

**Nova Scotia Blood Contingency Plan
Version 2.1**



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EXECUTIVE SUMMARY

Blood components and blood products are a vital resource supporting health care in Canada. Blood is a finite resource subject to shortages at national, provincial and local levels. The blood supply chain is susceptible to a number of external threats that may include, but are not limited to, labour disruptions, endemic disease outbreaks, extreme weather disturbances or disruptions in information and transportation systems. To ensure Nova Scotians have access to a safe and adequate supply of blood components and blood products in times of shortages, the Blood Emergency Response Team (BERT) requested the Nova Scotia Provincial Blood Coordinating Team, in collaboration with Canadian Blood Services (CBS), Nova Scotia Health (NSH) and the IWK Health Centre, to develop the *Nova Scotia Blood Contingency Plan*.

The purpose of this Contingency Plan is to maximize the effectiveness of a provincial response to a crisis that impacts the blood supply in Nova Scotia. This Contingency Plan provides a framework to ensure a consistent, coordinated response to a blood supply crisis throughout the province. This Contingency Plan delineates roles and responsibilities for all the relevant blood-system stakeholders and prompts the activation of provincial networks that will respond to a crisis based on blood component/blood product inventory levels.

This Contingency Plan has been developed as a stand-alone plan, but has also been designed to be operationally congruent with other provincial and national emergency plans. It is aligned with the [National Plan for Management of Shortages of Labile Blood Components](#) (National Plan) which has been endorsed by all of the Deputy Ministers of Health and by CBS.

This Contingency Plan addresses four phases of inventory availability, defined according to CBS inventory levels: Green, Amber, Red and Recovery. Activation of the Contingency Plan may also be signalled by the BERT based on anticipated, real, or perceived threats to the provincial blood component/blood product supply.

- **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 shortages that occur periodically and can be managed with existing CBS and hospital/zone actions.
- **Green Phase Advisory** implies that CBS inventory levels are low with respect to a particular blood component. All hospitals report daily inventories to CBS and prepare for potential crossing into Amber or Red Phase.
- **Amber Phase (serious shortage)** implies that blood inventory levels are insufficient to continue with routine transfusion practices. NSH/IWK implement specific measures outlined in this document in order to reduce blood usage and avoid Red Phase (critical shortage).

- **Red Phase (critical shortage)** implies that blood inventory levels are insufficient to ensure that patients with non-elective indications for transfusion will receive the required transfusion(s). NSH/IWK implement specific measures outlined in this document.
- **Recovery Phase** implies that blood inventories have begun to increase and are expected to be maintained at a level which would enable the return to Green Phase. NSH/IWK implement specific measures outlined in this document to avoid a return to a shortage situation.

This Contingency Plan is an evolving document, and will be amended as necessary. Document revisions will reflect lessons learned from blood shortage exercises and real life scenarios. Following a simulated exercise or full recovery in a live scenario, the Nova Scotia Provincial Blood Coordinating Team will conduct a retrospective review to assess the effectiveness of the plan and make any necessary revisions. Upon full recovery, NSH/IWK Blood Emergency Management Groups will also conduct their own retrospective review to assess and revise local Blood Emergency Management Plans as necessary.

ABBREVIATIONS

ADRD	Average daily red cell demand
BEMP	Blood Emergency Management Plan
BEMG	Blood Emergency Management Group
BERT	Blood Emergency Response Team
CBS	Canadian Blood Services
DHW	Department of Health and Wellness
DoH	Days on Hand
EHS	Emergency Health Services
IWK	Isaac Walton Killam Health Centre
MSBO	Maximum Surgical Blood Orders
NAC	National Advisory Committee on Blood and Blood Products
NEBMC	National Emergency Blood Management Committee
NSH	Nova Scotia Health
NSPBCT	Nova Scotia Provincial Blood Coordinating Team
PLTS	Platelets
P/T	Provincial/Territorial
P/TEBMC	Provincial/Territorial Emergency Blood Management Committee
TM	Transfusion Medicine

DEFINITIONS

Blood Component	Whole blood or a therapeutic component of blood intended for transfusion (e.g. red cells, platelets, plasma) that can be prepared using the equipment and techniques available in a blood centre.
Blood product	Any therapeutic product derived from blood or plasma and produced by a manufacturing process that pools multiple units (usually more than 12). Note: Examples of blood products include albumin, immunoglobulin preparations, and coagulation products.
Emergent	An occurrence coming into view, existence, or notice, often unexpectedly, with the potential to impact blood component inventories thus demands prompt action. E.g. pandemic flu, WNV, labour disruption.
Massively Bleeding Patient	The loss of one blood volume in a 24 hour period or the loss of $\geq 50\%$ blood volume in 3 hours, in an adult sized patient.
Optimal Inventory	The level which provides adequate supplies of blood for routine and emergency situations and minimizes component/product outdating. This may vary from site to site.
Recall	The removal from further distribution, or use, of a blood component or blood product.
Triage Team	Healthcare professionals responsible for triaging patients in need of massive transfusion during a red phase blood shortage. Triage team members utilize the national <i>Emergency framework for rationing of blood for massively bleeding patients during a red phase of a blood shortage</i> .
Urgent	Needing immediate action to contain the impact on blood component or blood product inventories

1.0 INTRODUCTION

1.1 Purpose

Blood components are a vital resource supporting health care in Canada. In a system of voluntary donation, these resources are often limited in quantity. The potential for shortages of blood components/products due to such labour disruptions, endemic disease outbreaks, extreme weather disturbances or disruptions in information and transportation systems is a reality that must be proactively addressed through contingency planning.

The purpose of this Contingency Plan is to maximize the effectiveness of a provincial response to a crisis that impacts the blood supply. The plan guides decision-making for organizations, committees and individuals associated with the management, supply and utilization of blood components and blood products in Nova Scotia. The plan provides these stakeholders with a framework to respond to the crisis in a consistent and coordinated manner and outlines instructions for the activation and action of local committees. This framework was designed to align with the National Advisory Committee (NAC)/CBS National Plan endorsed by all Deputy Ministers of Health.

1.2 Scope

This plan is provincial in scope and focuses on non-routine blood component supply shortages. It is specific to labile blood components (red blood cells, platelets, plasma and cryoprecipitate). Although manufactured blood products shortages are not specifically addressed, the concepts and structure of this plan will be followed for those occurrences.

The Plan addresses provincial activities related to communication, inventory management and utilization and does not discuss activities undertaken by CBS to increase the adequacy of supply.

This Contingency Plan has been developed to function as a stand-alone plan in the event that the blood supply is impacted by shortages and also as a companion plan to the [National Plan for the Management of Shortages of Labile Blood Components](#).

1.3 Key Participants Roles and Responsibilities

This plan delineates the roles and responsibilities for all the relevant blood system stakeholders. Each stakeholders' responsibilities relate to blood components and blood products and does not detail broader responsibilities from a public health perspective.

1.3.1 Canadian Blood Services (CBS)

CBS is responsible for the recruitment of donors, collections, donor testing, production and distribution of blood components and blood products. CBS manages the national blood inventory except for Quebec. CBS has a key role in notifying and communicating with hospital transfusion services in the event of a blood shortage. With respect to the National Plan, CBS has the ultimate responsibility for declaring inventory shortage phases, as well as determining inventory distribution on a national level in collaboration with the National Advisory Committee (NAC) as part of the National Emergency Blood Management Committee (NEBMC).

1.3.2 Department of Health and Wellness (DHW)

The DHW holds overall responsibility for the performance of the Nova Scotia health care system, while NSH/IWK are responsible for the delivery of the health system. In the event of a critical blood shortage, the DHW will advise the Health Emergency Operations Centre.

1.3.3 Perioperative Blood Management Program (PBMP)

The PBMP enhances patient care and patient satisfaction through education and perioperative blood conservation/management techniques.

1.3.4 The National Emergency Blood Management Committee (NEBMC)

The NEBMC ensures the implementation of the *National Plan for the Management of Shortages of Labile Blood Components*. The terms of reference for the NEBMC can be found in the *National Plan for Management of Shortages of Labile Blood Components*.

1.3.5 The Blood Emergency Response Team (BERT)

BERT is the equivalent to the Provincial/Territorial Emergency Blood Management Committee (P/TEBMC) outlined in the National Plan. Each provincial/territorial Department of Health and Wellness is responsible for establishing a Provincial/Territorial Emergency Blood Management Committee (P/TEBMC) and its terms of reference.

BERT key objectives are to:

- Develop a current response plan to minimize the impact of blood shortages;
- Work in accordance with the guidelines outlined in the National Plan;
- Ensure that the recommendations of the NEBMC and resulting national decisions are appropriately communicated within its jurisdiction;
- Solicit feedback on plan implementation from the hospital/zone Blood Emergency Management Groups (BEMGs);

- Provide the conduit for communications/feedback between the NEBMC and hospital/zone BEMGs;
- Establish a process to monitor plan adherence in times of blood shortages;
- Establish recommendations to manage plan non-adherence in times of blood shortages.

1.3.6 The Blood Emergency Management Group (BEMG)

BEMG is equivalent to the Hospital/Regional Health Authority Emergency Blood Management Committee (H/REMBC) outlined in the National Plan. The IWK Health Centre and each NSH zone has a responsibility to establish a BEMG. The purpose of a BEMG is to develop a Blood Emergency Management Plan (BEMP) in accordance with the guidelines outlined in this Plan and the National Plan. BEMGs should also serve as the communication conduit to the BERT. Recommended membership and suggested terms of reference are provided in Appendix C.

1.3.7 Nova Scotia Provincial Blood Coordinating Team (NSPBCT)

The responsibility for the maintenance of this plan rests with the NSPBCT. Its key objectives are to maximize the safe and appropriate management of blood components and blood products. In the event of a blood shortage the NSPBCT will:

- Monitor hospital inventory levels
- Provide the secretariat function to BERT, including:
- The dissemination of BERT’s response plan and recommendations to the DHW for approval, and subsequently to NSH/IWK TM Medical Directors or designates.
- Provide communication and coordination functions to NSH/IWK, including the dissemination of NSPBCT tools, PBMP advice and communications from BEMGs to BERT

1.3.8 Nova Scotia Health/IWK Health Centre (NSH/IWK)

NSH/IWK Medical Directors are required to establish BEMGs with a mandate to develop, implement and maintain a Blood Emergency Management Plan (BEMP). In addition, NSH/IWK TM Medical Directors or designates are to ensure a Triage Team, as outlined in the *National Plan for the Management of Shortages of Labile Blood Components*, is available.

1.4 Assumptions

Four key planning assumptions are embedded in this Contingency Plan:

1. NSH/IWK TM Medical Directors or designates have established BEMGs that will create local BEMPs to direct actions during all four inventory phases as well as

designate a Triage Team to formally oversee the triage process when required.

2. NSH/IWK TM Medical Directors or designates have developed and maintained current BEMPs ;
3. NSH/IWK are implementing actions to optimize appropriate transfusion through utilization activities in compliance with the Nova Scotia Guidelines for Blood Components as well as CSA Z902 Blood and Blood Components Standards;
4. That upon declaration of an Amber or Red Phase, all NSH/IWK TM Medical Directors or designates will promptly invoke their BEMPs simultaneously and implement communicated BERT recommendations to ensure a timely and coordinated response.

1.5 Plan Framework

This framework is composed of four phases (Green, Amber, Red and Recovery) which are defined by CBS inventory levels. Each phase is designed to be independent of the next, as threats or potential threats will have varying impacts on blood components inventories. It is conceivable to invoke a Red Phase directly from Green Phase, dependent on the real or perceived impact to blood components inventories. Each phase may apply to a single blood component or blood product or multiple blood components/blood products and may relate to one or more particular blood groups.

In addition to the Phases being based on CBS inventory levels, BERT may also invoke this Contingency Plan based on anticipated, real, or perceived threats to the provincial blood components supply. In the event that an emergent issue or event poses a serious threat to the provincial blood components supply, Red Phase may be initiated as a pre-emptive measure.

1.6 Ethics

During blood shortages, difficult decisions may need to be made on how to ration blood components. Collaborative approaches that may transcend the needs of a single patient, health care professional or institution may need to be implemented. This could represent a paradigm shift in decision-making for physicians—from a focus on individual patients to consideration of the “greater good”. Thus, in order to ensure acceptance and cooperation by all participants, a fair and transparent priority-setting process for rationing must be developed. The decision-making process used in the preparation of this Plan was based on established ethical principles as discussed in more detail in Appendix D of the National Plan.

2.0 Overview of Operational Steps

The NSPBCT, BERT, CBS, NSH/IWK, and the DHW share responsibility for the operation of this plan. Coordination and cooperation between each of these groups is essential to the plan's effectiveness. The flow of information between stakeholders is an essential element of the plan.

The collaboration between these groups revolves around a series of sequential steps:

1. Identification and assessment of the blood issue
2. Communication of a blood shortage
3. Development of the response plan
4. Communication and Implementation of the response plan
5. Monitoring compliance to the response plan
6. Recovery from the issue.

2.1 Identification and Assessment of the Blood Issue

Blood shortages are most likely to be first identified by CBS as they are the sole blood supplier (with the exception of Héma-Québec) in Canada. If a national blood shortage is threatened or identified, CBS contacts the chair of NAC to convene a meeting of the NEBMC and will determine whether to declare a shortage. Depending on severity of the shortage, a Green Phase Advisory or Amber/Red Phase alert will be issued. A blood shortage can occur at a national or provincial level.

2.2 Communication of a Blood Shortage

If CBS issues a Green Phase Advisory or Amber/Red Phase alert, this information will be communicated to Transfusion Medicine Laboratories and to the chair of BERT by the provincial NAC member(s) and NEMBC representative(s). The provincial NAC member(s) and representative(s) of the NEMBC are also members of BERT and serve as a communication link between the national and provincial committees. The key messages and advice issued by the NEBMC will be used by BERT in creating a response plan to the situation.

In the event that a blood shortage is isolated within the province/region, CBS will notify NSH/IWK TM Medical Directors or designates and the NSPBCT via standard communication channels. Depending on the situation BERT may be activated.

2.3 Development of the Response Plan

For minor shortages, Transfusion Medicine will assess and identify appropriate inventory management initiatives. If the shortage is more severe and is expected to last

for an extended period of time, the BERT chair(s) is to be notified by CBS, NSH/IWK or NSPBCT. The Chair(s) will decide whether to convene BERT. If BERT is convened a response plan will be developed.

2.4 Communication and Implementation of the Response Plan

The BERT chair will convene BERT and disseminate NEMBC recommendations. Following the meeting the NSPBCT will communicate BERT's response plan to NSH/IWK Medical Directors who will communicate to the BEMGs. After receiving BERT's response plan, zonal BEMG's will convene to implement these recommendations along with their own BEMPs.

2.5 Monitoring Compliance to the Response Plan

During a blood shortage, CBS will provide data on hospital inventories, average daily red cell demand and ordering practices. This information will be used by the NSPBCT to measure Transfusion Medicine compliance across the province.

In an Amber or Red Phase, Transfusion Medicine must implement documentation processes for release or non-release of blood components.

2.6 Recovery from the issue

The NEMBC and BERT will continue to assess inventory levels and communicate response plans until CBS notifies of a complete recovery and return to Green Phase.

Upon return to full recovery, BERT shall perform a retrospective review of the Provincial Plan to evaluate its functionality and determine necessary revisions. In addition, the BEMGs shall perform a retrospective review of their BEMPs and conduct a debriefing to determine the need for any necessary revisions.

Figure 1 provides an overview of the operational steps outlined in this plan

1. Identification & Assessment	2. Communication of Blood Shortage	3. Development of Response Plan	4. Communication and Implementation of the Response Plan	5. Monitoring Compliance	6. Recovery							
<p>The NEBMC is consulted to declare a blood shortage. Depending on the severity of the shortage CBS/NEBMC will issue:</p>						<p>Green Phase Advisory</p> <p>CBS/NEBMC communicates Green Phase Advisory to NSH/IWK, NSPBCT and BERT Chair</p> <p>BERT Chair assesses need to convene</p>	<p>BERT Does NOT Convene</p>		<p>NSH /IWK to assess and/or develop inventory management response plan</p>	<p>NSH Zones/IWK communicate response plan to internal stakeholders</p> <p>NSH /IWK reduces utilization and/or inventory levels</p>	<p>NSPBCT to frequently review provincial inventory levels</p>	<p>Inventory levels and response plan remains in effect until CBS communicates return to Green Phase</p>
							<p>BERT Convenes</p>		<p>BERT develops recommendations</p>	<p>NSPBCT advise NSH/IWK BEMG of BERT recommendations</p> <p>BEMGs implement recommendations</p>		
							<p>Amber Phase</p>	<p>CBS/NEBMC communicates Amber Phase to NSH/IWK, NSPBCT and BERT Chair(s)</p> <p>BERT convenes</p>	<p>BERT uses key messages and advice from NEBMC to develops response plan</p> <p>BERT meets regularly to reassess plan</p>	<p>NSPBCT advise and communicate to NSH/IWK BEMGS of BERT recommendations</p> <p>NSH /IWK BEMGs activate BEMPs and, implements BERT recommendations</p> <p>BEMG’s communicates response plan within their zone</p>		
<p>Red Phase</p>	<p>CBS/NEBMC communicates Red Phase to NSH/IWK, NSPBCT and BERT Chair</p> <p>BERT convenes</p>	<p>BERT uses key messages and advice from NEBMC and if instructed the framework for rationing blood for massively bleeding patients to develops response plan</p> <p>BERT meets regularly to reassess plan</p>	<p>NSPBCT advise NSH/IWK BEMGS of BERT recommendations</p> <p>NSH/IWK BEMGs activate BEMPs, implement BERT recommendations and if directed assemble the Triage Team</p> <p>BEMG’s communicates response plan within their zone</p>	<p>NSPBCT daily reviews provincial inventory levels</p> <p>Transfusion Medicine implements documentation processes for release or non-release of blood components</p>	<p>BERT continues to reassess response plan until CBS communicates return to Green Phase</p>							

3.0 Plan Structure

3.1 National Inventory levels used to define phases

CBS inventory levels represent only a portion of the total inventory within the blood system, as a significant part of the total inventory at any one time is maintained in hospitals. The national total blood component inventories (blood supplier and hospital combined) are derived from hospitals reporting daily inventory levels and are used by CBS to determine phases of inventory shortages (Table 1).

Table 1: CBS Inventory Levels Corresponding to Contingency Plan Phases

Phases	CBS Inventory Level – Hours/Days on Hand (DOH)		
	RBC's	Platelets	Plasma
Green	<p>> 4 DOH for O and A Rh positive blood groups,</p> <p>>3 DOH for all Rh negative blood groups</p>	<p>CBS can provide > 90% of the national daily requirement</p> <p>May include seeing 80-90% unit/fill rates in a few sites but recovery must occur within 12-24 hours</p>	<p>Plasma (Type O, A, B): > 14 DOH</p> <p>Plasma (Type AB) or CSP or Cryoprecipitate: > 21 DOH</p>
Green Advisory	<p>More than 3 successive days of 3-3.5 DOH for <u>either</u> O and A Rh positive blood groups</p> <p>More than 3 successive days of 2-3 DOH for either O Rh negative or multiple other Rh negative groups</p>	<p>CBS can provide 80-90% of the national daily requirement</p> <p>May include seeing lower unit/fill rates in a few sites but recovery must occur within 12-24 hours</p>	<p>Plasma (Type O, A, B): 7-14 DOH</p> <p>Plasma (Type AB) or CSP or Cryoprecipitate: 14-21 DOH</p>
Amber	<p>It is not possible to concisely define national inventory levels which would automatically trigger an Amber or Red Phase.</p> <p>Critical levels vary according to component, to blood group and to the anticipated length of a given shortage.</p>	<p>25-79% of daily national requirement, recovery NOT expected within 12-24 hours</p>	<p>Plasma (Type O, A, B): 3-7 DOH</p> <p>Plasma (Type AB) or CSP or Cryoprecipitate: 6-14 DOH</p>
Red	<p>It is not possible to concisely define national inventory levels which would automatically trigger an Amber or Red Phase.</p> <p>Critical levels vary according to component, to blood group and to the anticipated length of a given shortage.</p>	<p><25% of daily national requirement, recovery NOT expected within 12-24 hours</p>	<p>Plasma (Type O, A, B): < 3 DOH</p> <p>Plasma (Type AB) or CSP or Cryoprecipitate: < 6 DOH</p>

For approximate national inventory levels corresponding to each inventory phase, refer to <https://www.nacblood.ca/resources/shortages-plan/index.html>

3.2 Green Phase

Green Phase implies 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 with existing Canadian Blood Services/hospital actions.

Green Phase
CBS inventory supply: Normal circumstances where blood component/product inventories meet demand. No threat or perceived threat to blood component/product inventories.
Red Blood Cells: <ul style="list-style-type: none">● 4 DOH for O and A Rh positive blood groups● >3 DOH for all Rh negative blood groups
Platelets: <ul style="list-style-type: none">● CBS can provide > 90% of the national daily requirement● May include seeing 80-90% unit/fill rates in a few sites but recovery must occur within 12-24 hours
Plasma: <ul style="list-style-type: none">● Plasma (Type O, A, B) > 14 DOH● Plasma (Type AB) or CSP or Cryoprecipitate > 21 DOH

Green Phase: Roles and Responsibilities
In the Green Phase key stakeholders take the following action:
CBS: <ul style="list-style-type: none">● Manage the inventory nationally, including daily monitoring of the inventory and distribution of inventory across the country as appropriate.● Develop internal strategies to respond to periodic requirements to increase blood donations.● Coordinate the functioning of internal emergency response committees with the NEBMC activities/recommendations.● Provide leadership for the use of the Blood Component Disposition Report.● Assist hospitals in determining their Green/Amber/Red phase inventory levels.● Develop communication strategies and plans to inform hospitals, Health Canada, and provincial/territorial Ministries of Health of changes in inventory levels.
NSPBCT: <ul style="list-style-type: none">● Maintain, update and confirm support for the provincial contingency plan.● Organize simulation exercises to assess readiness and plan appropriateness.● Support NSH/IWK with inventory shortage education sessions.● Develop provincial guidelines (i.e. blood component utilization management, transport).● Maintain and update massive hemorrhage guidelines and algorithms.● Define optimal blood inventory levels and minimum blood inventory levels across the province● Perform regular inventory stocking reviews to assess appropriate levels
NSH/IWK BEMGs: <ul style="list-style-type: none">● Ensure development, maintenance and support of a local BEMP.● Ensure communication plans are developed and implemented.● Educate/train personnel on BEMP operations and institute regular updates.● Develop a documentation process for release or non-release of blood components in Amber or Red Phase

- Implement measures to ensure compliance with Nova Scotia's *Usage Guidelines for Blood Components*.
- Assess and review current utilization patterns for elective surgeries performed within the NSH/IWK.
- Initiate maximum surgical blood ordering schedules for elective surgeries for appropriate clinical services including annual revision when necessary (or more frequently if indicated).
- Ensure application of available blood conservation methodologies.
- Ensure a Triage Team is designated in order to prepare for potential triaging of massively bleeding patients if required during Red Phase. Triage Teams must be provided with the emergency framework for rationing of blood for massively bleeding patients during a red phase of a blood shortage developed by NAC.

Transfusion Medicine

- Report inventory levels to CBS daily if required. Include ALL units available in inventory not yet transfused or issued to a patient (i.e. for RBC include phenotyped and cross matched).
- Establish good blood utilization and inventory management practices to minimize wastage.
- Notify CBS and NSPBCT of situations that could result in increased demand or reduced availability of blood components.
- Monitor hospital adherence to transfusion guidelines.
- Develop a mechanism for the redistribution of blood components with other Nova Scotia hospitals.
- Continually assess if excess CBS shipping supplies need to be returned.

Green Phase ADVISORY

Brief situations where, while the overall inventory is in Green Phase, a particular blood type or component may be in limited supply and requires CBS to issue an advisory.

Green Phase ADVISORY: Roles and Responsibilities

In advisory phase additional roles and responsibilities include:

CBS:

- Communicate green phase advisory to hospitals and NSPBCT

NSPBCT:

- Liaise with the BERT Chair to determine if necessary to convene.

BERT (if convened):

- Determine blood conservation strategies
 - Consider reducing/recalling stock from small sites
- Recommend BEMGs convene to review BEMPs
- Provide recommendations to NSH/IWK to ensure appropriate measures are taken to reduce the possibility of an inventory shortage progressing to an Amber or Red phase.

NSH/IWK BEMGs:

- Communicate potential component shortage to appropriate clinical services including the Triage Team.
- Ensure Triage team is provided with the emergency framework for rationing of blood for massively bleeding patients during a red phase of a blood shortage developed by NAC.
- Convene BEMG if recommended by BERT
- Implement BERT recommendations

Transfusion Medicine:

- Continue Green Phase Activities
- Report accurate inventory levels daily into the CBS Hospital Distribution System
- Discontinue automatic ordering practices from CBS if applicable

- Adjust inventory to minimal required levels of affected component(s)
- Heighten vigilance to avoid any wastage of components due to outdating or other causes
- Participate in redistribution of blood components between hospitals
- If hospital access is restricted, ensure CBS and other couriers have hospital access arranged

3.3 Amber Phase

Amber Phase implies that blood inventory levels are insufficient to continue with routine transfusion practice. NSH/IWK are required to implement specific measures to reduce blood usage.

Amber Phase
CBS inventory supply: Serious shortage
Red Blood Cells: <ul style="list-style-type: none">● It is not possible to concisely define national inventory levels which would automatically trigger an Amber or Red Phase. Critical levels vary according to component, to blood group and to the anticipated length of a given shortage.
Platelets: <ul style="list-style-type: none">● 25-79% of daily national requirement and recovery NOT expected within 12-24 hours
Plasma: <ul style="list-style-type: none">● Plasma (Type O, A, B): 3-7 DOH● Plasma (Type AB) or CSP or Cryoprecipitate: 6-14 DOH

Amber Phase: Roles and Responsibilities
In the Amber Phase key stakeholders take the following action:
CBS: <ul style="list-style-type: none">● Implement communications plan and activate appropriate internal plans● In collaboration with the NEBMC and P/TEBMCs, decrease blood component issues to hospitals to levels determined appropriate to the situation.● Provide P/Ts representatives with the percentage capture of inventory reporting.● Provide P/Ts representatives with the provincial ADRD and inventory index.● Monitor hospital inventory requests to evaluate compliance.● Notifies chair of BERT/NSPBCT and NSH/IWK, indicating affected blood component, current inventories, anticipated period of recovery, and potential for an extension of recovery period requiring a move to Red Phase.● Provide regular communication of current inventory status to BERT/NSPBCT and NSH/IWK.
NSPBCT: <ul style="list-style-type: none">● Notifies BERT membership and initiates full BERT meeting to determine appropriate recommendations.● Notify NSH/IWK, EHS and the DHW of BERT recommendations. DHW to seek recommendation endorsement by Deputy Minister.● Monitor hospital compliance with and implementation of actions required in Amber Phase.
BERT <ul style="list-style-type: none">● Review and discuss recommendations, key messages and strategies from the NEBMC.● Recommend deferral of elective medical and surgical procedures which have a greater than 10% chance of requiring the affected blood component(s).<ul style="list-style-type: none">○ Elective procedures are defined as all procedures which are not urgent or emergency procedures.○ Urgent procedures: patient likely to have major morbidity if not performed within 1-28 days.○ Emergency procedures: Need to be performed within 24 hours to prevent death or major morbidity such as paralysis.

- Medical procedures include the administration of a blood component
- Develop recommendations and guidance for the province. Consider:
 - Group A plasma may also be considered as an alternate to group AB if appropriate mitigation and monitoring can be put in place.
 - Only transfuse O Rh negative red cells to persons less than 45 years of age with child bearing potential, or patients with a current/history of anti-D. All other patient groups, including those with requests for stat/uncrossmatched units receive O Rh positive red cells.
 - Cut MSBOs to 50% of normal reservation amount or perform ABO and screen with cross match on demand. Communication to surgeons/anaesthetists essential.

NSH/IWK BEMGs:

- Continue pertinent Green phase activities
- Convene local BEMG if recommended by BERT
- Activate local BEMP if recommended by BERT
- Implement pre-established communication plans. Ensure notification of applicable clinical disciplines within their facilities of Amber Phase shortage indicating affected blood component/blood product and anticipated period of recovery.
- In collaboration with the PBMP, increase use of blood conservation strategies and blood alternatives to decrease demand for blood.
 - Inform pharmacy they may experience an increase in the demand for alternative strategies to RBC and PLT transfusions
 - Urgent and emergency surgeries should occur in consultation with TM Medical Director.
 - Consider use of alternatives to minimize red cell requirements. Only the minimal number of units to stabilize patient should be used.
 - All requests for RBC transfusion in patients with an Hb level > 70 g/L must be approved by TM Medical Director or designate.
 - For RBC transfusion, follow guidelines for Amber Phase as outlined in Appendix C
 - For PLT transfusion, follow guidelines for Amber Phase as outlined in Appendix D
 - For patients with hypoproliferative anemias, single unit transfusion should be provided if alternatives to red cells are unsuccessful and significant symptoms associated with anemia are present. Reassessment of severity of symptoms after each unit is required.
- If not completed already, ensure a Triage Team is designated in order to prepare for potential triaging of massively bleeding patients if required during Red Phase. Triage Teams must be provided with the emergency framework for rationing of blood for massively bleeding patients during a red phase of a blood shortage developed by NAC

Transfusion Medicine:

- Continue pertinent Green phase activities
- Document total inventory levels in the CBS hospital Disposition Reporting System.
- Allow inventories to fall to minimum levels before making requests from CBS.
- If required, redistribute blood components and/or blood products between facilities.
- Heighten vigilance to avoid any wastage of components due to outdating or other causes.
- Implement BERT recommendations in a prompt manner.
- Implement documentation process for release or non-release of blood components.
- Consult TM Medical Director or designate if a deviation for exceptional purposes is required. All deviations and the justification for them require documentation.
- Implement documentation processes for release or non-release of blood components.

3.4 Red Phase

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

Red Phase:
CBS Inventory supply: Critical shortage
Red Blood Cells: <ul style="list-style-type: none">● It is not possible to concisely define national inventory levels which would automatically trigger an Amber or Red Phase. Critical levels vary according to component, to blood group and to the anticipated length of a given shortage.
Platelets: <ul style="list-style-type: none">● <25% of daily national requirement, recovery NOT expected within 12-24 hours
Plasma: <ul style="list-style-type: none">● Plasma (Type O, A, B): < 3 DOH● Plasma (Type AB) or CSP or Cryoprecipitate: < 6 DOH

Red Phase: Roles and Responsibilities
During the Red Phase all actions begun in Amber Phase (assuming that the Red Phase is preceded by an Amber Phase) will be continued. However, frequency of meetings and communication will be escalated and recommendations may be more extreme.
NEBMC: <ul style="list-style-type: none">● Makes recommendations as to whether or not triage and rationing guidelines for massively bleeding patients should be implemented. The Emergency framework for rationing of blood for massively bleeding patients during a red phase of a blood shortage was developed by NAC and can be found at nacblood.ca
CBS: <ul style="list-style-type: none">● Notifies chair of BERT/NSPBCT as well as the NSH/IWK indicating shortage cause, affected blood component/blood product, current inventories and anticipated period of recovery.● Provide regular communication of current inventory status to BERT/NSPBCT and NSH/IWK● Distribute components between distribution sites to ensure fair, equitable and transparent distribution to hospitals across the country.● Oversee and coordinate communications to the media regarding the blood supply and any need for donors.
NSPBCT: <ul style="list-style-type: none">● Notifies BERT membership and initiates full BERT meeting to determine appropriate recommendations.● Notify NSH/IWK, EHS and the DHW of BERT recommendations. DHW to seek recommendation endorsement by Deputy Minister.● Monitor hospital compliance with and implementation of actions required in Red Phase.
BERT: <ul style="list-style-type: none">● Convenes to assess the situation and develop a response plan, including recommendations to NSH/IWK, EHS and advice to DHW.● Possible recommendations include but are not limited to:<ul style="list-style-type: none">○ Assess current inventories. It may be necessary to move all affected blood components to hospitals with the highest likelihood of transfusion. Closely monitor inventory situations.

- Defer all medical and surgical procedures requiring the affected blood components with the exception of emergency surgical/medical procedures.
 - 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).
 - Emergency medical procedures are those in which a transfusion of the affected blood component would be required within 24 hours in order to prevent the patient's death (or major morbidity)
- To the extent possible, defer hematopoietic stem cell transplantation and chemotherapy treatments and any other medical treatments requiring ongoing need for the affected components.
- All requests for RBC transfusion in patients with a Hb level > 60 g/L must be reviewed by TM Medical Director or designate.
- For RBC transfusion, follow guidelines for Red Phase as outlined in Appendix C
- For PLT transfusion, follow guidelines for Red Phase as outlined in Appendix D
- Ensure documentation for release or non-release of blood components
- Use of split (aliquoted) platelets
- Extension of expiry dates for RBCs, platelets and/or plasma
- Utilization of cold stored platelets for bleeding patients. Cold stored platelets cannot be used for prophylactic purposes
- Expanded use of erythropoietin, antifibrinolytic agents, iron or folate supplementation, thrombomimetics

NSH/IWK BEMGs:

- Continue pertinent Green and Amber phase activities
- Convene to assess the specifics of the red phase, review BERT recommendations and determine a plan for implementation throughout the entirety of the shortage.
- Dispenses appropriate information and updates throughout the organization on an ongoing basis throughout the shortage.
- If directed by NEBMC and BERT, the TM Medical Director or designate shall assemble the Triage Team to initiate The Emergency framework for rationing of blood for massively bleeding patients during a red phase of a blood shortage.
- Initiate TM Medical Director's or designates authorization for all transfusions for affected component(s) in consultation with attending physician to prioritize according to clinical need and likelihood of survival on a case-by-case basis.
- Reduce transfusion triggers as advised.
- Initiate TM Medical Director's or designates consult prior to performing emergency surgery to ensure blood component inventory levels are sustainable.

Transfusion Medicine:

- Continue pertinent Green and Amber phase activities
- Closely monitor blood component inventories.
- Document total inventory levels in the CBS Hospital Disposition Reporting System.
- If required, redistribute blood components/blood products between facilities.
- Implement the documentation process for release or non-release of blood components.
- Implement systemic recommendations by BERT and BEMG.

3.5 Recovery Phase

Recovery Phase implies that blood component inventories have begun to increase and are expected to be maintained at a level that would facilitate resumption of transfusion activities.

Recovery Phase:

CBS inventory supply: Sequential return to Green phase based on inventory levels previously identified within each Phase. Recovery of hospital blood inventory and return to normal activities should be gradual to ensure the overall blood inventory level does not return to shortage levels.

Recovery Phase: roles and responsibilities

CBS:

- Notifies BERT chair and NSPBCP, and NSH/IWK of change in phase and stage, including affected blood component, current inventories and anticipated period of recovery to next phase. Notification simultaneous with notification of BERT recommendations, if applicable.
- Oversee and coordinate media announcements regarding the recovery of the blood supply.
- Upon full recovery, convene relevant personnel to debrief and identify recommendations for improvement.

BERT:

- Provides recommendations to NSH/IWK, EHS and advice to DHW on timelines and processes to allow for return to normal transfusion practices.

NSH/IWK BEMGs:

- Review BERT recommendations
- Develop action plan for graduated recovery and return to full services:
 - Review chronic transfusion, OR deferral/cancellation lists and current OR waiting lists to determine surgery reintegration plan.
 - Do not compress elective surgery backlogs during recovery period, as this may result in a secondary inventory shortage.
 - Delay surgeries most likely to require blood component support until inventories have stabilized and are maintaining Green Phase status.
 - Ensure slow and partial replacement of emergency stocks to sites that had inventory redistributed.
- Upon full recovery, conduct a retrospective review of BEMP's to evaluate its functionality and determine necessary revisions and make appropriate updates.
- Prepare a report on the BEMP's effectiveness for submission to NSH/IWK CEOs.

NSPBCT:

- Monitor hospital compliance to action plans for graduated recovery.
- Upon return to full recovery, conduct a retrospective review of the Provincial Plan to evaluate its functionality and determine necessary revisions and make appropriate updates.
- Prepare a report on the plan's effectiveness for submission to the DHW.

Transfusion Medicine:

- Maintain minimum inventory levels.
- Continue to report blood component inventory to CBS.
- Continue the documentation process for release or non-release of blood components.

4.0 Resources

- 4.1** [The National Plan for Management of Shortages of Labile Blood Components](#)
This Plan provides a framework which enables P/T Ministries of Health and hospitals/regional health authorities (RHA) to develop their own blood shortage management plans in a manner that is congruent and complementary with the National Plan.
- 4.2** [Emergency Framework for Rationing of Blood for Massively Bleeding Patients during a Red Phase of a Blood Shortage](#)
This document was developed to guide healthcare professionals in triaging patients in need of massive transfusion during a red phase blood shortage, where demand for blood greatly exceeds supply, and where all other measures to increase the supply of blood have been exhausted. This document guides all transfusion rationing decisions made in the red phase in Canada for patients predicted to need massive transfusion due to massive hemorrhage.
- 4.3** [The Nova Scotia Guideline for Blood Component Utilization in Adults and Pediatrics](#)
These guidelines provide clinical guidance to healthcare professionals on best practice pertaining to the appropriate use of blood components and restrictive transfusion triggers for adults and children.
- 4.4** [The Nova Scotia Guideline for Massive Hemorrhage](#)
This guideline provides clinical guidance to healthcare professionals for the appropriate control of massive blood loss. This document outlines essential components used to assess, support and stabilize patients experiencing a major hemorrhage.
- 4.5** [BEMP Template](#)
This template informs the development of the Blood Emergency Management Plan (BEMP) used by BEMGs when anticipated, real or perceived threats to provincial blood component/product inventories occur. The plan defines policy and objectives as well as management's commitment and actions to be taken in order to provide a consistent, coordinated provincial response thus maximizing the effectiveness of the Nova Scotia Provincial Blood Contingency Plan.

5.0 Acknowledgments

The Nova Scotia Provincial Blood Coordinating Team (NSPBCT) established the Blood Emergency Response Team (BERT) in 2004 as a mechanism to review emergent threats to the blood supply and to develop a response plan in order to minimize the impact to the health system. In January 2007, CBS approached the CBS P/T BLC with a request that a coordinated national plan be developed. The CBS P/T BLC endorsed this request and asked the National Advisory Committee on Blood and Blood Products (NAC) to provide leadership. The Nova Scotia Contingency Plan was used as a reference in the development of The National Plan for Management of Shortages of Labile Blood Components. We would like to acknowledge and thank past and present working group members for their contributions.

APPENDIX A: Blood Emergency Response Team (BERT) - Terms of Reference

1.0 Mandate:

It is the responsibility of the Nova Scotia Ministry of Health and Wellness to establish a Provincial Emergency Blood Management Committee (P/TEBMC) and its terms of reference, which should include the following responsibilities. In Nova Scotia, the P/TEBMC is BERT.

- Develop a response plan to minimize the impact of blood shortages;
- Work in accordance with the guidelines outlined in the National Blood Emergency Plan;
- Ensure that the recommendations of the National EBMC (NEBMC) and resulting national decisions are appropriately communicated within its jurisdiction;
- Solicit feedback on plan implementation from the hospital/zone Blood Emergency Management Groups (BEMGs);
- Provide the conduit for communications/feedback between the NEBMC and hospital/zone BEMGs;
- Establish a process to monitor plan adherence in times of blood shortages;
- Establish recommendations to manage plan non-adherence in times of blood shortages.

2.0 Membership:

In the event of an emergent situation, the BERT team will convene at the discretion of the Chair. The team members include:

- Provincial/Territorial Blood Representative for Nova Scotia
- National Advisory Committee on Blood and Blood Products Representative for Nova Scotia
- Department of Health & Wellness representatives
- Clinical Advisor, NSPBCT
- Program Manager, NSPBCT
- Laboratory Standards Coordinator, NSPBCT
- Transfusion Medicine Medical Directors, Pathology and Laboratory Medicine
- Zone Directors, Pathology and Laboratory Medicine
- Medical Director, CBS, Halifax
- Hospital Liaison Specialist, CBS, Halifax
- Laboratory Managers
- Ethics Representative
- Perioperative

- Ad hoc members may be added as need requires. i.e. nursing, quality specialists, patient representative

3.0 Chair

Will be the determined by the core members of BERT.

4.0 Quorum

Decisions are made by those present.

5.0 Meetings

BERT shall meet on an ad hoc basis by the call of any member, upon approval from the Chair.

6.0 Responsibility

BERT advises the Department of Health and Wellness on issues related to the blood supply and reports to the Provincial Transfusion Medicine Disciplinary Committee.

The NSPBCT will serve as the Secretariat. Activities include:

- Maintain contact list of members, arrange meetings/teleconferences
- Circulate the agenda (as available) and relevant information to all team members
- Record and distribute minutes of the meeting
- Distribute communications on behalf of the team

APPENDIX B: Blood Emergency Management Group (BEMG) - Terms of Reference

1.0 Mandate

The BEMG develops a Blood Emergency Management Plan (BEMP) in accordance with the guidelines outlined in the Provincial Blood Contingency Plan to ensure that these plans are appropriately communicated and adhered to in times of blood shortages.

During a blood shortage the BEMG has local executive authority and each facility should have a designated Lead Contact person available 24 hours/day, 7 days/week to receive and disseminate communications. It is critical the Blood Transfusion Medicine Medical Director is informed immediately of Amber or Red Phase declarations.

1.1 Key Objectives

- Develop and maintain local BEMPs
- Operationalizes BERT's recommendations in the respective Zones
 - Communication
 - Actions

2.0 Membership

BEMG membership will vary from facility to facility. Members may consist of the following representatives:

- Senior or Executive management
- Medical Director, Transfusion Medicine
- Internal Medicine (in large centers, consider Director of Critical Care Medicine and Hematology/Oncology)
- Surgery
- Anesthesiology
- Emergency Department
- Acute Medicine
- Obstetrics/Gynecology Department
- Multi Organ Transplant Program (MOTP)
- Stem Cell Transplant Program
- Nursing
- Laboratory Manager, Transfusion Medicine
- Transfusion Safety Officer/Nurse
- Facility/Zone Risk Manager
- Communications/Public Affairs
- Operations

Depending on the nature and/or severity of the emergency, other representatives may be included on an ad hoc basis.

3.0 Chair

The chair will be the Transfusion Medicine Medical Director or designate.

4.0 Quorum

Decisions are made by those present.

5.0 Meetings

BEMG shall meet on an ad hoc basis in response to BERT, CBS or a local event.

6.0 Responsibility

BEMG communicates to internal customers within their organization on issues related to the blood supply; ensuring processes are in place and evolve as necessary to fulfill their mandate and enable the key objectives outlined in these Terms of Reference. The BEMGs must provide status reports to BERT during activation of their BEMPs or when requested.

APPENDIX C: Guideline for the Use of RBC Transfusions in Children and Adults in Shortage Situations

Green Phase	Amber Phase	Red Phase
<p>Major Hemorrhage</p> <p>Follow NS guidelines for blood component transfusion or MTP as appropriate.</p>	<p>Major Hemorrhage</p> <p>Follow NS guidelines for blood component transfusion or MTP as appropriate.</p>	<p>Major Hemorrhage</p> <ul style="list-style-type: none"> Follow NS guidelines or MTP. Follow triage/rationing allocation framework if instructed by National Emergency Blood Management Committee ¹ or BERT.
<p>Surgery/Obstetrics</p> <p>Follow NS guidelines for blood component transfusion.</p>	<p>Surgery/Obstetrics</p> <ul style="list-style-type: none"> Urgent² and Emergency³ surgery in consultation with TM or BEMG Peri/postpartum hemorrhage. Consider use of alternatives to minimize red cell requirements For all situations, the minimal number of units to stabilize patient should be used. 	<p>Surgery/Obstetrics</p> <ul style="list-style-type: none"> Emergency situations in consultation with TM or BEMG Follow triage/rationing allocation framework if instructed by National Emergency Blood Management Committee ¹ or BERT.
<p>Non-Surgical Anemias⁴</p> <p>Follow NS guidelines for blood component transfusion.</p>	<p>Non-Surgical Anemias⁴</p> <ul style="list-style-type: none"> All requests for RBC transfusion in patients with a Hb level > 70 g/L must be reviewed by TM Medical Director or designate. For patients with hypoproliferative anemias, single aliquot/unit transfusion should be provided if significant symptoms associated with anemia but reassessment of severity of symptoms after each aliquot/unit is required. 	<p>Non-Surgical Anemias⁴</p> <ul style="list-style-type: none"> All requests for RBC transfusion in patients with an Hb level > 60 g/L must be reviewed by TM Medical Director or designate. For patients with hypoproliferative anemias, single aliquot/unit transfusion should be provided if significant symptoms associated with anemia but reassessment of severity of symptoms after each aliquot/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 bone marrow failure, trauma, surgery and delivery

Notes:

- 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 TM Medical Director or designate, in consultation with the patient’s physician, may consider the use of a blood component which has passed its Health Canada approved storage period. In such cases, the justification for the use of an outdated product must be documented by the responsible physician in the patient’s chart and every effort must be made to obtain specific patient consent.

APPENDIX D: Guideline for the Use of Platelet Transfusions in Children and Adults in Shortage Situations

Green Phase	Amber Phase	Red Phase
<p>Major Hemorrhage</p> <p>Follow NS guidelines for blood component utilization</p>	<p>Major Hemorrhage</p> <p>For head trauma or CNS bleeding maintain a platelet count > 80 x 10⁹/L.</p> <p>Withhold routine platelet issue in massive hemorrhage packs in the absence of a confirmed indication for platelet transfusion. (ex. Platelet dysfunction, Platelet count < 50 X 10⁹/L</p>	<p>Major Hemorrhage</p> <p>Same as Amber phase.</p>
<p>Invasive procedures/surgery</p> <p>Follow NS guidelines for blood component utilization</p>	<p>Invasive procedures/surgery</p> <ul style="list-style-type: none"> • Urgent¹ and Emergency² surgery in consultation with TM or BEMG. • In the presence of active bleeding or a surgical procedure maintain a platelet count > 50 x 10⁹/L or if CNS trauma/surgery a platelet count > 80 x 10⁹/L. • For non-surgical invasive procedures (other than bone marrow aspiration or biopsy) maintain a platelet count > 10 x 10⁹/L with image guidance. 	<p>Invasive procedures/surgery</p> <ul style="list-style-type: none"> • Emergency surgery in consultation with TM or BEMG. • All requests for platelet transfusion must be reviewed by TM Medical Director or designate.
<p>Bone marrow failure/hematopoietic stem cell transplantation/chemotherapy</p> <p>Follow NS guidelines for blood component utilization</p>	<p>Bone marrow failure/hematopoietic stem cell transplantation/chemotherapy</p> <ul style="list-style-type: none"> • Adhere to a maximum threshold platelet count of 10 x 10⁹/L for prophylactic platelet transfusions; consider lowering this threshold for routine prophylactic transfusions to 5 x 10⁹/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 platelet count > 10 x 10⁹/L must be reviewed by TM Medical Director or designate. • Split platelet count doses and use half doses in non-bleeding patients if necessary. 	<p>Bone marrow failure/hematopoietic stem cell transplantation/chemotherapy</p> <ul style="list-style-type: none"> • Eliminate all prophylactic transfusions. • All requests for platelet transfusions in non-bleeding patients must be reviewed by TM Medical Director or designate.

1. Urgent surgery – patient likely to have major morbidity if surgery not performed within the next one to 28 days.
2. Emergency surgery – patient likely to die (or have major morbidity) within 24 hours without surgery.

Notes:

- Given the relatively small volumes/number 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.
- Follow the same guidelines for cancelling/performing surgery as described in Appendix C.
- 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 platelet count thresholds for platelet transfusions for surgical bleeding or special procedures (such as ECMO) should be used.
- In Red or Amber phases, the TM Medical Director or designate, 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.