Government of Newfoundland and Labrador

Department of Health and Community Services
Provincial Blood Coordinating Program

EMERGENCY BLOOD MANAGEMENT PLAN	NLBCP-004

Office of Administrative Responsibility	Issuing Authority
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Effective Date	2019-06-24
Version	3.0
Review Due Date	2021-06-24

Background

A blood component shortage may occur at a National, Provincial/Territorial (P/T), Regional, 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, Regional, and/or facility levels.

The National Emergency Blood Management Committee (NEMBC) was developed to allow information sharing and input into decision making from all regions of Canada in the event of blood component shortages. The National Emergency Blood Management Committee (NEBMC) will ensure implementation of the National Plan by developing recommendations and providing advice to the P/T Ministries of Health, RHAs/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 each 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	Frozen Plasma	Cryo-precipitate
Green	Normal inventory levels exist and supply meets demand. Ranges from **ideal** inventory to temporary shortages which are managed between CBS and site actions.	**Ideal > 4 days on hand (DOH) for O Rh positive and A Rh positive.** More than 3 successive days of 3-3.5 DOH constitutes an advisory phase. **Ideal > 3 DOH for all Rh negative blood groups.** More than 3 successive days of 2-3 DOH constitutes advisory phase.	**Ideal > 90% of daily national inventory (DNI).** 80-90% constitutes advisory phase.	**Ideal Types O, A, B only > 2 weeks on hand (WOH).** 1-2 WOH constitutes advisory phase. **Type AB > 3 weeks on hand (WOH).** 2-3 WOH constitutes advisory phase.	**Ideal > 3 weeks on hand (WOH).** 2-3 WOH constitutes advisory phase.
Amber	Levels insufficient to continue routine transfusion practices and sites required to reduce usage.	2-3 DOH.	25-79% of DNI. **No** recovery expected within 12-24 hours.	**Types O, A, B only** 3-7 days DOH. **Type AB** 6-14 days DOH.	6-14 days DOH.
Red	Inventory levels are insufficient to ensure non-elective indications are fulfilled.	< 48 hours	< 25% of DNI. **No** recovery expected within 12-24 hours.	**Types O, A, B only** < 3 days DOH. **Type AB** < 6 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 RHAs. 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 (see sample alert in Appendix B).

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 RHAs/hospitals are encouraged to follow the Provincial Plan to develop their own EBM committees and Regional Plans.

This document provides guidance for the Newfoundland and Labrador Emergency Blood Management Committee (NLEBMC) and provides direction to the RHAs in developing plans specific to each RHA 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 EBMP may be implemented and/or initiated by the NEBMC, the PEBMC, CBS, RHA, 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. Communication pathways and triage teams are included as Appendix E and Appendix L respectively.

Definitions

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

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 PEBMC terms of reference.

Recommendations for **RHA/Hospital Emergency Blood Management Committee** membership:

- Representative of RHA/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)
- Transfusion Service Laboratory Manager
- RHA/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 RHA/Hospital group

It is recommended that the EBMCs meet on a regular basis, and that a simulation activity be performed at least every two years as revisions to current processes may be required based on evaluation of the simulated activity.

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 potential shortage is about to occur. 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 Regional). In times of **severe** shortages CBS consults with both the NEBMC and PEBMC 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/RHAs (such as development and implementation of the Regional and/or Facility Plan).

RHA/Site Impact and Actions

The inventory shortage phase and the unique requirements of specific sites in the RHAs 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. RHA/site protocols should include an ethical framework to manage allocation of available blood inventory. The National

Plan Synopsis for Triage Teams, Appendix L, is intended to assist RHAs/sites in this process. The "Emergency Framework for Rationing of Blood for Massively Bleeding Patients During a Red Phase of a Blood Shortage" may be accessed at the following link: http://www.nacblood.ca/resources/shortages-plan/emergency-framework-final.pdf

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 (H, I, J, and K).

Green Advisory Phase			
Inventory Supply Level	Canadian Blood Services	Provincial Blood Coordinating Program	RHA/Hospital Impact and Actions
Normal blood component/ product inventory levels are able to meet demand. Includes range of inventory levels from ideal inventory to periodic temporary shortages.	• Communicate through "business as usual" means any temporary inventory adjustments required due to a shortage of a particular component/product and/or group. • 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.	• Consult with CBS and TSOs in each of the RHAs to ensure current inventory meets demand at each site. • Provide guidance to RHAs/sites in preparing to implement their respective Emergency Blood Management Plans if shortages persists or worsen.	• Report hospital inventory Blood Component and Product Disposition System. • Normal utilization activities. • In advisory phase blood conservation strategies shall be implemented to prevent a more serious inventory issue. These include erythropoiesis- stimulating agents, thrombomimetics, intravenous/oral iron, antifibrinolytics, intraoperative cell salvage, interventional radiologic procedures, rapid access to endoscopy, and non-invasive surgeries.

Amber Phase			
Inventory Supply Level	Canadian Blood Services	Provincial Blood Coordinating Program	RHA/Hospital Impact and Actions
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/regional disaster. Inventory levels are insufficient to continue with routine transfusion practice and require measures to reduce blood component usage.	• In consultation with the NEBMC, determine need to activate the different levels of a shortage. • Communicate information to the PBCP and RHAs/Hospitals via Inventory Advisories or Blood Shortage Advisories. • Assist the PBCP in coordinating communication to RHAs/hospitals and the public. • Communicate current inventory status to the RHAs/hospitals • In collaboration with the RHAs implement the pre-established communication plan (see Appendix D and E). • Overses and co-ordinate all communications to the media regarding the blood supply or need to call for donors as required.	• Meet with the PEBMC to determine course of action. Approximate timeframe of 8 hours to cascade information (including actions required at RHA/hospitals) before CBS begins discussion with external stakeholder groups, donors, and media. • Notify senior management (via the RHA/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). • Liaise with other groups which may be impacted by	• Report hospital inventory Blood Component and Product Disposition System. • Communicate shortages to PBCP and hospital sites if order/fill rate impacts normal operations. • Hospitals will activate Amber Phase of EBMP. • Reduce inventory if possible as order fill rate will be less than 100% of “normal” request. • Triage **all** blood orders, Reduce or delay transfusion activity where possible. • Implement documentation process for release or non-release of blood components (see Appendix G). • For RBC and platelet transfusions follow guidelines for Amber Phase in Appendix F.

Continued shortage may progress to Red Phase. Improvements in inventory may progress to Recovery Phase.	• Ensures that the message was relayed effectively between all parties through confirmation of receipt documentation.	or who may be of assistance in minimizing the impact of the shortage (i.e. RHAs/hospitals, Health Emergency Management Team).	• Any requests that do not meet pre-determined acceptance criteria (see Appendix L) must be reviewed by the Blood Bank Medical Director or designate prior to issuing component/product. • Defer/cancel elective surgical procedures requiring the affected blood components/products. • Perform inter-hospital transfer when necessary to ensure reduced inventory is shared and used appropriately. **DO NOT** stockpile. **AVOID** outdating.

Red Phase			
Inventory Supply Level	Canadian Blood Services	Provincial Blood Coordinating Program	RHA/Hospital Impact and Actions
Severe and/or prolonged shortage of inventory or imminent severe threat to blood supply. Inventory levels are insufficient to ensure that patients with non-elective indications for transfusion will receive required transfusion(s).	• In consultation with the NEBMC determines to activate the different levels of a shortage. • Communicate this information to the PBCP and the RHAs/Hospitals via Inventory Advisories or Blood Shortage Advisories. • Consult with RHAs/hospitals regarding reduction of fill rates depending on severity and projection of length of shortage. • Assist the PBCP in coordinating communication to RHAs/hospitals and the public. • Communicate with PBCP and RHAs regularly with updated inventory status/phase, and anticipated recovery time. • Collaborate with the RHA(s) as per the pre-established communication plan (see Appendix D and E).	• Meet with PEBMC to determine course of action. • Approximate timeframe of 8 hours to cascade information (including actions required at RHA/hospitals) before CBS begins discussion with external stakeholder groups, donors, and media. • Notify senior management (via the RHA/hospital EBMC) of the need to defer **all non-emergent** medical and surgical procedures requiring the affected blood component/product. • Liaise with other groups which may be impacted by or assist in minimizing the impact of the shortage (i.e. RHAs/hospitals, Health	• Report hospital inventory Blood Component and Product Disposition System. • Hospitals activate EBMP Red Phase. • Order fill rates reduced to levels defined by CBS. • RHAs must communicate shortages to PBCP and hospital sites if order/fill rate impact normal operations. • Convene the RHA/hospital EBMC to monitor and control utilization. • RHAs/hospitals should follow the defined internal plan to reduce utilization (reduce/delay transfusion activity where possible, defer/cancel **all non-emergent** medical and surgical procedures requiring the affected blood component/product, and a triage protocol for all blood orders based on prioritization of need and reference to the Emergency

	• Oversee and co-ordinate all communications to the media regarding the blood supply or call for donors as required. Ensure that messages are relayed effectively between all parties through confirmation of receipt documentation. NEBMC will make recommendations as to whether or not triage and rationing guidelines for massively bleeding patients should be implemented.	Emergency Management Team).	Framework for Rationing of Blood for Massively Bleeding Patients during a Red Phase of a Blood Shortage, if applicable). • Implement documentation process for release or non-release of blood components/products (see Appendix G). • RBC transfusions and platelet transfusions follow guidelines for Red Phase in Appendix F. • Any requests that do not meet pre-determined acceptance criteria (see Appendix L) must be reviewed by the Blood Bank Medical Director or designate prior to issuing component/product. • Inter-hospital transfer when necessary to ensure inventory is being shared and used appropriately. **DO NOT** stockpile. **AVOID** outdating.

Recovery Phase			
Inventory Supply Level	Canadian Blood Services	Provincial Blood Coordinating Program	RHA/Hospital Impact and Actions
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.	• Continue communication with key stakeholders maintaining consistent key messages at all stages of the Recovery Phase. • Slowly increase order fill rates to allow hospital inventories to return to normal. • Notify hospitals when inventories have returned to normal. • Maintain continued contact with National, Provincial, and Regional/hospital EMBCs to ensure restoration of internal transfusion activity. • Participate in debriefing activities within 4-6 weeks post event and revise internal policies and procedures based on feedback.	• Continue communication with key stakeholders maintaining consistent key messages at all stages of the Recovery Phase. • Initial review of event with report given to the Minister of Health. • Participate in debriefing activities within 4-6 weeks post shortage to review and revise Provincial policies and procedures.	• Continue communication with key stakeholders maintaining consistent key messages at all stages of the Recovery Phase. • Continue to provide inventory levels to CBS on daily basis. • 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. • Slowly replace emergency stocks to sites that had inventory redistributed during the shortage. • Participate in debriefing activities within 4-6 weeks post shortage to review and revise RHA/hospital policies and procedures.

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: Sample emergency contact list
Appendix E: Communication Plan
Appendix F: Guidelines for RBC transfusions in children and adults in shortage situations
Guidelines for platelet transfusions in children and adults in shortage situations
Appendix G: Triage Tools
Appendix H: Green phase contingency plan checklists for hospitals
Appendix I: Amber phase contingency plan checklists for hospitals
Appendix J: Red phase contingency plan checklists for hospitals
Appendix K: Recovery phase contingency plan checklists for hospitals
Appendix L: Emergency framework for rationing of blood for massively bleeding patients during a red phase of a blood shortage – synopsis for triage team

References

National Advisory Committee (2015) The National Plan for Management of Shortages of Labile Blood Components. Canadian Blood Services. http://www.transfusionmedicine.ca/articles/national-plan-management-shortages-labile-blood-components.

Appendix A

Provincial Emergency Blood Management Committee Terms of Reference

Mandate

The mandate of the Newfoundland and Labrador Emergency Blood Management Committee (NLEBMC) is to support a consistent and coordinated response to all blood shortages; National, Provincial, Regional, or local; by developing guidelines and processes to assist RHAs/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 Plans (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 (the Provincial Blood Coordinating Program, Canadian Blood Services, and Emergency Blood Management Committees from all four RHAs) 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 RHA/site EBMCs;
- Ensure that NEBMC recommendations and resulting decisions are communicated to the RHAs/hospitals;
- Solicit feedback from the RHAs/hospitals on the National Plan;
- Provide communications/feedback from the RHAs/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/Provincial Blood Coordinating Program-Manager,
- Provincial NAC member/ Provincial Blood Coordinating Program Medical Advisor,
- Director Regional Services,
- Chief Medical Officer of Health,
- Provincial Blood Coordinating Program- Quality/Utilization Coordinator, and Transfusion Nurse,
- Representatives of tertiary care centre blood transfusion services,
- Representatives of Regional Health Authorities including rural or remote sites,
- Canadian Blood Services-Regional Medical Officer(s), Regional Director(s), and Regional Hospital Liaison Specialist(s), and
- Other members (e.g. RHA EBMC members) as warranted by the situation.

Chair

The co-chairs of the PEBMC will be the Provincial/Territorial Blood Liaison Committee Member/Provincial Blood Coordinating Program-Manager and the Provincial NAC member/ Provincial Blood Coordinating Program 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/Responsibilty

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

Appendix B

National Advisory Committee on Blood and Blood Products | Comité consultatif national sur 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

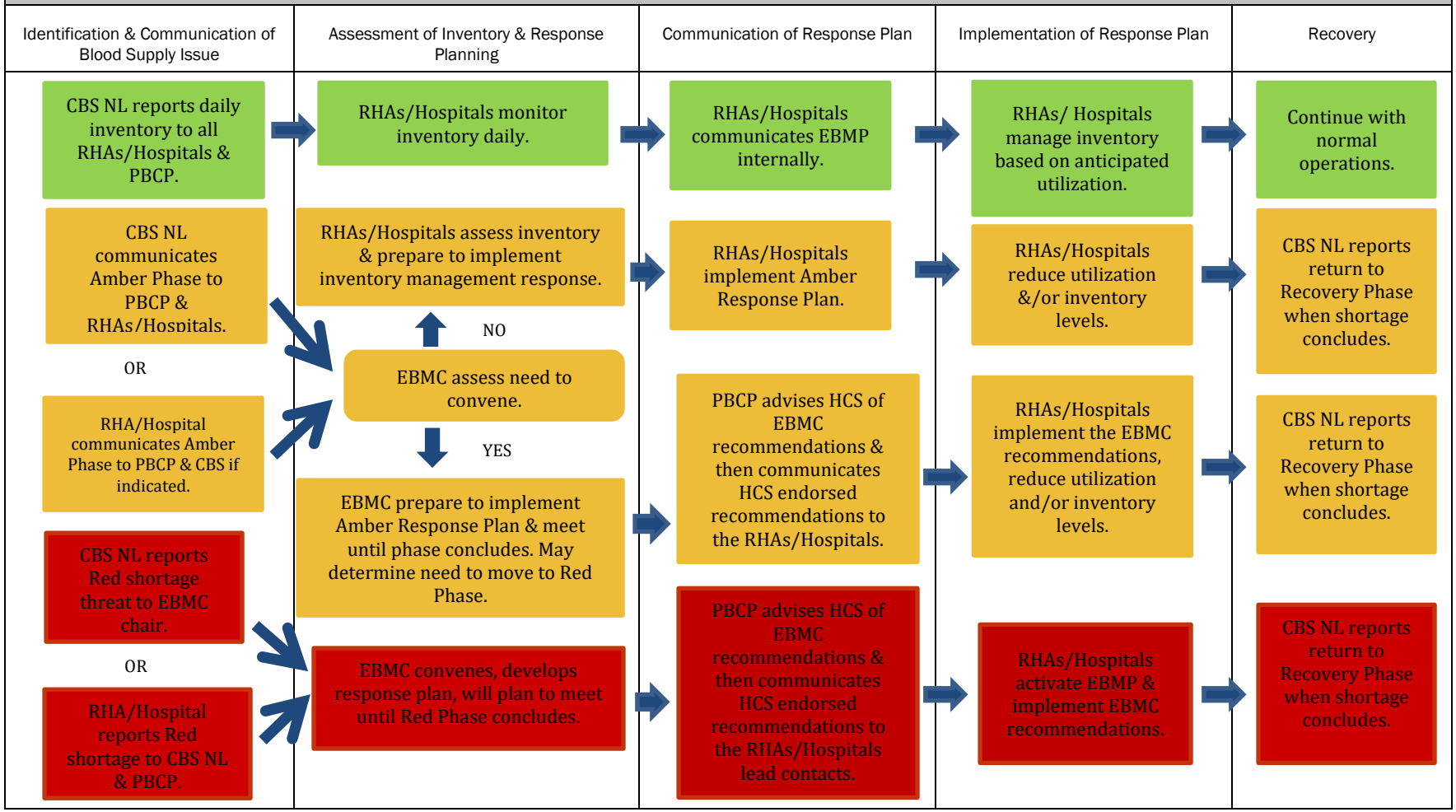
Date and time of issue	2017-??-?? / ??:?? (EDT)
Inventory Availability Phase	**?? PHASE**
Product(s)	?
Description	?
Impact on hospitals	??????? **Action required:** All hospitals are to provide daily inventory levels by Noon EDT until further notice. Hospital inventory is to be reported via the Blood Component and Product Disposition system: https://www.blood.ca/en/hospitals/blood-component-and-product-disposition-system 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.
For more information	For additional info, contact: 1. Your Hospital Liaison Specialist, Canadian Blood Services 2. Your representative to the Provincial Emergency Blood Management Committee 3. Your representative to your Hospital Emergency Blood Management Committee

*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.

Appendix C Newfoundland and Labrador Emergency Blood Management Plan



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

Blood Contingency Contact Information

Use the following table as a guide to organize and store emergency contact numbers. Add rows to accommodate each contact person. Review at least once a year to make sure names and numbers are still current.

Last Updated: _____

Organization : Eg. Within your Health Authority	Contact Person hospital emergency management personnel	Contact numbers
Newfoundland and Labrador Provincial Blood Coordinating Program(NLPBCP)	Daphne Osborne NLPBCP Program Manager	Land line: (709)729-5246 Pager: Cell phone: Fax: (709)729-4009 Email:daphneosborne@gov.nl.ca Other:
		Land line: Pager: Cell phone: Fax: Email: Other:
		Land line: Pager: Cell phone: Fax: Email: Other:
		Land line: Pager: Cell phone: Fax: Email: Other:
		Land line: Pager: Cell phone: Fax: Email: Other:

Organization	Contact Person	Contact numbers
Nearby hospitals		Land line: Pager: Cell phone: Fax: Email: Other:
Canadian Blood Services		Land line: Pager: Cell phone: Fax: Email: Other:
		Land line: Pager: Cell phone: Fax: Email: Other:
Local emergency services (e.g. Police, EMS)		Land line: Pager: Cell phone: Fax: Email: Other:
		Land line: Pager: Cell phone: Fax: Email: Other:
		Land line: Pager: Cell phone: Fax: Email: Other:
Other (Critical suppliers)		Land line: Pager: Cell phone: Fax: Email: Other:

The Plan for Management of Shortages of Labile Blood Components

APPENDIX E:
Communications Plan

Approved by
Ian Mumford
Chief supply chain officer
Canadian Blood Services

Dr.Lakshmi Rajappannair- Chair
National Advisory Committee on
Blood and Blood Products /
National Blood Emergency Blood
Management Committee

Reviewed by
Bernadette Muise-Lead PT
Blood Liaison Committee

Produced by
Lindy McIntyre
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Canadian Blood Services

Ron Vezina
Director, External
Communications and Media
Relations
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ABBREVIATIONS – Communications Plan

BSWG:	Blood Shortages Working Group
CBS:	Canadian Blood Services
CSCO:	CBS Chief supply chain officer
CBS P/T BLC:	Canadian Blood Services Provincial/Territorial Blood Liaison Committee
HQ:	Héma-Québec
NAC:	National Advisory Committee on Blood and Blood Products
NAC-BSWG:	National Advisory Committee Blood Shortages Working Group
NEBMC:	National Emergency Blood Management Committee
P/T:	Provincial/Territorial
NERT:	CBS National Emergency Response Team
LERT:	CBS Local Emergency Response Team
P/TEBMC:	Provincial/Territorial Emergency Blood Management Committee
PEBMC:	Provincial Emergency Blood Management Committee
PBCO:	Provincial Blood Coordinating Office
PHAC	Public Health Agency of Canada
RBC:	Red Blood Cells
RHA:	Regional Health Authorities

The Plan for Management of Shortages of Labile Blood Components

1.0 INTRODUCTION – Communications Plan

Effective and timely communication is critical in attempts to mitigate a national blood shortage, while in a shortage situation and afterwards during recovery efforts. The principal organizations involved in managing a blood shortage are Canadian Blood Services (CBS), the Provincial Territorial (PTs) Ministries of Health and Regional Health Authorities (RHAs)/hospitals. Each organization is independent, and has its own communications infrastructure, procedures and complexities. However, a common course of action is required by these partners, however different they may be, to promote alignment, consistency and collaboration during a crisis or potential crisis.

This communications appendix proposes a framework to achieve the best collaboration, allowing all parties to provide timely, accurate and credible information to various internal and external stakeholders for the purposes of operational and informational communication.

The communications appendix is broken down into four periods, corresponding to the phases of the Plan.

Note: This appendix provides overarching and general principles and key messages, and outlines high level communications flow. It is imperative that each jurisdiction produces its own communications plan based on specific needs, all while keeping consistent with direction from this document. It is also recommended that local communications committees include local CBS communications staff, where possible.

The Plan for Management of Shortages of Labile Blood Components

2.1 Communications Guiding Principles

In order to maintain trust, build confidence and ensure credibility among our diverse stakeholder groups, all partners in managing a blood shortage will commit to uphold and demonstrate the following communications principles during all phases of a shortage:

- Practice openness, honesty and transparency
- Provide a quick and timely response to situations/issues
- Use frank, clear and direct communications
- Be honest and transparent regarding safety and supply issues
- Inform employees and relevant stakeholders before the general public whenever possible
- Use consistent messages and regular communications
- Ensure collaboration and coordination of communications between partners
- Be careful not to assign blame for the situation on any organization or partner in the supply chain
- Explain not only what each of us is doing, but the "why" and "how" behind a decision or action
- Provide an opportunity for audience/stakeholder education on the blood system/ongoing need for blood.

2.2 Overarching Communications Objectives

The overarching communications objectives before, during and after a blood shortage situation are as follows:

- Maintain and build the trust and confidence of Canadians by demonstrating that Canadian Blood Services, the National Blood Emergency Management Committee (NEBMC) and the provinces and territories have a plan in place to ensure an optimized and equitable supply of blood and blood products for Canadians, even in the face of scarce supply.
- Ensure health providers have the information they need to make good patient care decisions.
- Demonstrate that Canadian Blood Services, the P/T Ministries of Health and RHAs/hospitals are working in close collaboration to manage the situation as effectively as possible.
- Reassure and involve stakeholders – particularly those who depend on blood products
- Engage Canadians as part of mitigation/recovery efforts

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2.3 Core Messages

- Canadian Blood Services, the P/T Ministries of Health and your local hospital/RHA have an effective plan in place to ensure the safe, optimal and equitable supply of blood and blood products for Canadians in the event of a blood shortage situation.
- Through the national inventory and inter-provincial collaboration, the plan ensures that patients who need blood products the most are the priority, regardless of race, socioeconomic status or location.
- Jurisdiction-specific core messages to be determine by provincial/local plans

2.4 Additional Key Messages

Additional key messages will be developed according to the inventory availability and the individual circumstances. Key message development will be driven by CBS in consultation with the NEBMC. To ensure timeliness of key message development, a smaller subset of CBS and NEBMC may be called upon to draft communications.

Cautionary Note: It is important to note, that as the inventory data analysis is still being finalized, the facts conveyed may be preliminary; more information will be provided as it becomes available.

2.5 Key Audiences (aka Stakeholders)

Key Audiences may vary from phase to phase, and each organization will have its own specific key internal and external stakeholders to address. It is assumed, for the purpose of this appendix, that CBS P/T Blood Liaison Committee, the National Advisory Committee (NAC), National Emergency Blood Management Committee (NEBMC) Provincial/Territorial Emergency Blood Management Committee (PEBMC) and Hospital/RHA EBMCs are all mutual key audiences.

The following is a list of shared key audiences that are likely to be impacted or concerned about blood shortages:

2.5.1 Internal Audiences

- Canadian Blood Services staff/volunteers
- PTBLC/Health Ministries/RHAs
- Hema Quebec
- Health Canada/PHAC
- Jurisdiction-specific internal audiences to be determined by provincial/local plans

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2.5.2 External Audiences

In addition to external national associations /organizations, external audiences also include:

- Transfusion medicine physicians, physicians, nurses and allied health care workers
- Transfusion medicine and outpatient procedure clinics
- Individual patients requiring blood and/or their loved ones
- News media
- General public

2.6 Recommended Spokespersons

Appropriate spokespersons, and their delegates, need to be identified at each phase, based on the shortage situation, the issue, and the jurisdiction. Examples of spokespeople are included below but final decisions / nominations need to be made by the appropriate EBMC:

National:

- Chief supply chain officer (CSCO)/designate
- Lead Province Ministry of Health (or other PT representative)
- Chair, National Advisory Committee on Blood and Blood Components (NAC) /National Emergency Blood Management Committee (NEBMC)/designate

Provincial:

Provincial spokespeople should be decided by the PEMBC but may include:

- P/T Ministry of Health designate
- Provincial CBS Medical Officers(s) and/or NAC member(s)
- Chair of Provincial Blood Office (if applicable)

Regional:

Regional / Hospital spokespeople should be decided by the H/REMBC but may include:

- Chairs of Hospital/Regional EBMCs
- Hospital / RHA Transfusion Medicine Medical Directors
- CBS Medical Officers, CBS Media Affairs or Chair of Local Emergency Response Team (LERT) (or designate)
- Hospital / RHA spokesperson once briefed by the H/REMBC

Stakeholders/Partners

- Depending on the length and severity of the shortage, it may be appropriate to identify other stakeholders or partners who may be available and/or willing to publicly support the contingency plan and to appeal to Canadians for donations.

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2.7 Tactics

Communication Tactics will vary from phase to phase and use a variety of existing internal and external communications channels that each partner has at its disposal. The nucleus for all communications must be a common set of key messages that have been developed and endorsed by CBS and the NEBMC. Each partner will speak to its area of responsibility and expertise.

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3.0 Phase Specific Inventory Communications Planning

As national blood inventory levels fluctuate, the general principles, strategies and objectives will remain constant; however, as the inventory lowers and specific actions are required that may be very visible to the public and that may impact patient care, the communications needs will intensify. The following sections outline how communications, in each phase, will build on the essential elements laid out above.

3.1 Green Phase Definition (from the national plan)

Green Phase implies that normal blood component inventory levels exist and supply generally meets demand. This phase includes a broad range of inventory levels ranging from an ideal inventory to temporary shortages that occur periodically and can be managed within the scope of existing Canadian Blood Services and hospital/RHA actions.

3.1.1 Green Phase Communications Approach

The Green phase is characterized by a wide range of inventory levels, from optimal levels, to temporary shortages of various components, to low levels that could require a public/media appeal for donations. Though the operational plan only calls for activation of the NEBMC when considering moving to an Amber or Red phase, consultation with the NEBMC chair and other members of the Committee may also be advisable under certain conditions in the Green phase. In particular, this should be considered when shipments to hospitals will be reduced across the board for a period of one week, and/or when CBS issues a mass public/media appeal for donations.

3.1.2 Green Phase - Activities

During optimal inventory situations, Canadian Blood Services communications about issues and activities related to the national blood inventory will occur through business-as-usual channels. That is, PT Liaison will receive relevant information through regularly scheduled meetings and/or ad hoc communications, and hospitals will receive information from either Hospital Liaison Specialists, CBS Medical Officers and/or other CBS staff with whom they are typically in contact (an example of this would be daily inventory notices from CBS to hospitals).

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During the Green Phase, while inventory levels are optimal, communication activities related to this appendix should focus on emergency preparedness. The following are some of the activities that should be conducted:

- Endorsement of this communications plan appendix
- Development of similar communications plans at the provincial level and the RHA/hospital level
- Development and updating (yearly) of contact lists of Emergency Blood Management Committee members
- Distribution of the contact list to members
- Testing of infrastructure (e.g. Email, including spam filter testing, fax, text message, teleconference, NAC website dark pages, back-ups)
- Table top exercises
- Amending and enhancing the communications plans based on opportunities/challenges identified in exercises.

3.1.3 Green Phase – Temporary Reduction of Hospital Order Fill Rates

While the overall inventory is in Green Phase, occasionally a particular blood type or component may be in limited supply and require CBS to make cuts to routine hospital orders. Most of these situations will be brief, and CBS will communicate temporary inventory adjustments to hospitals through "business-as-usual" channels. (Annex 1)

Should the situation extend over one week, the following process is recommended:

1. If no change in hospital inventory management practice is recommended, CBS will continue to communicate updated information through "business-as-usual channels". See Annex 1 example.
2. These inventory updates would be distributed to PTBLC, hospitals and other stakeholders via CBS' business-as-usual channels.
3. These updates would also be shared with the NEBMC members on a FYI basis.

Should the situation persist, prior to going to a public media appeal for donors, or to discussing the potential of an Amber phase, the CBS CSCO will consult with the NEBMC Chair to convene the NEBMC to determine if there are any changes to hospital inventory management practice can assist with and/or improve the situation internally.

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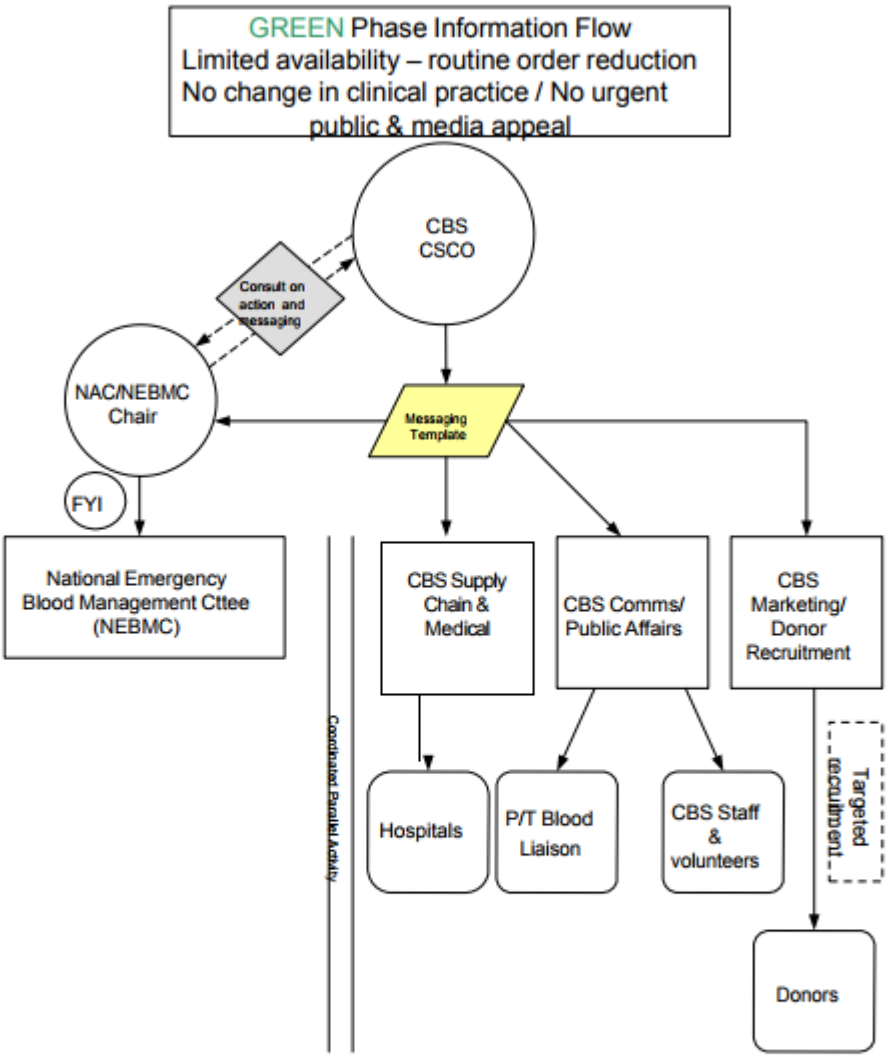

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3.1.4 Green Phase – Public Appeal for Donations

Canada boasts of a very loyal blood donor base whose repeat donations give the blood system the stability in needs. However, when surges in demand, weakening of supply, or a combination thereof, begin to erode the national inventory, and when all other recruitment efforts have been exhausted, a mass public/media appeals may be undertaken to avert a blood shortage. If the shortage is specific to a certain blood group or component, these appeals should be as targeted as possible – ie. O negative blood donors – to prevent the system from being overwhelmed dealing with donors that are not required urgently. Appeals are a last resort but Canadians have traditionally responded quickly and in great number. This tactic is seldom employed in Canada because it promotes an emergency-response pattern of donation rather than continuous donation, it causes long wait times and customer service issues, and erodes public trust in those involved in managing Canada's blood supply.

When appeals are issued, strong language about the seriousness of the situation is required to cut through the clutter of mass communication messages. Engagement of hospital staff and physicians is critical because:

- The healthcare team can provide a compelling voice about the possible impacts on patient care of insufficient donations
- Media will likely go to hospitals anyway for comment on how the situation is impacting patient care
- Hospital staff may hear media reports that inadvertently make the situation worse than it is
- Patients with ongoing or upcoming procedures that require blood may enquire about the status of their care
- Finally, hospital transfusion medicine personnel may be able to help alleviate the situation (i.e. by moving blood around in between institutions, promoting blood donation within their hospital/RHA, etc)

In the event of a media appeal, the following procedure should guide the information flow:

1. CBS CSCO advises NEBMC Chair that CBS is considering issuing a public/media appeal within 24-48 hours.
2. NEBMC Chair can offer input to CBS CSCO on actions

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3. CBS produces Inventory Advisories with key messages
4. NEBMC Chair convenes with NEBMC members
5. CBS cascades messaging to its stakeholders (P/T liaison committee, hospitals, patient groups, donors, etc.) via business-as-usual channels
6. NEBMC members share with their PEBMC
7. PEBMC share with hospital/RHA EBMC (if applicable)

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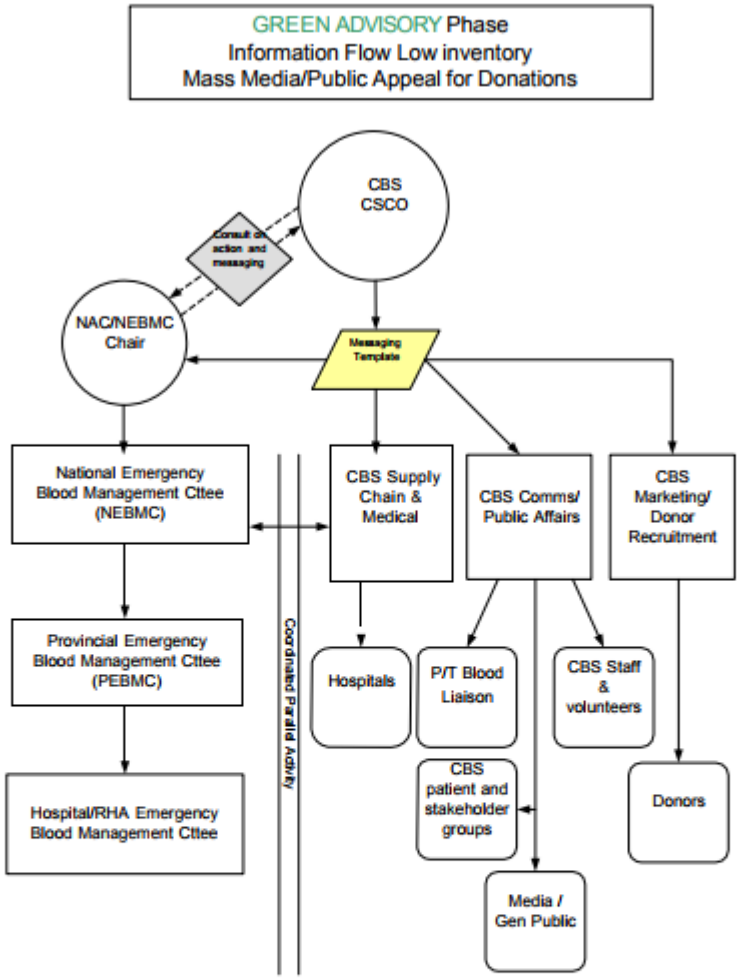

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3.2 Amber Phase Definition (from the National Plan)

Amber Phase implies that blood inventory levels are insufficient to continue with routine transfusion practice and hospitals/RHA will be required to implement specific measures to reduce blood usage.

3.2.1 Amber Phase Communications Approach

The declaration of an Amber Phase means that patient care is being impacted, either by delay, cancellation or postponement of non-urgent procedures that require blood and/or blood products. Canada has not experienced a shortage of this nature on a national basis in recent history. More than ever, clear, consistent and coordinated communication will be essential towards maintaining the trust of key stakeholders and informing them of how the situation is being managed so that optimal care decisions can be made for patients.

3.2.2 Determination of an Amber Phase

As indicated in the operational plan, a shortage situation is most likely to be identified by CBS, but it may also be identified by a region/health authority and escalated accordingly. In either case, contact with the NEBMC Chair would be required to convene a meeting of the NEBMC to take the next steps in making a final determination of the phase.

3.2.3 Convening the NEBMC

The Chair of the NEBMC will call a meeting of the members of the NEBMC and their designates as quickly as appropriate to the severity and time-sensitivity of the situation, typically within 24 hours. The use of email, text messaging, fax and telephone fan-out calls may be employed to reach members/designates of the NEBMC, using the contact preference indicated by the members/designates (information that should be collected and updated in times of Green – optimal inventory levels. Note: CBS has developed the Emergency Message Broadcast System for the NEBMC, which will be used to contact members/designates during a national shortage). It is critical that confirmation of message receipt is achieved – another method of communication must be used until that confirmation is obtained (e.g. if there is no response to an e-mail, call the cell phone).

At this time, the NEMBC would discuss if the shortage could be managed internally. The final determination of the phase would be made by the CBS CSCO, with this counsel from the NEBMC being the primary consideration.

3.2.4 Frequency of NEBMC Meetings during Amber Phase

The CBS CSCO and NEBMC Chair will hold, at a minimum, weekly meetings during the Amber Phase, and possibly more depending on the nature of the shortage. At the very least, the NEBMC will meet going into and out of each phase of this plan.

3.2.5 Communications In Between Meetings

For updates and information sharing that does not require a decision by the NEBMC, electronic memoranda will be distributed to the members from the NEBMC secretariat. There will also be regular updates to the NAC website for public members for all NEBMC decisions as well as a password protected section of the NAC website for members of the NEBMC. Additionally, hospitals will continue to receive inventory bulletins. (Annex 2)

3.2.6 Approval of Key Messages

At the end of each teleconference, the NEBMC Chair and CBS CSCO will summarize the key decisions of the meeting and formulate key messages that will be used by NEBMC members to cascade communication to the PEBMCs and CBS' internal / external stakeholders. Key messages from CBS should focus on the state of the inventory, a confirmation of the phase, mitigation efforts being made to address the situation and when the group can expect further communication. Key messages from the NEBMC should focus on the impact on clinical practice and transfusion protocols, and the counsel being made to the Provinces, RHAs and hospitals on how to best triage the limited supply of blood they have available through in-hospital supplies, and what they can expect from CBS.

3.2.7 Cascading Communication

The NEBMC will be the conduit to the PEBMC, via Inventory Advisories (or Blood Shortage Advisories). It is imperative that those involved in managing the shortage (i.e. CBS, NEBMC, PEBMC, and Hospital/RHA EBMC) are informed prior to external outreach to stakeholder groups, media.

Process:

1. NEBMC approved key messages are distributed to the entire NEBMC, which includes the CBS representatives on NEBMC.
2. In parallel, key messages will be circulated to:

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a. key divisions and departments at CBS, including its Business Continuity infrastructure (National and Local Emergency Response Teams). CBS will communicate inventory status only (hospital action is to be communicated by the PEBMC) to hospitals via fax, email and/or text messages. If available, other channels of information dissemination may be required (verbal messengers, satellite phones, etc.)to ensure communication has been received.
b. The Provincial/ Territorial Emergency Blood Management Committee via either the P/T Blood Liaison Committee Representative or Provincial NAC representative.
c. The Hospital / Regional EBMCs via the PEBMCs.

3. The PEBMC will be given approximately 8 hours (exact time to be determined by the NEBMC) to cascade information, after which time CBS will begin outreach to external stakeholder groups, donors and the media (if appropriate).

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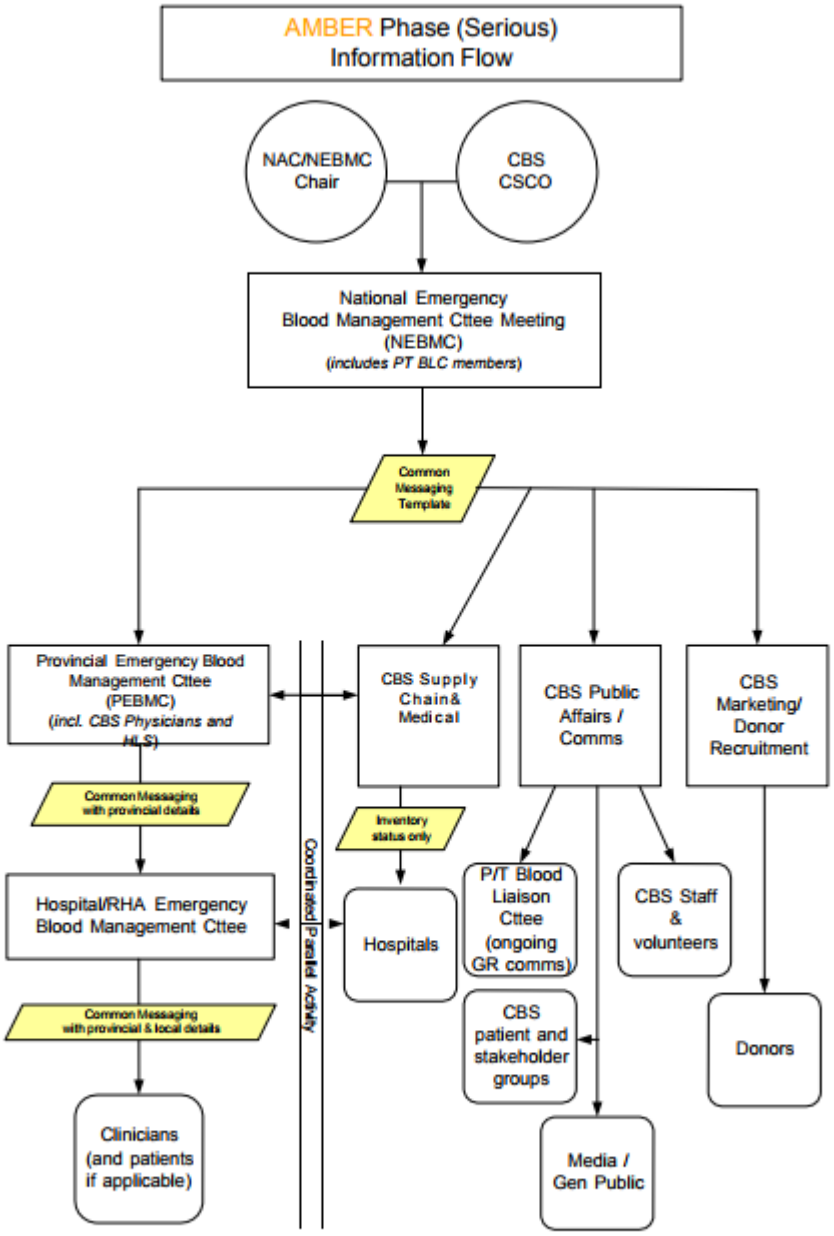

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3.3 Red Phase Definition (from the Plan)

Red phase implies that blood inventory levels are insufficient to ensure that patients with non-elective indications or need for transfusion will receive the required transfusion(s).

3.3.1 Red Phase Communications Approach

The declaration of a Red Phase means that patient care is being impacted, and that all medical/surgical procedures requiring the affected components with the exception of emergency surgical procedures be deferred or canceled. Emergency surgical procedures are those that need to be performed within 24 hours in order to prevent the patient's death (or major morbidity such as paralysis). Canada has not experienced a shortage of this nature in recent history. More than ever, clear, consistent and coordinated communication will be essential towards maintaining the trust of key stakeholders and informing how the situation is being managed.

3.3.2 Determination of a Red Phase

As indicated in the operational plan, a shortage situation is most likely to be identified by CBS, but it may also be identified by a region/health authority and escalated accordingly. In either case, contact with the NEBMC Chair would be required to convene a meeting of the NEBMC. Final determination of the phase would be made by the CBS CSCO with counsel from the NEBMC being the primary consideration

3.3.3 Convening the NEMBC

The Chair of the NEBMC will call a meeting of the members of the NEBMC and their designates to happen as quickly as appropriate to the severity and time-sensitivity of the situation – within approximately 4 hours for a Red Phase. The use of email, text messaging, fax and telephone fan-out calls may be employed to reach members of the NEBMC, using the contact preference indicated by the member (information that should be collected and updated in times of Green – optimal inventory levels. Note: CBS has developed the Emergency Message Broadcast System for the NEBMC, which will be used to contact members during a national shortage). It is critical that confirmation of message receipt is achieved – another method of communication must be used until that confirmation is obtained (e.g. if there is no response to an e-mail, call the cell phone).

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3.3.4 Frequency of NEBMC Meetings during Red Phase

During the Red Phase, the NEBMC will ideally hold daily meetings but at the minimum will convene twice weekly unless there is consensus of the NEBMC to delegate meetings to a smaller subset of the NEBMC which must at a minimum include the NAC Chair and CBS CSCO.

3.3.5 Communications In Between Meetings

For updates and information sharing that does not require a decision by the NEBMC, electronic memoranda will be distributed to the members from the NEBMC secretariat. There will also be regular updates to the NAC website for public members for all NEBMC decisions as well as a password protected section of the NAC website for members of the NEBMC. Additionally, hospitals will continue to receive inventory bulletins. (Annex 3)

3.3.6 Approval of Key Messages

At the end of each teleconference, the NEBMC Chair and CBS CSCO will summarize the key decisions of the meeting and formulate key messages that will be used for cascading communication to PEBMCs and to CBS' internal and external stakeholders. Key messages from CBS should focus on the state of the inventory, a confirmation of the phase, mitigation efforts being made to address the situation and when the group can expect further communication. Key messages from the NEBMC should focus on the impact on clinical practice and transfusion protocols, and the counsel being made to the Provinces, RHAs and hospitals on how to best triage the limited supply of blood they have available through in-hospital supplies, and what they can expect from CBS.

3.3.7 Cascading Communication

The NEBMC will be the conduit to the PEBMC, via Inventory Advisories (or Blood Shortage Advisories). It is imperative that those involved in managing the shortage (i.e. CBS, NEBMC, PEBMC, H/RHA EBMC) are informed prior to external outreach to stakeholder groups, media.

Process:

1. NEBMC approved key messages are distributed to the entire NEBMC, which includes the CBS representatives on NEBMC.
2. In parallel, key messages will be circulated to:
    a. key divisions and departments at CBS, including its Business Continuity infrastructure (National and Local Emergency Response Teams). CBS will

communicate inventory status only (hospital action is to be communicated by the PEBMC) to hospitals via fax, email and/or text messages. If available, other channels of information dissemination may be required (verbal messengers, satellite phones, etc.) to ensure communication has been received.

b. The Provincial/ Territorial Emergency Blood Management Committee via either the P/T Blood Liaison Committee Representative or Provincial NAC representative.
c. The Hospital / Regional EBMCs via the PEBMCs.
d. NAC website NEBMC Members Section will be updated as new information is available.

3. The PEBMC will be given approximately 8 hours (exact time to be determined by the NEBMC) to cascade information, after which time CBS will begin outreach to external stakeholder groups, donors and the media (if appropriate).

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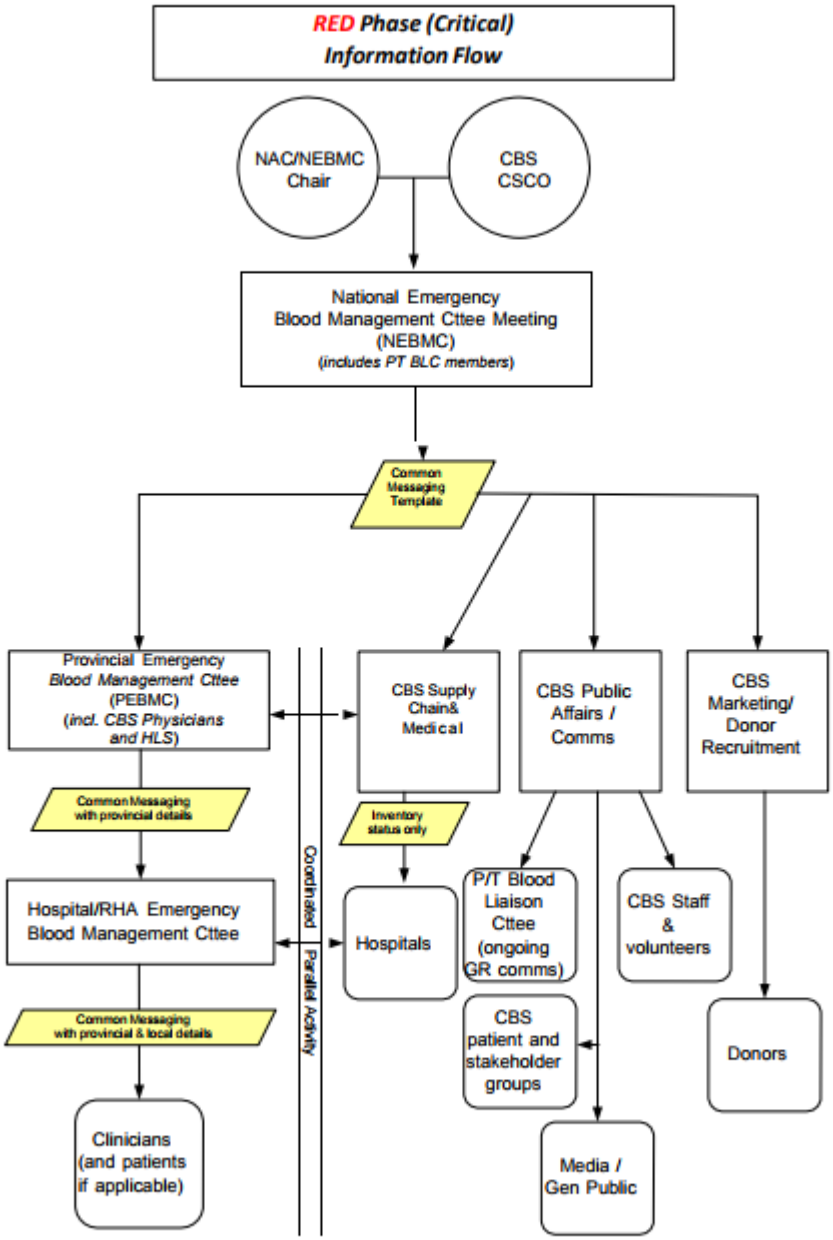

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3.4 Recovery Phase Definition (from the National Plan)

Recovery Phase implies that blood component 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 Phase.

3.4.1 Recovery from Red to Amber

If the blood component inventory levels show signs of sustained improvement, a meeting of the NEBMC will be called as per established procedure to determine if the situation warrants upgrading to the Amber phase. Decisions related to that discussion will be communicated to EBMC groups and other stakeholders as outlined in the communication process for the Amber phase.

3.4.2 Recovery from Amber to Green

If the national inventory shows sustained signs of growth, a meeting of the NEBMC will be called as per established procedure to determine if the situation warrants upgrading to the Green phase.

Decisions related to that discussion will be communicated to EBMC groups and other stakeholders as outlined in the communication process for the Amber phase. Subsequent communications will follow the process outlined in the Green phase of this communications appendix.

Even if the phase is upgraded to Green, it is unlikely that will imply business as usual operations. Though elective procedures will now be permitted to proceed, there is still a strong likelihood that routine orders of some blood components will be reduced. There is also the chance of increased demand for blood products to respond to a backlog of procedures that were postponed by the shortage. Messaging of a return to Green phase, and yet not operating business as usual may send mixed messaging. Therefore, it will be critical that all those involved in Emergency Blood Management at the national, provincial and regional/hospital level remain engaged and use consistent coordinated communications until the return to business as usual.

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4.0 Communications Evaluation

Evaluation of the communications functions will improve program delivery and determine if communications are effective in meeting objectives at all stages of a shortage. This includes the development of evaluation tools to confirm various audiences have been reassured that CBS, hospitals and governments are working together to ensure an equitable and ethical approach to blood shortages, are responding appropriately to various needs as they arise, and are managing the situation to control panic both internally and externally. Evaluation tools will be used to gauge changes in attitudes, behaviours, knowledge, status or levels of functions for each shortage phase.

Evaluation activities will include ongoing monitoring of:

- Media relations - Daily monitoring and analysis of media coverage will determine if strategy is working and if improvements and/or corrections are required.
- Web visits / enquiries
- Stakeholder feedback (via direct contact and/or social media)
- CBS call centre inquiries
- Health Hotline inquiries (if applicable)
- Requests for information and other feedback
- Public opinion polling and attitudinal market research (during shortage if issue is prolonged, or part of post-mortem analysis)
- Post-mortem surveying of EBMC members at the national, provincial and local levels.

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

Green Phase	Amber Phase	Red Phase
Major Hemorrhage	Major Hemorrhage	Major Hemorrhage
Follow your hospital/RHA guidelines.	Follow your hospital/RHA guidelines.	Follow your hospital/RHA guidelines. Follow triage/rationing allocation framework if instructed by NEBMC (1).
Surgery/Obstetrics	**Surgery/Obstetrics**	**Surgery/Obstetrics**
Follow your hospital/RHA guidelines.	Urgent (2) and emergent (3) 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 (1).
Non-Surgical Anemias 4	**Non-Surgical Anemias 4**	**Non-Surgical Anemias 4**
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.

1 These guidelines are available on http://www.nacblood.ca/resources/shortages-plan/index.html.
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). However measures to share units among neonates or between neonates and larger patients should be used to the extent possible.
- In Red or Amber phases, the hospital/RHA 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 F: Guideline for the use of Platelet Transfusions in children and adults in shortage situations

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

Green Phase	Amber Phase	Red Phase
Bone marrow failure/ hematopoietic Stem cell transplantation/ Chemotherapy	Bone marrow failure/ hematopoietic stem cell transplantation/ chemotherapy	Bone marrow failure/ hematopoietic stem cell transplantation/ chemotherapy
Adhere to a maximum threshold PC of 10 x 10^9/L for prophylactic platelet transfusions.	Adhere to a maximum threshold PC of 10 X 10^9/L for prophylactic platelet transfusions; consider lowering this threshold for routine prophylactic transfusions to 5 x 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 x 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.

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Notes :

- PC = Platelet Count.
- Given the relatively small volumes/numbers of units required, transfusions for neonates (i.e. patients less that 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). However measures to share units among neonates or between neonates and larger patients should be used to the extent possible.
- Follow the same guidelines for cancelling/performing surgery as described in Table 1.
- 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 (such as ECMO) should be used.
- In Red or Amber phases, the hospital/RHA 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.

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APPENDIX G: 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? ☐ Y ☐ 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? ☐ Y ☐ 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? ☐ Y ☐ 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:____

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APPENDIX G: 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 ☐ Yes ☐ No(if no refer to standard tracking log) Has patient received product in the previous 24 h? ☐ Yes ☐ No If yes, list products:	Age:_____ Hemoglobin:_____ Platelet:_____ INR:_____ PTT:_____ Fibrinogen:_____ Product Requested	Blood Group:_____ pH:_____ Lactate:_____ Temp:_____
Section B: Forward to TMS Director/Triage Team to complete		
Meets any exclusion criteria ☐ Yes ☐ No If yes, which one(s)?	Date/Time of assessment:	SOFA score:
Meets any specific exclusion criteria ☐ Yes ☐ No If yes, which one(s)?	Date/Time of assessment:	SOFA score:
Decision made to administer ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ 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 H

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 Emergency Blood Management Committee (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 I

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 PBCP and CBS) if inventory shortage identified by RHA/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 J

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 Canadian Blood Services (CBS). Verify contents of satellite stock (eg. Operating rooms, Emergency rooms).
- ☐ Define notification process (to PBCP and CBS) if inventory shortage identified by RHA/Hospital.
- ☐ 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.
- ☐ 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 Emergency Blood Management Committee 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 K

Recovery Phase Contingency Plan Checklist for Hospitals

Following notification from Canadian Blood Services (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 Emergency Blood Management Committee 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.

Appendix L

- 1 - Emergency framework for rationing of blood for massively bleeding patients during a red phase of a blood shortage – Synopsis for Triage Team – October 11, 2012

Emergency framework for rationing of blood for massively bleeding patients during a red phase of a blood shortage - Synopsis for Triage Team

Purpose and Scope

The National Advisory Committee on Blood and Blood Products (NAC—an advisory committee, composed of hospital-based transfusion medicine experts chosen by their respective Provincial Ministries of Health and Canadian Blood Services representatives that report to a joint Canadian Blood Services/Provincial and Territorial Ministries of Health committee) developed the National Plan for the Management of Shortages of Labile Blood Components (The National Shortages Plan). The National Shortages Plan required further expansion for dealing with patients who require massive blood transfusion during a red phase blood shortage. This document has been developed as an adjunct to the National Shortages Plan (available at www.nacblood.ca) to address these massively hemorrhaging patients as they can consume up to 25% of the national blood supply and urgent decisions are needed to ration blood to these patients during a red phase blood shortage.

The document for the rationing of blood for massive hemorrhage (defined as expected blood loss of one blood volume over less than a 24 hour period; 0.5 blood volume in 3 hours; or four or more units of red blood cells in one hour) is a guide for the management of patients in need of massive transfusion (trauma patients, patients undergoing liver/lung/heart transplantation, patients requiring ventricular assist devices or extracorporeal membrane oxygenation, patients with ruptured aortic aneurysms or gastrointestinal bleeding and obstetrical patients) during a red phase blood shortage. A red phase blood shortage is defined as the availability of less than 48 hours of red blood cell units in Canada where it is not foreseeable that a shortage will be averted by increasing the collection of blood or by reducing elective surgical procedures. In other words, the blood inventory levels are insufficient to ensure that patients with non-elective indications for transfusion will receive the required transfusion.

This document has been developed to ensure that blood transfusions are provided to Canadians during a red phase blood shortage in an ethical, fair, and transparent way to ensure that the greatest numbers of lives are saved and to minimize the suffering and maximize the use of alternatives for those who may not survive due to insufficient availability of blood.

Target Audience

This emergency framework is intended to be used by key blood system participants who are defined to be Canadian Blood Services, hospitals and regional health authorities, the Provincial and Territorial Ministries of Health and the National Emergency Blood Management Committee (NEBMC) as per the National Shortages Plan.

Summary of the Development Process

In 2009, a working group of experts was convened to develop an emergency framework. The working group members were from large tertiary care centres in Canada and had expertise in transfusion medicine, trauma, anesthesiology, gastroenterology heart/lung/liver transplantation, obstetrics, cardiovascular surgery, allied health, medical ethics, law and

methodology. The working group also included members of the National Advisory Committee on Blood and Blood Products. The working group did not include patient representatives, although widespread lay consultation was sought during the development process.

A systematic search was conducted of the literature to identify predictors of massive blood loss and mortality to guide the working group members in determining which patients would be the most likely to benefit from blood transfusion.

An extensive literature search was also conducted for ethical frameworks and allocation protocols dealing with the allocation of scarce resources as the allocation of any scarce resource is one of the most challenging ethical issues faced in health care. This emergency framework was developed to ensure a fair, transparent and just distribution of blood when the demand for transfusion will exceed the available resources. This framework may transcend the needs of a single patient, health care professional or institution but represents a focus on the 'greater good'.

The working group through an iterative process developed recommendations that were assigned a level of evidence and grade of recommendation according to the Canadian Task Force (www.canadiantaskforce.ca). In addition to the recommendations, the working group also adapted a previously published Canadian critical care triage protocol developed for pandemic influenza planning. Recommendations for the patients who are massively hemorrhaging do not address comorbidities that may impact on the survival of patients.

National experts including professional societies, the blood provider and lay groups reviewed the final recommendations to provide input on the recommendations. Their agreement to all recommendations and the overall document review was elicited and all comments were subsequently addressed in the final document.

The Triage Team

It is recommended that triage teams be established in advance of a shortage. The role of the triage team is to provide a structure that formally oversees the triage process be it provincial /regional or at the hospital level during a crisis. The triage team should receive comprehensive information on the triage framework in advance of a blood shortage being declared. The triage team must be a multidisciplinary team with adequate background knowledge in terms of patient triage and managing patients under a 'crisis standard of care'.

Membership

The triage team should be comprised of any of the following and be appointed by the regional/hospital transfusion committee or regional/hospital emergency blood management committee (the number of team members should be proportional to the transfusion volume of the institution or region):

- 3 - Emergency framework for rationing of blood for massively bleeding patients during a red phase of a blood shortage – Synopsis for Triage Team – October 11, 2012

1. Triage Team Leader. The triage team leader should be an experienced physician with familiarity in triaging critically ill patients, broad based knowledge of resources and capabilities of healthcare organizations. Will have final responsibility and authority over clinical decisions
2. A Management Representative. A management representative is required to provide guidance on the capability of the organization regarding resources, personnel, external support, and internal and external communications.
3. An ethicist.
4. A nursing supervisor to provide direction on alternate care
5. Representative from the emergency room, trauma, transplantation, cardiovascular surgery, gastroenterology, and obstetrics to provide updates on demand, impact and assist in decision making.
6. Palliative care nurse or physician for patients not triaged to receive blood.
7. Social worker
8. Chaplain
9. Medical laboratory technologist

In addition, the triage team leader should have another triage physician available to them for assistance with decision making for difficult cases. The regional/hospital transfusion committee or Regional/Hospital Emergency Blood Management Committee should appoint members of the triage teams with the number of individuals proportional to the transfusion volume of the institution or region. It will be the responsibility of the triage teams to report back to the transfusion committee or emergency blood management committee all triage decisions made.

The triage teams must be educated on the background information and how to apply the triage tool in advance of a blood shortage. The responsibility for education of physicians and triage teams rests with the Regional Emergency Blood Management Committee in collaboration with the Hospital/Regional/District Health Authority. Specific training at dedicated intervals is difficult to achieve as there is varying frequency with which simulation exercises occur, the level of involvement of various medical services during a simulation and a large turnover of physicians throughout the system. However, through simulation exercises, continuous education, and dissemination of the National Blood Shortages Plan and this emergency framework, physicians would be more inclined to align with the National Blood Shortages Plan to ensure all patients receive quality levels of care during a shortage. Post simulation reporting may provide the best training opportunities in that lessons learned can be addressed at the Medical Advisory Committee level. Training and development modules should occur in collaboration with Canadian Blood Services as they will be instrumental in invoking the National Blood Shortages Plan. A core part of this pre-shortage education should clearly focus the triage team on their

role in ensuring the best care for the community of patients that they serve, rather than the needs of individual patients.

Responsibilities

The responsibilities of the triage team are to ensure

- documentation of the state of emergency (i.e., that an emergency has been activated, that all existing resources are exhausted, the rationale for withholding transfusion, and that all supportive care and blood conservation strategies will be instituted);
- documentation of inclusion/exclusion criteria;
- adherence to decisions and alternate levels of care;
- efficient and regular re-evaluation of patients;
- reevaluation of triaged patients daily and every 10th red blood cell transfusion;
- physicians receive the required assistance; and,
- the public receive information about the status of the emergency and where to obtain further information.

Implications

The triage team should not be directly involved in the care of the patient. The triage team assigned to allocate blood components needs to be clearly cognizant that their duty is to the population, not just to the individual patient. The triage teams should be blinded to identifying patient information when presented with clinical information in determining if a patient is eligible to receive transfusion as per the triage criteria. It is suggested that the triage team convene in an area not within the immediate vicinity of the patient bedside. Typically given the acute and emergent nature of the presenting cases, it is anticipated that there will be no ability to manage an appeals process in the middle of the mass casualty situation or other disaster. In addition, decisions during a massive hemorrhage must be made within minutes and therefore a formal appeals process is not clinically feasible as such the triage decisions must be final with no appeal process. The triage teams should be offered adequate administrative and psychological support.

There must be sufficient coverage of the triage team to allow for 24 hour coverage. The triage team decisions need to be reported daily to the Regional/Hospital Emergency Blood Management Committee to ensure 'over triage' and 'under triage' errors are minimized. Consideration needs to be given by the hospital of having a joint intensive care and transfusion triage teams, where possible, to maximize the use of resources. The triage decisions need to be transparently communicated to the patient, the patient's family, the clinical team caring for the patient and recorded clearly in the patient's chart. Patients should be re-assessed at a minimum

of daily, every 10th unit of red blood cells, or sooner if their clinical status improves or deteriorates substantially prior to 24 hours.

In the setting of a scarcity of multiple hospital resources, the blood triage tool should be utilized sequentially with the other rationing tools. It is possible that a blood shortage may occur as an isolated event or in the setting of multiple resource scarcity (e.g., ventilators or critical care beds). In the setting of an isolated blood shortage, all other available therapies, including blood conservation strategies, should be offered to all patients. In addition, ensuring pain and symptom management should be a core part of the triage team's oversight responsibility so that patients and their families do not feel abandoned.

Documentation

Clear and complete documentation will be essential for a complete patient record and for evaluation after the red phase. In the patient chart, the triage team shall document the following: phase of blood shortage, triage decision, reason for exclusion if applicable, date/time of next planned re-evaluation, a copy of the triage documentation tool, and the number to page if the clinical status of the patient substantially improves or deteriorates before the next planned re-assessment. Extensive clinical notes will not be possible, or appropriate, as the triage team will be required to triage multiple patients. Documentation can be delegated to any member of the triage team and need not be done by the triage physician. Documentation on the triage documents should include a triage tracking log of all cases and a triage sheet for each patient. Efforts should be made to be as complete as possible to allow for the best possible review of triage decisions after the resolution of the red phase. At the end of each shift, a copy of the documents should be given to the chair of the Regional/Hospital Emergency Blood Management Committee, or their designate, and the original documents given to the next triage team with appropriate verbal handover. At the completion of the red phase, copies of all triage tools should be forwarded to the Provincial Emergency Blood Management Committee for review and analysis.

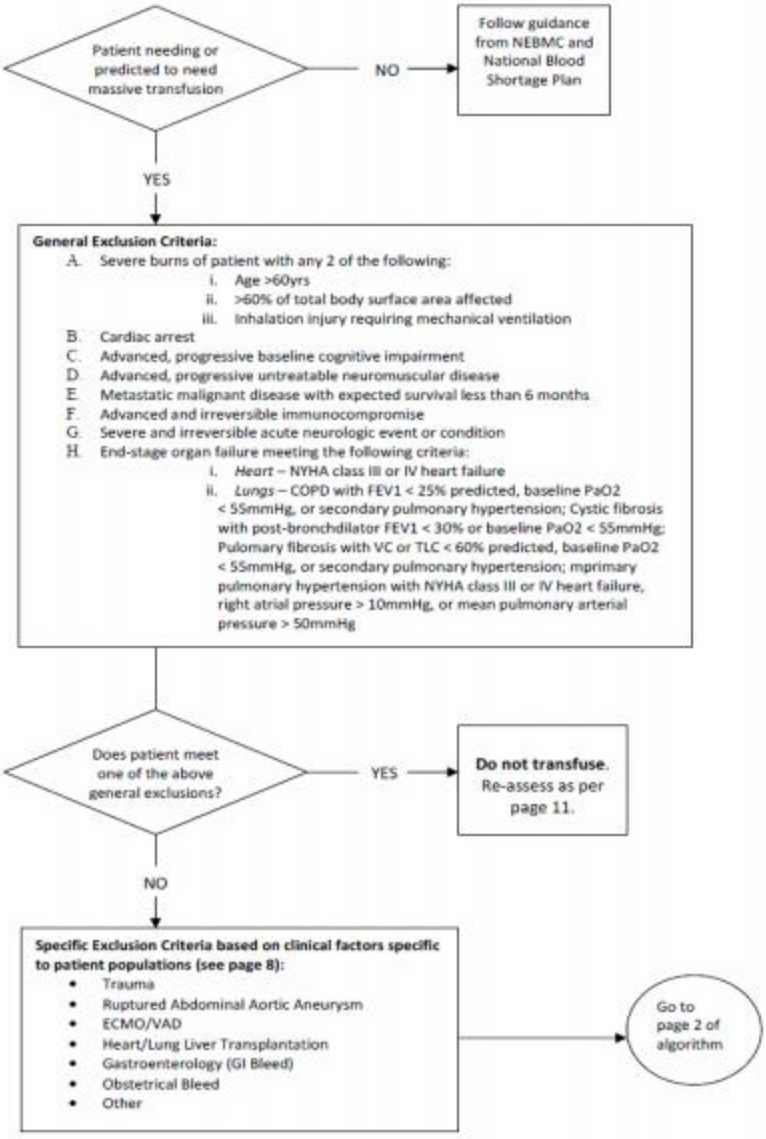
The Framework

Patient Population: This framework applies only to patients experiencing massive hemorrhage (defined as expected blood loss of one blood volume over less than 24 hours; 0.5 blood volume in three hours; or four or more units of red blood cells in 1 hour) during a red phase blood shortage.

In general all patients should receive access to all available blood conservation strategies including but not limited to: erythropoiesis-stimulating agents, intravenous iron, oral iron, antifibrinolytics, intraoperative cell salvage, interventional radiologic procedures, rapid access to endoscopy, and non-invasive surgeries.

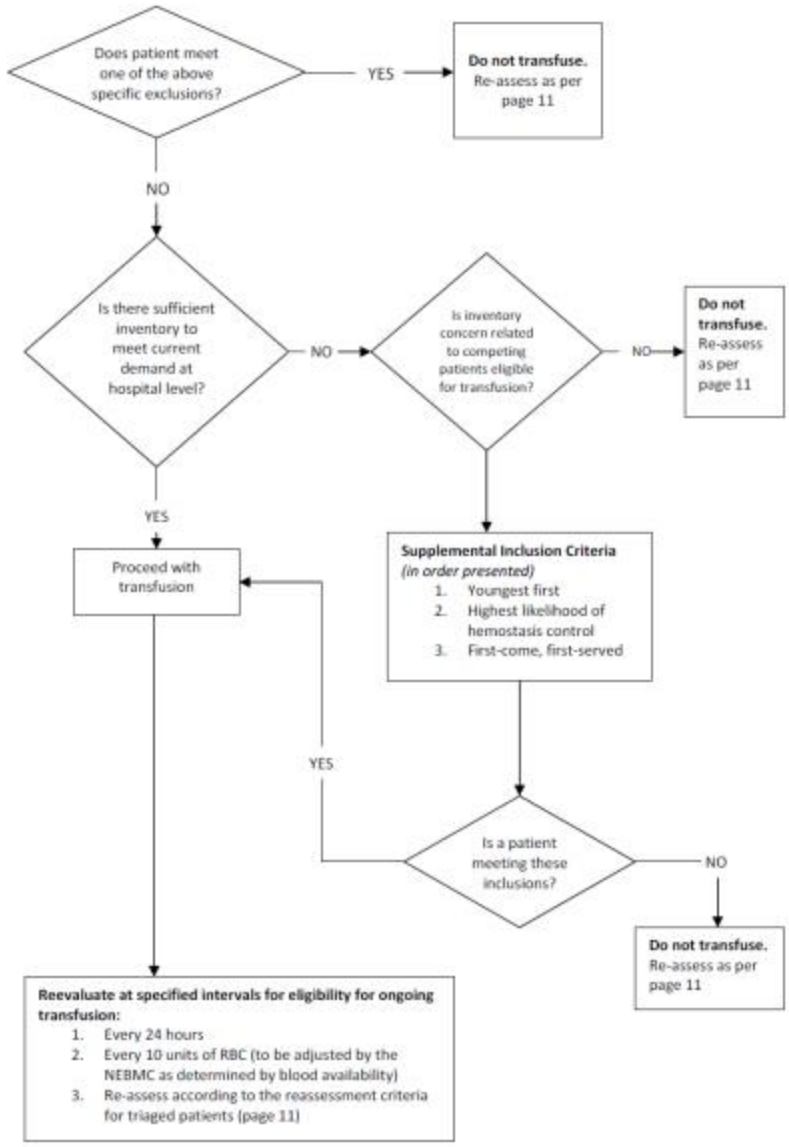
- 6 - Emergency framework for rationing of blood for massively bleeding patients during a red phase of a blood shortage – Synopsis for Triage Team – October 11, 2012

Figure 1 – Algorithm for the Triage Team (page 1)



- 7 - Emergency framework for rationing of blood for massively bleeding patients during a red phase of a blood shortage – Synopsis for Triage Team – October 11, 2012

Figure 1 – page 2



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Specific Exclusion Criteria for Massively Bleeding Patients:

Trauma

1. **During a red phase, do not administer transfusions to children or adults with non survivable brain injury.**
   Level of evidence: III
   Grade of recommendation: A
   Clinical Consideration: CT scanning should be done as soon as possible to confirm the diagnosis of a non survivable brain injury.

2. **During a red phase, do not administer transfusion to children or adults with a Glasgow Coma Scale ≤3 who have hypotension not attributable to reversible factors and who have fixed and dilated pupils.**
   Level of evidence: III
   Grade of recommendation: A

3. **During a red phase, do not transfuse patients after the declaration of brain death for the purpose of deceased organ donation.**
   Level of evidence: III
   Grade of recommendation: A

4. **During a red phase, do not administer transfusions to adults or children with penetrating cranial trauma and a Glasgow coma scale ≤3 that is not attributable to reversible factors.**
   Level of evidence: III
   Grade of recommendation: B

5. **During a red phase, do not administer transfusions to adults or children with penetrating cranial trauma, a Glasgow coma scale <8 that is not attributable to reversible factors, hypotension and severe thoracoabdominal trauma.**
   Level of evidence: III
   Grade of recommendation: B

6. **During a red phase, do not administer transfusions to adults or children with blunt trauma, and a Glasgow Coma Scale ≤3 that is not attributable to reversible factors.**
   Level of evidence: III
   Grade of recommendation: B

7. **During a red phase, do not administer transfusions to adults or children with blunt trauma who have lost vital signs pre-hospitalization.**
   Level of evidence: III
   Grade of recommendation: A

8. **During a red phase, do not administer transfusions to patients with transcranial gunshot injuries.**
   Level of evidence: III
   Grade of recommendation: A

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9. **During a red phase, do not administer transfusions to patients >65 years with severe brain injury and profound shock and severe thoracic or abdominal trauma.**
   Level of evidence: III
   Grade of recommendation: B

10. **During a red phase, do not administer transfusions to patients >75 years with moderate brain injury, a Glasgow Coma scale of <12, who are in profound shock and who have thoracoabdominal injury.**
    Level of evidence: III
    Grade of recommendation: B

Ruptured Abdominal Aortic Aneurysm

1. **During a critical blood shortage, do not transfuse patients who have a cardiac arrest preoperatively.**
   Level of evidence: III
   Grade of recommendation: B

2. **During a critical blood shortage, do not transfuse patients with a systolic blood pressure less than 70mmHg who are unresponsive to fluid resuscitation and have lost consciousness.**
   Level of evidence: III
   Grade of recommendation: B

3. **During a critical blood shortage, do not transfuse patients with RAAA that do not meet criteria for emergent vascular repair.**
   Level of evidence: III
   Grade of recommendation: I

ECMO/VAD

1. **During a red phase, do not transfuse patients who require ECMO/VAD and who have multi-organ (> 1 organ) failure.**
   Level of evidence: III
   Grade of recommendation: B

2. **During a red phase, inform patients/families that patients receiving ECMO/VAD support who have multi-organ failure may not receive transfusion support if massively bleeding.**
   Level of evidence: III
   Grade of recommendation: B

Heart, Lung, Liver Transplantation

1. **Deceased Donor Organ Recovery - During a red phase, deceased donor organ recovery for transplantation should proceed, with the understanding that the deceased donor will not be transfused in the process of deceased donor stabilization.**
   Level of evidence: III

Grade of recommendation: B

2. **Deceased Donor Transplantation - During a red phase, deceased donor solid organ transplants may proceed with informed consent regarding increased risk from restriction of blood transfusion, and with the understanding (among patient and all involved physicians) that blood may not be available for transfusion.**
   Level of evidence: III
   Grade of recommendation: B

3. **Living Donor Transplantation – During a red phase, living donor transplantation should be deferred.**
   Level of evidence: III
   Grade of recommendation: B

Gastroenterology (refer to Section 8 of the expanded emergency framework for further information)

1. **During a red phase do not administer transfusions to patients with gastrointestinal bleeding and a Rockall score >8.**
   Level of evidence: III
   Grade of recommendation: B

2. **During a red phase do not administer transfusion to patients with liver cirrhosis and gastrointestinal (i.e. variceal) bleeding who have a Child Pugh score more than 10 (MELD score of more than 18) and who are not on the list for transplantation.**
   Level of evidence: III
   Grade of recommendation: B

3. **During a red phase, triage patients with gastrointestinal bleeding to centers with endoscopy to minimize the use of blood products.**
   Level of evidence: III
   Grade of recommendation: B

Obstetrics

1. **In a red phase, red cell transfusion should not be withheld from the bleeding obstetrical patient.**
   Level of evidence: II-2-III
   Grade of recommendation: B

Other massively bleeding situations not listed above

1. **In a red phase, for patients massively bleeding for reasons not listed above, do not transfuse patients for whom the triage team believes the mortality rate exceeds 80%**

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Reassessment for Triaged Patients

1. Patients triaged to no blood components:

   Patients triaged to no transfusion care will be re-assessed at a minimum of every 24 hours. The triage team will review requests from the most responsible physician if an improvement in a patient's status would now qualify them to be triaged to active transfusion management. In addition, the triage team will assure that the patient and their family are given adequate access to psychological support and that adequate symptom management is given to minimize pain and distress.

2. Patients triaged to blood components:

   For patients triaged to active transfusion care, they will be re-assessed at a minimum of every 10 units of red blood cells (including pediatrics) or every 24 hours for patients receiving less than 10 units of blood or until cessation of hemorrhage(or more frequently – e.g. every 5 units - if deemed necessary by the NEBMC). At each assessment, the triage team will utilize the following variables to guide their decisions regarding the value of continued transfusions: SOFA score, total blood products used, need for ongoing transfusion support and ability to control bleeding with either surgery or other procedure (e.g. interventional radiology, endoscopy). Patients with a SOFA score >11, continued need for large amounts of blood components, and with no foreseeable ability to control blood loss will be triaged to palliative care.

Documentation for Transfusion Decisions

Transfusion decisions should be documented on a patient tracking tool. An example of a patient tracking tool is available in the appendix of this document.

Competing Patients Triaged to Active Transfusion Care

In the event of two or more patients requiring blood components at the same hospital for whom both qualify for active transfusion management by the triage team, the following principles (in order) are suggested to prioritize transfusion resources:

1. Administer blood to the youngest patients first i.e. pediatric patients first
2. Administer blood to patients who have the highest likelihood of hemostasis control
3. Administer blood according to the first-come, first-served principle.

In the event that two or more patients are competing for blood components at different hospitals and the blood still resides at the local blood centre, the same aforementioned principles will be applied jointly by the blood centre physician and the triage team leader from the hospitals involved.

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Appendix A – Documentation Tools and Clinical Scoring

Triage Tracking Log – Emergency Disposition of Blood during Red Phase Blood Shortage

Tracking Number	Medical Record Number	Last Name	First Name	Location	Blood Group
1					
2					
3					
4					
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38					

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Patient Triage Record' – Emergency Disposition of Blood during Red Phase Blood Shortage

Patient Tracking Number	Hospital	
Reason for Massive hemorrhage	Date of Triage	Time of Triage
Predicted to need >10 units in the next 24 hours ☐ Yes ☐ No(if no refer to standard tracking tool) Has patient received product in the previous 24 h? ☐ Yes ☐ No If yes, list products:	Age Hemoglobin Platelet INR PTT Fibrinogen	Blood Group pH Lactate Temp
Meets any exclusion criteria ☐ Yes ☐ No If yes, which one(s)?	Product Required	Units of ABO compatible product available
Meets any specific exclusion criteria ☐ Yes ☐ No If yes, which one(s)?	Date/Time of assessment	SOFA score
Decision made to administer blood? ☐ Yes ☐ No	Date/Time	Number of units & products transfused
Patient outcome at 24 hours	Date/Time	Re-assessment Decision
Comments by Triage Team	Comments regarding patient and family concerns	
Triage Documentation completed by	Signature	
Triage Officer Name	Signature	
Follow-up		
Patient Outcome at Discharge	Patient Outcome at 6 months	

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Glasgow Coma Scale
Teasdale G, Jennett B. Assessment of coma and impaired consciousness. A practical scale.Lancet. 1974 Jul 13;2(7872):81-4.

The chart from the above reference has been modified to reflect a more recent version of the scale:

Eye opening	Spontaneous	4
	To speech	3
	To pain	2
	None	1
Best verbal response	Orientated	5
	Confused	4
	Inappropriate	3
	Incomprehensible	2
	None	1
Best motor response	Obeying	6
	Localising	5
	Withdraws	4
	Flexing	3
	Extending	2
	None	1

Rockall Score
As described by T A Rockall, R F A Logan, H B Devlin, T C Northfield, and the steering committee and members of the National Audit of Acute Upper Gastrointestinal Haemorrhage. Gut. 1996;38:316-321.

Rockall Score	**0**	**1**	**2**	**3**
Age	< 60 years	60 – 79 years	> ▪ 80 years	
Shock	'No shock', systolic BP > ▪ 100, pulse < 100	'Tachycardia', systolic BP > ▪ 100, pulse > ▪ 100	'Hypotension', Systolic BP < 100	
Comorbidity	No major comorbidity		Cardiac failure, ischaemic heart disease, any major comorbidity	Renal failure, liver failure, disseminated malignancy
Diagnosis	Mallory-Weiss tear, no lesion identified and no SRH	All other diagnoses	Malignancy of upper GI tract	
Major SRH	None of dark spot only		Blood in upper GI tract, adherent clot	

Child Pugh Score

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Pugh RN, Murray-Lyon IM, Dawson JL, Pietroni MC, Williams R Transection of the oesophagus for bleeding oesophageal varices. Br J Surg. 1973 Aug;60(8):646-9.

Clinical and Biochemical Measurements	Points Scored for Increasing Abnormality		
	1	2	3
Encephalopathy (grade)	none	1 and 2	3 and 4
Ascites	Absent	Slight	Moderate
Bilirubin (mg per 100 ml)	1 - 2	2 - 3	> 3
Albumin (g per 100 ml)	3.5	2.8 – 3.5	< 2.8
Prothrombin time (sec. prolonged)	1 - 4	4 - 6	> 6
For primary biliary cirrhosis – Bilirubin (mg per 100 ml)	1 - 4	4 - 10	> 10

MELD Score
As per Kamath P.S, et al. A model to predict survival in patients with end-stage liver disease. Hepatology. 2001; 33(2): 464-470.

Formula : $3.8*\log_e(\text{bilirubin[mg/dL]}) + 11.2*\log_e(\text{INR}) + 9.6*\log_e(\text{creatinine [mg/dL]}) + 6.4*(\text{etiology: 0 if cholestatic or alcoholic, 1 otherwise})$.

An online calculator is available: http://www.mayoclinic.org/meld/mayomodel6.html

SOFA Score
The SOFA score as described by Vincent JL, Moreno R, Takala J, Willatts S, De Mendonca A, Bruining H, et al. The SOFA (sepsis-related organ failure assessment) score to describe organ dysfunction/failure. on behalf of the working group on sepsis-related problems of the european society of intensive care medicine. Intensive Care Med. 1996 Jul;22(7):707-10.

SOFA Score	0	1	2	3	4
PaO2/FIO2 Ratio	>400	≤400	≤300	≤200 and mechanically vented	≤100 and mechanically vented
Platelet Count	>150	≤150	≤100	≤50	≤20
Bilirubin umol/L	<20	20-32	33-101	102-204	>204
Hypotension (ug/kg/min)	None	MAP<70	Dopamine ≤5 or dobutamine (any dose)	Dopamine >5 or epinephrine ≤0.1 or norepinephrine ≤0.1	Dopamine >15 or epinephrine >0.1 or norepinephrine >0.1
Glasgow Coma Scale	15	13-14	10-12	6-9	<6
Creatinine (umol/L)	<110	110-170	171-299	300-440 or <500 mL/day	>440 or <200 mL/day