time.</li> <li>• Collaborate with the Zone(s) as per the pre-established communication plan.</li> </ul>	<ul style="list-style-type: none"> <li>• Meet with Provincial EBMC to determine course of action.</li> <li>• Approximate timeframe of 8 hours to cascade information (including actions required at Zone/hospitals) before CBS begins discussion with external stakeholder groups, donors, and media.</li> <li>• Notify senior management (via the Zone/hospital EBMC) of the need to defer <b>all non-emergent</b> medical and surgical procedures requiring the affected blood component/product.</li> <li>• Liaise with other groups which may be impacted by or assist in minimizing the impact of the shortage (i.e. Zones/hospitals, Health Emergency Management Team).</li> </ul>	<ul style="list-style-type: none"> <li>• Report hospital inventory <a href="#">Blood Component and Product Disposition System</a>.</li> <li>• Hospitals activate EBMP Red Phase.</li> <li>• Order fill rates reduced to levels defined by CBS.</li> <li>• Zones must communicate shortages to NLPBCP and hospital sites if order/fill rate impact normal operations.</li> <li>• Convene the Zone/hospital EBMC to monitor and control utilization.</li> <li>• Zones/hospitals should follow the defined internal plan to reduce utilization (reduce/delay transfusion activity. Where possible, defer/cancel <b>all non-emergent</b> medical and surgical procedures requiring the affected blood component/product. Utilize a triage protocol for all blood orders based on prioritization of need and reference to the Emergency Framework for Rationing of Blood</li> </ul>

	<ul style="list-style-type: none"> <li>Oversee and co-ordinate all communications to the media regarding the blood supply or call for donors as required.</li> </ul> <p>Ensure that messages are relayed effectively between all parties through confirmation of receipt documentation.</p> <p>NEBMC will make recommendations as to whether or not triage and rationing guidelines for massively bleeding patients should be implemented.</p>		<p>for Massively Bleeding Patients during a Red Phase of a Blood Shortage (if applicable).</p> <ul style="list-style-type: none"> <li>Implement documentation process for release or non-release of blood components/products.</li> <li>RBC transfusions and platelet transfusions follow guidelines for Red Phase in Appendix D.</li> <li>Any requests that do not meet pre-determined acceptance criteria must be reviewed by the Blood Bank Medical Director or designate prior to issuing component/product.</li> <li>Inter-hospital transfer when necessary to ensure inventory is being shared and used appropriately. <b>DO NOT</b> stockpile. <b>AVOID</b> outdateding.</li> </ul>
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Recovery Phase			
Inventory Supply Level	Canadian Blood Services	NLPBCP	Zone/Hospital Impact and Actions
<p>Blood component/product inventories have begun to increase and are expected to be maintained at a level that would enable hospitals to move from Red to Amber and subsequently to the Green Phase or from Amber to Green.</p>	<ul style="list-style-type: none"> <li>• Continue communication with key stakeholders maintaining consistent key messages at all stages of the Recovery Phase.</li> <li>• Slowly increase order fill rates to allow hospital inventories to return to normal.</li> <li>• Notify hospitals when inventories have returned to normal.</li> <li>• Maintain continued contact with National, Provincial, and Regional/hospital EMBCs to ensure restoration of internal transfusion activity.</li> <li>• Participate in debriefing activities within 4-6 weeks post event and revise internal policies and procedures based on feedback.</li> </ul>	<ul style="list-style-type: none"> <li>• Continue communication with key stakeholders maintaining consistent key messages at all stages of the Recovery Phase.</li> <li>• Initial review of event with report given to the Minister of Health.</li> <li>• Participate in debriefing activities within 4-6 weeks post shortage to review and revise Provincial policies and procedures.</li> </ul>	<ul style="list-style-type: none"> <li>• Continue communication with key stakeholders maintaining consistent key messages at all stages of the Recovery Phase.</li> <li>• Continue to provide inventory levels to CBS on daily basis.</li> <li>• Hospitals increase blood usage/activity (including any elective medical or surgical procedures) slowly, and gradually increase inventories as it may take time for overall blood inventory levels to recover.</li> <li>• Slowly replace emergency stocks to sites that had inventory redistributed during the shortage.</li> <li>• Participate in debriefing activities within 4-6 weeks post shortage to review and revise Zone/hospital policies and procedures.</li> </ul>

## Supplemental Materials

- Appendix A: Provincial Emergency Blood Management Committee Terms of Reference
- Appendix B: Sample fax indicating blood shortage from NAC/CBS
- Appendix C: Newfoundland Labrador Emergency Blood Management Plan Algorithm
- Appendix D: Guidelines for RBC transfusions in children and adults in shortage situations  
Guidelines for platelet transfusions in children and adults in shortage situations
- Appendix E: Triage Tools
- Appendix F: Green phase contingency plan checklists for hospitals
- Appendix G: Amber phase contingency plan checklists for hospitals
- Appendix H: Red phase contingency plan checklists for hospitals
- Appendix I: Recovery phase contingency plan checklists for hospitals

## References

National Advisory Committee (2022) The National Plan for Management of Shortages of Labile Blood Components. [https://nacblood.ca/sites/default/files/2022-03/20220309\\_National%20Plan%20for%20Management%20of%20Shortages%20of%20Labile%20Blood%20Components.pdf](https://nacblood.ca/sites/default/files/2022-03/20220309_National%20Plan%20for%20Management%20of%20Shortages%20of%20Labile%20Blood%20Components.pdf)

## Appendix A: Provincial Emergency Blood Management Committee Terms of Reference

### Mandate

The mandate of the Provincial Emergency Blood Management Committee (PEBMC) is to support a consistent and coordinated response to all blood shortages; National, Provincial, Zonal, or local by developing guidelines and processes to assist Zones/facilities during shortages and by working in consultation with the National Emergency Blood Management Committee (NEBMC) and Canadian Blood Services (CBS).

### Roles/Responsibilities

- Develop a response plan to minimize the Provincial impact of blood shortages;
- Review current Emergency Blood Management Plan (EBMP) to determine readiness to respond to any potential impacts to blood supply;
- Collect all available current resources and best practices to discuss any potential changes and/or supplemental material to be added to existing plan;
- In collaboration with relevant key stakeholders - NL Provincial Blood Coordinating Program (NLPBCP), CBS and EMBCs from all four zones - plan and implement simulation exercises to test the EBMP;
- Audit simulation exercises to determine any areas requiring change and/or additions;
- In the event of an actual shortage, provide guidance to the zone/site EBMCs;
- Ensure that NEBMC recommendations and resulting decisions are communicated to the zones/hospitals;
- Solicit feedback from the zones/hospitals on the National Plan;
- Provide communications/feedback from the zones/hospitals EBMC back to the NEBMC;
- Establish a plan to monitor adherence to the Plan during actual shortages;
- Establish recommendations to manage any non-adherences to the Plan.

### Membership

Core Team members:

- Provincial/Territorial Blood Liaison Committee Member/NLPBCP Manager,
- Provincial NAC member/ NLPBCP Medical Advisor,
- Chief Medical Officer of Health (when appropriate),
- NLPBCP Quality/Utilization Coordinator,
- NLPBCP Transfusion Nurse,
- Representatives of tertiary care centre blood transfusion services,
- Representatives of Newfoundland and Labrador Health Services (NLHS) zones including rural or remote sites,
- CBS Hospital Liaison Specialist(s), and
- Other members (e.g., Zone EBMC members) as warranted by the situation.



## **Chair**

The co-chairs of the PEBMC will be the NLPBCP Utilization/Quality Coordinator and the Provincial NAC member/ NLPBCP Medical Advisor.

## **Meetings**

A minimum requirement of an annual meeting is required. Otherwise, the PEBMC shall meet on an ad hoc basis by the call of any member, and upon approval from the Chair.

## **Quorum**

Decisions are made by those who are present.

## **Reporting/Responsibility**

The PEBMC advises the Department of Health and Community Services on issues related to blood supply and management of shortages.

Appendix B: Sample fax indicating blood shortage from NAC/CBS



National Advisory Committee | Comité consultatif national sur  
on Blood and Blood Products | le sang et les produits sanguins



Canadian Blood Services  
Société canadienne du sang

**URGENT: IMMEDIATE ACTION REQUIRED**

**To: ALL HOSPITAL SITES**  
**From: National Emergency Blood Management Committee\***  
**Subject: ????? PHASE ADVISORY**

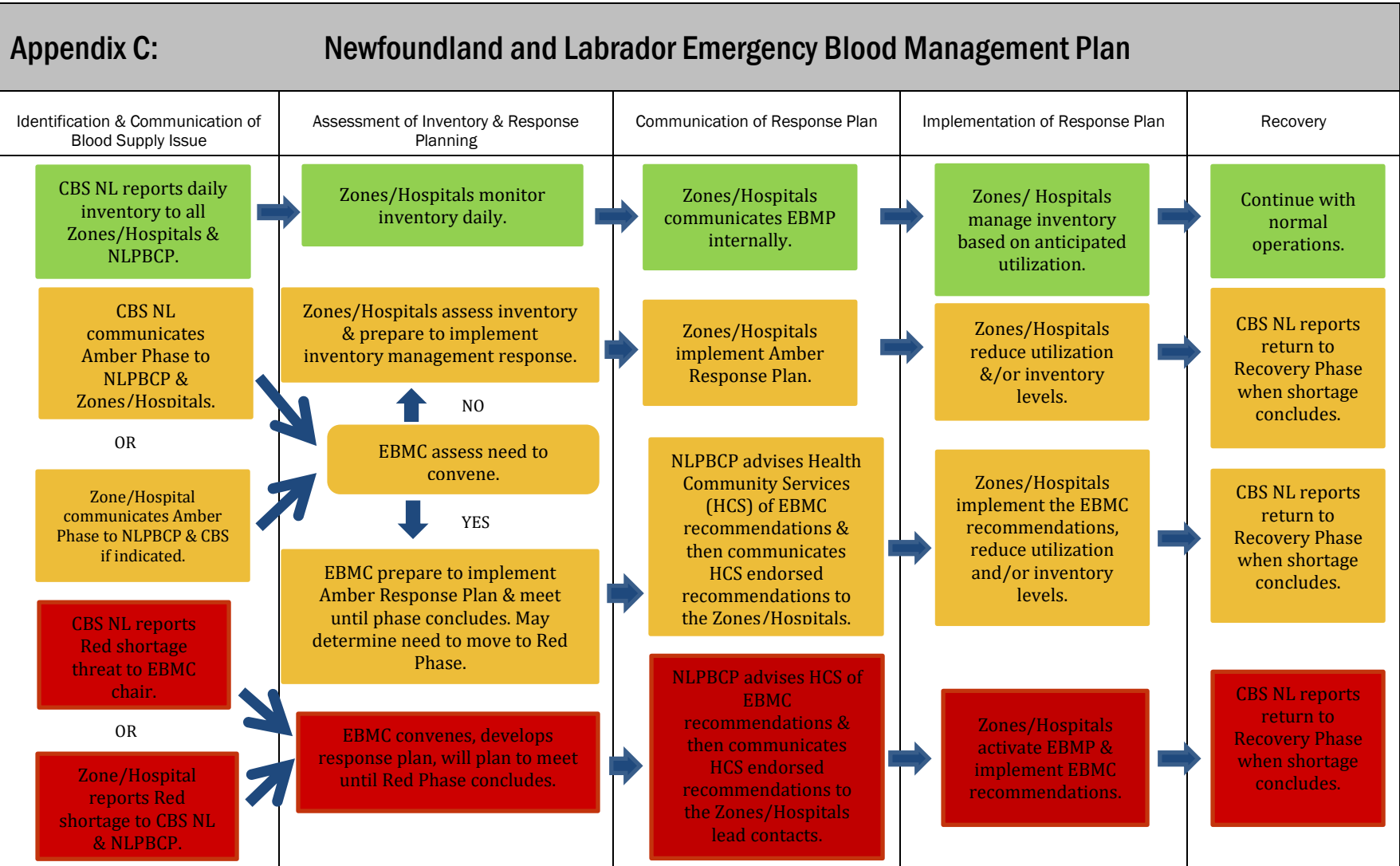
**National Inventory SHORTAGE Advisory**

<b>Date and time of issue</b>	2017-??-?? / ??:?? (EDT)
<b>Inventory Availability Phase</b>	?? PHASE
<b>Product(s)</b>	?
<b>Description</b>	?
<b>Impact on hospitals</b>	<p>???????</p> <p><b>Action required:</b> All hospitals are to provide daily inventory levels by Noon EDT <u>until further notice</u>. Hospital inventory is to be reported via the Blood Component and Product Disposition system: <a href="https://www.blood.ca/en/hospitals/blood-component-and-product-disposition-system">https://www.blood.ca/en/hospitals/blood-component-and-product-disposition-system</a> For hospital customers within the provinces of British Columbia and Manitoba, please follow your local approved processes for sharing inventory data with Canadian Blood Services.</p>
<b>For more information</b>	<p>For additional info, contact:</p> <ol style="list-style-type: none"> <li>1. Your Hospital Liaison Specialist, Canadian Blood Services</li> <li>2. Your representative to the Provincial Emergency Blood Management Committee</li> <li>3. Your representative to your Hospital Emergency Blood Management Committee</li> </ol>

\*The National Emergency Blood Management Committee is comprised of the National Advisory Committee on Blood and Blood Products, Provincial Territorial Blood Liaison representatives and key Canadian Blood Services personnel. This group will develop recommendations and provide advice to the P/T Ministries of Health, hospitals and regional health authorities, and Canadian Blood Services to support a consistent and coordinated response to critical blood shortages in Canada.

For information about the National Blood Shortages Plan, please see:  
<http://www.nacblood.ca/resources/shortages-plan/index.html>

*If you require this advisory in an accessible format, please contact your local Canadian Blood Services Hospital Liaison Specialist.*



It is possible that shortages are so sudden and severe that a Red Phase is called immediately, or after a period of Amber Phase that a Red Phase is called.

## Appendix D: Guideline for the use of RBC transfusions in children and adults in shortage situations

Green Phase	Amber Phase	Red Phase
<b>Major Hemorrhage</b>	<b>Major Hemorrhage</b>	<b>Major Hemorrhage</b>
Follow your Hospital/Zone guidelines.	Follow your hospital/Zone guidelines.	Follow your hospital/Zone guidelines. Follow triage/rationing allocation framework if instructed by NEBMC (1).
<b>Surgery/Obstetrics</b>	<b>Surgery/Obstetrics</b>	<b>Surgery/Obstetrics</b>
Follow your hospital/Zone guidelines.	Urgent (2) and emergent (3) surgery in consultation with Zonal EBMC. Peri/post-partum hemorrhage. For all situations, the minimal number of units to stabilize patient should be used.	Emergency situations in consultation with Zonal EBMC. Follow triage/rationing allocation framework if instructed by NEBMC (1).
<b>Non-Surgical Anemias (4)</b>	<b>Non-Surgical Anemias (4)</b>	<b>Non-Surgical Anemias (4)</b>
Follow your hospital/Zone 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.

1 These guidelines are available at [The National Plan](#)

2 Urgent surgery – patient likely to have major morbidity if surgery not performed within the next one to 28 days.

3 Emergency surgery – patient likely to die (have major morbidity) with 24 hours without surgery.

4 Includes anemia following trauma, surgery and delivery.

- Given the relatively small volumes/numbers of units required, transfusions for neonates (i.e. patients less than 4 months of age) and intrauterine transfusions would be given according to usual guidelines (i.e. would not be restricted even in times of shortage). Measures to share units among neonates or between neonates and larger patients should be used where possible.
- In Red or Amber phases, the hospital/Zone blood bank director, in consultation with the patient’s physician, may consider the use of a blood component which has passed its Health Canada approved storage period. In such cases the justification for the use of an outdated product must be documented by the responsible physician in the patient’s chart, and every effort must be made to obtain, specific patient consent.

Appendix D: Guideline for the use of **Platelet Transfusions** in children and adults in shortage situations

Green Phase	Amber Phase	Red Phase
<b>Major Hemorrhage</b>	<b>Major Hemorrhage</b>	<b>Major Hemorrhage</b>
<p>Immune thrombocytopenia and life- or limb-threatening bleeding maintain PC &gt;10 x 10<sup>9</sup>/L.</p> <p>For head trauma or CNS bleeding maintain a PC &gt;100 x 10<sup>9</sup>/L.</p> <p>Other significant bleeding, or acute promyelocytic leukemia at acute presentation, maintain a PC &gt;50 x 10<sup>9</sup>/L.</p>	<p>For head trauma or CNS bleeding maintain a PC &gt; 80 x 10<sup>9</sup>/L.</p>	<p>Same as Amber phase.</p>
<b>Invasive procedures/ surgery/ ECMO</b>	<b>Invasive procedures/ surgery/ ECMO</b>	<b>Invasive procedures/ surgery/ ECMO</b>
<p>For non-surgical invasive procedures maintain a PC &gt;20 x 10<sup>9</sup>/L (central venous catheter insertion, paracentesis, thoracentesis).</p> <p>For lumbar puncture maintain a PC &gt;50 x 10<sup>9</sup>/L.</p> <p>For CNS surgery maintain a PC &gt;100 x 10<sup>9</sup>/L.</p> <p>For ECMO maintain a PC &gt; 50-80 x 10<sup>9</sup>/L.</p>	<p>Urgent (2) and emergency (3) surgery in consultation with Zonal EBMC. In presence of active bleeding or surgical procedure maintain a PC &gt; 50 x 10<sup>9</sup>/L or if CNS trauma/surgery a PC &gt; 80 x 10<sup>9</sup>/L.</p> <p>For non-surgical invasive procedures (other than bone marrow aspiration or biopsy) maintain a PC &gt; 10 x 10<sup>9</sup>/L with image guidance.</p> <p>For lumbar puncture, maintain a PC &gt;20 x 10<sup>9</sup>/L.</p> <p>For ECMO maintain a PC &gt; 50 x 10<sup>9</sup>/L.</p>	<p>Emergency surgery in consultation with Zonal EBMC.</p> <p>All requests for platelet transfusion must be reviewed by designated medical personnel.</p>

Green Phase	Amber Phase	Red Phase
Bone marrow failure/ hematopoietic stem cell transplantation/ chemotherapy / chronic transfusion recipients	Bone marrow failure/ hematopoietic stem cell transplantation/ chemotherapy/ chronic transfusion recipients	Bone marrow failure/ hematopoietic stem cell transplantation/ chemotherapy/ chronic transfusion recipients
Adhere to a maximum threshold PC of $10 \times 10^9/L$ for prophylactic platelet transfusions.	Adhere to a maximum threshold PC of $10 \times 10^9/L$ for prophylactic platelet transfusions; 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 Platelet Concentrate doses and use half doses in non-bleeding patients if necessary.	Eliminate all prophylactic transfusions. All requests for platelet transfusions in non-bleeding patients must be reviewed by designated medical personnel.

The Plan for Management of Shortages of Labile Blood Components

Notes :

- PC = Platelet Count.
- Given the relatively small volumes/numbers of units required, transfusions for neonates (i.e. patients less than 4 months of age) and intrauterine transfusions would be given according to usual guidelines (i.e. would not be restricted even in times of shortage). Measures to share units among neonates or between neonates and larger patients should be used to the extent possible.
- Split doses of platelets (apheresis or buffy coat) should be considered if available. **Health Canada advises that splitting doses of platelets is considered aliquoting and is not a processing activity which requires registration.** Sample aliquoting procedures are available on the NAC website.
- Lower PC thresholds for platelet transfusions for surgical bleeding or special procedures should be used.
- In Red or Amber phases, the hospital/Zone blood bank director, in consultation with the patient's physician, may consider the use of a blood component which has passed its Health Canada approved storage period. In such cases the justification for the use of an outdated product must be documented by the responsible physician in the patient's chart, and every effort must be made to obtain, specific patient consent.

## Appendix E: Triage Tools

### Triage Tools - Triage Tracking Log [SAMPLE ONLY]

#### Triage Tracking Log – Emergency Disposition of Blood

Is Patient needing or predicted to need massive transfusion?  Y  N

If yes, go to “Massive Transfusion Record for Patient” If no, complete line below.

Date: \_\_\_\_\_ Facility: \_\_\_\_\_ Units Affected: \_\_\_\_\_

Is Patient needing or predicted to need massive transfusion? <input type="checkbox"/> Y <input type="checkbox"/> N If yes, go to “Massive Transfusion Record for Patient” If no, complete line below.											
Patient Initials/Tracking Number	Patient MRN	Age	ABO /D	Ordering Physician	Indication Not Bleeding = NB Bleeding = B Unknown = U In the OR = O	Hgb /Plt	# of Components Ordered	# of Components Issued	Surgery cancelled?		# of units saved by following Protocol
									Yes	No	
Comments: _____											

Is Patient needing or predicted to need massive transfusion? <input type="checkbox"/> Y <input type="checkbox"/> N If yes, go to “Massive Transfusion Record for Patient” If no, complete line below.											
Patient Initials/Tracking Number	Patient MRN	Age	ABO /D	Ordering Physician	Indication Not Bleeding = NB Bleeding = B Unknown = U In the OR = O	Hgb /Plt	# of Components Ordered	# of Components Issued	Surgery cancelled?		# of units saved by following Protocol
									Yes	No	
Comments: _____											

Is Patient needing or predicted to need massive transfusion? <input type="checkbox"/> Y <input type="checkbox"/> N If yes, go to “Massive Transfusion Record for Patient” If no, complete line below.											
Patient Initials/Tracking Number	Patient MRN	Age	ABO /D	Ordering Physician	Indication Not Bleeding = NB Bleeding = B Unknown = U In the OR = O	Hgb /Plt	# of Components Ordered	# of Components Issued	Surgery cancelled?		# of units saved by following Protocol
									Yes	No	
Comments: _____											



## Appendix E: Triage Tools

### Triage Tools – Patient Record [SAMPLE ONLY]

Massive Transfusion Record for Patient: Emergency Disposition of Blood during Red Phase Blood Shortage

Section A: To be completed by TMS Technologist		
Patient Initials/Tracking Number :	Hospital Number:	Patient location:
Reason for Massive hemorrhage:	Date of Triage :	Time of Triage:
Predicted to need >10 units in the next 24 hours <input type="checkbox"/> Yes <input type="checkbox"/> No (if no refer to standard tracking log)	Age: _____	Blood Group: _____
	Hemoglobin: _____	pH: _____
Has patient received product in the previous 24 h? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, list products:	Platelet: _____	Lactate: _____
	INR: _____	Temp: _____
	PTT: _____	
	Fibrinogen: _____	
	Product Requested	
Section B: Forward to TMS Director/Triage Team to complete		
Meets any exclusion criteria <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, which one(s)?	Date/Time of assessment:	SOFA score:
Meets any specific exclusion criteria <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, which one(s)?	Date/Time of assessment:	SOFA score:
Decision made to administer <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:	Number of units & products transfused:
Patient outcome at 24 hours:	Date/Time:	Re-assessment Decision:
Comments regarding patient/family completed by Triage Team:		
Triage Documentation completed by:	Signature:	
Triage Officer Name:	Signature:	
Follow-up:		
Patient Outcome at Discharge:	Patient Outcome at 6 months:	



## Appendix F

### Green Phase Contingency Plan Checklists for Hospitals

Inventory levels can be maintained at optimal levels. Daily utilization is uninterrupted.

#### Prepare Emergency Blood Management Plan:

- Establish EBMC.
- Develop Hospital Contingency Plan for managing blood shortages:
  - Define blood conservation methods;
  - Identify surgeries associated with high blood loss;
  - Define stepwise reduction of blood use to occur upon activation of plan;
  - Identify stakeholders to be notified upon activation of plan;
  - Develop communication templates to be used for notification for each of the phases: Green; Green Advisory; Amber; Red; and Recovery;
  - Develop an ethical framework and triage protocol (for those who are massively bleeding) in the event that the shortage progresses to Red Phase. Developing this in advance of actually requiring it should improve flow and outcomes if and when it is actually required.
- Ensure Emergency Blood Management Plan is integrated into Facility Disaster Plan.
- Provide training on the contents of the plan and the communication strategy related to blood shortages.
- Schedule a simulated blood shortage scenario to trial the plan.

#### Practice good blood utilization / management

- Ensure that 'best practices' in inventory management of blood components and blood products are in place.
- "On hand" inventory levels should be determined and made available indicating the number of days on hand required based on historical data and represented by the following levels: optimal (> 3 days average daily use) or minimal (< 2 days average daily use).
- Practice routine strategies to ensure blood component/product outdating is minimized.
- Establish relationships with other nearby facilities and develop a plan to share inventory in the event of a shortage.
- Adopt guidelines for the use of blood products to ensure effective utilization Surgical Blood Order Schedule (MSBOS) and/or protocol for review of blood ordering practice by physicians using 'Best Practice' parameters.

## Appendix G

### Amber Phase Contingency Plan Checklist for Hospitals

Shortage may be short term and not severe. Shortage may not affect all facilities.  
Insufficient inventory is available to continue with routine transfusion practice.

Amber phase of facility plan should:

- Ensure CBS is notified. Call the 24 hour call line, if a local situation occurs that could affect blood supply (e.g. equipment failure or multiple traumas).
- Define response to notification of a blood shortage if received from CBS including prioritization list of areas where reduction of blood will occur.
- Define notification process (to NLPBCP and CBS) if inventory shortage identified by Zone/Hospital.
- Include notification to internal personnel including Transfusion Manager, Medical Director, Chair of Transfusion Medicine Committee, Chair of EBMC and other staff.
- Include communication template and pre-approved contact list including names/numbers of those to be notified in Amber phase (include pager numbers, fax numbers, email addresses).
- NOTE: It is also important to prepare a communication to notify patients and their families to explain the need for possible deferral of their treatment should it become necessary.
- Determine if additional communication and/or actions are required to further conserve use of existing blood inventory. Reevaluate on a regular basis to determine if interventions are having positive impact or are changes required to further conserve.
- Assess need for inter-hospital transfer of blood components/products. A list of transport options for nearby hospitals with contact numbers should be available.
- Give direction to reduce red cell stock (if shortage applies to RBCs) to keep on hand by 25% (3 day versus 4 day levels) and reinforce **NOT** to stockpile inventory.
- Identify one person to act as a main contact with CBS to communicate any inventory needs, status of inventory at Canadian Blood Services and to attend regular conference calls held by CBS providing updates on the inventory status. This person/position should be determined beforehand and documented to ensure everyone understands who is responsible for this role.
- If necessary, institute pre-approval of requests for blood components prior to releasing. The person/position assigned to perform pre-approvals and what criteria will be used, should be determined beforehand.

## Appendix H

### Red Phase Contingency Plan Checklist for Hospitals.

Inventory shortage predicted to be long term and/or severe.

#### Red phase of facility plan should:

- Activate EBMP Red Phase with a defined internal plan to reduce blood utilization.
- Include notification of the Medical Director of Transfusion Service and Chairperson of Transfusion committee and/or Emergency Blood Management Committee to determine if additional communication and/or actions are required to further conserve use of existing blood inventory. Reevaluate on a regular basis to determine if interventions are having positive impact or are changes required to further conserve.  

Report **ALL** blood inventory levels to the CBS. Verify contents of satellite stock (eg. Operating rooms, Emergency rooms).
- Define notification process (to NLPBCP and CBS) if inventory shortage identified by Zone/Hospital.
- Identify one person to act as a main contact with CBS to communicate any inventory needs, status of inventory at CBS and to attend regular conference calls held by CBS providing updates on the inventory status. This person/position should be determined beforehand and documented to ensure everyone understands who is responsible for this role.
- Ensure internal hospital notification is issued (in writing) to Program Directors, Division Chiefs of Surgery, Anesthesia, Critical Care, Trauma/Emergency, Children/Women's Health, Hematology and Medicine, Directors of Laboratory Services, Diagnostic Services and Nursing, Chair of the Transfusion Medicine Committee (or its equivalent) and EBMC members.
  - Pre-approved contact list and communication template should be available;
  - EBMC members should be identified, contact list should be available.
- Communication will include pre-determined modification (developed in Green phase) to ordering practices. Conserve blood component inventory. The Medical Director of the Transfusion Service or delegate shall review all orders that fall outside these parameters.
- NOTE: It is also important to prepare a communication to notify patients and their families to explain the need for possible deferral of their treatment should it become necessary.
- Include contact information for other nearby sites if a need is identified for inter-hospital transfer of blood components/products (list of available transport options with contact numbers should be available).

- Reduce blood component stock kept on hand to minimum levels.
- DO NOT** issue blood to 'stock' fridges such as operating room or trauma room.
- DO NOT** stockpile product to safeguard local needs as this may result in increasing the overall risk to patients at other institutions.
- Include direction to work with CBS Medical Director to determine priority inventory needs in region. CBS will communicate internally to ensure discussions with hospitals are not in isolation of each other.

## Appendix I

### Recovery Phase Contingency Plan Checklist for Hospitals

Following notification from CBS that inventory levels are on the rise, it is vital that hospital blood usage remains restricted to critical needs or increases at a controlled pace in order to ensure levels do not result in a shortage in the Recovery Phase.

Recovery phase of plan should include:

- A communication template, approved distribution list and contact information.
- Notification, in writing, to the Division Chiefs of Surgery, Anesthesia, Critical care, Trauma/Emergency, Hematology and Medicine; Directors of Laboratory Services, Diagnostic Services, and Nursing; Chair of the Transfusion Medicine Committee (or its equivalent); and the EMBC members.
- Requests for blood components/products shall continue to be monitored and reviewed until CBS has notified the hospital of a return to the Green Phase.
- Participation in debriefing activities to review and revise hospital plans as a means of continued improvement.