NATIONAL PLAN FOR THE MANAGEMENT OF SHORTAGES OF LABILE BLOOD COMPONENTS

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

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

Canadian Blood Services
it's in you to give

2009-09-28

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ABBREVIATIONS

BGTD	Biologics and Genetic Therapies Directorate
BSWG	Blood Shortages Working Group
CBS	Canadian Blood Services
CBS P/T BLC	Canadian Blood Services Provincial/Territorial Blood Liaison Committee
CSA	Canadian Standards Association
H/REBMC	Hospital/Regional Emergency Blood Management Committee
HQ	Héma-Québec
HTC	Hospital Transfusion Committee
MBOS	Maximum Blood Ordering Schedule
MOH	Ministry of Health
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
P/TEBMC	Provincial/Territorial Emergency Blood Management Committee
PBCO	Provincial Blood Coordinating Office
RBC	Red Blood Cells
RHA	Regional Health Authorities

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EXECUTIVE SUMMARY

Labile blood components, i.e. those blood components collected, produced and distributed by Canadian blood suppliers, are a vital resource supporting health care in Canada. The supply of these resources could be compromised by a number of external threats such as labour disruptions, endemic disease outbreaks, extreme weather disturbances or disruptions in transportation systems. In times of severe shortages, the allocation of blood components could present a significant challenge to the provision of health care. To prepare for such a challenge, the Canadian Blood Services (CBS) Provincial/Territorial (P/T) Blood Liaison Committee asked the National Advisory Committee on Blood and Blood Products (NAC) to develop a framework to determine the equitable allocation of labile blood components in times of severe shortage. In response to that request NAC, in collaboration with CBS, produced a draft framework document which was then widely circulated among potential stakeholders for comment, and then revised, taking into consideration the comments received. This document, the National Plan for the Management of Shortages of Labile Blood Components (hereafter called the Plan) is the recommended framework developed through that process.

The specific purpose of the Plan is to maximize the effectiveness of a national response to any crisis which impacts the adequacy of the blood supply in Canada, with primary emphasis on the jurisdictions served by CBS, but also in contemplation of close collaboration with participants of the blood system in Québec. The Plan assumes that all efforts to increase the available supply of blood components have been exceeded and addresses the allocation of the available scarce blood supply. The Plan addresses labile blood components; however many of the principles would also be applicable to a shortage of fractionated or recombinant plasma protein products.

The Plan provides a framework which will enable 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 with the national Plan. This approach is aimed at achieving the consistency and collaboration crucial to the effective management of a blood shortage.

Based on a number of stated assumptions, the Plan addresses four phases of inventory availability – Green, Amber, Red and Recovery.

- 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/RHA actions.
- Amber Phase implies that the national blood inventory is insufficient to continue with routine transfusion practices and hospitals/RHA will be required to implement specific measures, as outlined in this document, in order to reduce blood usage.
- 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).

- Recovery Phase implies that blood component inventories have begun to increase and are expected to be maintained at a level which would enable the return from Red to Amber and subsequently to Green Phase.

The roles and responsibilities of the principal participants, namely CBS, P/T Ministries of Health and Canadian hospitals/RHA, in each of these phases is described in this document. The emergency blood management committees that would be required to successfully manage a blood shortage as well as a proposed communication plan are also described.

The optimal management of a severe blood shortage will depend upon the commitment of all stakeholders in the blood system to work collaboratively to assure that scarce resources are used in a fair and equitable manner. The Plan is intended to provide a framework, which if followed, will ensure that optimisation. It is nevertheless recognized that lessons will be learned in each shortage situation and it is anticipated that the Plan will undergo modification following each situation in which it is implemented.

1 INTRODUCTION

1.1 The Canadian Blood System

Canada has two blood operators - Canadian Blood Services (CBS) which serves all the provinces and territories except Québec and Héma-Québec (HQ) which serves Québec. CBS and HQ collect blood donations from voluntary donors, prepare blood components and distribute them to hospitals in their respective jurisdictions. CBS and HQ are funded by the provinces and territories that they serve, but the management of the blood supply is entirely CBS's and HQ's responsibility for their respective jurisdictions. Both CBS and HQ are also responsible for managing the supply of commercially obtained plasma protein products (e.g. intravenous gammaglobulin, albumin and coagulation factor concentrates) and recombinant coagulation factors.

Within the Ministry of Health (MOH) in each province and territory (P/T) served by CBS there is one identified person, the P/T Blood Representative, who has the primary responsibility for interactions between CBS and their province/territory. The P/T Ministries of Health select one jurisdiction, on a rotating basis, to act as the Lead P/T on behalf of all jurisdictions for a period of two years.

The P/T Blood Representatives, together with selected representatives from the CBS executive and senior management teams form a committee known as the CBS Provincial/Territorial Blood Liaison Committee (CBS P/T BLC). This committee is co-chaired by a CBS representative and the P/T Blood Representative for the Lead Province. This committee meets on a regular basis and constitutes the major forum for formal communications between CBS and its funders.

CBS solicits advice from various stakeholders through its advisory committees (as well as other as hoc forums). One such committee is the National Advisory Committee on Blood and Blood Products (NAC), a committee consisting primarily of physicians, appointed by their respective P/T MOH, with expertise in the field of transfusion medicine. The NAC reports to the CBS P/T BLC (current NAC membership and its terms of reference are provided in Appendix A). As described below NAC has played a pivotal role in the development of the National Plan for Management of Blood Shortages.

1.2 Initiation of a National Plan for the Management of Blood Shortages of Labile Blood Components

In January 2007, Canadian Blood Services approached the CBS P/T BLC with a request that a coordinated plan be developed to address the allocation of available blood components to Canadian hospitals (and ultimately Canadian patients) served by CBS in times of extreme shortage. The CBS P/T BLC endorsed this request and asked the NAC to provide the leadership for the development of a National Plan for Management of Blood Shortages that would:

- identify important ethical principles to be applied when faced with blood shortages;
- provide recommendations for the integration, in times of significant blood shortages, of the activities of institutions/organizations involved in blood collection, distribution and use;
- provide recommendations for the distribution and utilization management of blood components in times of significant blood shortages;
- outline roles and responsibilities of CBS, provincial/territorial authorities and hospitals/regional health authorities (RHA) with respect to the allocation of scarce blood components in times of shortage and to the preparation required to be ready to effectively manage such shortages;
- provide reference materials for hospitals/RHA to facilitate their development of plans to manage blood shortages;
- review and update the Plan at least every 5 years, or more often if necessary, and after each instance in which the Plan is used.

NAC in turn convened the National Advisory Committee Blood Shortage Working Group (NAC-BSWG) and tasked it with the development of the Plan. A final Draft Plan was prepared and disseminated for stakeholder comment in the fall of 2008. The consultation process and its results are summarized in Appendix B. The document was then revised in consideration of the comments received. This, the final 'Plan' [dated 2009-09-28], has been endorsed by the National Advisory Committee on Blood and Blood Products, Canadian Blood Services, and the Provincial/Territorial Ministries of Health in jurisdictions served by CBS.

1.3 Purpose and Scope

The purpose of the Plan is to maximize the effectiveness of a national response to any crisis that affects the adequacy of the blood supply in Canada, with primary emphasis on the jurisdictions served by CBS, but also in contemplation of close collaboration with blood system participants in Québec. The Plan provides a framework that will enable provincial and territorial Ministries of Health and hospitals/RHA to develop their own blood shortage management plans in a manner that is congruent with the national Plan. This approach is aimed at achieving the consistency and collaboration which is crucial to the equitable allocation of scarce blood resources in times of severe shortage. The Plan addresses blood components collected, produced and distributed by CBS (i.e. red blood cell, platelet and frozen plasma components). However many of the principles would also be applicable to a shortage of fractionated or recombinant plasma protein products.

1.4 Key Participants and Stakeholders

It is intended that the Plan will be used by key blood system participants who, for the purposes of the Plan, are defined to be Canadian Blood Services, hospitals and regional health authorities, the provincial and territorial Ministries of Health and the NAC. Some provinces have Provincial Blood Coordinating Offices; while not referred to specifically in the Plan, it is assumed that they, under the auspices of the corresponding Ministry of Health,

will also play a key role in the implementation of the Plan. The Plan delineates roles and responsibilities for each of these participants.

Stakeholders for the Plan are considered to be these participants, as well as others potentially affected (or representing those potentially affected) by the Plan such as patient/blood recipient societies, health care professional societies, Héma-Québec, Health Canada and others.

2 ASSUMPTIONS

The assumptions used in the development of the Plan are as follows.

A. The Plan operates within the existing blood system structure, including the legislative and regulatory framework currently in place.

A basic principle of the Canadian blood system, as stated by Judge Horace Krever *(Commission of Inquiry on the Blood System in Canada Final Report, p.1047)* that is pertinent to this Plan is the following:

A fundamental value that must guide the blood supply system in Canada is that blood is a public resource, given altruistically by persons in Canada for the benefit of other persons in this country. Profit should not be made from the blood that is donated in Canada. The operator of the blood supply system must act as a trustee of this public resource for the benefit of all persons in Canada.

With respect to the Canadian legislative and regulatory framework, the main features pertinent to the Plan are the following:

- provincial and territorial authority and responsibility for the delivery of the Canadian health care system, pursuant to the principles of the *Canada Health Act*: each province or territory therefore has a role in the management of blood delivery and blood utilization in its jurisdiction, including its role in hospital oversight;
- Canadian Blood Services' mission: "*Canadian Blood Services operates Canada's blood supply in a manner that gains the trust, commitment and confidence of all Canadians by providing a safe, secure, cost-effective, affordable and accessible supply of quality blood, blood products and their alternatives"*;
- regulation of the blood system by Health Canada, pursuant to the *Food and Drugs Act,* and adherence to a series of existing industry standards.

B. The Plan assumes that all efforts to increase the available supply of blood components have been exceeded.

As indicated above (Section 1.3) and by the name of this document, the purpose of the Plan is to optimise the allocation of blood components when the supply of such components is severely compromised. It is not the purpose of the Plan to address mechanisms to increase the supply of blood components in the face of threats to that supply. Those aspects of

emergency preparedness are extremely important and must be (and have been) addressed by CBS in other documents and plans (see Section 3.2.1 and Appendix C). For the purposes of this Plan, it is assumed that in the instance of severe shortage CBS has already fully implemented such measures and in spite of this, the supply of blood is insufficient to meet demand.

C. The Plan promotes collaboration.

The Plan is intended to promote the most efficient use of a limited supply of blood components in a situation of emergency, through significant collaboration by participants in the Canadian blood system, collectively achieving the benefits and bearing the risks of doing so. The optimal allocation of blood components in a time of severe shortage will depend upon the ability of all participants to act in a highly professional, collaborative and transparent manner.

D. The Plan is based upon established ethical principles.

During blood shortages, difficult decisions will 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.

E. The Plan recognizes previous and ongoing work in this domain and represents an iterative process.

The Plan was initially built upon the work related to management of blood shortages done by others and available at the time the NAC-BSWG began their work, in particular plans developed by the United Kingdom National Blood Service, Héma-Québec and the Nova Scotia Provincial Blood Coordinating Program, as well as the more general work done by groups responsible for disaster or pandemic planning. As work on the Plan progressed, other plans - both those being developed within Canada and those being developed internationally - became available and were consulted. Plans available publicly are listed in Appendix E. The Plan also incorporates many of the initiatives already undertaken in Canadian hospitals to encourage optimal transfusion practice.

It will be necessary to refine and amend the Plan over time as more information becomes available, as inventory management and demand-forecasting methods evolve and when/if experience is gained in actual shortage situations. The participants will establish a process to periodically review and modify, as required, the content of the Plan (as per Section 1.2).

F. The Plan acknowledges potential legal liability concerns.

The Plan recognizes the potential for legal activity on behalf of patients denied blood components in a shortage, where a decision not to administer blood - a decision made pursuant to the agreed-upon protocols in the Plan - results in an adverse outcome. It is recommended that the Plan undergo legal and/or risk management review by representatives of the participating institutions and that, to the extent possible, protections be put in place for those who will be applying the Plan and making real-time decisions pursuant to it. It is hoped that the development of a national Plan will, in and of itself, assist hospitals and physicians to make the most appropriate medical (and hence legal) decisions.

The NAC-BSWG recognizes the ethical dilemma placed on physicians/hospitals who will be asked to make difficult decisions to preserve and prioritize use of inventory. To provide support to those who will be responsible for making such decisions, NAC will be convening a subcommittee to develop guidelines for discontinuing blood transfusion therapy for patients with potentially massive requirements but in whom there is a very remote chance of benefit. These guidelines will constitute an appendix to the Plan as soon as they are available. Finally, for a variety of reasons including legal considerations, careful record-keeping of decisions made pursuant to the Plan will be of paramount importance. It is recommended that preparations be undertaken to make the recording of such decisions, in the event of a crisis, as easy and efficient as possible. [Appendix H – Documentation Toolkit has been provided as examples of forms that may or may not be adapted by hospital or regional health authorities for use during a blood shortage.]

G. The Plan assumes that all areas of the country served by CBS would be simultaneously affected in an approximately equal manner; however provincial and/or regional differences can also be addressed by the Plan.

The Plan is written to address a severe shortage of the blood supply with the assumption that the demand for blood would be approximately equal across all jurisdictions served by CBS. However given the large size of the country, it is possible that different scenarios with respect to supply and demand could arise. Since CBS manages the blood inventory nationally, a decrease in blood supply due to a decrease in blood collections in one area (as could occur during a major and prolonged labour disruption) without a concomitant decrease in demand or increase in blood collections in other areas could result in a decrease in inventory available to all hospitals served by CBS. Alternately a simultaneous decrease in supply and demand could occur in one region only (as occurred during the 2002 SARS outbreak in Ontario) – this scenario would not likely necessitate the invocation of this Plan unless the blood supply was affected much more severely than the demand. If the blood supply were severely compromised, but the requirement for blood differed across the country, then decreased need for blood in one or several regions could be incorporated into decisions regarding blood component allocations. However it is assumed that such planning would still occur using the mechanisms described in this Plan.

H. The Plan acknowledges Canada's diverse geography and diverse expertise in Transfusion Medicine.

The Plan acknowledges Canada's diverse geography, remote locations and the fact that there are many very small hospitals in rural locations that do not carry large blood inventories. The reality is that there is limited expertise in Transfusion Medicine in these remote and/or rural locations and this will need to be considered. Any reductions or recommendations will need to take these jurisdictions and their special needs into consideration

3 PLAN STRUCTURE – OVERVIEW

In keeping with other plans to manage blood shortages, this Plan considers four phases of inventory availability, defined below. Roles and responsibilities for the participants (CBS, P/T MOH, and hospitals/RHA) are described in this section in general terms and then specifically for each of the participants in each of the phases in Section 6.

3.1 Phases of Inventory Availability

The Plan considers four phases of inventory availability – green, amber, red and recovery. An inventory availability or shortage phase could apply to a single component (e.g. platelets) or to a particular blood group of a component (e.g. O negative red blood cells) or could involve multiple blood components. As well, different components could be in different phases (e.g. at one given time inventory availability for red blood cells could be at Amber Phase while that of platelets could be at Red Phase).

3.1.1 Green Phase

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.

3.1.2 Amber Phase

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.

3.1.3 Red Phase

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).

3.1.4 Recovery Phase

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.

3.1.5 CBS Inventory Levels at Green, Amber and Red Phases

It is not possible, a priori, to define precise national inventory levels which would automatically trigger the declaration of an Amber or Red Phase. Critical levels vary according to component (and in particular, in relationship to the component's acceptable storage period), to blood group and to the anticipated length of a given shortage (including the effect of projected collections). Red blood cell (RBC) inventories (i.e. inventories of units

ready for release, exclusive of units in processing/testing) at CBS are categorized as optimal through critical according to the number of "days on hand" which, as shown below, correspond approximately to inventory levels that could represent Green, Amber and Red Phase inventories. In actual functioning, a separate determination is made daily at CBS for the inventory for each blood group. Internally, CBS has defined response mechanisms that are activated if there are three successive days of less than 72 hours on hand for more than one of the following blood groups: O Rh Positive, O Rh Negative, A Rh Positive or A Rh Negative. The declaration of an Amber or Red Phase would depend as much on the predicted ability of CBS to increase blood inventories through increased collections as the actual inventory on any one day, i.e. the declaration of a Red or Amber Phase would usually be made only if CBS were forecasting a sustained decreased in inventory levels.

Approximate inventory levels that could lead to the declaration of Amber or Red Phase if sustained are shown in the following tables.

Red Cell Inventory

RBC Inventory Level	***CBS Days On Hand***	***CBS # Units on Hand***
Green Phase (minimal decrease to optimal)	>72 hours	> 8,900 units
Amber Phase (serious)	48 – 72 hours	6,000 to 8,899
Red Phase (critical)	< 48 hours	< 5,999

Platelet Inventory

Platelet Inventory Level*	***% of National Requirement***
Green Phase (minimal decrease to optimal)	50 – 100% of daily national requirement
Amber Phase (serious)	25 – 50% of daily national requirement, recovery expected within 12 hours
Red Phase (critical)	< 25% of daily national requirement, no recovery expected within 12 hours

*As platelets only have a shelf-life of 5 days and CBS routinely does not have more than a 1.5 day inventory on hand at any time, platelet inventory levels are expressed as a percentage of the daily national requirement rather than "days on hand".

Frozen Plasma Inventory

Frozen Plasma Inventory Level	*CBS Days On Hand*	*CBS # Units on Hand*
Green Phase (minimal decrease to optimal)	> 10 days	8,900 units
Amber Phase (serious)	3 – 10 days	2,700 – 8,899 units
Red Phase (critical)	< 3 days	< 2,699 units

Cryoprecipitate Inventory

Cryoprecipitate Inventory Level	*CBS Days On Hand*	*CBS # Units on Hand*
Green Phase (minimal decrease to optimal)	> 20 days	2,800
Amber Phase (serious)	6 – 20 days	800 – 2,799 units
Red Phase (critical)	< 6 days	< 799 units

There is also ongoing work at CBS (through the CBS Supply Chain Management Forum) to enhance production targets and better define the inventory levels required to effectively support hospitals. As this work proceeds, more consistent and rigorous definitions for inventory targets for all blood components will be developed and added to this document.

3.1.6 Total Inventory Levels

CBS inventory levels represent only a part of the total inventory within the blood system, as a large part (and likely the majority) of the total inventory at any one time is already in storage in hospital/RHA blood banks. Optimal management of blood shortages will require information on total blood inventories, including information on inventories in hospitals/RHA. CBS is currently working with hospitals to collect this information in real time and with hospitals and provincial/territorial MOH to determine the optimal way to share this information with all appropriate stakeholders.

3.1.7 Actual Allocation of Blood Components in Times of Shortages

The actual allocation of blood components to hospitals/RHA in times of severe shortages will be determined by CBS in consultation with national and P/T blood emergency management committees (described in Section 4) and will take into consideration usual requirements, the nature of the situation leading to the shortage, inventory requirements, and work done by

hospitals/RHA as part of Green Phase activities (as described in Section 6.1). Further details concerning this are given in Section 6.4.

3.2 Key Participant Roles and Responsibilities

This section outlines the general roles and responsibilities of the following agencies/institutions as they relate to blood components only and does not include broader responsibilities from a public health perspective. Each agency/institution has a responsibility to develop disaster preparedness plans that include blood shortage management as a key element and are appropriate to each respective agency/institution.

3.2.1 Canadian Blood Services

Canadian Blood Services (CBS) manages the blood supply in all provinces and territories except Québec. As part of this mandate, CBS currently engages in a number of activities to identify, avert and as necessary, alleviate and manage a national shortage. Its basic activity in this regard is the ongoing management of the inventory as a single national inventory (as opposed to multiple regional inventories). CBS also has mechanisms in place to allow sharing of blood components between CBS and Héma-Québec if necessary.

CBS has developed and continues to refine business continuity and business recovery plans to minimize the impacts of adverse events on the national inventory. In the CBS Business Continuity Management Framework, it is recognized that events/disasters could negatively affect the availability of donors, CBS staff, equipment, IT systems, transportation systems and/or facilities upon which the maintenance of the national inventory are critically dependent. Business continuity and recovery plans have been developed to mitigate disruptions to each of these critical dependencies (also known as "points of failure") and are described in more detail in Appendix C.

To ensure that its Business Continuity Management planning takes into consideration industry best practices, CBS is a member of an international group of blood suppliers, including the American Red Cross, America's Blood Centres, the Australian Red Cross Blood Service, and the European Blood Alliance. CBS also works closely with the Public Health Agency of Canada and other federal and provincial/territorial government departments (e.g. Transport Canada) in developing its business continuity plans.

With respect to the specific requirements of the Plan, Canadian Blood Services will have the ultimate responsibility for declaring various phases of blood component shortages and recovery from such shortages as well as determining the distribution of blood components in accordance with the phase of criticality. However, as described in Section 4.1 below, both these activities would occur only following consultation with the National Emergency Blood Management Committee (NEBMC, described in Section 4.1 below) and in consideration of its advice.

Canadian Blood Services will also have a key role in coordinating communications as detailed in Section 5 below and will provide the secretariat for the NEBMC (Section 4.1).

3.2.2 CBS-P/T Blood Liaison Committee

The general mandate of the CBS P/T Blood Liaison Committee (CBS P/T BLC) is to facilitate the work between the participating governments and CBS to support CBS in the provision of a safe, secure and affordable national blood supply.

For the purposes of this Plan, the CBS P/T BLC is responsible for establishing the NEBMC and its terms of reference, including membership and lines of communication that will enable the rapid response and decision-making necessary for it to function effectively during a blood shortage.

The CBS P/T BLC is also responsible for reviewing the Plan from time to time and ensuring that the NAC updates the Plan as required.

3.2.3 Provincial and Territorial Ministries of Health

Given that the provision of health care and essential services falls under provincial/territorial jurisdiction, there are a number of ways in which the Ministries of Health and their staff will be involved in the execution of the Plan. Every provincial/territorial Ministry of Health is responsible for the development of detailed provincial/territorial plans to manage blood component shortages, including the establishment in each province/territory of a Provincial/Territorial Emergency Blood Management Committee (P/TEBMC) and its terms of reference. Provincial/territorial plans should comply with the requirements outlined in the Plan and should be linked to each province/territory's other emergency preparedness plans. It is strongly recommended that a standardized phasing system of inventory availability (Green, Amber, Red and Recovery as defined in this Plan) be adopted by all provinces/territories. Finally, the P/T MOH should play a leadership role in encouraging hospitals/RHA to comply with their provincial plan and the national Plan and, in collaboration with the P/TEBMC, to monitor the level of compliance in the institutions within their jurisdiction.

3.2.3.1 Provincial/Territorial Blood Representatives

A major responsibility of the P/T Blood Representative in each province/territory is to provide advice and support to the Deputy Minister and Minister of Health on issues affecting the blood system. In this capacity, P/T Blood Representatives would have central roles to play in the establishment of a Provincial/Territorial Emergency Blood Management Committee (P/TEBMC) and the development of their respective detailed provincial/territorial/hospital/RHA plans to manage shortages of blood components.

All P/T Blood Representatives will participate on the NEBMC, providing a link between national and P/T response plans to ensure a consistent and coordinated national response to a blood component shortage (see Section 4 below). In this capacity, P/T Blood Representatives will be responsible for ensuring the establishment of both internal and external lines of communications to enable consistency and coordination within and among P/T jurisdictions, hospitals/RHA and the blood operators.

3.2.3.2 Lead P/T Blood Representative

The P/T Blood Representative of the Lead P/T will play a leadership role in facilitating communications between the various participants and stakeholders and each provincial/territorial MOH.

3.2.4 National Advisory Committee on Blood and Blood Products

The NAC mandate is to provide medical and technical advice on the utilisation management of blood and blood products to the P/T MOH and CBS. In light of this mandate, and given NAC's expertise, NAC was requested by the CBS P/T BLC to develop this Plan. For this work NAC convened the NAC Blood Shortages Working Group (NAC-BSWG). The NAC-BSWG has subsequently also established a Communications Sub-committee as described in Section 5.2.1 and is establishing a sub-committee to develop guidelines for discontinuing blood transfusion therapy for patients with potentially massive requirements but in whom there is a very remote chance of benefit as described in Section 2, part F.

The NAC-BSWG will review the implementation and outcomes of the Plan after each simulation exercise and each live activation, for ongoing refinement and modification of the Plan, and shall report these findings to all members of NAC and the NEBMC.

NAC will also play a key role on the NEBMC; the Chair of the NAC will Chair the NEBMC and all NAC members will be members of the NEBMC (see Section 4.1).

3.2.5 Hospitals/Regional Health Authorities

Each facility/region should establish a Hospital/RHA Emergency Blood Management Committee (H/REBMC) (see Section 4.3) and a Hospital/RHA Blood Shortage Management Plan. The purpose of a Hospital/RHA Blood Shortage Management Plan is to delineate lines of responsibility, decision-making processes, and effective communication to enable the H/REBMC to respond appropriately during a shortage. Such hospital/RHA plans should also define which staff members will participate in the H/REBMC and how a reduction in blood component usage will be achieved.

Hospital/regional blood shortage management plans should be based on, and comply with, the requirements outlined in this Plan. It is strongly recommended that a standardized phasing system of inventory availability (Green, Amber, Red and Recovery as defined in the Plan) be adopted by all Hospital/Regional Blood Shortage Management Plans.

4 EMERGENCY BLOOD MANAGEMENT COMMITTEES

This section describes the blood emergency management committees at the national, provincial/territorial and hospital/RHA levels that will be necessary to facilitate information flow and decision making.

4.1 National Emergency Blood Management Committee

A National Emergency Blood Management Committee (NEBMC) is necessary to ensure the implementation of a national Plan. The NAC-BSWG carefully considered the size and functioning of this committee. The membership and terms of reference of the NEBMC were developed taking into consideration the need for all regions to share information and have input into decision-making, while acknowledging the challenge of convening a large committee in a timely manner.

The major components of the NEBMC Terms of Reference are as follows:
(see also Appendix F)

4.1.1 Mandate

The National Emergency Blood Management Committee (NEBMC) will develop recommendations and provide advice to the P/T Ministries of Health, hospitals/RHA and CBS to support a consistent and coordinated response to critical blood shortages in Canada.

To this end, the NEBMC will:

- provide advice to CBS with respect to determining the appropriateness of declaring an amber or red phase situation, and recovery from these situations;
- provide recommendations on the distribution of blood components in amber and red phases;
- provide recommendations on previously unforeseen circumstances related to critical blood shortages;
- provide recommendations concerning the communication of the shortages to key stakeholders;
- ensure the necessary communication between the NEBMC and the P/TEBMCs.

4.1.2 Membership

The Chair of the NEBMC will be the current chair of the NAC.

The membership of the NEBMC will include the following:

- CBS officials as determined by CBS and including the following
  - Chief Operating Officer
  - Executive Director, Product & Hospital Services
  - Director, Product & Hospital Services
  - Director, Operations Support
  - Executive Medical Director
  - Director, Government Relations
  - Director, Internal Communications
  - Director, Media Relations & External Communications
- all National Advisory Committee for Blood and Blood Products (NAC) members
- all Provincial/Territorial Blood Representatives
- Québec MOH representative (to be determined)

- Hema-Québec representative (to be determined)
- Health Canada BGTD representative (Ex-Officio)
- two blood transfusion recipient representatives, chosen jointly by CBS and NAC; one should be an actual blood transfusion recipient (present or past) and the other should be a representative of an appropriate patient society

4.1.3 Meetings/Quorum

NEBMC will hold regular meetings, emergency simulation meetings and meetings convened at the time of shortages. Regular meetings and emergency simulation meetings will be extremely important to ensure that the committee can effectively function in times of shortages. Meetings in times of shortages will be convened at the request of CBS and/or the Lead Province as described in Section 5.1.1.

There will be no requirement for quorum and decisions of the NEBMC will be made by consensus. Consensus is defined as 80% (or greater) agreement of the NEBMC members present. In the event consensus is reached, the CBS Chief Operating Officer will take the NEBMC recommendation as his or her primary consideration in rendering decisions related to matters identified by the NEBMC mandate. In the event that consensus cannot be reached, the CBS Chief Operating Officer will make the decisions using knowledge of current and future CBS inventories and considering the advice received from the NEBMC. A Secretariat, provided by CBS, shall support the work of the NEBMC.

4.1.4 Communications

4.1.4.1 NAC Members

In their NEBMC role, NAC members will serve as medical/technical advisory representatives for their respective provinces to the NEBMC. In conjunction with their PT representative, they will facilitate dissemination and implementation of NEBMC recommendations to their P/TEBMC and H/REBMC.

4.1.4.2 P/T Representatives

In their NEBMC role, P/T representatives will facilitate the dissemination and implementation of NEBMC recommendations within their respective ministries of health and to their P/TEBMC.

4.2 Provincial/Territorial Emergency Blood Management Committees

It is the responsibility of the Ministries of Health of each province or territory to establish a Provincial (or Territorial) Emergency Blood Management Committee (P/TEBMC) and its terms of reference, which should include the following responsibilities:

- develop a response plan to minimize the provincial/territorial impact of blood shortages;
- work in accordance with the guidelines outlined in this Plan;

- ensure that the recommendations of the NEBMC and resulting national decisions are appropriately communicated within its jurisdiction;
- solicit feedback on implementation of the Plan from the H/REBMC;
- provide the conduit for communications/feedback between the NEBCM and H/REBMCs;
- establish a process to monitor adherence to the Plan in times of blood shortages;
- establish recommendations to manage non-adherence to the Plan in times of blood shortages.

Thus, each P/TEBMC will work collaboratively as required with the NEBMC and its jurisdiction's H/REBMCs.

Provinces or territories may wish to consider having a core or an executive P/TEBMC and then an expanded membership depending upon the extent of the crisis.

Core team members must include:
- P/T Blood Representative
- Provincial NAC member(s)

Core team members would also usually include:
- Chief Medical Officer of Health
- Medical Director Provincial Blood Program (if applicable)
- Program Manager Provincial Blood Program (if applicable)
- Representatives of tertiary care centre blood transfusion services
- Representatives of rural or remote sites
- Regional Medical Director(s), Canadian Blood Services
- Regional Director(s) of Product and Hospital Services, Canadian Blood Services
- Regional Hospital Liaison Specialist(s), Canadian Blood Services

In the event the situation warrants, the core team members could be expanded to include:
- District/Regional Health Authorities and/or tertiary care centre CEOs
- District/Regional Health Authorities and/or tertiary care centre designates for:
    - Transfusion Services Medical Directors
    - Laboratory Managers
    - Risk Managers
    - Transfusion Safety Officers
    - Quality Specialists
    - Nursing administrators
    - Executive management representatives
    - Physician user group representatives
    - Chairs of transfusion committees
- Blood recipient representative(s)
- Other individuals as designated by the group

4.3 Hospital/RHA Emergency Blood Management Committee

Each hospital or Regional Health Authority (RHA) has a responsibility to establish a Hospital/RHA Emergency Blood Management Committee (H/REBMC) whose mandate is to develop a Blood Shortages Management Plan in accordance with the guidelines outlined in this Plan and to ensure that these plans are appropriately communicated and adhered to in times of blood shortages. H/REBMCs should also serve as the communication conduit to the P/TEBMC. In small provinces/territories it is possible that the P/TEBMC and H/REBMC would be one single body.

H/REBMC membership will vary from facility to facility; the following outlines potential membership:

- Representative of hospital/RHA senior or executive management
- Medical Director, Blood Transfusion Service
- Head, Department of Internal Medicine (or in larger centres could be Heads of Critical Care Medicine and Haematology/Oncology)
- Head, Department of Surgery
- Head, Department of Anesthesiology
- Head, Emergency Department
- Head, Obstetrics/Gynecology Department
- Chair of the Blood Transfusion Committee
- Director of Nursing
- Transfusion Service Laboratory Manager
- Transfusion Safety Officer
- Hospital/RHA Risk Manager
- Director, Communications/Public Affairs
- Other members as deemed appropriate by the Hospital/RHA Blood Transfusion Committee.

5 COMMUNICATIONS

Strong communication coordination will be necessary to achieve optimal management of a severe blood shortage. Two distinct types of communications need to be considered: 1) operational communications between and among various bodies or organizations and groups of health care professionals that need to occur for the necessary actions to be taken (small “c” communications); and 2) informational communications with internal (staff) and external (public/media) audiences (big “c” communications).

In times of severe blood shortages these two types of communications will be occurring nearly simultaneously, thus need to be well-coordinated and consistent. Advance planning is essential. This section provides a basic overview of the communications approach on both fronts.

5.1 Operational Communications

Operational communications within the blood system refers to the small "c" communications between and among the bodies or organizations and groups of health care professionals that will be responsible for actually implementing the Plan.

5.1.1 Activation of Operational Blood Shortage Communications

In most cases, the possibility of a significant blood component shortage that could possibly (or, less often, that would necessarily) lead to the declaration of an Amber (or, less often, Red) Phase would be first identified within CBS. However, it is also possible that a shortage situation could be first identified by (or brought to the attention of) a provincial Health Ministry or another stakeholder. In either case, the first step would be for CBS, or, in the second case, a provincial Ministry via the Lead Province, to contact the NAC chair with a request to convene the NEBMC. The NEBMC would then meet within a time delay (usually 24 hours or less) appropriate to the situation, with the number of members or designates available; as described in Section 4.1 above there would be no requirement for a quorum and decisions would be made by those in attendance. Final decisions as to the measures to be taken would be made by the CBS Chief Operating Officer, as per the terms of reference for the NEBMC (Section 4.1 and Appendix F), using knowledge of current and future CBS inventories and taking as his or her primary consideration advice received from the NEBMC. These decisions would include:

- determination of the Phase (i.e. a declaration of Amber or Red Phase, or a decision to remain in Green Phase);
- the level of inventory issues that CBS would distribute to each province or territory;
- the timing and mode of communications to hospitals/RHA;
- determination of the frequency of future meetings of the NEBMC;
- any other matters deemed to require explicit decisions by this committee.

5.1.2 Information Flow from the NEBMC to the P/TEBMC and the H/REBMC

As stated previously, all P/T Blood Representatives and all NAC member(s) (or designates) would be members of both the NEBMC and their respective P/TEBMC and in that way would provide the communication links between the national and their provincial/territorial committee. Following a meeting of the NEBMC, each P/T Blood Representative would then immediately (or in an appropriately timely manner) convene a meeting of their P/TEBMC in order to ensure that timely and accurate communications and actions occur in each province or territory. If a decision is made to move to an Amber or Red Phase (or recovery from such a phase) this would be communicated to the P/TEBMC and decisions made as to how best to communicate this information to hospitals in their jurisdictions, preferably according to a predetermined plan. Each H/REBMC would be convened according to the pre-established provincial or territorial plan.

It will be extremely important that communications to the hospitals/RHA from various sources be coordinated and consistent. Communications to hospitals/RHA will occur via two

communication chains: direct communication from CBS to hospitals/RHA and communications via the P/TEBMC. Therefore, it is essential that the persons responsible for communications to hospitals in CBS, the P/T MOH, and the P/TEBMC be in constant and close contact.

It should be noted that in situations of anticipated shortage, it is likely that CBS would already, while still in Green Phase, have communicated with the hospitals and the provincial/territorial MOH about the impending shortages prior to actually activating this communication network.

When an Amber or Red Phase is declared attempts should be made to have the initial communication to this effect come from the P/TEBMC and/or the P/T MOH; however, if this is not possible, in agreement with the P/T MOH an initial communication may come directly from CBS. Following the declaration of an Amber (or Red) Phase and communication of this to hospitals, CBS would communicate on a regular (likely daily) basis with hospitals/RHA concerning blood inventories and blood issues to hospitals; the P/TEBMC would communicate with hospitals/RHA according to the provincial plan.

All members of the NEBMC would be copied on all communications sent from CBS. All P/TEBMC communications to hospitals/RHA in their jurisdictions would be sent to the NEBMC secretariat at CBS who would, in turn, ensure that all NEBMC members received copies of these communications. Where time permits, the NEBMC should receive CBS communications prior to it being sent to the hospitals/RHA. However, this may not always be possible.

5.2 Informational Communications

In the event of a severe blood shortage, participants in the Plan will invoke their own crisis/emergency communications plan, which would likely include both internal and external components for keeping staff, stakeholders and the public informed (big “c” communications).

It will be extremely important that communications to internal audiences and the public and media are timely, accurate and consistent. Therefore, CBS, in addition to invoking its own crisis/emergency communications plan, will be responsible for leading a NAC-BSWG Communications Sub-Committee that will establish a big “C” communications network for the coordination of communications to internal and external audiences, facilitate the consistency of messaging and ensure a coordinated approach by all participants to media relations.

5.2.1 Communications Sub-Committee Membership and Scope

This sub-committee and its terms of reference are currently being developed. The proposed membership and mandate are described in this section; these may evolve over time.

5.2.1.1 Membership

The core membership of the Communications Sub-Committee shall include the following:

- Co-Chairs:
  - CBS Director, Media Relations & External Communications
  - Lead P/T Ministry of Health communications professional (as determined by the Lead P/T)
- Representatives
  - CBS Director, Government Relations
  - CBS, Director, Operations Support and Business Continuity Management
  - CBS, Head Office communications representative
  - CBS, regional communications representatives (one west, one east)
  - CBS, Hospital Liaison Specialist representative
  - NAC Chair
  - Lead P/T Blood Representative
  - Additional P/T Blood Representatives or delegates (as determined by the lead P/T)

In addition to the core membership, additional representatives should include:

- One or more MOH communications professional(s);
- One or more hospital/RHA communications professional(s);
- Canadian Medical Association communications representative (for assistance with communications to doctors).

5.2.1.2 Mandate

The Communications Sub-Committee will be responsible for drafting the Communications Appendix for the Plan (which will subsequently be added to the Plan) and for ensuring that it:

- considers/has input from all levels of representation;
- considers all phases within the Plan;
- considers existing crisis communications plans (pandemic, business continuity, etc.);
- establishes a network for coordination of internal information flow and messaging;
- establishes a network for coordination of external information flow and messaging;
- determines media spokespersons/approach;
- provides necessary communications materials for each phase, such as key messages, frequently asked questions and answers, and other tools for internal and external audiences; in all phases messaging will need to
  - be honest and serious about the situation;
  - be as reassuring as is possible, considering the situation, regarding safety and supply issues;
  - outline the actions that are being taken by the participants; and
  - provide an opportunity for audience education on the blood system/ongoing need for blood.

6 SPECIFIC PARTICIPANT ACTIONS

This section of the Plan provides recommendations for specific actions for blood system participants during the four phases of the plan.

It is assumed that each of the participants will have developed general emergency response/ business continuity plans and that these plans will be activated as required during a period of blood shortages, in addition to activating plans specific to blood shortages.

6.1 Green Phase

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 with existing Canadian Blood Services/hospital actions.

During the Green Phase, actions will focus on ensuring that plans to address potential shortages are developed and that blood components are used safely and appropriately, as described below.

6.1.1 Canadian Blood Services

- Confirm support for this Plan including the policy, legal and ethical implications of the Plan. Develop a comprehensive disaster preparedness plan.
- Manage the inventory nationally, including daily monitoring of the inventory and distribution of inventory across the country as appropriate.
- Ensure that mechanisms are in place for rapid sharing of inventory between Canadian Blood Services and Héma-Québec.
- Develop internal strategies to respond to periodic requirements to increase blood donations.
- Coordinate the functioning of internal emergency response committees (the CBS National and Local Emergency Response Teams) with the NEBMC activities/recommendations.
- Hold mock drills to evaluate internal and external responses to blood shortages.
- Provide leadership for the use of the Blood Component Disposition Report to monitor component outdates and to implement measures to decrease such outdates.
- Assist hospitals/RHA in determining their green phase (i.e. optimal), amber phase (i.e. serious), and red phase (i.e. critical) inventory levels.
- Develop communication strategies and plans to inform hospitals, Health Canada, and provincial/territorial Ministries of Health of changes in inventory levels, including both decreases below optimum levels and recovery to normal levels.
- Work with P/T MOH and hospitals/RHA to establish systems for transparent sharing of information pertaining to hospital/RHA blood component inventories and blood

component utilization, including sharing of information among hospitals/RHA and with CBS.
- Establish the Communications Sub-committee (see Section 5.2.1).

6.1.2 Provinces/Territories

- Confirm support for this Plan including the policy, legal and ethical implications of the Plan.
- Identify and empower a government program/agency or committee charged with the development of provincial/territorial blood component shortage management plans.
- Establish Provincial/Territorial Blood Emergency Management Committees.
- Actively encourage all hospitals/RHA to follow the Plan's guidelines and monitor their compliance in doing so, particularly with respect to the following activities:
  - development of transfusion committees as per the CSA standard Z902-04 Section 4.4
  - implementation of transfusion guidelines
  - participation in blood component disposition and inventory reporting to Canadian Blood Services
  - establishment of systems for transparent sharing of information pertaining to hospital/RHA blood component inventories and blood component utilization, including sharing of information among hospitals/RHA and with Canadian Blood Services
  - development of blood redistribution programs and other methods/programs to minimize blood component outdating
  - implementation of H/REBMC.

6.1.3 Hospitals/RHA

- Confirm support for this Plan including the policy, legal, and ethical implications of the Plan.
- Ensure that there is a functional Hospital/RHA Transfusion Committee (HTC). (In most hospitals/RHA the HTC will oversee the activities listed below.)
- Develop and implement transfusion guidelines. These should address both appropriate indications and appropriate dosing of blood components and should include guidelines for situations when particular components are not available, e.g. CMV seronegative RBCs/platelets, ABO/Rh identical components, etc. Examples of published guidelines that could be used to assist hospitals/RHA in this task are listed in Appendix G.
- Monitor adherence to transfusion guidelines, including the performance of transfusion audits.
- Exercise scrutiny of orders that are outside hospital/RHA guidelines.
- Ensure application of available blood conservation methodologies.
- Develop and implement a strategy for perioperative blood inventory management**,** either a maximimum blood ordering schedule (MBOS) or an alternate strategy**.**
- Develop processes for inventory management including guidelines for efficient inventory utilization and acceptable levels of outdating blood components.
- Participate in Blood Component Disposition reporting to Canadian Blood Services.

- Record the RBC inventory levels on the Blood Component Order Form when submitting a routine blood order as per the routine order schedule.
- In collaboration with Canadian Blood Services, determine the hospital/RHA inventory levels or green (optimal), amber (serious) and red (critical) levels, by blood group and component.
- Develop a mechanism for the redistribution of product between hospitals/RHA.
- Establish a Hospital/RHA Emergency Blood Management Committee with a mandate to develop, implement and maintain a blood shortage plan that encompass all four phases of this Plan.
- Develop a documentation process for release or non-release of blood components in Amber or Red Phase.
- Notify Canadian Blood Services of situations that could result in increased demand or reduced availability of blood components.

6.2 Amber Phase

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.

During the Amber Phase, the following actions will be taken.

6.2.1 Canadian Blood Services

- Implement the predetermined communications plan (see Section 5).
- Activate internal plans appropriate for Amber Phase.
- Decrease blood component issues to hospitals to levels determined appropriate to the situation and in consultation with the NEBMC and P/TEBMCs (see Section 6.4).
- Monitor hospital/RHA inventory requests to evaluate compliance with the Plan and/or the NEBMC and P/TEBMCs recommendations and report possible instances of non-adherence to the NEBMC and the appropriate P/T Blood Representative(s).
- Collect data on hospital use of blood and total (i.e. CBS plus hospital) blood inventories on daily basis and provide it to provinces/territories.
- Provide any other appropriate/necessary information to provinces/territories to assist them to coordinate their communications to hospitals/RHA and the public.

6.2.2 Provinces/Territories

- Activate internal plans appropriate for Amber Phase.
- In collaboration with Canadian Blood Services, implement the pre-determined communications plan (see Section 5).
- Notify senior management of hospitals/RHA of the requirement to defer elective medical and surgical procedures which are likely to require the affected blood components. Elective surgical procedures are considered to be all surgical procedures which are not urgent or emergency procedures. Urgent surgical procedures are those for which a patient

is likely to have major morbidity if surgery is not performed within the next one to 28 days. 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).
- Monitor hospital compliance with and implementation of the actions required in Amber Phase.

6.2.3 Hospitals/RHA

.Activate internal plans appropriate for Amber Phase.
- Convene the Hospital/RHA Emergency Blood Management Committee to monitor and control utilization of the affected blood components.
- Implement pre-established communications plans.
- Adjust inventory levels of affected components to levels consistent with those previously determined appropriate for Amber Phase.
- Request inventory from CBS based on Amber Phase requirements.
- Defer/cancel elective surgical procedures requiring the affected blood components. Elective surgical procedures are considered to be all surgical procedures which are not urgent or emergency procedures. Urgent surgical procedures are those for which a patient is likely to have major morbidity if surgery is not performed within the next one to 28 days. 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).
- Defer/cancel elective medical procedures requiring the affected blood components.
- For RBC transfusions, follow guidelines for Amber Phase as outlined in Table 1.
- For platelet transfusions, follow guidelines for Amber Phase as outlined in Table 2.
- For frozen plasma and cryoprecipitate transfusions, ensure strict adherence to guidelines established in Green Phase. (The decrease in elective procedures should lead to a decrease in the use of these components.)
- Refer all requests for the affected blood components that do not fulfill pre-determined acceptance criteria to the Blood Bank Medical Director or designate prior to issuing product.
- Implement the documentation process for release or non-release of blood components.
- Appendix H – Documentation Toolkit has been provided as examples of forms that may or may not be adapted by hospital or regional health authorities for use during a blood shortage.

6.3 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).

During the Red Phase all actions begun in Amber Phase (assuming that the Red Phase is preceded by an Amber Phase) will be continued. In particular, ongoing communications as described in the communication plan (Section 5) remain vitally important. In addition, the following actions will be taken.

6.3.1 Canadian Blood Services

- Implement the predetermined communications plan (see Section 5).
- Activate internal plans appropriate for Red Phase.
- Decrease blood component issues to hospitals to levels determined appropriate to the situation and in consultation with the NEBMC and P/TEBMCs (see Section 6.4).
- Monitor hospital/RHA inventory requests to evaluate compliance with the Plan and/or the NEBMC and P/TEBMCs recommendations and report possible instances of non-adherence to the NEBMC and the appropriate P/T Blood Representative(s).
- Collect data on hospital use of blood and total (i.e. CBS plus hospital) blood inventories on daily basis and provide it to provinces/territories.
- Provide any other appropriate/necessary information to provinces/territories to assist them to coordinate their communications to hospitals/RHA and the public.

6.3.2 Provinces/Territories

- Activate internal plans appropriate for Red Phase.
- In collaboration with Canadian Blood Services, implement the pre-determined communication plan (see Section 5)
- Notify senior management of hospitals/RHA of the requirement to defer all medical and surgical procedures likely to require the affected blood components with the exception of emergency 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).
- Monitor hospital compliance with and implementation of the actions required in Red Phase.

6.3.3 Hospitals/RHA

- Activate internal plans appropriate for Red Phase.
- Convene the Hospital/RHA Emergency Blood Management Committee to monitor and control utilization of the affected blood components.
- Implement pre-established communications plans.
- Adjust inventory levels of affected components to levels consistent with those previously determined appropriate for Red Phase.
- Request inventory from CBS based on Red Phase requirements. (See also Section 6.4.)
- Defer/cancel all medical/surgical procedures requiring the affected components with the exception of emergency surgical 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).
- To the extent possible, defer haematopoietic stem cell transplantation and chemotherapy treatments and any other medical treatments requiring ongoing need for the affected blood components.
- For RBC transfusions, follow guidelines for Red Phase as outlined in Table 1.
- For platelet transfusions, follow guidelines for Red Phase as outlined in Table 2.

- For frozen plasma and cryoprecipitate transfusions, ensure strict adherence to guidelines established in Green Phase. (The restriction of procedures to emergency procedures only procedures should lead to a decrease in the use of these components.)
- Refer all requests for the affected blood components that do not fulfill pre-determined acceptance criteria to the Blood Bank Medical Director or designate prior to issuing product.
- Implement the documentation process for release or non-release of blood components.
- Appendix H – Documentation Toolkit has been provided as examples of forms that may or may not be adapted by hospital or regional health authorities for use during a blood shortage.

6.4 Determination of the Allocation of Blood Components from CBS to Hospitals/RHA in Amber and Red Phases

The way in which decisions for the allocation blood components from CBS to hospitals/RHA in Amber or Red Phase would be made cannot be determined definitely *a priori*. However the 3 possible following methods could be considered and, in an actual shortage situation, it is likely that a combination of these 3 methods would be used.

The first and ideal scenario would be that, in Green Phase, every hospital/RHA would optimize its blood use according to the Green Phase recommended activities and would determine the amount of blood required to support the restricted activities permitted in Amber and Red Phases. In that ideal scenario CBS would then issue to each hospital/RHA the amount of blood requested and these amounts would correspond to the restricted Amber or Red Phase activities. This Plan recommends that hospitals/RHA served by CBS begin to strive now to reach this goal.

However, in practice, all hospitals/RHA may not have completed this work at the time of a blood shortage. In that case, actual blood component allocations during times of severe shortage will be determined by CBS in consultation with the NEBMC and where appropriate (e.g. in the case of a regional disaster) selected P/TEBMC, using one or a combination of the following 2 methods.

1) Blood component issues from CBS could be determined using the percentage of blood normally going to each province - if the whole country was equally effected by the situation then the percentages would be what they currently are; if provinces were not affected equally by the underlying situation then it could be decided that blood allocation would not be the same as under normal conditions. However this method has the potential disadvantage of making equal cuts to provinces whose hospitals/RHA have strived to optimize blood use in Green Phase as those that have not made any such efforts; this would have to be taken into account as far as possible.
2) Blood component issues from CBS could be decreased to an equivalent number of units per capita in all provinces. This method of allocation would have to be adjusted to consider the number of emergency procedures likely to performed in more populous provinces versus those with smaller populations and less intensive medical

or surgical procedures. However it would have the advantage of not further penalizing provinces where extensive efforts had been made to optimize blood utilization.

For either of the latter 2 scenarios, each province would direct CBS as to the precise distribution of components in its provinces (e.g. an equivalent decrease to all hospitals or relatively smaller or larger decreases to selected institutions such as hospitals in remote areas or hospitals performing relatively more emergency procedures who might receive relatively smaller decreases). Each hospital/RHA would determine the distribution of components to individual patients or categories of patients within its institution(s), while respecting the transfusion guidelines described above and presented in Tables 1 and 2.

In any of the above scenarios it is unlikely that blood issues to hospitals in the territories would be decreased as these represent a small absolute number of blood components.

In addition, as described above, it will be important for each MOH, in conjunction with CBS, to monitor the compliance of hospitals/RHA with the Plan and for the MOH to intervene, if necessary, in situations where non-compliance is identified.

6.5 Recovery Phase

Plans for the recovery phase have yet to be determined by the NAC-BSWG.

Table 1: 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.[1]
Surgery/Obstetrics	**Surgery/Obstetrics**	**Surgery/Obstetrics**
Follow your hospital/RHA guidelines	Urgent [2] and emergency [3] surgery in consultation with H/RBEMC	Urgent & Emergency surgery in consultation with H/RBEMC
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	Consideration should be given to lowering the RBC transfusion triggers established for the amber phase All requests for RBC transfusion in patients with a Hb level > 70 g/L must be reviewed by designated medical personnel

[1] Guidelines to determine stopping principles to be developed
[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

Notes

- 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.
- 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..

Table 2: 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**
Follow your hospital/RHA guidelines	Follow your hospital/RHA guidelines	Follow your hospital/RHA guidelines
Invasive procedures/ surgery	**Invasive procedures/ surgery**	**Invasive procedures/ surgery**
Follow your hospital/RHA guidelines	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 > 100 x 10^9/L For non-surgical invasive procedures (other than bone marrow aspiration or biopsy) maintain a PC > 30 x 10^9/L	Emergency surgery in consultation with H/RBEMC All requests for platelet transfusion must be reviewed by designated medical personnel
Bone marrow failure/ hematopoietic stem cell transplantation/ chemotherapy	**Bone marrow failure/ hematopoietic stem cell transplantation/ chemotherapy**	**Bone marrow failure/ hematopoietic stem cell transplantation/ chemotherapy**
Follow your hospital/RHA guidelines	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 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	Eliminate all prophylactic transfusions. All requests for platelet transfusions in non-bleeding patients must be reviewed by designated medical personnel

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
- Issuing of lower doses of platelets may be used (i.e. 1-2 units) or split doses of Buffy Coat platelets. 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.

APPENDICES

Appendix A	National Advisory Committee on Blood and Blood Products
Appendix B	Stakeholder Consultation in the Development of the National Plan for the Management of Shortages of Labile Blood Components
Appendix C	Canadian Blood Services Business Continuity Plans
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APPENDIX A: National Advisory Committee on Blood and Blood Products

[http://www.nacblood.ca/about-nac/members-list.html]

Dr. Susan Nahirniak, Chair
Medical Director, Transfusion Services
University of Alberta Hospital, Edmonton AB

Medical Representatives:

Dr. Brian Berry
Director of Hematopathology
Royal Jubilee Hospital, Victoria, BC

Dr. Louis Wadsworth,
Division of Hematopathology
Children's & Women's Health Centre of BC,
Vancouver BC

Dr. Meer Taher Shabani Rad
Medical Director for Transfusion Medicine
Foothills Medical Centre, Calgary, AB

Dr. Edward Alport, Medical Head, Department
of Pathology and Laboratory Medicine
Qu'Appelle Health Region, Regina, SK and
Medical Director, Canadian Blood Services,SK

Dr. Catherine Moltzan
Medical Director, Transfusion Medicine for
Diagnostic Services of Manitoba
St. Boniface General Hospital,
Winnipeg, MB

Dr. Brian Muirhead,
Department of Anaesthesiology
Winnipeg Health Sciences Centre,
Winnipeg, MB

Dr. Jeannie Callum, Director
of Transfusion Medicine & Tissue Banks
Sunnybrook Health Sciences Centre,
Toronto, ON

Dr. John Freedman,
Director Transfusion Medicine,
St. Michael's Hospital,
Toronto, ON

Dr. David Anderson
Head, Division of Hematology
QE II Health Sciences Centre,
Halifax, NS

Dr. Sean Dolan,
Division of Hematology
Saint John Regional Hospital,
Saint John, NB

Dr. Lucinda Whitman
Divisional Chief, Laboratory/Hematology
Eastern Health
St. John's, NF

P/T Government Representative:

Brian Sandilands
Manager, Transfusion & Transplantation Unit
Alberta Health and Wellness (Lead Province)
Acting PT representative

Canadian Blood Services Representatives:

David Howe, Executive Director,
Product & Hospital Services,
Canadian Blood Services

Mathias Haun,
Director, Plasma Products and Services,
Canadian Blood Services

Dr. Heather Hume,
Executive Medical Director
Canadian Blood Services

Others:

Dr. Georges Rivard
Directeur, Clinique d'hématologie
Hôpital Ste-Justine, Montreal, QC

Samuel Hester
NAC project co-ordinator
Alberta Health and Wellness

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

TERMS OF REFERENCE

[http://www.nacblood.ca/about-nac/terms-of-reference.html]

1.0 Mandate

1.1 The NAC shall provide medical and technical advice on the utilization management of blood and blood products to the provincial and territorial [PT] Ministries of Health and Canadian Blood Services [CBS]. To this end, the NAC shall:

- Provide advice on technical issues of blood supply, including matters directly affecting the practice of transfusion medicine in hospitals;
- Share information about blood and blood product utilization and utilization management efforts, and play a supportive role in the development of guidelines for product use;
- Provide professional leadership in assisting the PT Ministries of Health in identifying (through the initiation of pharmacoeconomic studies and other methods), designing and implementing cost-effective blood utilization management initiatives for the optimization of patient care within their own jurisdictions; and
- Assist Canadian Blood Services in its product selection process.

1.2 The NAC shall report to the PT/CBS Blood Liaison Committee.

2.0 Membership

2.1 The PT/CBS Blood Liaison Committee and CBS shall appoint representatives to the NAC as follows:

- Each PT may appoint two representatives from the following categories:
- A health care professional with experience in transfusion medicine or expertise in blood utilization management.
- Ministry of Health personnel with primary responsibility for blood resource management.
- In addition to providing advice and professional leadership with the NAC, the PT members are expected to serve as champions within their own jurisdictions for blood utilization management initiatives.
- CBS shall appoint four representatives.

2.2 The NAC may invite additional experts to meetings on an ad hoc basis, to provide expertise on the subject matter being discussed.

2.3 Members shall serve for a two-year term. The term of any member may be extended by the body that appointed them (PT/CBS Blood Liaison Committee). Membership terms should be staggered.

2.4 In carrying out its function, the NAC may establish subcommittees to address specific issues as well as provide representation on CBS and other national initiatives. It would be the expectation that members serve on at least 2 of these task groups per year.

2.5 The NAC shall nominate a Chair and Vice-Chair from among its members. The Chair role will rotate with the lead province for a two-year term, while the Vice-Chair will be selected from the next lead province. These appointments shall be subject to endorsement by the PT/CBS Blood Liaison Committee. The chair and Vice-Chair shall serve a two-year term. When feasible, the Chair will rotate with the appointment of the Lead Province for blood and blood products at the PT Committee level. The terms may be extended by agreement of the NAC, subject to endorsement by the PT/CBS Blood Liaison Committee.

3.0 Meetings

3.1 NAC shall meet at least two times per year, or at the call of the Chair. Additional teleconferences may be held at the call of the Chair or at the call of a standing member, upon the approval of the Chair. The Vice-Chair shall chair meetings in the absence of the Chair.

3.2 Decisions shall be made by consensus among the members present. The quorum will be 50% plus 1.

4.0 Communications and Support

Secretariat and Project Coordinator

4.1 Providing the Secretariat will be the responsibility of the lead province. The PT Collaborative Fund includes a 1.0 FTE Project Coordinator. The Secretariat and Project Coordinator shall support the work of the NAC. The Secretariat and/or Project Coordinator shall be responsible for:

- Coordination and administrative support of meetings
- Administration of the NAC's budget
- Distribution of communications to the PT/CBS Blood Liaison Committee and NAC members
- Assistance with investigative or analytical work that may be required for the identification and resolution of blood utilization issues

4.2 The Secretariat and/or Project Coordinator shall report all proceedings and recommendations of the NAC to the PT/CBS Blood Liaison Committee and shall report all relevant communications (eg: guidance, requests or decisions) from the PT/CBS Blood Liaison Committee to the NAC.

Members

4.3 NAC members shall report NAC discussions and recommendations to the PT/CBS Blood Liaison Committee. It is expected there will be clear communications and mutual support between groups.

PT Ministries of Health

4.4 NAC will support one member from each province, Project Coordinator and the secretariat, to attend meetings. PTs who appoint more than one representative for their province are expected to fund the additional representative from their respective jurisdictions.

5.0 Evaluation

5.1 The NAC will prepare an annual work plan for review and approval by the PT/CBS Blood Liaison Committee.

6.0 Conflict of Interest

6.1 Any NAC committee member that has an interest that is or could be seen by a reasonable third party to be a conflict between the NAC committee members' professional interest and the issue that is before the NAC committee must declare such a conflict to the NAC committee chair. If the committee chair is in conflict of interest it must be declared to the committee. Members are to complete a conflict of interest form on an annual basis and update as appropriate for the NAC Committee.

Appendix B
Stakeholder Consultation in the Development of the National Plan for the Management of Shortages of Labile Blood Components

Background

When the CBS P/T Blood Liaison Committee requested NAC to prepare a National Plan for the Management of Shortages of Labile Blood Components (Plan) they specifically asked that the Plan be based on accepted ethical principles for the allocation of scarce health care resources. The ethical principles that were used are described briefly in the Plan and in more detail in Appendix D. An important element of these principles is the requirement for consultation with stakeholders who could potentially be affected by the Plan's recommendations. In order to include such a consultation in the development of the Plan, a draft Plan was prepared and circulated to stakeholders for comment. The consultation process, results and changes to the Plan and other subsequent actions are described in this appendix.

Methods

Consultation process and compilation of the responses

The responsibility for the overall management of the consultation was given to CBS. The draft Plan, version 2008-10-27, was used for the consultation. CBS and the NAC-BSWG prepared a list of national societies, representing health care professionals and blood transfusion recipients, to be consulted. The P/T MOH (in the jurisdictions served by CBS) determined the list of provincial stakeholders to be consulted in their jurisdictions. An on-line survey using Zoomerang® was developed for the consultation; it consisted of 45 questions with each question asking for comments on an individual section of the draft Plan.

The consultation was conducted from November 2008 through January 2009.

CBS conducted the consultation of the national societies using the on-line survey.

For provincial/territorial stakeholders, the consultation was conducted in 1 of the following 3 ways:

- CBS conducted the whole consultation i.e. contacted the stakeholders using the on-line survey and collated the results: Ontario, Newfoundland, Yukon.
- CBS and the P/T MOH conducted the consultation jointly, i.e. the P/T MOH contacted the stakeholders using the on-line survey and CBS collated the results: Manitoba. Alberta, New Brunswick.
- The P/T MOH conducted the whole consultation i.e. contacted the stakeholders using stakeholder meetings and collated the results, which were then forwarded to CBS: Saskatchewan, Nova Scotia, British Columbia.

CBS then compiled all the responses from all the provinces/territories and national societies in one electronic database, including the following details: province, affiliation, hospital or non-hospital and the number of participants contributing to the response.

Review of the responses

In spring 2009, the NAC-BSWG held a 2 day face-to-face meeting and then a teleconference to review the compiled comments. The group reviewed each non-editorial comment separately and a response was determined and documented. In addition, a list of actions was developed to address the most significant and/or recurrent suggestions and concerns.

The draft plan was then revised to produce the final Plan.

Results

Responses received

There were a total of 57 responses to the consultation survey representing the input of 286 individuals (159 hospital based individuals, 127 non-hospital based). A total of 382 comments were received for all questions in the survey. Only 34 of these were considered to be editorial in nature; the remaining 348 were comments on the actual content of the document. The number of survey recipients, responders and responses, by province/territory or society is shown in Table 1. The list of national societies contacted and whether or not they responded is shown in Table 2.

No reviewer expressed opposition to the principle of establishing a national plan that could be used as a framework for the development of provincial and/or regional plans. Several very thoughtful comments and suggestions for improvement were submitted.

Common themes/concerns that emerged included:

- Education is required regarding the role of the NAC, the provincial Ministries of Health, CBS and the blood system as a whole.
- Ethicists should be consulted in the development of plans.
- Small facilities especially those in remote areas and/or those with limited resources will require assistance to develop plans
- It would be helpful to have clearer definitions on the level of reduced inventories that would trigger the declaration of amber and red phases.
- There were concerns regarding the exact way in which the determination of the allocation of blood for CBS to hospitals/RHA would be made.
- There were concerns that the NEBMC might be too large to function quickly and effectively in times of blood shortages.
- There were concerns about the communication challenges and the need for a very well defined communications plan.
- There should be a mechanism for monitoring compliance with the Plan and consideration of actions that would be taken if some hospitals/RHA were not complying with recommendations of the Plan.

- There were concerns about the possible medicolegal repercussions for health care professionals implementing the recommendations of the Plan.
- It would be helpful to have more guidance in determining appropriate blood transfusion therapy in times of blood shortages for patients with potentially massive requirements but in whom there is a very remote chance of benefit.

Actions subsequent to the review of comments received

The draft Plan was revised taking into consideration the comments received in the consultation. In particular, more precision about probable inventory levels in amber and red phase was added, a discussion of the possible methods of determining the allocation of blood components was added and the section on communication and the various emergency blood management committees was divided into 2 sections and the functioning of the national committee was described in more detail. In addition, the NAC-BSWG decided to establish two additional sub-committees, namely the Communication Sub-committee (described in Section 5.2.1 of the Plan) and a sub-committee to develop guidelines for discontinuing blood transfusion therapy for patients with potentially massive requirements but in whom there is a very remote chance of benefit.

Table 1: Number of Survey Recipients and Responses

Group	# Contacted	# Responses	Total # people participating **
National Societies	39 organisations	13	16
AB	90	7	53
BC	31	1	18
MB	121	3	62
NB	9	1	5
NF	27	2	18
NS	34	3 [compiled from 34 contacted respondents]	34
ON	77	8	18
SK	18 organisations	7 [compiled from 18 contacted organizations]	61
YK	2	1	1
PEI	1	0	0
	Total =	57	286

** Number of people participating in a response is greater that # responses because some responses were a team effort.

Table 2: National Societies Surveyed

National societies contacted that responded:

Canadian Association of Emergency Physicians
Canadian Anaesthesiologists' Society
Canadian Association of Transplant
Canadian Medical Association
Canadian Paediatric Society
Canadian Society for Medical Laboratory Science
Canadian Society of Transplantation
Canadian Bone & Marrow Transplant Group
Childhood Cancer Foundation Candlelighters Canada
Canadian Medical Protective Association
Healthcare Insurance Reciprocal of Canada
Sickle Cell Disease Parents Support Group, CHEO
Thalassemia Foundation of Canada = 13

National societies contacted that *did not* respond:

Anemia Institute for Research and Education
Aplastic Anemia and Myelodysplasia Association of Canada
Arthritis Society of Canada
Association of Hemophilia Clinic Directors of Canada
Bruce Denniston Bone Marrow Society
Canadian Association of Critical Care Nurses
Canadian Association of Neuroscience Nurses
Canadian Cancer Society
Canadian Critical Care Society
Canadian Hematology Society
Canadian Hemophilia Society
Canadian Immunodeficiencies Patient Organization
Canadian Liver Foundation
Canadian Neurosciences Federation
Canadian Nurses Association
Canadian Society for Transfusion Medicine
Canadian Society of Cardiac Surgeons
Canadian Society of Transplantation
International Society for Heart and Lung Transplantation
Kidney Foundation of Canada
National Emergency Nurses Affiliation
Neutropenia Support Association Inc.
Physicians and Nurses for Blood Conservation
The Leukemia and Lymphoma Society of Canada
The Society of Obstetricians and Gynaecologists of Canada
Trauma Association of Canada = 26

Acknowledgements

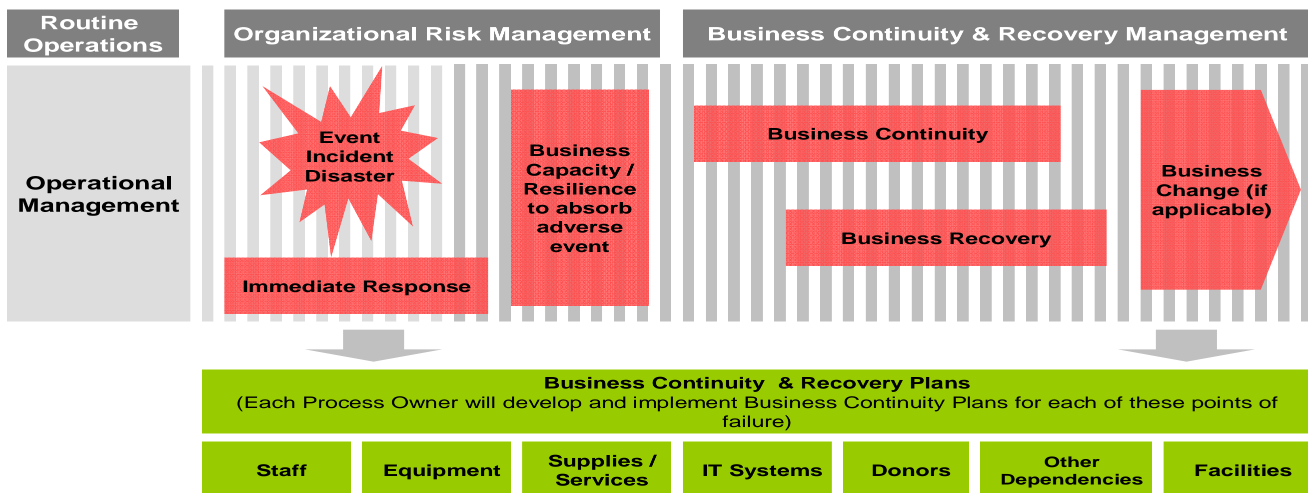
The NAC-BSWG would like to acknowledge and thank all stakeholders who provided feedback on the draft Plan in this consultation process and Ms Karen Asmar, Manager Transfusion Medicine Programs CBS who compiled the results.

APPENDIX C:
Canadian Blood Services Business Continuity Plans

Canadian Blood Services (CBS) manages the blood supply in all the provinces and territories except Québec. As part of this mandate, CBS currently engages in a number of activities to identify, avert and as necessary, alleviate and manage a national shortage. Its basic activity in this regard is the on-going management of the inventory as a single national inventory (as opposed to multiple regional inventories). CBS also has mechanisms in place to allow sharing of blood components between CBS and Héma-Québec if necessary.

Within the context of its Business Continuity Management Framework, CBS develops and refines business continuity and business recovery plans to minimize the impacts of adverse events on the national inventory. The Framework recognizes that events/disasters could negatively impact the availability of donors, CBS staff, equipment, IT systems, transportation systems and/or facilities (all referred to as potential points of failure) each of which the maintenance of the national inventory is critically dependent. To support its Business Continuity Management Program, Canadian Blood Services has established a Business Continuity Management Team which has responsibility to work with CBS Process Owners to continually enhance CBS' Program and to incorporate industry best practices. The Business Continuity Management Team works with Process Owners to identify critical dependencies within each potential point of failure and to support the development of business continuity plans to work around these points of failure. Canadian Blood Services' first line of defence regarding blood component shortages is to proactively prevent or minimize them through the development; implementation and exercising of these business continuity management plans which are intended to resolve potential organizational disruptions before they have the potential to result in blood component shortages.

Business Continuity Management Framework



For example, within the "IT Systems" stream of the Framework, CBS has put in place business continuity and recovery plans for its Blood Management System (used to manage the CBS national blood inventory). Business continuity plans for this critical system include the ongoing availability of two computer servers, each located at a different CBS site, which can be used to run the Blood Management System; the availability of manual processes that would allow CBS to continue basic operations when the IT system is not available and a contract with an external IT firm to make available a non-CBS owned server onto which the Blood Management System could be transferred should all other systems fail.

Canadian Blood Services recognizes that the availability of these business continuity management plans might not be sufficient to respond to crises of a more catastrophic nature (e.g. influenza pandemic with severe impacts on staff and donor population, etc). To supplement these proactive steps, CBS is also working towards defining three tiers of strategic responses which are more "reactive" in nature and which would be implemented when the proactive measures are determined to be insufficient to address the crisis at hand. The strategies within each of the three tiers progress in terms of their impact on patient care. For example, the "Tier One" strategies include those that do not impact blood component specifications while those in "Tier Three" might.

"Tier One" includes those strategies that are currently available to Canadian Blood Services and which have, as required, already been deployed to respond to potential or actual blood shortages. If successful in producing the required outcome, they would result in no change in how patient care is carried out. The "Tier One" strategies include:

- Increasing organizational capacity to respond to blood component shortages or short-term increased demand resulting from a local emergency, etc. Canadian Blood Services has established processes in place to add capacity to its operations (e.g. additional blood donor clinics) and to launch situation specific messages to donors and the general public. Canadian Blood Services' donors are highly motivated in responding to emergency needs and have demonstrated this commitment in the past when CBS has been required to increase organizational capacity.
- Importing of blood components from Hema-Quebec to augment CBS' inventories.
- Re-directing work from one CBS site to alternate CBS sites to address temporary loss of capacity in one or more sites (e.g. transferring donor testing activities from one Donor Testing Laboratory to another). This is a well-established component of CBS business continuity response strategies which has been utilized and proven effective.
- Re-assigning staff from pre-defined less critical job functions within a site to more critical job functions within that same site to respond to staffing shortages. For example, staff or managers in non-supply chain based positions who hold certification as Medical Laboratory Technologists might be temporarily re-assigned to supply chain based positions to maintain production or testing, etc.
- Re-deploying staff from one CBS to another CBS site in response to staffing shortages or to assist with increased operational activity resulting from a temporary increase in capacity.

Canadian Blood Services is currently working to augment these strategies with additional ones that would be deployed if the “Tier One” strategies were not sufficient to address the potential or actual blood shortage. Risk / benefit assessments are being performed on other potential response mechanisms and preliminary high-level discussions with relevant stakeholder groups are underway or planned. These additional business continuity management strategies, if adopted, will be grouped to form the “Tier Two” and “Tier Three” strategic responses. At this time, the inclusion or exclusion of these strategies in Canadian Blood Services’ overall Business Continuity Program has not been finalized. However, for information purposes only, the strategies being investigated for potential inclusion in CBS’ Business Continuity Management Program are:

Tier Two:

- Temporary suspension of some donor selection criteria which would not impact product specifications (e.g. during an influenza pandemic with severe population impacts, CBS might reduce donation intervals to increase the availability of eligible donors).
- Importation of blood components from a non-Canadian blood operator which has demonstrated similar product specifications as Canadian Blood Services (e.g. same donor deferral criteria, same transmissible disease testing protocols, etc).

Tier Three:

- Temporary implementation of CBS process changes which would impact normal product specifications. For example, Canadian Blood Services might elect to temporarily suspend West Nile Virus testing during the winter season if the availability of donor testing staff were to be compromised.
- Importation of blood components from a non-Canadian blood operator whose product specifications are different than those of Canadian Blood Services.

To ensure that its Business Continuity Management planning takes into consideration industry best-practice, CBS is a member of an international group of blood suppliers, including the American Red Cross, America’s Blood Centres, the Australian Red Cross Blood Service, and the European Blood Alliance. CBS also works closely with the Public Health Agency of Canada and other federal and provincial/territorial government departments (e.g. Transport Canada) in developing its business continuity plans.

While CBS proactively undertakes business continuity and recovery planning to minimize the impacts of adverse events on the national inventory, it also recognizes that not all risks can be precisely forecasted and therefore cannot be prescriptively planned for. Consequently, despite these best efforts there might be events/disasters which result in a reduced national blood inventory which necessitate changes in transfusion practice. The development and availability of this Plan is in itself an integral part of proactive business continuity planning.

With respect to the specific requirements of the Plan, Canadian Blood Services will have the ultimate responsibility for declaring various Phases of blood component shortages and recovery from such shortages as well as determining the distribution of blood components in accordance with the phase of criticality. However, as described in Section 4 below, both these activities would usually only occur following consultation with a national advisory committee, the National Emergency Blood Management Committee (NEBMC) and in consideration of its advice.

Canadian Blood Services will also have a key role in coordinating communications as detailed in the Communications Plan (Section 4) below and will provide the secretariat for the National Emergency Blood Management Committee.

APPENDIX D: Ethical Considerations in Management of Blood Shortages

Rationale

During blood shortages, difficult decisions will need to be made on how to ration blood products. A fair and transparent priority-setting process (rationing) based on shared ethical values must be developed.

Why?

- To ensure acceptance and cooperation, need to make the values behind decisions public
- Decisions based on shared ethical values will carry greater trust, legitimacy and authority
- World Health Organization (WHO) requires emergency planners to address ethical issues and to use an ethical framework for emergency preparedness planning

Who?

- Emergency planners involved in the development of plan for management of blood shortages, i.e. Canadian Blood Services, hospital representatives, representatives of the provincial and territorial governments, national and regional liaison groups, patient groups and members of general public.

How?

- Emergency planners will convene a public consultation with various stakeholders including provincial blood coordinating offices, regional health authorities, hospitals, patient representatives and public at large. Public consultation is necessary to confirm that the current plan is based on ethical values shared by members of society.

Tools for development of an ethical framework

The document *Stand on Guard for Thee* was published in the aftermath of SARS epidemic in Toronto. The purpose of the document was to provide emergency planners with essential tools to create an ethical framework on which emergency preparedness plans may be based.

The document identifies ten **substantive values** to guide ethical decision-making. A few of these values are of particular relevance for the plan involving management of blood shortages.

1 Equity

It is paramount to maintain equity in crisis situations. During a shortage, a finite pool of available blood products will be distributed in a fair manner to those who have the greatest need and greatest opportunity to benefit from them. Similar cases will be treated similarly to allow for a fair distribution of benefits and burdens.

2 Solidarity

Blood shortage calls for collaborative approaches that set aside traditional values of self-interest or territoriality among provinces, hospitals or health care professionals.

3 Trust

Decision-makers must maintain stakeholders trust while implementing control measures during an evolving crisis.

4 Stewardship

Those entrusted with governance roles should be guided by the notion of stewardship: trust, ethical behavior, and good decision-making. Decisions regarding resources should strive to achieve best patient health and public health outcomes under shortage situation.

Five **procedural values** were also identified.

1. **Reasonable** – decisions must be made by credible and accountable people and based on reasons that stakeholders agree are relevant to meeting health needs in crisis
2. **Open and transparent** – decision-making process must be open to scrutiny
3. **Inclusive** - stakeholders should be engaged in the decision-making process. Decisions should be made with stakeholders' views/beliefs in mind
4. **Responsive** – there should be opportunities to revisit and revise decisions as well as the mechanisms to address any disputes and complaints.
5. **Accountable** – there should be a mechanism in place to ensure that decision makers are answerable for their actions and inactions

During a shortage, allocation of scarce blood products should be guided by the above values. When available resources are exceeded, the focus will shift from doing the best for the individual patient to the public health goal of doing the greatest good for the greatest number while balancing obligations to individuals and individual needs. Depending on the severity of the shortage, this may include suspension of prophylactic transfusions and elective procedures requiring blood products to allow provision of emergency treatments. This may also involve cessation of transfusion support in terminal or moribund patients. Whatever may

be the case, an attempt should be made to provide a consistent level of care across all affected regions.

A fair and transparent priority-setting process (rationing or resource allocation) must be developed. Decision-makers should

- engage stakeholders in determining what criteria should be used to make resource allocation decisions
- demonstrate how these decisions are defensible in light of the priority setting criteria and available information
- ensure that clear rationales for allocation decisions are publicly accessible
- provide justification for any deviation from the pre-determined criteria
- ensure that there exist formal mechanisms for stakeholders to bring forward any new information, to appeal or raise concerns about particular decisions and to resolve disputes
- evaluate the process to assess its adequacy and impact on all involved parties

On a national level, a single blood shortage contingency plan will be developed. The plan will be developed by representatives of blood suppliers, governing structures, and hospitals. Members of broader public and professional and patient interest societies will be solicited for input. This plan will identify the key players, define phases of shortage and specify actions that are to occur in each phase. To ensure the success of the plan, each province/territory and each hospital must review and endorse the plan.

Uniform guidelines of transfusion practice should be developed and adhered to. Presence of guidelines will reduce the potential for each physician to have to design and defend individual strategies for individual cases and will ensure consistency in practice. Ideally guidelines should be implemented on a national basis with government providing policy support for implementation. Appropriate liability protections for providers and institutions must be assured. The guidelines should be based on existing evidence and include indications for receiving a scarce blood product and a prioritization tool. Transfusion guidelines should also include exclusion and/or stopping criteria to limit utilization of scarce resources in patients deemed unsalvageable. Whenever possible, inclusion and exclusion criteria should be based on objective information. Criteria should be implemented in a tiered fashion, so that as resources are exhausted, another tier of exclusion criteria is implemented. Guidelines should be published and widely disseminated amongst all stakeholders.

A multidisciplinary triage committee should be set up in each institution to assist with decision-making re: blood rationing on a case by case basis. The existence of such committee will ensure that all departments/services are treated fairly and that decision-making process is transparent. Proceedings of this committee will be recorded to allow for a retrospective review of the process for adequacy and efficacy.

Further Reading [Ethics]

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APPENDIX E: OTHER PLANS ADDRESSING BLOOD SHORTAGES

Plan Title	Link
Chief Medical Officer's National Blood Transfusion Committee, Development of an integrated blood shortages plan for the National Blood Service and hospitals	http://hospital.blood.co.uk/library/pdf/ESD_PCS_HL_001_01.pdf
Ontario Contingency Plan for Management of Blood Shortages and the Contingency Planning Toolkit - ORBCoN	http://www.transfusionontario.org/media/docs/Contingency%20Planning%20Toolkit.pdf
Nova Scotia Blood Contingency Plan – draft, Feb 08, 2008	http://www.gov.ns.ca/health/nspbcp/cp/docs-bcp/flowcharts/Rev'd%20draft%20Cont.%20plan%20vers%2036.pdf
Maintaining a Safe and Adequate Blood Supply in the Event of Pandemic Influenza, Guidelines for National Blood Transfusion Services – World Health Organization, 19 May 2006	http://www.who.int/bloodproducts/quality_safety/WHO_Guidelines_on_Pandemic_Influenza_and_Blood_Supply.pdf
Ensuring Transfusion and Transplantation Safety During Blood Shortages, Theresa Wiegmann, JD, on behalf of AABB Interorganizational Task Force on Domestic Disasters and Acts of Terrorism, August 22, 2007	http://www.hhs.gov/ophs/bloodsafety/presentations/wiegmann0807.pdf
Disaster Operations Handbook, Coordinating the Nation's Blood Supply During Disasters and Biological; V.2.0, October 2008, American Association of Blood Banks	http://www.aabb.org/Documents/Programs_and_Services/Disaster_Response/disastophndbkv2.pdf
Pandemic Influenza, Planning for Blood Organisations, Consolidating the work of the European Blood Alliance Emergency Planning Action Group (EBA EPAG)	http://www.isbt-web.org/uploads/documents/PandemicInfluenza.pdf

APPENDIX F:
The National Emergency Blood Management Committee Terms of Reference

Mandate

The National Emergency Blood Management Committee (NEBMC) will develop recommendations and provide advice to the Provincial/Territorial (P/T) Ministries of Health, hospitals/regional health authorities (RHA) and Canadian Blood Services (CBS) to support a consistent and coordinated response to critical blood shortages in Canada.

To this end, the NEBMC will:
- provide advice to CBS with respect to determining the appropriateness of declaring an amber or red phase situation, and recovery from these situations;
- provide recommendations on the distribution of blood components in amber and red phases;
- provide recommendations on previously unforeseen circumstances related to critical blood shortages;
- provide recommendations concerning the communication of the shortages to key stakeholders;
- ensure the necessary communication between the NEBMC and the Provincial/Territorial Emergency Blood Management Committee(s) (P/TEBMC).

Membership

The Chair of the NEBMC will be the current chair of the National Advisory Committee for Blood and Blood Products (NAC). The Vice-Chair of NAC shall act as chair in the absence of the NEBMC /NAC Chair.

The membership of the NEBMC will include the following:
- CBS officials as determined by CBS and including the following
    - Chief Operating Officer
    - Executive Director, Product & Hospital Services
    - Director, Product & Hospital Services
    - Director, Operations Support
    - Executive Medical Director, Transfusion Medicine
    - Director, Internal Communications
    - Director, Government Relations
    - Director, Media Relations & External Communications
- all NAC members
- all P/T Blood Representatives
- Québec Ministry Representative (to be determined)
- Hema-Québec Representative (to be determined)
- Health Canada BGTD (Ex-Officio)

- two blood transfusion recipient representatives, chosen jointly by CBS and NAC; one should be an actual blood transfusion recipient (present or past) and the other should be a representative of an appropriate patient society.

Every member of the NEBMC is responsible for naming a designate in the event that he/she is unavailable. The term of any member will be determined by the body that appointed them.

The NEBMC may invite additional experts to meetings on an ad hoc basis to provide expertise on the subject matter being discussed (e.g. Public Health Agency of Canada in the event of a blood shortage secondary to an infectious risk).

Meetings/Quorum

NEBMC will hold regular meetings, emergency simulation meetings and meetings convened at the time of shortages. Regular meetings and emergency simulation meetings will be extremely important to ensure that the committee can effectively function in times of shortages. Regular meetings will consist, at a minimum, of two teleconferences per year. Regular meetings and simulation meetings will be convened at the call of the Chair. Meetings in times of shortages will be convened at the request of CBS, the Lead Province and/or the Chair.

There is no requirement for quorum and decisions of the NEBMC will be made by consensus. Consensus is defined as 80% (or greater) agreement of the NEBMC members present. In the event consensus is reached, the CBS Chief Operating Officer will take the NEBMC recommendation as his or her primary consideration in rendering decisions related to matters identified by the NEBMC mandate. In the event that consensus cannot be reached, the CBS Chief Operating Officer will make the decisions using knowledge of current and future CBS inventories and considering the advice received from the NEBMC.

Communications and Support

Secretariat

A Secretariat, provided by CBS, shall support the work of the NEBMC. The Secretariat shall be responsible for:

- maintaining an up-to-date contact list of members and their designates;
- arranging meetings/teleconferences at the direction of the Chair, including planned and unplanned simulation meetings;
- reporting all proceedings and recommendations of the NEBMC to all members of the NEBMC and their designates and to all P/TEBMC;
- distribution of relevant information and reports from P/TEBMC, CBS or other relevant sources to all NEBMC members and their designates.

NAC Members

In their NEBMC role, NAC medical members will serve as medical/technical advisory representatives for their respective provinces to the NEBMC. In conjunction with their P/T Blood Representative, they will facilitate dissemination and implementation of NEBMC recommendations to their P/TEBMC and Hospital/Regional Health Authority Emergency Blood Management Committee(s) (H/REBMC).

P/T Representatives

In their NEBMC role, P/T representatives will facilitate the dissemination and implementation of NEBMC recommendations to their respective Ministries of Health and their P/TEBMC.

Evaluation

The NAC`s Blood Shortage Working Group will review the implementation and outcomes of the Plan after each simulation exercise and live activation for ongoing refinement and modification of the Plan, and shall report these findings to all members of the NEBMC.

APPENDIX G
GUIDELINES FOR THE OPTIMAL USE OF BLOOD COMPONENTS

A. Broad Guidelines on Blood Components

Clinical Guide to Transfusion, Fourth Edition, Canadian Blood Services, July 2006
http://209.217.107.132/Web/tmws.nsf/resources/CBC_CGT/$file/CBS-CGT-BM.pdf

Bloody Easy 2, Blood Transfusions, Blood Alternatives and Transfusion Reactions, A Guide to Transfusion Medicine, Second Edition, 2005, JL Callum and PH Pinkerton.
http://sunnybrook.nextmovelearning.com/demo_pg.asp

Clinical Practice Guidelines: Appropriate Use of Blood Components – Summary. Australia and New Zealand Society of Blood Transfusion, 2001.
http://www.anzsbt.org.au/publications/documents/BloodComp.pdf

Clinical Practice Guidelines on the Use of Blood Components (red blood cells, platelets, fresh frozen plasma, cryoprecipitate). National Health and Medical Research Council (Australia), 2001. http://www.nhmrc.gov.au/publications/synopses/_files/cp78.pdf

McClelland DBL, editor. Handbook of Transfusion Medicine, 4th Ed. United Kingdom: TSO (The Stationery Office), 2007.
http://www.transfusionguidelines.org.uk/docs/pdfs/htm_edition-4_all-pages.pdf

Transfusion Medicine Handbook 2008: A Guide to the Clinical Use of Blood Components, Blood Products and Blood Transfusion Procedures in New Zealand. New Zealand Blood Service, 2008.
http://www.nzblood.co.nz/site_resources/library/Transfusion_Medicine_Handbook_2008.pdf

B. Guidelines for Specific Components

Red Blood Cells

Blood Transfusion and the Anaesthetist: Red Cell Transfusion. The Association of Anaesthetists of Great Britain & Ireland, 2008.
http://www.aagbi.org/publications/guidelines/docs/red_cell_08.pdf

Guidelines for red blood cell and plasma transfusion for adults and children.
Crosby E, MD, Ferguson D, MD, FRCPC, Hume HA, MD, FRCPC, Kronick JB, MD, PhD, FRCPC, Larke B, MD, CM, DclSc, et al. CMAJ 1997; 156 (11 suppl):S1-S24.
http://www.cmaj.ca/cgi/data/156/11/DC1/6

Guidelines for Red Blood Cell Transfusion. British Columbia Transfusion Medicine Advisory Group, 2003.
http://www.bloodlink.bc.ca/images/stories/rbcguidelines%282003%29.pdf

Guidelines for the Clinical Use of Red Cell Transfusions. British Committee for Standards in Haematology. Brit J Haematol 2001; 113, 24-31.
http://www.bcshguidelines.com/pdf/bjh2701.pdf

Guidelines for the Use of Group O RhD Negative Red Cells. M.F.Murphy for the NBS Transfusion Medicine Clinical Policies Group. National Blood Service (Britain), 2001.
http://www.blood.co.uk/hospitals/library/pdf/FUM002.pdf

Plasma

Recommendations for the use of therapeutic plasma.
Heim MU, Meyer B, Hellstern P. Curr Vasc Pharmacol. 2009 Apr;7(2):110-9. Review.

Clinical Practice Guidelines: Appropriate Use of Fresh Frozen Plasma and Cryoprecipitate – Summary. Australia and New Zealand Society of Blood Transfusion, 2001. http://www.anzsbt.org.au/publications/documents/FrozenPlasma.pdf

Guidelines for red blood cell and plasma transfusion for adults and children. Crosby E, MD, Ferguson D, MD, FRCPC, Hume HA, MD, FRCPC, Kronick JB, MD, PhD, FRCPC, Larke B, MD, CM, DclSc, et al. CMAJ 1997; 156 (11 suppl):S1-S24.
http://www.cmaj.ca/cgi/data/156/11/DC1/6

Guidelines for the Use of fresh-frozen plasma, cryoprecipitate and cryosupernatant. Duguid J, O'Shaughnessy DF, Atterbury C, Bolton Maggs P, Murphy M, Thomas D, Yates S, Williamson LM. The British Society for Haematology 2004;126: 11–28.
http://www.bcshguidelines.com/pdf/freshfrozen_280604.pdf

Recommendations for the use of therapeutic plasma. Heim MU, Meyer B, Hellstern P. Curr Vasc Pharmacol. 2009 Apr;7(2):110-9. Review.

Cryoprecipitate

Clinical Practice Guidelines: Appropriate Use of Fresh Frozen Plasma and Cryoprecipitate – Summary. Australia and New Zealand Society of Blood Transfusion, 2001. http://www.anzsbt.org.au/publications/documents/FrozenPlasma.pdf

Guidelines for the Use of fresh-frozen plasma, cryoprecipitate and cryosupernatant. Duguid J, O'Shaughnessy DF, Atterbury C, Bolton Maggs P, Murphy M, Thomas D, Yates S, Williamson LM. The British Society for Haematology 2004;126: 11–28.
http://www.bcshguidelines.com/pdf/freshfrozen_280604.pdf

Platelets

Clinical Practice Guidelines: Appropriate Use of Platelets– Summary. Australia and New Zealand Society of Blood Transfusion, 2001.
http://www.anzsbt.org.au/publications/documents/Platelets.pdf

Guidelines for Platelet Transfusion. Y. Lin, L. Foltz. British Columbia Transfusion Medicine Advisory Group, 2004.
http://www.bloodlink.bc.ca/images/stories/plateletguidelinesnov04.pdf

Guidelines for the Use of Platelet Transfusions. British Committee for Standards in Haematology. British Journal of Haematology 2003;122: 10–23.
http://www.bcshguidelines.com/pdf/platelettrans040703.pdf

C. Guidelines for the Transfusion of Infants and Children

Broad Guidelines

Transfusion guidelines for neonates and older children. British Committee for Standards in Haematology. British Journal of Haematology 2004;124: 433–453.
http://www.bcshguidelines.com/pdf/Neonates_124_4_2004.pdf

Amendment: Transfusion guidelines for neonates and older children. British Committee for Standards in Haematology. British Journal of Haematology 2004;124: 433–453.
http://www.bcshguidelines.com/pdf/amendments_neonates_091205.pdf

Management of anemia in the newborn; Naomi L.C. Luban; Early Human Development (2008) 84, 493–498

Red Blood Cells

Guidelines for red blood cell and plasma transfusion for adults and children. Crosby E, MD, Ferguson D, MD, FRCPC, Hume HA, MD, FRCPC, Kronick JB, MD, PhD, FRCPC, Larke B, MD, CM, DclSc, et al. CMAJ 1997; 156 (11 suppl):S1-S24.
http://www.cmaj.ca/cgi/data/156/11/DC1/6

Red blood cell transfusions in newborn infants: Revised guidelines. Fetus and Newborn Committee, Canadian Paediatric Society (CPS). Paediatrics & Child Health 2002; 7: 553-558. http://www.cps.ca/english/statements/FN/fn02-02.htm

When to transfuse preterm babies; E F Bell; Arch. Dis. Child. Fetal Neonatal Ed. 2008;93;F469-F473

Platelets

Neonatal and infant platelet transfusions; D.A. SESOK-PIZZINI AND D. FRIEDMAN; Immunohematology, volume 24 , number 1 , 2008 c15

Plasma

Guidelines for red blood cell and plasma transfusion for adults and children. Crosby E, MD, Ferguson D, MD, FRCPC, Hume HA, MD, FRCPC, Kronick JB, MD, PhD, FRCPC, Larke B, MD, CM, DclSc, et al. CMAJ 1997; 156 (11 suppl):S1-S24. http://www.cmaj.ca/cgi/data/156/11/DC1/6

C. Perioperative Blood Transfusion

Practice guidelines for perioperative blood transfusion and adjuvant therapies: an updated report by the American Society of Anesthesiologists Task Force on Perioperative Blood Transfusion and Adjuvant Therapies. American Society of Anesthesiologists Task Force on Perioperative Blood Transfusion and Adjuvant Therapies. Anesthesiology. 2006 Jul;105:198-208.

D. Management of Massive Blood Loss / Haemorrhage

Guidelines on the management of massive blood loss. Stainsby D, MacLennan S, Thomas D, Isaac J, Hamilton PJ. British Journal of Haematology 2006;135: 634–641. http://www.bcshguidelines.com/pdf/bloodloss_2006.pdf

APPENDIX H – Documentation Toolkit

The following forms are examples of forms that could be adapted for use by hospitals or regional health authorities during a blood shortage. They are not intended to be prescriptive, but may be used as a place to begin with the development of site specific documentation for use during a blood shortage.

- **Requests for Blood Components During a Blood Shortage**
- **Blood Component Screening Log for Use During a Blood Shortage**
  [adapted from Sunnybrook Health Sciences Centre]
- **OR Cancellation Report for Use During a Blood Shortage**
  [adapted from Ontario Contingency Plan]
- **Transfusion Log for Use During a Blood Shortage**
  [adapted from Ontario Contingency Plan]

Appendix H

REQUESTS FOR BLOOD COMPONENTS DURING A BLOOD SHORTAGE

Phase: ☐ Amber ☐ Red

Facility: ______________________________ MR#: ______________________________

Component(s) Requested: ☐ Red Cells, # _____ ☐ Platelets, # _____ ☐ Plasma, # _____

Date/Time required: ____

Requested by: ____

Reason for request: ____

Laboratory Data: Hgb: ________ Plt: ____________ INR: ______________

Comments: ____

Number or Products Transfused ______________

Post Transfusion Laboratory data: Hgb: _____ Plt: __________ INR ___________

Adverse events within 24 hours: ____

Additional components requested within 24 hours ________________________________

Comments:

QA

Review of existing processes ____

Recommendation for change ____

Appendix H

Blood Component Screening Log for Use During a Blood Shortage

Phase: ☐ Amber ☐ Red

Facility: ______________________________

Date: 20 / / at 0800 hr **to** 20 / / at 0800 hr

Time	MR#	Last Name	Product & # **Requested**	MD Requesting	Clinical Indication	Products **Available**	Decision	MD reviewing
			☐ Red Cells, # ___ ☐ Platelets, # ____ ☐ Plasma, # _____			☐ Red Cells, # ___ ☐ Platelets, # ____ ☐ Plasma, # _____		
			☐ Red Cells, # ___ ☐ Platelets, # ____ ☐ Plasma, # _____			☐ Red Cells, # ___ ☐ Platelets, # ____ ☐ Plasma, # _____		
			☐ Red Cells, # ___ ☐ Platelets, # ____ ☐ Plasma, # _____			☐ Red Cells, # ___ ☐ Platelets, # ____ ☐ Plasma, # _____		
			☐ Red Cells, # ___ ☐ Platelets, # ____ ☐ Plasma, # _____			☐ Red Cells, # ___ ☐ Platelets, # ____ ☐ Plasma, # _____		

Page ___ of____

Adapted from Sunnybrook Health Sciences Centre

Appendix H

OR Cancellation Report for Use During a Blood Shortage

Surgery Type	Number of Procedures cancelled	Number of Procedures deferred	Adverse Patient Outcome (describe and occurrences)

Page ___ of ___

adapted from Ontario Contingency Plan

Appendix H

Transfusion Log for Use During a Blood Shortage

Patient Type (Service)	Procedure deferred	Relevant Laboratory Results	Length of delay due to transfusion	Adverse patient outcomes (describe any occurrences)

Page ___ of ___

adapted from Ontario Contingency Plan