

ONTARIO HOSPITAL TOOLKIT FOR EMERGENCY BLOOD MANAGEMENT

VERSION: 4.0

DATE: 2026



Inspiring and facilitating best
transfusion practices in Ontario.



Table of Contents

Introduction.....	3
1. Establishing a Hospital Emergency Blood Management Committee (HEBMC)	4
1.1 Hospital Emergency Blood Management Committee and Sample Terms of Reference	4
Hospital Emergency Blood Management Committee (HEBMC)	4
HEBMC Sample Terms of Reference	4
1.2 Preparedness Checklist for Hospitals Developing their Emergency Blood Management Plan	8
Appropriate blood utilization and inventory management (HTS)	9
1.3 Hospital Contingency Phase Self-Assessment Tool.....	11
Green Phase Hospital Self-Assessment tool	11
Green Phase Advisory Hospital Self-Assessment tool.....	13
Amber Phase Hospital Self-Assessment tool	14
Red Phase Hospital Self-Assessment Tool	16
Recovery Phase Hospital Self Assessment Tool	19
2. Developing a Corporate Hospital Emergency Blood Management Plan (HEBMP)	22
2.1. Generic Corporate Hospital Emergency Blood Management Plan	22
2.2. Triage of Massively Bleeding Patients – Corporate Hospital Policy	34
Sample Patient Triage Record	42
2.3. Documentation Logs	46
Transfusion Order Log.....	46
Triage Tracking Log	46
2.4. Calculating Target Inventory Levels by Phases of a Blood Shortage	47
Platelet Tips for Inventory Management in Shortages (Platelet TIMS)	48
2.5. NAC Guidelines for RBC and Platelet Transfusions During Shortages	51
Guideline for the Use of Red Blood Cell (RBC) Transfusions in Children and Adults in Shortage Situations	51
Guideline for the Use of Platelet Transfusions in Children and Adults in Shortage Situations.....	52
3. Communications	53
3.1 Notification Table	53



Documentation of Notification Log	54
3.2 Memo Templates.....	55
Amber Phase Shortage.....	56
Red Phase Shortage	57
Emergency Framework Implementation – Triage of Massively Bleeding Patients.....	58
Recovery Phase Shortage.....	59
Urgent: Patient Notification of Blood Shortage	60
4. Training and Competency	61
4.1 How to Respond in a Blood Shortage – Information for Physicians, Nursing and MLT’s	61
Physicians and Nursing	61
Medical Laboratory Technologists	65
4.2 Blood Shortage Training Checklist	67
4.3 Blood Shortage Plan Competency Training Quiz	69
4.4 What You Need to Know About Management of Blood Shortages	71
Acknowledgements	72
Revisions	72

Introduction

With the release of the Ontario Contingency Plan for the Management of Blood Shortages, version 4.0, this toolkit functions as an adjunct to assist Ontario hospitals in preparing for blood shortage and updating or developing their in-house contingency plan. The toolkit includes practical recommendations, as well as sample forms that hospitals can adapt to conform with their internal forms and policies.

It is imperative that a hospital’s contingency plan is in place and widely accessible at all times, and the plan pertains not only to the functioning of the transfusion service/laboratory, but to all areas of the hospital where transfusion of blood components or blood products may be required. The awareness and involvement of hospital leadership should therefore be part of the development process.

This toolkit was developed by a team of the Ontario Regional Blood Coordinating Network (ORBCoN), who are also members of the Contingency Planning Working Group of the Ontario Emergency Blood Management Committee (OEBMC).

Some of the following documents were modeled off existing hospital policies, generously provided to us, to assist in rendering the Ontario Contingency Plan for practical use.



1. Establishing a Hospital Emergency Blood Management Committee (HEBMC)

1.1 Hospital Emergency Blood Management Committee and Sample Terms of Reference

Hospital Emergency Blood Management Committee (HEBMC)

According to the *Public Hospitals Act*, Regulation 965 and CAN/CSA Z902 hospitals are required to develop plans for emergency situations that could place a greater than normal demand on the services provided by the hospital or disrupt the normal hospital routine. Hospitals should therefore develop and maintain a plan to respond to blood shortages by reducing their demand for the affected blood component or product^{1,2}.

In the event of a shortage of the blood supply, efforts will need to be made at the hospital/facility level to reduce the use of blood components/blood products affected by the shortage. Shortages can result from:

- Events adversely affecting donor population (e.g. pandemic influenza, low donor attendance)
- Events adversely affecting CBS or other manufacturers' ability to collect, test and/or process and deliver blood to hospitals (regulatory failure or catastrophic equipment or building failure, labour disruption, severe weather conditions)
- Unexpected increase in demand for specific blood component/product

In order to ensure blood components and products are available for those patients whose need is life threatening, it will be paramount that hospitals have strategies to reduce routine use of blood to preserve it for these individuals. Actions required may vary for each event and will be dependent on the severity of the situation.

HEBMC is a multidisciplinary committee and can be a separate hospital committee, or subcommittee of another hospital committee such as the Transfusion Committee in smaller hospitals. HEBMC should include hospital staff who order, issue and administer blood, as well as senior administration. Responsibilities include assisting in emergency planning for shortages of blood components and products and implementing the plan during a shortage.

HEBMC Sample Terms of Reference

Purpose/Mandate/Role

The Hospital Emergency Blood Management Committee (HEBMC) will take a collaborative approach to the development of a Hospital Emergency Blood Management Plan (HEBMP) to address the use of blood components/products in the event of a critical shortage in supply. It is recommended that the HEBMP is included or referenced in the hospital's emergency preparedness plan, or made available to the emergency preparedness committee, with the understanding that the hospital's HEBMP is based on the Ontario Emergency Blood Management Committee (OEBMC)/Ministry Of Health (MOH) developed Ontario Contingency Plan for the Management of Blood Shortages³.



In accordance with individual hospital's policies, HEBMC should report to Medical Advisory Committee, or similar leadership committee.

HEBMC follows guidance from OEBMC/MOH and the National Emergency Blood Management Committee (NEBMC) in preparation of and during blood shortages. Activities will be consistent with the Provincial and National plans to manage shortages in the blood supply with some flexibility to tailor these policies and actions to address local needs and issues.

Responsibilities

The HEBMC's responsibility is to develop, implement, review and enforce a HEBMP. The HEBMP includes both actionable items and a communication structure within the hospital.

Key deliverables of the HEBMC include:

- Development and maintenance of HEBMP, in line with the Ontario Contingency Plan³.
- Convening and activating the HEBMP during a shortage.
- Recording of meeting minutes.
- Develop and/or adopt guidelines for transfusions to aid in screening of blood orders in Amber and Red Phase shortages, in line with the Ontario Contingency Plan and NEBMC/OEBMC directives.
- Communication plan for fan-out of notification including communication templates to ensure notification of relevant staff in the event of a blood shortage.
- Development of Triage team including for allocation of scarce resources as outlined in the Ontario Contingency Plan (v4.0, section 2.2.4 Red Phase)³.
- Documentation log sheets for recording of triage decisions for massively bleeding patients during red phase.
- Liaison with and receive updates from Hospital Transfusion Service (HTS).
- Support clinical care areas during a shortage.
- Support the HTS Medical Director/Authority in relief or reduction from other professional duties during an Amber or Red Phase shortage.

When the HEBMP is activated during a blood shortage, the HEBMC actions may include, depending on the phase of shortage:

- Reducing affected inventory held on site.
- Screening of blood orders.
- Establish/invoke a triage team for triaging of massively bleeding patients during red phase, in accordance with the Emergency Framework developed by the National Advisory on Blood and Blood products^{4,5}. Review and record these triage patient outcomes, to ensure 'over triage' and 'under triage' errors are minimized.
- HEBMC will serve as support to the triage team, to resolve any undue pressure to deviate from Emergency framework criteria^{4,5}.
- Deferral of non-urgent elective surgical and medical procedures requiring the component in shortage.
- Documentation of deferred transfusions and procedures.
- Communication of the situation throughout the hospital.



Membership and Voting

The HEBMC will be led by a Chair and Co-Chair (terms of reference should specify how these positions are selected) and may include representation from the following disciplines (as applicable) where blood is used:

- Surgery (e.g., Cardiac, Thoracic, Orthopedic)
- Anesthesiology
- Intensive Care/Trauma/Emergency
- Oncology
- Medical/Hematological (including Hematopoietic Stem Cell Transplant)
- Pediatric/Neonate
- Obstetrics/Gynecology
- Hospital Transfusion Services (HTS)
- Nursing representatives of relevant clinical services
- Senior leadership representative (non-voting optional)

The HEBMC (or equivalent committee) Terms of Reference may include definitions of quorum and outline the process for decision making, when needed.

Meeting procedures

Frequency of meetings: On demand, also during and at least once following an Amber or Red Phase blood shortage.

Agenda and Minutes: as per hospital policies.

Conflict of Interest Declaration: as per hospital policies.

Review and Approval

ToR to be reviewed at regular intervals, in accordance with individual hospital's policies, by the committee or the Transfusion Committee.

Approval date and review dates by the sponsoring body/committee: YYYY/MM/DD

The format of this sample terms of reference was adapted from the Ontario Hospitals Association Form 8.8 Sample Format for Committee Terms of Reference⁶.

Section References

1. [Public Hospitals Act](#) R.S.O. 1990, c.P.40 e-Laws–Ontario
2. National Standard of Canada, CAN/CSA-Z902-25, Blood and blood components; March 2025. CSA Group; Toronto, Ontario.
3. Ontario Contingency Plan for the Management of Blood Shortages. (Version 4.0). Ontario Provincial Blood Programs Coordinating Office, Ministry of Health. 2026.



4. [The National Plan for Management of Shortages of Labile Blood Components](#). National Advisory Committee on Blood & Blood Products & Canadian Blood Services; July 14, 2025
5. [Emergency Framework for Rationing of Blood for Massively Bleeding Patients during a Red Phase of a Blood Shortage](#). Working Group on Emergency Disposition of Blood during a Red Phase Blood Shortage: National Advisory Committee on Blood and Blood Products; April 14, 2012.
6. Ontario Hospitals Association Form 8.8 Sample Format for Committee Terms of Reference [Ontario Hospital Association Guide to Good Governance Forms](#) accessed on April 21, 2026.



1.2 Preparedness Checklist for Hospitals Developing their Emergency Blood Management Plan

This tool provides a step-by-step guide for hospitals to consider when they are developing their Hospital Emergency Blood Management Plan (HEBMP) to ensure they have incorporated all necessary key tasks/activities required according to the Ontario Plan. All HEBMP's should have hospital transfusion service specific information and hospital wide information.

- ☐ Establish Hospital Emergency Blood Management Committee (HEBMC).
- ☐ Develop Terms of Reference for HEBMC.
- ☐ Develop Hospital Emergency Blood Management Plan (HEBMP) and associated laboratory contingency policy for blood shortages.
 - ☐ Ensure that contents of HEBMP are maintained according to Ontario Contingency Plan and hospital policies.
 - ☐ Ensure HEBMP is incorporated into, or made available to, Hospital Emergency Preparedness/Management committees/plan.
 - ☐ Identify surgeries associated with blood loss (greater than 10% probability of blood use based on historical data for your hospital) refer to, or consider developing, a Maximum Surgical Blood Order Schedule (MSBOS).
 - ☐ Define available blood conservation methods/blood alternatives, for example, implement patient blood management (PBM) and apply strategies as outlined in bloodless medicine policy or equivalent.
 - ☐ Determine target inventory levels for blood components by phase of shortage (Green, Green Phase Advisory, Amber, Red), and a process to adjust CBS orders accordingly.
 - ☐ Develop communication strategy for phases (Green phase advisory, Amber, Red, Triage of massively bleeding patients, Recovery) and associated templates to be used for notification of staff and patients.
 - ☐ Identify key stakeholders to be notified upon activation of plan, by phase.
 - ☐ Develop process to maintain updated contact information.
 - ☐ Develop a process to adopt and communicate NEBMC/OEBMC directives during a shortage.
 - ☐ Develop a process to screen transfusion orders during a shortage using hospital guidelines and/or NAC Guidelines for use of RBC/Platelet Transfusions in children and adults in shortages situations.
 - ☐ Develop and maintain documentation templates to record transfusion order deferral or cancellations.
 - ☐ Establish a process to document and recall deferred/cancelled non-urgent/non-emergent elective surgical and medical procedures.



- ☐ Develop hospital triage policy based on the NAC [Emergency framework for rationing of blood for massively bleeding patients in a red phase](#), including accompanying triage tracking and documentation records.
 - ☐ Identify triage officer / team members to implement reduction of blood use if required.
 - ☐ Determine process for adjudication or allocation of scarce resources (refer to section 2.2.4 Red Phase in the Ontario Contingency Plan).
- ☐ Develop training materials and train staff on the contents of the plan and the communication strategy related to blood shortages.
- ☐ Develop a debrief process to review the hospital response to the shortage event and to identify any areas for improvement.
- ☐ Participate in provincial exercises to test the plan (where applicable).
- ☐ Specify retention periods as per hospital policies for communication, processes and policies. Individual patient-related documentation should be retained within the patient's medical record.

Appropriate blood utilization and inventory management (HTS)

- ☐ Develop a process to report hospital disposition of blood components by blood group to CBS Hospital Portal regularly (blood.ca web-based reporting system).
- ☐ Develop a process to report hospital inventory into CBS Hospital Portal regularly (blood.ca web-based reporting system).
- ☐ Define hospital inventory levels to ensure normal blood demand will be filled but wastage is minimized.
- ☐ Adopt best practices in inventory management ([ORBCoN Inventory Management Toolkit](#)).
- ☐ Determine strategies to minimize blood component/product outdating (e.g. participate in redistribution).
- ☐ Define policies for when appropriate to store blood in satellite locations, including process for recall during shortage events.
- ☐ Establish redistribution linkages (develop agreements between hospitals to support redistribution).
- ☐ Outline policies and procedures for redistribution (appropriate shipping containers, packaging configurations, and documentation), ensuring validation/verification/audit of process as required.
- ☐ Adopt guidelines and order sets for the use of blood components to ensure effective utilization (See [Ontario Transfusion Quality Improvement Plan](#) Toolkit).
- ☐ Perform periodic audits to review appropriateness of blood ordering (consider [Using Blood Wisely](#)).
- ☐ Develop and maintain protocol for responding to patients with massive hemorrhage. See ([Provincial MHP Recommendations](#)).



- ☐ Establish a policy for the use of Group A plasma in massive hemorrhage protocols during a shortage when patient blood group is undetermined or not historical group B or AB.
- ☐ Define process for re-stocking thawed plasma during a shortage, if appropriate.
- ☐ Establish process to ensure Laboratory Information System (LIS) codes remain updated for products carried by CBS and Héma-Québec.
- ☐ Determine LIS restrictions on issuing of expired blood components.
- ☐ Outline appropriate communication strategies with CBS hospital liaison specialist.
- ☐ Determine laboratory suitability for splitting components, ensuring processes for validation, maintenance, labelling as required.
- ☐ Specify retention periods as per applicable standards for communication, processes, documentation logs and policies. Individual patient-related documentation should be retained within the patient's medical record.



1.3 Hospital Contingency Phase Self-Assessment Tool

This tool is available for hospitals to use as a guide during a shortage to ensure that all required steps have been activated during each phase of a blood shortage. It can also be used following a shortage by your HEBMC to evaluate your hospital's adherence to the Ontario Contingency Plan¹, overall preparedness and identifying areas of improvement.

The OEBMC may request copies of the self-assessment tool post shortage to inform future decision-making during times of blood shortages.

Green Phase Hospital Self-Assessment tool

CBS Inventory Phase	Key Objectives & Actions	Response
Green Phase	Hospitals (Hospital Transfusion Services [HTS], Hospital Emergency Blood Management Committee [HEBMC])	
	HTS - Inventory Reporting - Are daily inventory levels reported to Canadian Blood Services (CBS) via the Hospital Portal², including all units not yet transfused or issued (e.g., phenotyped and crossmatched RBCs)? If no, reason: - Is monthly disposition of blood components reported to CBS by blood group. If no, reason: 	☐ Y ☐ N ☐ Y ☐ N
	Inventory & Utilization Management HTS - Are inventory stocking levels regularly reviewed, and target levels defined for Green, Green Phase Advisory, Amber, and Red Phases? - Are blood ordering practices regularly audited? (e.g., participating in Using Blood Wisely³) - Has a hospital wide Massive Hemorrhage Protocol (MHP) been adopted in line with provincial recommendations⁴? HEBMC - Have transfusion guidelines and patient blood management strategies been developed and implemented⁵?	☐ Y ☐ N ☐ Y ☐ N ☐ Y ☐ N ☐ Y ☐ N



	Are blood alternatives being considered and used where appropriate? (e.g., access to IV iron or Revised PBM algorithm 2021⁶)	☐ Y ☐ N
	Have surgical procedures with >10% probability of blood use been identified (e.g., via MSBOS)?	☐ Y ☐ N
	HTS - Redistribution Planning	
	Have redistribution agreements been developed with other hospitals?	☐ Y ☐ N
	Are policies and procedures in place for redistribution, including storage and documentation requirements?	☐ Y ☐ N
	HTS - System Integration	
	Have Héma-Québec codes been built into the Laboratory Information System (LIS) for possible acceptance into inventory?	☐ Y ☐ N
	HEBMC - Hospital Emergency Blood Management Plan	
	Has a Hospital Emergency Blood Management Plan (HEBMP) been developed to respond to MOH/NEBMC/OEBMC requests during shortages?	☐ Y ☐ N
	Has the HEBMP been incorporated into your hospital emergency management/preparedness plan?	☐ Y ☐ N
	Has the HEBMP been communicated to clinical hospital staff, and are staff trained on their roles and responsibilities during a shortage? (e.g., through Medical and Nursing Advisory committees)	☐ Y ☐ N
	Have blood conservation strategies been identified and prepared for implementation?	☒ Y ☐ N
	Has a transfusion order screening policy been developed?	☐ Y ☐ N
	If appropriate, has a triage officer/team been identified and trained on their specific roles during a blood shortage?	☐ Y ☐ N



Green Phase Advisory Hospital Self-Assessment tool

CBS Inventory Phase	Key Objectives & Actions	Response
Green Phase Advisory or Regional Shortages	Hospitals (HTS, HEBMC)	
	HTS- Internal Communication Have appropriate laboratory personnel been informed according to the Hospital Emergency Blood Management Plan (HEBMP)?	☐ Y ☐ N
	HTS- Mandatory Inventory Reporting & Monitoring Are daily inventory levels reported to CBS within the NEBMC-specified daily timeframe via the Hospital Portal, including all units not yet transfused or issued (e.g., phenotyped and crossmatched RBCs)? If no, reason:	☐ Y ☐ N
	HTS - Transfusion Practice & Inventory Management - Are transfusion orders reviewed to ensure adherence to hospital transfusion guidelines / Ontario Contingency Plan or NEBMC guidance? - Are redistribution processes being used to avoid outdating? - Has your inventory been reduced as instructed by NEBMC or Ontario Plan? If no, reason:	☐ Y ☐ N ☐ Y ☐ N ☐ Y ☐ N
	HTS - National / Provincial Communications - Is guidance from NEBMC and OEBMC being followed? If no, reason: - Has CBS been informed (via Hospital Liaison Specialist) of any potential changes in blood demand?	☐ Y ☐ N ☐ Y ☐ N



CBS Inventory Phase	Key Objectives & Actions	Response
Amber Phase	Hospitals (HTS, HEBMC)	
	HEBMC - Activation & Communication - Has the Hospital Emergency Blood Management Plan (HEBMP) been initiated for Amber Phase? ☐ Y ☐ N - Has the internal communication plan been launched? ☐ Y ☐ N - Has the HEBMC been convened (if needed) to monitor and control utilization? ☐ Y ☐ N	
	HTS - Mandatory Inventory Reporting & Participation - Are daily inventory levels reported to CBS within the NEBMC-specified daily timeframe via the Hospital Portal, including all units not yet transfused or issued (e.g., phenotyped and crossmatched RBCs)? If no, reason: _____ _____ - Is the hospital participating in CBS production/distribution site teleconferences as scheduled? ☐ Y ☐ N	
	HTS - Transfusion Order Oversight - Are transfusion orders being screened according to NEBMC/OEBMC guidance (NAC Guidelines for RBC and Platelet Transfusion during Blood Shortages)⁷? ☐ Y ☐ N - Are orders outside of guidelines being reviewed by the Transfusion Medicine Medical Director or designate? ☐ Y ☐ N	
	HTS - Inventory Management - Have inventory target levels for affected components been reduced for Amber Phase as defined in the HEBMP? ☐ Y ☐ N - Have units been returned from satellite storage locations? ☐ Y ☐ N - Is crossmatching performed on demand only, and units released from crossmatched inventory (i.e., post-surgery) as appropriate? ☐ Y ☐ N - Has redistribution been initiated avoid wastage due to outdating? ☐ Y ☐ N - Is Group A plasma being considered as an alternative to AB plasma in MHPs when appropriate? ☐ Y ☐ N	



HEBMC – Demand Management

- Are blood conservation strategies and alternatives being used to reduce demand? ☐ Y ☐ N
- If directed by NEBMC/OEBMC, have non-urgent elective procedures (>10% chance of requiring blood) been deferred or cancelled? ☐ Y ☐ N
- Have non-urgent transfusions requiring affected components been deferred or cancelled? ☐ Y ☐ N
- Have all deferral/cancellation decisions been documented on the [Transfusion Order log](#) and in patient medical record? ☐ Y ☐ N

HEBMC - Patient Communication

- Have patients and families been notified if treatment is deferred, with reasons provided (e.g., using the [Patient Notification of Blood Shortage](#) template)? ☐ Y ☐ N

Comments, challenges, successes, and feedback from stakeholders:



CBS Inventory Phase	Key Objectives & Actions	Response
Red Phase	Hospitals (HTS, HEBMC)	
	HEBMC - Activation & Communication - Has the HEBMP been activated for Red Phase? ☐ Y ☐ N - Has the internal communication plan been launched? ☐ Y ☐ N - Has the HEBMC been convened (if needed) to monitor and control utilization? ☐ Y ☐ N	
	HTS - Mandatory Inventory Reporting & Coordination - Are daily inventory levels reported to CBS within the NEBMC-specified daily timeframe via the Hospital Portal, including all units not yet transfused or issued (e.g., phenotyped and crossmatched RBCs)? If no, reason: _____ _____ - Is the hospital participating in CBS production/distribution site teleconferences as scheduled? ☐ Y ☐ N	
	HTS- Transfusion Order Oversight - Are transfusion orders being screened according to NEBMC/OEBMC guidance (NAC Guidelines for RBC and Platelet Transfusion during Blood Shortages)⁷? ☐ Y ☐ N - Are orders outside of guidelines being reviewed by the Transfusion Medicine Medical Director or designate? ☐ Y ☐ N	
	HTS- Inventory Management - Have inventory target levels for affected components been reduced for Red Phase as defined in the HEBMP? ☐ Y ☐ N - Have units been returned from satellite storage locations? ☐ Y ☐ N - Is crossmatching performed on demand only, and units released from crossmatched inventory (i.e., post-surgery) as appropriate? ☐ Y ☐ N - Has redistribution been initiated to avoid wastage due to outdating? ☐ Y ☐ N - Is Group A plasma being considered as an alternative to AB plasma in MHPs when appropriate? ☐ Y ☐ N	
	HEBMC - Demand Management	



	Are NEBMC/OEBMC recommendations being followed? If no, reason: 	☐ Y ☐ N
	Have all elective, non-emergency procedures requiring affected components been deferred or cancelled?	☐ Y ☐ N
	Have deferred / cancelled non-urgent transfusions been documented on the Transfusion Order log and in the patient medical record?	☐ Y ☐ N
	Are all transfusion order decisions reported to the HEBMC?	☐ Y ☐ N
	Allocation of Scarce Resources:	
	Has triage team been notified of assistance in situation of needing to allocate scarce resource? (see Ontario Contingency Plan v4.0 section 2.2.4 Red Phase¹)	☐ Y ☐ N
	Is reassessment of denied orders happening at defined intervals?	☐ Y ☐ N
	HEBMC - Emergency Framework Activation^{8,9,10}	
	If directed by NEBMC, has the Emergency Framework for massively bleeding patients been activated?	☐ Y ☐ N
	Have physicians been notified of the Emergency Framework activation?	☐ Y ☐ N
Has the triage team been assembled and roles and responsibilities defined?	☐ Y ☐ N	
Has the Triage Tracking log (laboratory) been initiated for massively bleeding patients?	☐ Y ☐ N	
Is the triage team documenting decisions on the Patient Triage Record?	☐ Y ☐ N	
Has the triage team been made aware of psychosocial supports?	☐ Y ☐ N	
Additional Strategies:		
Have other strategies (e.g., deferral of chemotherapy or stem cell transplants, component splitting) been considered?	☐ Y ☐ N	
- Are blood conservation strategies and alternatives being maximized? - Is PCC being used as an alternative to plasma if supply is critical? - Are units of RBCs or Platelets being split when appropriate? - Are NEBMC recommendations on extending expiry of components being followed, if applicable?	☐ Y ☐ N ☐ Y ☐ N ☐ Y ☐ N	



	Triage Team - Ethical Considerations & Reassessment of massively bleeding patients	
	Has consideration been given to stopping transfusion in patients with very low survival probability (as per Emergency Framework)⁸?	☐ Y ☐ N
	- Are patients denied blood being reassessed at least daily, or sooner if their condition changes? - Are supportive care and palliative measures being provided when transfusion is withheld?	☐ Y ☐ N ☐ Y ☐ N
	HEBMC - Patient Communication	
	Have patients and families been notified if treatment is deferred, with reasons provided (e.g., using the Patient Notification of a Blood Shortage template)?	☐ Y ☐ N
Comments, challenges, successes, and feedback from stakeholders:		



Recovery Phase	Hospitals (HTS, HEBMC)	
	HEBMC - Activation & Communication - Has the internal communication plan been launched? - Has the Recovery Phase of the HEBMP been initiated?	☐ Y ☐ N ☐ Y ☐ N
	HTS - Mandatory Inventory Reporting & Surveillance - Are daily inventory levels reported to CBS within the NEBMC-specified daily timeframe via the Hospital Portal, including all units not yet transfused or issued (e.g., phenotyped and crossmatched RBCs)? If no, reason: - Has CBS HLS been informed of any surge the hospital anticipates that might affect return to normal operations?	☐ Y ☐ N ☐ Y ☐ N ☐ N/A
	HTS - Inventory Management Has there been a gradual return to Green Phase inventory levels once CBS confirmed stability?	☐ Y ☐ N
	HEBMC - Demand Management - Has the HEBMC been convened to support decisions and maintain close surveillance of blood use for 24–48 hours? - Have patients for elective surgeries and non-urgent transfusions been recalled/rescheduled as directed by NEBMC to avoid a surge in demand? - Are blood conservation strategies and alternatives still being applied? - Is the HEBMC maintaining vigilance over transfusion orders to ensure adherence to hospital-approved guidelines and a gradual return to normal?	☐ Y ☐ N ☐ Y ☐ N ☐ Y ☐ N ☐ Y ☐ N
	Post-Recovery Debrief & Feedback - Once CBS declares a return to Green Phase, has the HEBMC been convened within 4–6 weeks to debrief and recommend updates to the HEBMP? - Have suggestions for improvement to the Ontario Plan been submitted to the Regional ORBCoN representative?	☐ Y ☐ N ☐ Y ☐ N



Section References

1. Ontario Contingency Plan for the Management of Blood Shortages. (Version 4.0). Ontario Provincial Blood Programs Coordinating Office, Ministry of Health. 2026.
2. User Guide - Canadian Blood Services Hospital Portal. V 2.0 Feb 2, 2021. Canadian Blood Services.
3. Audit & Intervention - Using Blood Wisely [Internet]. Using Blood Wisely. 2026 [cited 2026 Mar 25]. Available from: <https://usingbloodwisely.ca/intervention/>
4. Massive Hemorrhage Protocol – ORBCoN [Internet]. Transfusionontario.org. 2019 [cited 2026 Mar 25]. Available from: <https://transfusionontario.org/en/category/massive-hemorrhage-protocol/>
5. [Bloody Easy 5.1](#), 2023 [Ontario Transfusion Quality Improvement Plan \(OTQIP\)](#), 2025
6. [Revised PBM algorithm 2021](#) ONTraC program [Internet]. Ontracprogram.com. 2023 [cited 2026 Mar 25].
7. [The National Plan for Management of Shortages of Labile Blood Components](#). National Advisory Committee on Blood & Blood Products & Canadian Blood Services; July 14, 2025



8. [Emergency Framework for Rationing of Blood for Massively Bleeding Patients during a Red Phase of a Blood Shortage](#). Working Group on Emergency Disposition of Blood during a Red Phase Blood Shortage: National Advisory Committee on Blood and Blood Products; April 14, 2012.
9. [Emergency framework for rationing of blood for massively bleeding patients during a red phase of a blood shortage – Synopsis for Triage Team](#). National Advisory Committee on Blood and Blood Products; October 11, 2012.
10. [Triage tool for the rationing of blood for massively bleeding patients during a severe national blood shortage: guidance from the National Blood Transfusion Committee](#). Doughty H, Green L, Callum J, Murphy MF; National Blood Transfusion Committee. Br J Haematol. 2020 May 20;10.1111/bjh.16736. doi: 10.1111/bjh.16736. Online ahead of print. PMID: 32436251



2. Developing a Corporate Hospital Emergency Blood Management Plan (HEBMP)

2.1. Generic Corporate Hospital Emergency Blood Management Plan

This is a hospital wide plan that should be part of your corporate policies, and complement any strategies, processes or policies developed by the laboratory. This template can be used by hospitals to develop their HEBMP. The HEBMP should be developed by the hospital's emergency blood management committee (HEBMC) or equivalent, in conjunction with other key hospital stakeholders, such as risk/emergency management and leadership.

Key elements of the plan may include:

Principle

Blood components and products are supplied directly to hospitals from Canadian Blood Services (CBS). If CBS is unable to fill inventory requests for blood components or blood products at requested levels, hospitals shall have a policy and procedure in place to adjust their usage in response to request from the National Emergency Blood Management Committee (NEBMC) and/or the Ontario Emergency Blood Management Committee (OEBMC) which includes representation from the Ministry of Health (MOH). The degree of reduction of blood inventory levels/shipments from CBS required will be dependent on the severity, expected length of the shortage and the specific component/product in shortage. It is critical that stockpiling of the component/product in shortage does not occur at the hospital level.

Blood shortages are categorized into phases to help define the required level of response/reduction at the hospital level. Each of these phases will be communicated by CBS and OEBMC.

Green Phase: No blood shortage exists. CBS can fill the majority of hospital requests to optimal inventory levels. Hospitals practice routine strategies to minimize product wastage and ensure appropriate utilization.

Green Phase Advisory: CBS inventory is low for a particular blood component or there may be potential for a supply shortage (inability of CBS to collect adequate donations to meet demand, or a large loss of supply). Hospitals will be required to report their available inventory to aid in the assessment of the need to escalate to an Amber or Red Phase.

Amber Phase: CBS is unable to fulfil hospital requests as submitted to maintain an optimal inventory level. The shortage may result from a short-term imbalance between the supply and hospital demand. Hospitals will be required to reduce inventory levels and may be required to defer non-urgent elective surgical/medical procedures and non-urgent transfusions requiring the affected blood component.

Red Phase: CBS will declare a Red Phase when blood component/product inventory is at a critically low level nationally and is not expected to improve for a prolonged time. In this situation, hospital demand will continue to outpace available inventory. Hospital action is required to reduce inventory levels and will be required to



defer/cancel non-emergency surgical or medical procedures requiring the affected blood components/products to conserve for critical and life-threatening situations only.

Recovery Phase: When inventory begins to improve it is critical that hospital use does not resume at normal operating rates immediately. Blood use reductions should remain in place until CBS indicates that inventory has reached a stable level. A notification from CBS will advise hospitals when inventory has returned to a stable level. Following this notification, hospitals can gradually increase usage as directed.

Scope/Related Policies

The following are suggested related policies that might be in place that should be reviewed when developing either the HEBMP or Hospital Transfusion Service (HTS) policy.

HTS policy

- i. Stock inventory levels defined (by blood component/product to include normal operating levels (optimal) and emergency/critical inventory levels).
- ii. Redistribution/transfer of blood to/from another facility (as contingency).
- iii. Initial communication plan of blood shortage to hospital departments.
- iv. Screening of blood component/product transfusion orders (appropriate indication).

HEBMP

- i. Maximum Surgical Blood Order Schedule (MSBOS).
- ii. Use of hospital specific, approved transfusion guidelines/order sets and policies for screening blood orders.
- iii. Allocation of scarce resources / triage.
- iv. Deferring / cancellation and rescheduling of surgical and medical procedures.
- v. Issuing hospital wide communication.
- vi. Patient notification of deferred/canceled procedures.

Records/Forms/Documents

1. Communication memo templates for internal notification of medical, nursing and laboratory personnel and patients.
 - i. Amber Phase memo
 - ii. Red Phase memo
 - iii. Triage of Massively Bleeding Patients memo
 - iv. Recovery Phase memo
 - v. Patient notification memo
2. Laboratory specific communication forms relating to CBS notification.
 - i. Form to record CBS conference calls on inventory status.
3. Hospital specific transfusion guidelines/order sets and laboratory policies for screening blood orders.
4. Contact list of personnel and leadership to receive notification memos by phase.



5. Documentation logs for recording decisions relating to reduction of blood use (reduction, deferral, cancellation and triage).
6. Minutes to HEBMC meetings held during the shortage.

Procedure

Phase	Include in HEBMP	Include in HTS specific policy
Green Phase: Normal operations, preparation phase	- Develop and maintain hospital wide HEBMP and establish HEBMC or equivalent. - Prepare facility to ensure ability to respond to a notification of blood shortage. - Distribute the HEBMP to relevant hospital stakeholders (at minimum those in the communication strategy). - Consider holding a mock blood shortage exercise to test plan and staff competency. - Develop/adopt hospital approved transfusion guidelines. - Develop a structure and process for a triage team. - Support existing blood conservation strategies.	- Develop and maintain laboratory specific blood contingency policies. - Follow standard operating procedures under normal blood inventory (optimal) levels. - Train laboratory staff on contents of the blood shortage plan and communication strategy. - Assist hospital leadership in developing/adopting transfusion guidelines, Maximum Surgical Blood Order Schedule. - Establish redistribution partnerships. - Reporting of daily inventory levels to CBS by blood group. - Build Hema Quebec e-codes in LIS for acceptance of products into inventory.



Phase	Include in HEBMP	Include in HTS specific policy
Green Phase Advisory: concern exists with respect to supply	N/A	- Determine responsibility, timeline, method and appropriate level of leadership notification upon receiving notification of Green Phase Advisory from CBS. For example, laboratory staff to notify internal personnel: - Manager/supervisor responsible for transfusion service. - Medical Director responsible for transfusion service. - Monitor communications from CBS and MOH and follow recommendations from NEBMC and OEBMC. - Report inventory to CBS (using web-based disposition reporting system). Reduce inventory levels as recommended. - In case of a regional, anticipated short term shortage of platelets: Hospitals with cardiopulmonary bypass surgery and trauma centres to consider deferring prophylactic platelet transfusions for non-bleeding patients to later in the day, in order to have platelets available for trauma and cardiac surgery. Communicate any shortage in early morning to cardiac surgery team.

Phase	Include in HEBMP	Include in HTS specific policy
Include all actions in Green Phase Advisory		
Amber Phase		
Initiate hospital wide internal communication	- Convening of HEBMC or equivalent committee. - Distribute notification memo to clinical areas as per individual hospital policy. - Follow directives from NEBMC/OEBMC regarding: - Directed strategies (e.g., conservation measures, deferral/cancellation of procedures). - Document any deferred or cancelled procedures.	- Activation of HEBMP. - Upon notification of Amber Phase from CBS, notify internal personnel (refer to Amber Phase memo template): - Develop an acknowledgement process of receipt of Blood Shortage communication (Notification Log). - Assign key point person to liaise with CBS regarding inventory status.



Phase	Include in HEBMP	Include in HTS specific policy
Include all actions in Green Phase Advisory		
	Implement alternative treatment as required.	- Document communication between hospital laboratory and CBS relating to inventory status/levels. - In case of a regional, anticipated short term shortage of platelets: Hospitals with cardiopulmonary bypass surgery and trauma centres to consider deferring prophylactic platelet transfusions for non-bleeding patients to later in the day, in order to have platelets available for trauma and cardiac surgery. Communicate any shortage in early morning to cardiac surgery team.
Implement reduction of inventory levels held on site		- Reduce desired inventory target (on hand inventory levels) to defined Amber level. - Reduce or recall inventory held in satellite storage locations (trauma room, operating room) to HTS.
Implement review of orders for the affected blood component(s)/ product(s)	- Physicians planning non-urgent elective medical procedures that may require affected component, to submit these requests in advance to HTS medical director or designate. - Adopt and support "Guidelines for RBC and Platelet Transfusions in Adults and Children in Shortage Situations".	- Adopt NEBMC recommendations for screening transfusion orders. - HTS physician or designate reviews each request that does not comply with guidelines and makes a decision on approval and documents the decision. - Ensure all orders for blood requested for surgical use comply with the facility MSBOS as applicable. - Reduce crossmatches held post operatively for any blood not required during surgery. - Consider relieving HTS medical director of other duties to focus on management of blood shortage.
If shortage continues, review non-urgent elective surgeries and medical procedures and non-urgent	- As directed by NEBMC or OEBMC, designated medical personnel (HEBMC or transfusion committee) reviews all impending non-urgent elective surgery and medical procedures for potential blood use and defers as appropriate. - Deferral of elective surgery will be completed in consultation with Chief of Surgery following existing hospital policy/procedure and as directed by NEBMC/MOH/OEBMC. - Document deferral decisions for rescheduling as per hospital policy. - Deferred/canceled patients must be notified - refer to patient notification memo template. - Provide total daily deferral numbers to HTS for statistics and reporting to OEBMC/MOH.	



Phase	Include in HEBMP	Include in HTS specific policy
Include all actions in Green Phase Advisory		
transfusions scheduled	- Encourage use of patient blood management practices including: - use of erythropoietin, - oral and/or intravenous iron, - use of medication to reduce blood loss (e.g. tranexamic acid), and - peri-operative blood salvage. - Statistical Monitoring: - Monitor total daily non-urgent elective surgical/medical procedure deferral numbers and report to OEBMC/MOH as directed. - Record total daily non-urgent transfusion deferrals. - In AB plasma shortage, consider substituting group A plasma in massive transfusion protocols.	

Phase	Include in HEBMP	Include in HTS specific policy
Include all actions in Amber Phase		
Red Phase		
Initiate hospital wide internal communication	Distribute notification memo to clinical areas as per individual hospital policy.	Upon notification of Red Phase from CBS, notify internal personnel as per laboratory policy (refer to Red Phase memo template).
Implement reduction of inventory levels held on site		Reduce inventory target (on hand inventory levels) to defined red level.
Implement review of orders for the affected blood component(s)/ product(s)	- HEBMC adopt "Guidelines for RBC and Platelet Transfusions in Adults and Children in Shortage Situations". - Follow directions as provided from NEBMC and OEBMC. - Hospital to assign designated physician(s) to review all blood orders received (e.g., HEBMC clinicians on day shift, designate off hours). - Base approval on individual clinical evaluation and whether the need is deemed to be life threatening.	- Consider relieving HTS medical director of other duties to focus on management of blood shortage. - HTS medical director to assist HEBMC physician team in clinical decision making. - The blood component(s) in short supply should not be held or reserved for any patient.



Phase	Include in HEBMP	Include in HTS specific policy
Include all actions in Amber Phase		
	- Document ALL transfusion decisions of affected blood component on log sheets. - The blood component(s) in short supply should not be held or reserved for any patient.	
If shortage continues, review non-urgent elective surgeries and medical procedures and non-urgent transfusions scheduled	- As directed by NEBMC or OEBMC, designated medical personnel (HEBMC or transfusion committee) reviews all impending non-urgent elective surgery and medical procedures for potential blood use and defers as appropriate. - Deferral of elective surgery will be completed in consultation with Chief of Surgery following existing hospital policy/procedure and as directed by NEBMC/MOH/OEBMC. - Document deferral decisions for rescheduling as per hospital policy. - Deferred/canceled patients must be notified - refer to patient notification memo template. - Provide total daily deferral numbers to HTS for statistics and reporting to OEBMC/MOH. - Encourage use of patient blood management practices including: - use of erythropoietin, - oral and/or intravenous iron, - use of medication to reduce blood loss (e.g. tranexamic acid), and - peri-operative blood salvage. - Statistical Monitoring: - Monitor total daily non-urgent elective surgical/medical procedure deferral numbers and report to OEBMC/MOH as directed. - Record total daily non-urgent transfusion deferrals. - In AB plasma shortage, consider substituting group A plasma in massive transfusion protocols.	
Communicate with other nearby facilities		The HTS medical director will communicate with other nearby hospital facilities (local CBS Medical Director may be involved) to determine if inter-hospital transfer is required to support patients in critical need of blood component(s) / product(s).
Consider options of splitting blood component(s)		Consider splitting components if feasible.
Allocation of scarce resources	The National Plan does not address the situation where a specific component is required at one time and fewer units are available than eligible patients	



Phase	Include in HEBMP	Include in HTS specific policy
Include all actions in Amber Phase		
	needing transfusion (and splitting of units is not feasible or not sufficient), outside of the scenario of massive bleeding patients. In this rare event it is suggested that the allocation of the scarce resources to be done by the triage team. The allocation may involve using the decision algorithm used in the NAC Emergency framework for rationing of blood for massively bleeding patients during a red phase of a blood shortage- Synopsis for Triage Team ⁹ , or other established decision process for allocation of scarce medical resources during shortages.	
Implement NAC Emergency Framework	Implement the NAC Emergency Framework for rationing blood in massively bleeding patients in a Red Phase if directed by NEBMC.	

Phase	Include in HEBMP	Include in HTS specific policy
Recovery Phase		
Initiate internal communication		Upon notification of Recovery Phase by CBS, notify all internal personnel previously notified of the shortage (refer to Recovery Phase memo template).
Maintain inventory levels targeted to hold on site at reduced levels	Continue to refrain from holding inventory in satellite storage locations (trauma room, operating room) until return to Green Phase.	- Maintain inventory at Amber level until notified by CBS that national inventory has reached stability. - Refrain from issuing inventory to satellite storage locations (trauma room, operating room) until return to Green Phase. - Continue to report inventory to CBS as requested.



Review of orders for the blood component(s) / product(s) that the shortage applies to		- HTS technologist continue to prospectively screen blood orders against facility adopted guidelines for relevant affected component. - HTS physician or designate will review each request that does not comply with facility adopted guidelines and make approval decisions or discuss request with ordering physician. - Ensure all orders for blood requested for surgical use comply with the facility MSBOS as applicable. - Reduce crossmatches held period post operatively for any blood not required during surgery.
Review of elective transfusions scheduled	- As inventory improves based on prioritization of need as determined by the HEBMC or designated physician(s): - Gradually resume elective transfusion, beginning with non-surgical patients. - Gradually reschedule deferred surgical and medical procedures including transfusions.	Keep CBS informed about any operational changes that may impact demand for blood.
Return to green phase	- Return to normal operations. - HEBMC to consider facilitating feedback. - Convene HEBMC to review the event and assess adequacy of hospital response.	- Once communication from CBS is received that blood inventory for the component(s) / product(s) that was in short supply has recovered, gradually increase the inventory held on site to optimal levels. - Supply any statistical monitoring to OEBCMC / MOH as requested.



Guidelines for Red Blood Cell and Platelet Transfusions by Phase

Guidelines for the use of Red Blood Cell (RBC) Transfusion in Children and Adults in Shortages Situations

(Appendix B in Ontario Plan, Table 5 in the National Plan)

Green Phase	Amber Phase	Red Phase
Major Hemorrhage	Major Hemorrhage	Major Hemorrhage
Follow your hospital guidelines.	Follow your hospital guidelines.	Follow your hospital guidelines. Follow triage/emergency framework if instructed by NEBMC. ^a
Surgery/Obstetrics	Surgery/Obstetrics	Surgery/Obstetrics
Follow your hospital guidelines.	Urgent ^b and emergency ^c surgery in consultation with HEBMC. Peri/post-partum hemorrhage: consider use of alternatives to minimize RBC requirements. For all situations, the minimal number of units to stabilize patients should be used.	Emergency situations in consultation with HEBMC. Follow triage/emergency framework if instructed by NEBMC. ^a
Non-Surgical Anemias/Medical Procedures^d	Non-Surgical Anemias/Medical Procedures^d	Non-Surgical Anemias/Medical Procedures^d
Follow your hospital guidelines.	All requests for RBC transfusion in patients with a Hb level >60 g/L must be reviewed by designated medical personnel. For patients with hypoproliferative anemias or other chronic transfusion needs, single unit transfusion should be provided if alternatives to red cells are unsuccessful and significant symptoms associated with anemia are present. Reassessment of severity of symptoms after each unit is required.	All requests for RBC transfusion in patients with a Hb level > 50 g/L must be reviewed by designated medical personnel. For patients with hypoproliferative anemias or other chronic transfusion needs, single unit transfusion should be provided if alternatives to red cells are unsuccessful and significant symptoms associated with anemia are present. Reassessment of severity of symptoms after each unit is required. Follow the guidance found in the CanHaem ¹⁰ Blood conservation for hemoglobinopathy patients during pandemic blood shortage .

- These guidelines are available on NAC website: [Emergency framework for rationing of blood for massively bleeding patients during a red phase blood shortage](#).
- Urgent surgery: a patient likely to have major morbidity if surgery not performed in the next 1 to 28 days.
- Emergency surgery: patients are likely to die or have major morbidity within 24 hours without surgery.
- Non-surgical anemias include anemia associated with bone marrow failure, post traumatic injury, extracorporeal membrane oxygenation (ECMO), post-operative states and associated with obstetrics. Medical procedures include but are not limited to simple transfusion, exchange transfusion, high-dose chemotherapy and stem cell transplant.



Guidelines for the use of Platelet Transfusions in Children and Adults in Shortage Situations

(Appendix C in the Ontario Plan, Table 6 in the National Plan)

Green Phase	Amber Phase	Red Phase
Major Hemorrhage	Major Hemorrhage	Major Hemorrhage
Immune thrombocytopenia and life- or limb-threatening bleeding maintain PC > 10 x 10⁹/L. For head trauma or CNS bleeding maintain a PC > 100 x 10⁹/L. Other significant bleeding, or acute promyelocytic leukemia at acute	For head trauma or CNS bleeding maintain a PC > 80 x 10⁹/L. Withhold routine platelet issue in massive hemorrhage packs in the absence of a confirmed indication for platelet transfusion (e.g. platelet dysfunction, PC < 50 x 10⁹ /L).	Same as Amber phase.
Invasive Procedures/Surgery/ECMO	Invasive Procedures/Surgery/ECMO	Invasive Procedures/Surgery
For non-surgical invasive procedures maintain a PC > 20 x 10⁹/L (central venous catheter insertion, paracentesis, thoracentesis). For lumbar puncture maintain a PC > 20 x 10⁹/L. For CNS surgery maintain a PC > 100 x 10⁹/L. For ECMO maintain a PC > 50-80 x 10⁹/L.	Urgent^a and emergency^b surgery in consultation with HEBMC. In presence of active bleeding or surgical procedure maintain a PC > 30 x 10⁹/L or if CNS trauma/surgery a PC > 80 x 10⁹/L. For non-surgical invasive procedures (other than bone marrow aspiration or biopsy) maintain a PC > 10 x 10⁹/L with image guidance. For lumbar puncture, maintain a PC > 10 x 10⁹/L.	Emergency surgery in consultation with HEBMC. All requests for platelet transfusion must be reviewed by designated medical personnel.
Bone Marrow Failure/ Hematopoietic Stem Cell Transplantation/Chemotherapy/Chronic transfusion recipients	Bone Marrow Failure/Hematopoietic Stem Cell Transplantation/ Chemotherapy/ Chronic transfusion recipients	Bone Marrow Failure/ Hematopoietic Stem Cell Transplantation/Chemotherapy/ Chronic Transfusion recipients
Adhere to a maximum threshold PC of 10 x 10⁹/L for prophylactic platelet transfusions.	Adhere to a maximum threshold PC of 10 X10⁹/L for outpatient prophylactic platelet transfusions; consider lowering this threshold to 5 x 10⁹/L for inpatient prophylactic transfusions. Transfuse autologous stem cell transplant patients only if symptoms of bleeding. All requests for a platelet transfusion in non-bleeding patients with a PC > 10 x10⁹/L must be reviewed by designated medical personnel. Split PC doses and use of half doses in non-bleeding patients if necessary.	Cease all prophylactic transfusions. All requests for platelet transfusions in non-bleeding patients must be reviewed by designated medical personnel.

- Urgent surgery: patient likely to have major morbidity if surgery not performed within the next 1 to 28 days.
- Emergency surgery: patient likely to die or have major morbidity within 24 hours without surgery.



Resources

Canadian Standards Association Standards for Blood and Blood Components, CSA Z902:25. CSA Group. Mar 2025.

Medical Laboratory Accreditation Requirements (Version 9.1). Accreditation Canada Diagnostics. June 2025.

Ontario Contingency Plan for the Management of Blood Shortages (Version 4.0). Ontario Provincial Blood Programs Coordinating Office, Ministry of Health. 2026.

The National Plan for the Management of Shortages of Labile Blood Components. National Advisory Committee on Blood and Blood Products & Canadian Blood Services. July 14, 2025.

Emergency Framework for Rationing of Blood for Massively Bleeding Patients during a Red Phase of a Blood Shortage. Working Group on Emergency Disposition of Blood during a Red Phase Blood Shortage: National Advisory Committee on Blood and Blood Products. April 14, 2012.

Revisions

Ensure that any revisions or updates of the HEBMP are documented and the previous versions archived can be accessed, as per your hospital's document control policy.



2.2. Triage of Massively Bleeding Patients – Corporate Hospital Policy

This is a hospital wide policy that should be part of your HEBMP, and complement any strategies, processes or policies developed by the hospital for other situations where triaging may be warranted. The policy should be developed by the hospital's emergency blood management committee (HEBMC) or equivalent, in conjunction with other key hospital stakeholders, such as risk/emergency management and leadership.

Key elements of the plan may include:

Policy

During a period of critical blood component shortage, it may be necessary to withhold transfusion support for massively bleeding patients to maintain product availability for other individuals. As such decisions carry significant medical, legal, and ethical repercussions, therefore a designated triage team, operating under a defined framework, is required to perform this task of triaging patients requiring blood and blood products. The following information is in alignment with the National Advisory Committee on Blood and Blood Products - Emergency Framework for Rationing of Blood for Massively Bleeding Patients during a Red Phase of a Blood Shortage document^{1,2}. Corporate hospital policies may already have a framework for triaging patients in critical shortages (e.g., respirators during COVID, critical drug shortages) and should be considered in addition to specific information outlined for blood component shortages.

A triage team including team leader should be identified by the hospital HEBMC to handle the complex and critical nature of adjudication, and it is recommended that the triage team be established in advance of a potential blood shortage. Depending on the size and scope of the hospital this multidisciplinary team may be comprised of the following administrative and clinical positions:

1. Triage Team Leader. The triage team leader should be an experienced physician with familiarity in triaging critically ill patients, and broad-based knowledge of resources and capabilities of healthcare organizations. The triage team leader will have the final responsibility and authority over clinical decisions.
2. A Management Representative. A management representative is required to provide guidance on the capability of the organization regarding resources, personnel, external support, and internal and external communications.
3. An ethicist³.
4. A nursing supervisor to provide direction on alternate care.
5. Representative from the emergency room, trauma, transplantation, cardiovascular surgery, gastroenterology, and obstetrics to provide updates on demand, impact and assist in decision making.
6. Palliative care nurse or physician for patients not triaged to receive blood.
7. Social worker.
8. Chaplain.
9. Hospital Transfusion Service representative.

Identified core members of the triage team should have designates to ensure 24-hour availability. Team members should ensure that they are staying up to date with the following:



- Familiar with principles of patient triage and resource rationing frameworks during scarcity.
- Familiar with other corporate emergency hospital policies and the hospital emergency blood management plan.

Principles

The triage team should make patient-care decisions based on the following minimum principles:

- The team must remain separate from the direct clinical care of the patient.
- The team's responsibility extends to all patients served by the Transfusion Service, not solely the individual patient under review.
- The team should be blinded to any patient-identifying information that is not essential to the triage decision.
- During a massive hemorrhage, an appeals process is not clinically feasible; therefore, the agreed-upon triage framework must be applied rapidly and decisively without an appeal mechanism.
- If transfusion support is withdrawn, all appropriate pain and symptom-management measures, as well as alternative care environments, must be made available as needed.

The triage team has the responsibility of providing a copy of the patient's triage record to the HTS at the end of each shift. HTS will provide this copy with patient identifiers to the patient care team, to ensure the documentation of the following adjudication elements in the patient's record:

1. Component and phase of blood shortage.
2. Triage decision
3. Reason for exclusion, if applicable
4. Date/time of next planned re-evaluation
5. Contact information from the triage team leader to provide a status update for the patient before the next re-assessment.

The triage team should have adequate administrative and psychological support services available to them.

Procedure

1. Upon notification that the Hospital Emergency Blood Management Plan (HEBMP) has been activated in red phase blood shortage, the HEBMC should ensure that the triage team leader has contacted the other triage team members to confirm availability and, if unable to confirm, identify appropriate designate(s).
 - NEBMC will instruct hospitals when implementation is required of the Emergency Framework for Rationing of Blood for Massively Bleeding Patients during a Red Phase of a Blood Shortage.
2. Upon notification from NEBMC, HTS will initiate hospital communication regarding [implementation of triage in massively bleeding patients](#).
3. The Hospital Transfusion Service (HTS) will identify any patients experiencing or anticipated to need massive hemorrhage protocol activation and create an anonymized [Patient Triage Record](#) (section A) for each, populated with a unique tracking number, the cause of massive hemorrhage, and the date and time of triage.



- A corresponding [triage tracking log](#), linking each patient's identifiers with the unique tracking number documented on the [Patient Triage Record](#), will be maintained by the HTS and not provided to the triage team, to maintain blinding.
4. The triage team leader should convene a meeting of the triage team in a non-clinical service area of the hospital. Time and location of this meeting should be communicated to the HTS to ensure that the clinical team is aware of patient treatment adjudication by the triage team.
 - Contact information for the clinical team shall be provided to the triage team for information/updates on the clinical condition of the patient.
 - HEBMC/HTS or designate will provide the patient care team with the anonymized patient triage record number as well as patient identifiers, to enable communication between the triage team and patient care team regarding patient status and exclusion criteria, while maintaining blinding of patient identifiers to the triage team
 5. While maintaining blinding of patient identifiers, the triage team will need to determine if the patient being triaged meets any of the **general exclusion criteria** as outlined in the Emergency Framework for Rationing of Blood for Massively Bleeding Patients during a Red Phase of a Blood Shortage (see [algorithm](#)).
 - This information will be documented on the [Patient Triage Record](#) (section B).
 - At the end of each shift, or at least daily, a copy of these records is provided to HEBMC.
 - After completion of Red Phase, a copy of these records is provided to OEBMC.
 6. If **No** to all general exclusion criteria, the triage team will determine presence of any **specific exclusion criteria**, as outlined in the Emergency Framework for Rationing of Blood for Massively Bleeding Patients during a Red Phase of a Blood Shortage, from the following clinical categories:

(These criteria apply to adults and pediatrics patients unless otherwise specified)

- **Trauma** (any of the following)
 - i. Non-survivable brain injury.
 - ii. Glasgow Coma Scale = 3 with hypotension not attributable to reversible factors and with fixed and dilated pupils.
 - iii. Declared brain death, for the purpose of deceased organ donation.
 - iv. Penetrating cranial trauma and Glasgow Coma Scale = 3 not attributable to reversible factors.
 - v. Penetrating cranial trauma, Glasgow Coma Scale less than 8 not attributable to reversible factors, hypotension and severe thoracoabdominal trauma.
 - vi. Blunt trauma and a Glasgow Coma Scale = 3 not attributable to reversible factors.
 - vii. Blunt trauma with lost vital signs pre-hospitalization.
 - viii. Transcranial gunshot injuries.
 - ix. Age greater than 65 years with severe brain injury, profound shock and severe thoracic or abdominal trauma.
 - x. Age greater than 75 years with moderate brain injury, a Glasgow Coma Scale less than 12, in profound shock, and with thoracoabdominal injury.



- **Ruptured abdominal aortic aneurysm** (any of the following):
 - i. Pre-operative cardiac arrest.
 - ii. Systolic blood pressure less than 70 mmHg, unresponsive to fluid resuscitation, and lost consciousness.
 - iii. Does not meet criteria for emergent vascular repair.
- **Extracorporeal membrane oxygenator (ECMO) / ventricular assist device (VAD)**
 - i. Multi-organ (more than one organ) failure.

NOTE: Physicians, patients and families should be notified that they may not receive transfusion support if massively bleeding while on ECMO/VAD and having multi-organ failure, during a red phase shortage.

- **Organ transplantation** (any of the following):
 - i. Deceased donor organ recovery for transplantation should proceed, with the understanding that the deceased donor will not be transfused in the process of deceased donor stabilization.
 - ii. Deceased donor solid organ transplants may proceed with informed consent regarding increased risk from restriction of blood transfusion, and with the understanding (among patient and all involved physicians) that blood may not be available for transfusion.
 - iii. Living donor - recovery should be deferred until shortage has resolved.
- **Gastroenterology** (any of the following):
 - i. Gastrointestinal bleeding and a Rockall score greater than 8.
 - ii. Liver cirrhosis and gastrointestinal (i.e. variceal) bleeding with Child-Pugh score greater than 10 (MELD score greater than 18) and not listed for transplantation.
- **Obstetrics:**
 - i. No exclusions (i.e. transfusion should **not** be withheld).
- **Other situations:**
 - ii. Any patient for whom the triage team believes the mortality rate exceeds 80%.

7. All triage team members must agree with the determination of general or specific exclusion criteria and decision on transfusion support. Members will sign the [Patient Triage Record](#) indicating agreement.

- If in agreement that patient **meets** any of the general or specific exclusions criteria and that transfusion support is to be withheld, then the patient will be reassessed every 24 hours or earlier if the clinical team communicates that the patient's condition has significantly improved and would qualify for transfusion support.
- If in agreement that patient **does not meet** any of the general or specific exclusion criteria and that transfusion support will continue, then the patient will be reassessed after every 10th unit of RBC's (or as directed by NEBMC) or every 24 hours for patients receiving less than 10 units of blood until cessation of hemorrhage.



8. Forward signed [Patient Triage Record](#) to HTS. HTS keep one copy with triage tracking log and forward one copy to clinical care area for patient chart. Copy for patient chart may include identifying patient information (name, MRN) obtained from triage tracking log.
9. HTS will notify triage team at the time of 10th unit of RBC issued for patient reassessment.
 - For all subsequent meetings of triage team, the HTS will provide original anonymized [Patient Tracking Record](#)(s) for that patient with any new information for triage team to assess and document reassessment decision.
10. Triage team leader will reconvene triage team at a minimum frequency of every 24 hours and/or as every triaged patient has received 10 units of RBCs.
 - HTS should be aware of all scheduled meetings to ensure that any newly identified patients requiring triage have a [Patient Tracking Record](#) completed for review by the triage team.
 - Reassessment decisions will be based on SOFA score (see [appendix](#)), total blood products used, need for ongoing transfusion support and ability to control bleeding with surgical or medical procedures. Patients with a SOFA score >11, continued need for large amounts of blood components and no foreseeable ability to control blood loss will be triaged to palliative care.
 - Reassessment decisions by triage team should be documented in section C of [Patient Triage Record form](#).
11. Continue steps 1-9 until NEBMC indicates that the blood shortage has improved and implementation of the Emergency Framework for Rationing of Blood for Massively Bleeding Patients during a Red Phase of a Blood Shortage can be discontinued.
12. HTS to forward all [Patient Triage Records](#) daily to HEBMC (or Hospital Transfusion Committee, as applicable) for review
 - HEBMC will review and record patient outcomes, to ensure 'over triage' and 'under triage' errors are minimized
 - Anonymized Patient Triage Records may be requested by Ministry of Health / Ontario Emergency Blood Management Committee and should be submitted on request.

Limitations

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

1. Administer blood to the youngest patients first (with the goal of maximizing the number of years of life saved).
2. Administer blood to patients who have the highest likelihood of hemostasis control.
3. Administer blood according to the first-come, first-served principle.

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



Appendix

SOFA Score

The SOFA score as described by Vincent et al⁴.

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



Decision Tree for Triage Team

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

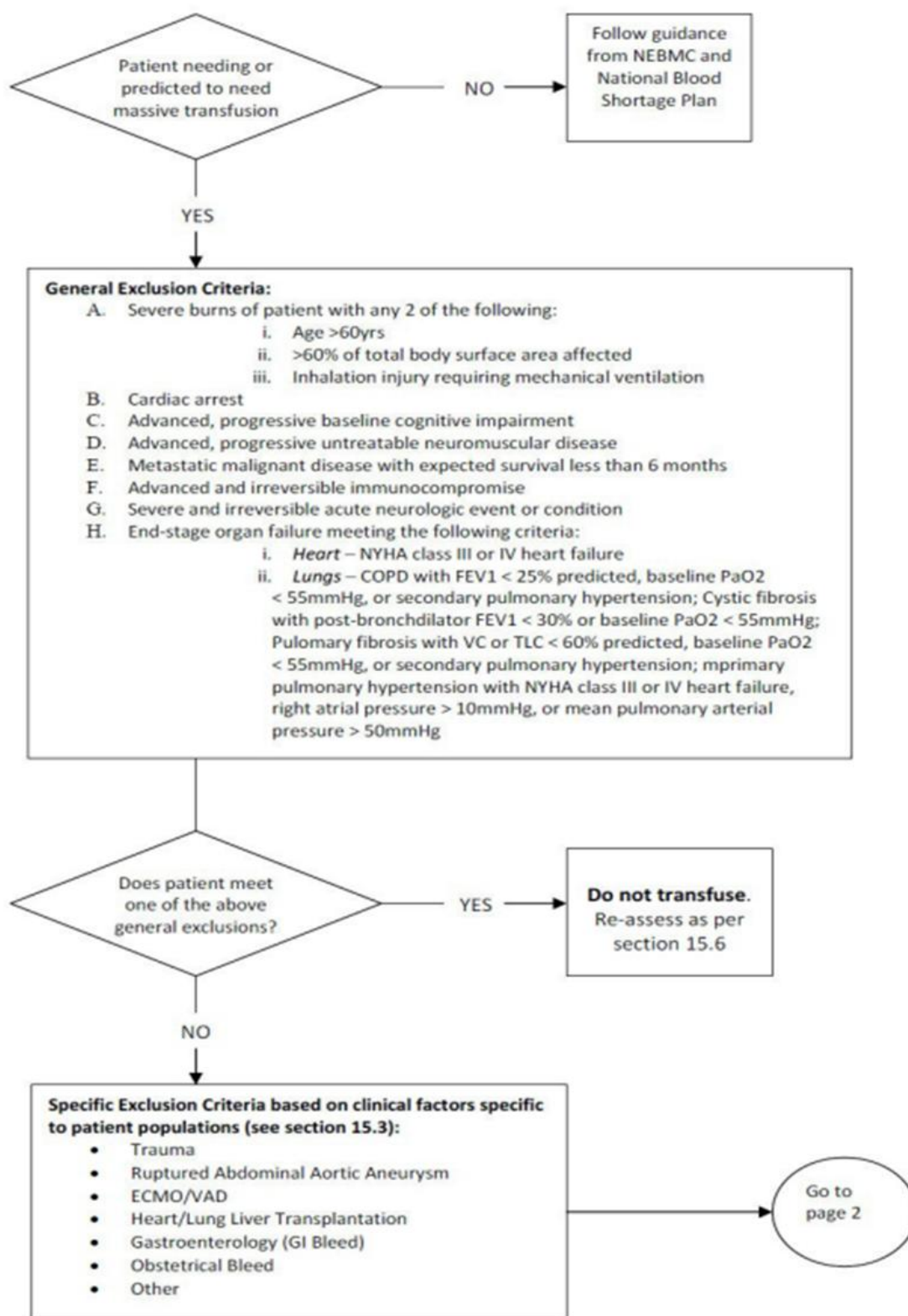
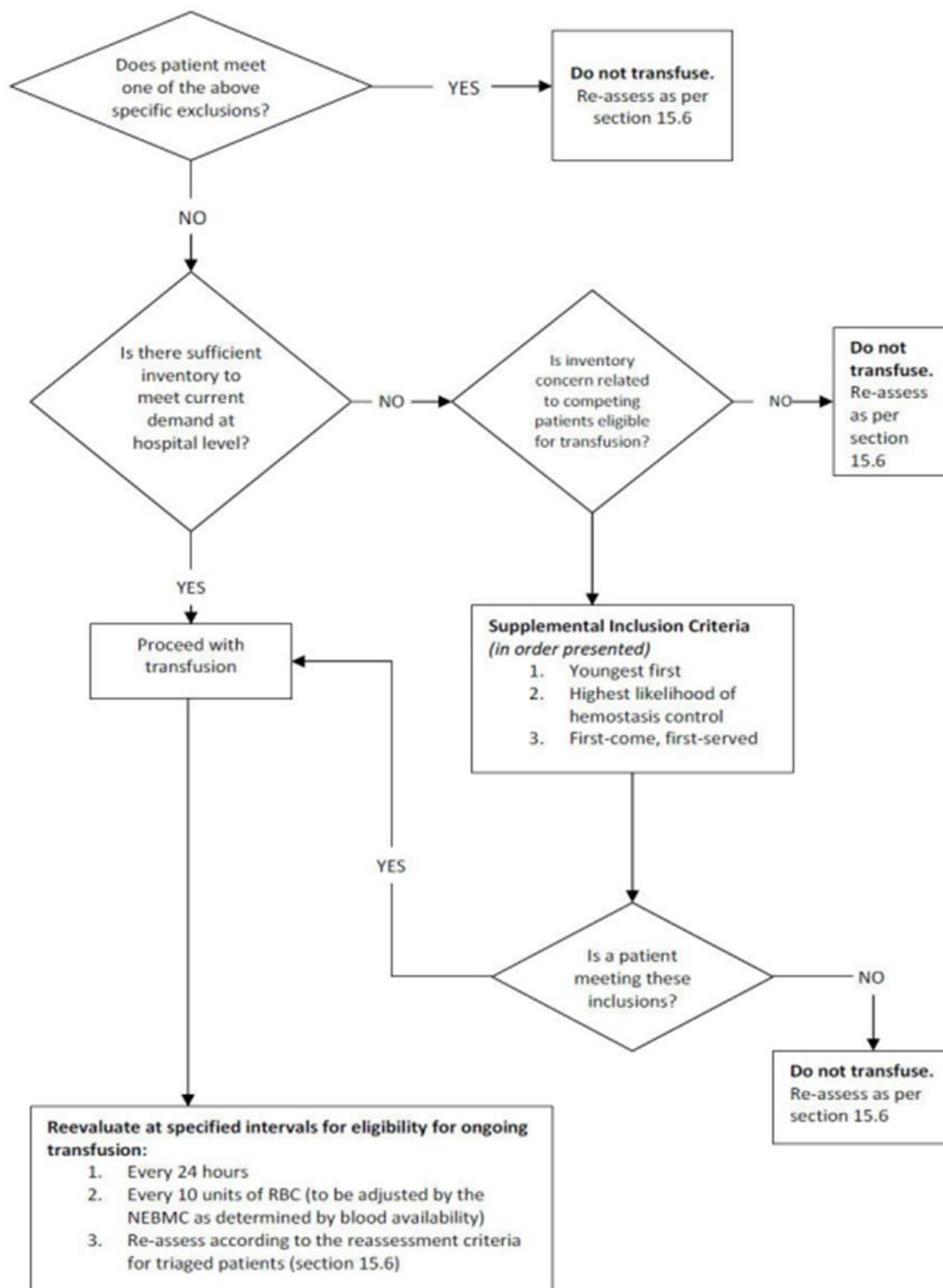


Figure 1 – (page 2)



Sample Patient Triage Record

Section A: Completed by Hospital Transfusion Service

Date/time NEBMC invoked Emergency Framework for Triage of Massively Bleeding Patients:		
Patient Tracking Number:		
Age:	ABO/Rh group:	Additional antigen matching required:
Location:		Date/Time of Triage Assessment:
Cause of bleeding:		
Most responsible physician at time of triage (name and contact info):		
Has patient received product in the previous 24 hrs?	☐ Yes	☐ No
Predicted need more than 10 units in next 24 hrs?	☐ Yes	☐ No (refer to standard tracking tool)

Section B: Completed by the Triage Team

Does the patient have **any** of the following exclusion criteria?

General	Specific
☐ Severe burns with any two of the following: • Age > 60 years • >60% of body surface area affected • Inhalation injury requiring mechanical ventilation ☐ Cardiac arrest ☐ Advanced, progressive baseline cognitive impairment ☐ Advanced, progressive, untreatable neuromuscular disease ☐ Metastatic malignant disease with expected survival less than 6 months ☐ Advanced and irreversible immunocompromise ☐ Severe and irreversible acute neurologic event or condition ☐ End-stage organ disease meeting the following criteria: • Heart: NYHA class III or IV heart failure • Lungs: ○ COPD with FEV1 less than 25% predicted, baseline PaO2 less than 55 mmHg, or secondary pulmonary hypertension ○ Cystic fibrosis with post-bronchodilator FEV1 less than 30% or baseline PaO2 less than 55 mmHg	Trauma (any of the following): ☐ Non-survivable brain injury ☐ Glasgow Coma Scale = 3 with hypotension not attributable to reversible factors and with fixed and dilated pupils ☐ Declared brain death (for purpose of deceased organ donation) ☐ Penetrating cranial trauma and Glasgow coma scale = 3 not attributable to reversible factors ☐ Penetrating cranial trauma, Glasgow coma scale less than 8 not attributable to reversible factors, hypotension and severe thoracoabdominal trauma ☐ Blunt trauma and a Glasgow Coma Scale = 3 not attributable to reversible factors ☐ Blunt trauma and vital signs lost pre-hospitalization ☐ Transcranial gunshot injuries ☐ Age greater than 65 years with severe brain injury, profound shock and severe thoracic or abdominal trauma ☐ Age greater than 75 years with moderate brain injury, a Glasgow Coma scale of less than 12, in profound shock and with thoracoabdominal injury Ruptured abdominal aortic aneurysm (any of the following): ☐ Pre-operative cardiac arrest



General	Specific
○ Pulmonary fibrosis with VC or TLC less than 60% predicted, baseline PaO2 less than 55 mmHg, or secondary pulmonary hypertension ○ Primary pulmonary hypertension with NYHA class III or IV heart failure, right atrial pressure greater than 10 mmHg, or mean pulmonary arterial pressure greater than 50 mmHg	□ Systolic blood pressure less than 70 mmHg, unresponsive to fluid resuscitation, and lost consciousness □ Does not meet criteria for emergent vascular repair ECMO/VAD: □ Multi-organ (more than 1 organ) failure (patients and families to be notified that they may not receive transfusion support if massively bleeding) Organ transplantation (any of the following): □ Deceased donor organ recovery for transplantation should proceed, with the understanding that the deceased donor will not be transfused in the process of deceased donor stabilization. □ Deceased donor solid organ transplants may proceed with informed consent regarding increased risk from restriction of blood transfusion, and with the understanding (among patient and all involved physicians) that blood may not be available for transfusion. □ Living donor (recovery should be deferred until shortage has resolved) Gastroenterology (any of the following): □ Gastrointestinal bleeding and a Rockall score greater than 8 □ Liver cirrhosis and gastrointestinal (i.e. variceal) bleeding with Child-Pugh score greater than 10 (MELD score of greater than 18) and not listed for transplantation Obstetrics: □ No exclusions (i.e. transfusion should not be withheld) Other situations: □ Any patient whom the triage team believes the mortality rate exceeds 80%
Additional considerations or information pertinent to reassessment:	

Final decision by triage team:	☐ Continue transfusion support	☐ Withdraw transfusion support
Patient to be reassessed	☐ every 10 th unit of RBC's	☐ every 24 hours (or as indicated)
Triage Physician Signatures (Every physician team member shall sign indicating agreement with patient assessment)		
Name:	Signature:	



Name:	Signature:
Name:	Signature:
Name:	Signature:
Name:	Signature:

Section C – To be completed by Triage Team at reassessment if still bleeding or rebleeding, every 10 units or at 24hr as applicable.

Date and Time of Reassessment (YYYY/MM/DD 24:00)	Does patient meet specific exclusion criteria?	SOFA score (enter value)	Decision on Transfusion Support	Reassessment sign off by Triage Leader / designate, name and signature
	☐ No ☐ Yes Specify:		☐ Continue/start ☐ Withhold	
	☐ No ☐ Yes Specify:		☐ Continue/start ☐ Withhold	
	☐ No ☐ Yes Specify:		☐ Continue/start ☐ Withhold	
	☐ No ☐ Yes Specify:		☐ Continue/start ☐ Withhold	
	☐ No ☐ Yes Specify:		☐ Continue/start ☐ Withhold	

Reassessment comments:

Section D – To be completed by HEBMC or HTS

Patient outcome at 24 hours of cessation of hemorrhage / blood shortage		
Patient outcome at discharge		
Patient outcome at 6 months		
Documentation forwarded to MOH / OEBMC	☐ Yes ☐ No	Date:



References

1. [Emergency Framework for Rationing of Blood for Massively Bleeding Patients during a Red Phase of a Blood Shortage](#). Working Group on Emergency Disposition of Blood during a Red Phase Blood Shortage: National Advisory Committee on Blood and Blood Products; April 14, 2012.
2. [Emergency framework for rationing of blood for massively bleeding patients during a red phase of a blood shortage – Synopsis for Triage Team](#). National Advisory Committee on Blood and Blood Products; October 11, 2012.
3. Strech D, Hurst S, Danis M. The role of ethics committees and ethics consultation in allocation decisions: A 4-stage process. Med Care. 2010 Sep;48(9):821-6.
4. Vincent JL, Moreno R, Takala J, Willatts S, De Mendonca A, Bruining H, et al. The SOFA (sepsis-related organ failure assessment) score to describe organ dysfunction/failure. on behalf of the working group on sepsis-related problems of the european society of intensive care medicine. Intensive Care Med. 1996 Jul;22(7):707-10.

Resources

[Triage tool for the rationing of blood for massively bleeding patients during a severe national blood shortage: guidance from the National Blood Transfusion Committee](#). Doughty H, Green L, Callum J, Murphy MF; National Blood Transfusion Committee. Br J Haematol. 2020 May 20;10.1111/bjh.16736. doi: 10.1111/bjh.16736. Online ahead of print. PMID: 32436251



2.3. Documentation Logs

Documentation logs are used by HTS/HEBMC to document the screening decisions of transfusion orders, re-evaluations and the tracking of patients assigned to the triage team for decisions. These logs can be paper based or electronic. With newer systems allowing for sharing capabilities across departments, electronic tracking systems could be considered. For this toolkit, examples are provided in excel as downloadable versions for hospital use. Screen shots of templates are provided below.

Transfusion Order Log

	A	B	C	D	E	F	G	H	I	J	K	L
1	CBS Notification Phase		Please select phase						If paper print out of order available, please keep with log for reference			
2	Blood Component in Shortage		Please select component		Blood Group (if shortage only applies to specific blood group)		Multiple Groups:					
3	Date / Time (YYYY/MM/DD and 24:00)	Medical Record Number	Patient Name (Last,First)	Patient Location	Ordering Clinician (Last Name and Specialty)	Blood Component/ Product Requested	Indication	Dosage (# units, g, vials)	Relevant lab result (Hb, INR, Plt)	Decision information (Specify)	Reevaluation (Specify and date)	
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

Triage Tracking Log

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Tracking Number	Medical Record Number	Last Name	First Name	Location	Blood Group	Date time to Triage team	This triage tracking log is intended for use when Emergency Framework for rationing of blood for massively bleeding patients during a red phase blood shortage.						
2	1													
3	2													
4	3													
5	4													
6	5													
7	6													
8	7													
9	8													
10	9													
11	10													
12	11													
13	12													
14	13													
15	14													
16	15													
17	16													
18	17													
19	18													
20	19													
21	20													
22														
23														

Patient information is not sent to Triage team.



2.4. Calculating Target Inventory Levels by Phases of a Blood Shortage

This tool will assist hospitals in determining the level of on hand inventory for different blood components for each phase of inventory level (Green, Green Phase Advisory, Amber, Red).

Hospitals should determine their ideal on-site inventory to ensure that average transfusion orders can be met, allowing for some emergency needs. A target inventory level should be set to ensure overstocking does not occur. Overstocking can lead to product outdating.

In a blood shortage, inventory levels should be defined by the severity of the shortage. By reducing the target inventory level, the demand from CBS for the affected blood component will be lower, which could help to ease the imbalance between supply and demand. When counting inventory, this should include all available inventory such as any on hold/crossmatched, phenotyped and irradiated units.

Reducing inventory will be the first step hospitals should take in response to lowering demand for the affected blood component. Based on historical recommendations (Ontario Toolkit for Emergency Blood Management version 2016 and [ORBCoN Inventory Calculator for Red Cells](#)) the amber phase inventory is suggested to be 75-50% of green phase inventory, and red phase inventory is suggested to be 50-25% of green phase inventory. During an actual shortage, hospitals should follow directions for target inventory levels from the National Emergency Blood Management Committee (NEBMC).

Determining Target Hospital Inventory Levels by Phase of a Blood Shortage*:

Phase	Red blood cells	Platelets**	Frozen plasma**
Green (100%)	6-9 days	2 days	10 days
Green Phase Advisory	Reduce by 10% or as directed	N/A	N/A
Amber	4-6 days	1 day	3-10 days
Red	2-4 days	< 1 day	1-3 days

*based on average daily use

**stock these components only if used on a regular basis or as directed by your transfusion medicine Medical Director or Consultant.

Smaller or remote hospitals that stock a minimum number of red cells may have a relatively greater green phase inventory and lesser or no reduction in inventory target levels in response to a blood shortage.

More information on how to calculate appropriate hospital inventory levels can be found in the Inventory Management Toolkit - <https://transfusionontario.org/en/category/toolkits/inventory-management/>.

[Inventory Calculator for Platelets](#)

[Inventory Calculator for Red Cells](#)



Platelet Tips for Inventory Management in Shortages (Platelet TIMS)

Introduction

During platelet shortage situations, active screening and management of platelet orders are required, including the direct discussion of platelet requests with ordering physicians. The use of ABO and/or Rh mismatched platelets, the lowering of platelet transfusion thresholds, and dosing adjustments may all be necessary.

Share Inventory: Utilize redistribution programs by sharing any near to expiry platelets with other hospitals or contacting other hospitals before placing new orders with your blood supplier.

Transfusing platelets non-identical for ABO or Rh

Major and Minor Mismatches in Platelet Transfusion

ABO antigens are present on the surface of platelets. The plasma in which the platelets are suspended is of the same ABO group as the donor platelets and may contain anti-A and/or anti-B isoagglutinins. A major mismatch or 'cellular-incompatible' platelet transfusion occurs when the transfused platelets, or the red cells in the platelet component, exhibit antigens not present in the recipient e.g., group A platelets to a group O recipient or RhD positive platelets to a RhD negative recipient. A minor mismatch, or 'plasma-incompatible' transfusion occurs when the plasma in the platelet component contains antibody to antigens on the recipient's red cells e.g., group O platelets to a group A recipient. Several reviews of this topic are available^{1,2,3,4}.

ABO non-identical platelets

While ABO-identical platelets are the preferred component, these may not always be available in a shortage situation. Transfusion of ABO-incompatible platelets may lead to a decreased posttransfusion platelet count increment (PCI), although it is unclear whether this has significant clinical consequences. This effect is cumulative after multiple cellular-incompatible transfusions^{5,6,7}.

Transfusion of plasma-incompatible platelets, especially group O platelets (containing anti-A and anti-B isoagglutinins) to a non-group O recipient, carries the risk of hemolysis in the recipient, although this is uncommon. Depending on the method used and the definition of high titre, approximately 10-40% of group O platelets contain high titres of isoagglutinins^{8,9}. Since the introduction of pathogen reduced platelets in 2022 these pooled platelets are suspended in a mixture of about 60% PAS-E and 40% donor plasma; approximately 75 mL of plasma. This reduction in the amount of plasma in a dose of platelets also reduces but does not eliminate the risk of significant hemolysis in the case of ABO mismatched platelet transfusion.

Plasma-incompatible platelet transfusion may also lead to a positive direct antiglobulin test (DAT) in the recipient.



The selection of platelets for transfusion is shown in the Table:

Patient ABO Group	Platelet Donor ABO Group		
	1 st Choice	2 nd Choice	3 rd Choice
O	O	A, B, AB	N/A
A	A	AB	B, O
B	B	AB	A, O
AB	AB	A, B	O

Options for approaching an ABO plasma-incompatible transfusion:

- Since the introduction of pathogen reduced platelets, which have a lower volume of plasma, titres of anti-A and/or anti-B are generally no longer performed.
- Limit the volume of incompatible plasma transfused per 24-hour period e.g., 15 mL for neonate, incrementally higher volumes for older children, and 350 - 600 mL for adults¹⁰.

Canadian Standard for Mismatched Platelet Transfusions

- CSTM Standard v5 (Dec 2022) clause 5.4.3.4: “Recipients should be transfused with platelet concentrates in which the plasma is ABO compatible with the recipient’s red cells. There shall be an established policy for ABO/RhD group substitution, including when platelets with group compatible plasma are not available”¹¹.

Rh non-identical platelets

Although platelets do not express Rh antigens, the component contains red cells (about 0.5 mL in a buffy coat pool and less than 0.001 mL in an apheresis donation), which may trigger an immune response in the recipient¹². If Rh positive platelets must be given to an Rh-negative female of child-bearing potential, Rh immune globulin (RHIG) should be given to prevent sensitization. One 300µg/1500IU dose of RHIG will protect against exposure to 15 mL of red cells. Based on the RHIG half-life of 3 weeks, one dose should cover multiple Rh-positive platelet transfusions for 4 weeks. RHIG prophylaxis is not necessary for males, or for females without childbearing potential, because the alloimmunization rate is very low at 1.44%¹³. Administration of RHIG, which is passive anti-D, complicates future compatibility testing and precludes the use of an electronic crossmatch until the passive antibody has disappeared from the circulation. In these situations, transfusion may be delayed.

Splitting platelet doses

If a sterile docking device is available, one platelet dose can be split into multiple doses¹⁴. Health Canada advises that splitting doses of platelets is considered aliquoting and must follow applicable regulations but is not a processing activity which requires hospital registration.



Section References

1. Cid J et al. Platelet transfusion – the art and science of compromise. *Transfus Med Hemother* 2013;40:160.
2. Fung MK et al. Transfusion of platelets containing ABO-incompatible plasma: a survey of 3156 North American laboratories. *Arch Path Lab Med* 2007;131:909.
3. Lin N. High titre anti-A/B testing of donors within NHS Blood and Transplant (NHSBT). Information document INF 178/2, effective 2012. Available at <http://hospital.blood.co.uk/media/28090/inf1782-high-titre-anti-ab-testing-of-donors-within-nhsbt.pdf>.
4. Cooling L. ABO and platelet transfusion therapy. *Immunohematology* 2007;23(1):20.
5. Shehata N et al. ABO-identical versus nonidentical platelet transfusion: a systematic review. *Transfusion* 2009;49:2442.
6. Triulzi DJ et al. The impact of platelet transfusion characteristics on posttransfusion platelet increments and clinical bleeding in patients with hypoproliferative thrombocytopenia. *Blood* 2012;119(23):5553.
7. Slichter SJ et al. Factors affecting posttransfusion platelet increment, platelet refractoriness, and platelet transfusion intervals in thrombocytopenic patients. *Blood* 2005;105:4106.
8. Larsson LG et al. Acute intravascular hemolysis secondary to out-of-group platelet transfusion. *Transfusion* 2000;40:902.
9. Josephson CD et al. Significant numbers of apheresis-derived group O platelet units have “high titre” anti-A/A,B: implications for transfusion policy. *Transfusion* 2004;44:805.
10. Fontaine MJ et al. How we treat: risk mitigation for ABO-incompatible plasma in plateletpheresis products. *Transfusion* 2012;52:2081.
11. CSTM Standards for Hospital Transfusion Services v.5; December 2021 (revised December 2022). Canadian Society for Transfusion Medicine; Ottawa, Ontario.
12. Cid J et al. Risk of Rh(D) alloimmunization after transfusion of platelets from D+ donors to D- recipients. *Transfusion* 2005;45:453.
13. Cid J et al. Low frequency of anti-D alloimmunization following D+ platelet transfusion: the Anti-D Alloimmunization after D-incompatible Platelet Transfusions (ADAPT) study. *Br J Haematol* 2015;168:598.
14. Slichter SJ et al. Dose of prophylactic platelet transfusions and prevention of hemorrhage. *NEJM*;2010:362.



2.5. NAC Guidelines for RBC and Platelet Transfusions During Shortages

Guideline for the Use of Red Blood Cell (RBC) Transfusions in Children and Adults in Shortage Situations

(Appendix B in the Ontario Contingency Plan for the Management of Blood Shortages, Table 6 in the National Plan for Management of Shortages of Labile Blood Components)

Green Phase	Amber Phase	Red Phase
Major Hemorrhage	Major Hemorrhage	Major Hemorrhage
Follow your hospital guidelines.	Follow your hospital guidelines.	Follow your hospital guidelines. Follow triage/emergency framework if instructed by NEBMC. ^a
Surgery/Obstetrics	Surgery/Obstetrics	Surgery/Obstetrics
Follow your hospital guidelines.	Urgent ^b and emergency ^c surgery in consultation with HEBMC. Peri/post-partum hemorrhage: consider use of alternatives to minimize RBC requirements. For all situations, the minimal number of units to stabilize patients should be used.	Emergency situations in consultation with HEBMC. Follow triage/emergency framework if instructed by NEBMC. ^a
Non-Surgical Anemias/Medical Procedures ^d	Non-Surgical Anemias/Medical Procedures ^d	Non-Surgical Anemias/Medical Procedures ^d
Follow your hospital guidelines.	All requests for RBC transfusion in patients with a Hb level >60 g/L must be reviewed by designated medical personnel. For patients with hypoproliferative anemias or other chronic transfusion needs, single unit transfusion should be provided if alternatives to red cells are unsuccessful and significant symptoms associated with anemia are present. Reassessment of severity of symptoms after each unit is required.	All requests for RBC transfusion in patients with a Hb level > 50 g/L must be reviewed by designated medical personnel. For patients with hypoproliferative anemias or other chronic transfusion needs, single unit transfusion should be provided if alternatives to red cells are unsuccessful and significant symptoms associated with anemia are present. Reassessment of severity of symptoms after each unit is required. Follow the guidance found in the CanHaem Blood conservation for hemoglobinopathy patients during pandemic blood shortage .

- These guidelines are available on NAC website: [Emergency framework for rationing of blood for massively bleeding patients during a red phase blood shortage](#)
- Urgent surgery: patient likely to have major morbidity if surgery not performed within the next 1 to 28 days.
- Emergency surgery: patient likely to die or have major morbidity within 24 hours without surgery.
- Non-surgical anemias include anemia associated with bone marrow failure, post traumatic injury, extracorporeal membrane oxygenation (ECMO), post-operative states and associated with obstetrics. Medical procedures include but are not limited to simple transfusion, exchange transfusion, high-dose chemotherapy and stem cell transplant.



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

(Appendix C in the Ontario Contingency Plan for the Management of Blood Shortages, Table 6 in the National Plan for Management of Shortages of Labile Blood Components)

Green Phase	Amber Phase	Red Phase
Major Hemorrhage	Major Hemorrhage	Major Hemorrhage
Immune thrombocytopenia and life- or limb-threatening bleeding maintain PC $>10 \times 10^9/L$. For head trauma or CNS bleeding maintain a PC $>100 \times 10^9/L$. Other significant bleeding, or acute promyelocytic leukemia at acute presentation, maintain a PC $>50 \times 10^9/L$.	For head trauma or CNS bleeding maintain a PC $> 80 \times 10^9/L$. Withhold routine platelet issue in massive hemorrhage packs in the absence of a confirmed indication for platelet transfusion (e.g. platelet dysfunction, PC $< 50 \times 10^9/L$).	Same as Amber phase.
Invasive Procedures/Surgery/ECMO	Invasive Procedures/Surgery/ECMO	Invasive Procedures/Surgery
For non-surgical invasive procedures maintain a PC $> 20 \times 10^9/L$ (central venous catheter insertion, paracentesis, thoracentesis). For lumbar puncture maintain a PC $> 20 \times 10^9/L$. For CNS surgery maintain a PC $> 100 \times 10^9/L$. For ECMO maintain a PC $>50-80 \times 10^9/L$	Urgent^a and emergency^b surgery in consultation with HEBMC. In presence of active bleeding or surgical procedure maintain a PC $> 30 \times 10^9/L$ or if CNS trauma/surgery a PC $> 80 \times 10^9/L$. For non-surgical invasive procedures (other than bone marrow aspiration or biopsy) maintain a PC $>10 \times 10^9/L$ with image guidance. For lumbar puncture, maintain a PC $>20 \times 10^9/L$. For ECMO maintain a PC $>50 \times 10^9/L$	Emergency surgery in consultation with HEBMC. All requests for platelet transfusion must be reviewed by designated medical personnel.
Bone Marrow Failure/ Hematopoietic Stem Cell Transplantation / Chemotherapy/ Chronic transfusion recipients	Bone Marrow Failure/ Hematopoietic Stem Cell Transplantation / Chemotherapy/ Chronic transfusion recipients	Bone Marrow Failure/ Hematopoietic Stem Cell Transplantation / Chemotherapy/ Chronic Transfusion recipients
Adhere to a maximum threshold PC of $10 \times 10^9/L$ for prophylactic platelet transfusions.	Adhere to a maximum threshold PC of $10 \times 10^9/L$ for outpatient prophylactic platelet transfusions; consider lowering this threshold to $5 \times 10^9/L$ for inpatient prophylactic transfusions. Transfuse autologous stem cell transplant patients only if symptoms of bleeding. All requests for a platelet transfusion in non-bleeding patients with a PC $>10 \times 10^9/L$ must be reviewed by designated medical personnel. Split PC doses and use of half doses in non-bleeding patients if necessary.	Cease all prophylactic transfusions. All requests for platelet transfusions in non-bleeding patients must be reviewed by designated medical personnel.

a. Urgent surgery: patient likely to have major morbidity if surgery not performed within the next 1 to 28 days.

b. Emergency surgery: patient likely to die or have major morbidity within 24 hours without surgery.



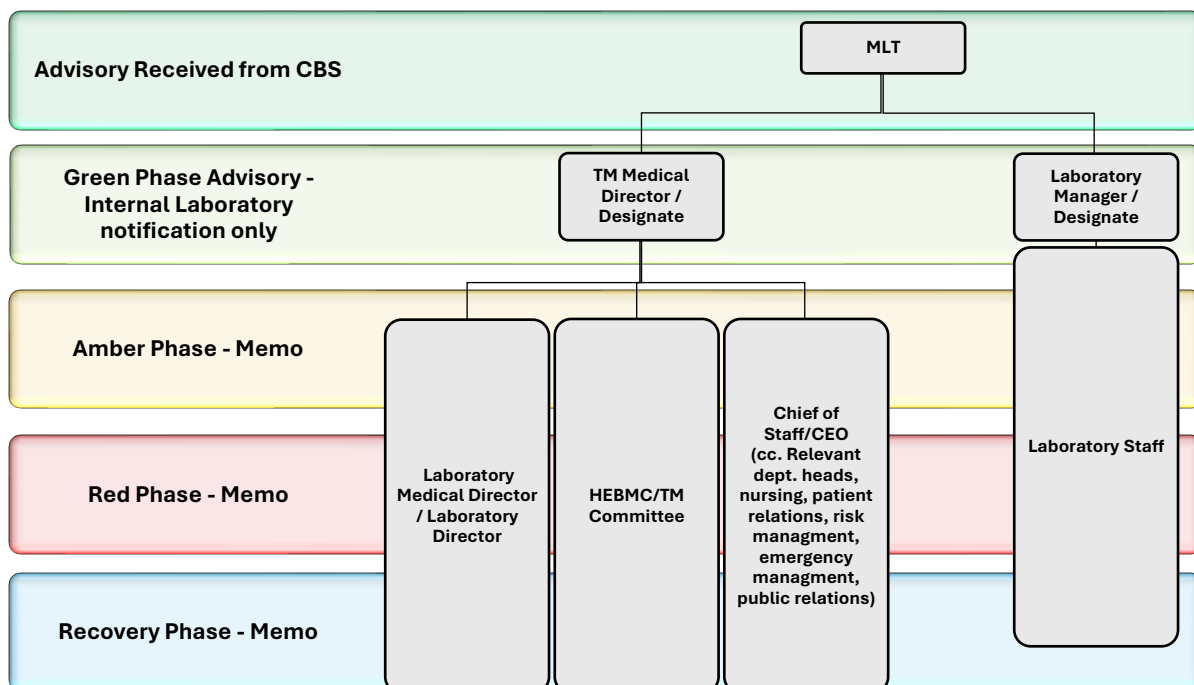
3. Communications

3.1 Notification Table

This template is intended to be a guide on who could be contacted in a blood shortage and a way to keep track of the communication that has been sent out. It can be customized by each hospital as required.

CBS Notification Phase: ☐ Green Phase Advisory ☐ Amber ☐ Red ☐ Recovery			
Blood Component: ☐ Red Blood Cells ☐ Platelets ☐ Plasma ☐ Other:			
Date notification of blood shortage received from CBS:			
Staff member receiving fax/phone call			
Initiate <u>Notification Log</u> based on hospital communication flow			
Notification of Senior/Charge/Manager completed	☐ Yes	☐ No	
Internal hospital fax memos or email prepared	☐ Yes	☐ No	Date/Time:
Fax memos or email issued	☐ Yes	☐ No	Date/Time:
Hospital inventory reported to CBS	☐ Yes	☐ No	Date/Time:

Hospital Communication



Documentation of Notification Log

Responsible person to complete notification	Name of person notified	Position	Date/time notified	Initial of person completing the notification
Receiver of initial fax / call		Laboratory Manager/designate		
Receiver of initial fax / call		TM MD or designate		
Laboratory Manager		TM/Laboratory Staff		
TM Med Director		Laboratory Medical Director / Chief Pathologist		
TM Med Director/Laboratory Medical Director		HEBMC		
		Transfusion Committee		
		CEO		
		Medical Chief of Staff		
		Clinical Department Heads		
		Risk Management		
		Nursing		
		Emergency Management Committee		
		Communication/Public Relations		
		Patient Relations		



3.2 Memo Templates

To aid in notification of internal hospital staff as well as patients who might be affected by a blood shortage, these memo templates are provided to hospitals to incorporate into their HEBMP. Each memo template can be revised as needed at the time of a blood shortage but will greatly reduce the time needed to develop communications. Templates are provided for communication of Amber Phase, Red Phase, Triage of Massively Bleeding Patients and Recovery Phase. A template for notification of patients impacted by the blood shortage is also provided.

Areas for customization specific to the shortage are noted in the template as 'Optional'

Template 1: [Amber Phase](#)

Template 2: [Red Phase](#)

Template 3: [Triage of Massively Bleeding Patients](#)

Template 4: [Recovery Phase](#)

Template 5: [Patient/Family notification](#)



Urgent: Notification of Blood Shortage

To: [Enter name of Chairpersons of Transfusion Committee, Emergency Blood Management Committee, CEO and Chief of Staff]

From: [Enter name of Medical Director of Transfusion Service and Chief of Pathology/Laboratory services]

cc: [Enter – as applicable – name of Department Heads for Anesthesia, Surgery, Critical Care, Emergency, Trauma, Hematology, Medicine, Obstetrics/Gynecology, Oncology, and Radiology, Directors of Laboratories, Nursing, Risk Management, Emergency Management, Communications / Public Relations, Patient Relations Officer.]

Date: [Enter date] Time: 'Optional'

Re: **Amber Phase Shortage**

Canadian Blood Services (CBS) is experiencing a shortage of [Enter name of blood component/product here]. Hospital blood inventory levels may be reduced to conserve components for critical cases.

'Optional'- The shortage is the result of [Enter the reason for the shortage here].

The following modifications will be implemented:

- It may become necessary to defer non-urgent elective transfusions and/or elective surgical procedures associated with probable blood use should the supply situation become prolonged.
- RBC/PLT shortage: Follow the National Advisory Council on Blood and Blood Products [Guidelines for the Use of Red Blood Cell \(RBC\)](#) and [Platelet Transfusions in Children and Adults in Shortage Situations](#) (HTS-include copies with memo)
- 'Optional' [Enter modifications as directed by NEBMC].

Follow the hospital emergency blood management procedure/plan for – **Amber Phase**, until further notice.

Inventory is being monitored at the national level and updates will be provided regarding recovery of supply or possible escalation to a Red Phase.



Urgent: Notification of Blood Shortage

To: [Enter name of Chairpersons of Transfusion Committee, Emergency Blood Management Committee, CEO and Chief of Staff]

From: [Enter name of Medical Director of Transfusion Service and Chief of Pathology/Laboratory services]

cc: [Enter – as applicable – name of Department Heads for Anesthesia, Surgery, Critical Care, Emergency, Trauma, Hematology, Medicine, Obstetrics/Gynecology, Oncology, and Radiology, Directors of Laboratories, Nursing, Risk Management, Emergency Management, Communications / Public Relations, Patient Relations Officer.]

Date: [Enter date] Time: 'Optional'

Re: **Red Phase Shortage**

Canadian Blood Services (CBS) is experiencing a severe shortage of [Enter name of blood component/product here]. Hospital blood inventory will be reduced to conserving blood components for critical cases only.

'Optional' The shortage is the result of [Enter the reason for the shortage here].

The following modifications to blood ordering will be implemented:

- Defer/cancel all non-emergency surgical or medical procedures requiring the affected blood components.
- RBC/PLT shortage: Follow the National Advisory Council on Blood and Blood Products [Guidelines for the Use of Red Blood Cell \(RBC\)](#) and [Platelet Transfusions in Children and Adults in Shortage Situations](#) (HTS-include copies with memo)
- 'Optional' [Enter modifications as directed by NEBMC].
- In the event of supply not meeting demand in patients meeting criteria for transfusion, the allocation of scarce resources may be determined by a hospital triage team or equivalent.
- For massively bleeding patients, triaging may be implemented, if directed by the National Emergency Blood Management Committee.

Follow the hospital emergency blood management procedure/plan for – **Red Phase**, until further notice.

Inventory is being monitored at the national level and updates will be provided regarding recovery of supply.



Urgent: Notification of Implementation of Triage of Massively Bleeding Patients

To: [Enter name of Chairpersons of Transfusion Committee, Emergency Blood Management Committee, CEO and Chief of Staff]

From: [Enter name of Medical Director of Transfusion Service and Chief of Pathology/Laboratory services]

cc: [Enter – All physicians and as applicable – name of Department Heads for Anesthesia, Surgery, Critical Care, Emergency, Trauma, Hematology, Medicine, Obstetrics/Gynecology, Oncology, and Radiology, Directors of Laboratories, Nursing, Risk Management, Emergency Management, Communications / Public Relations, Patient Relations Officer.]

Date: [Enter date] Time: 'Optional'

Re: **Emergency Framework Implementation – Triage of Massively Bleeding Patients**

Canadian Blood Services (CBS) is experiencing a shortage of [Enter name of blood component/product here]. Hospital blood inventory levels have been reduced to conserve components for critical cases.

The National Emergency Blood Management Committee in conjunction with the Ontario Ministry of Health are instructing all hospitals to activate their triaging protocols in alignment with the [Emergency Framework for rationing of blood for Massively Bleeding Patients during a red phase blood shortage](#).

The following is effective immediately:

- All patients experiencing or anticipating need for more than 10 units of RBCs in the next 24 hours must be reported to the Transfusion Medicine Laboratory immediately upon identifying.
- Triage team will determine patient eligibility for affected blood components, based on predetermined criteria and communicate back to clinical team lead.

For further information, refer to hospital emergency blood management procedure/plan – [Enter name of Triage of Massively Bleeding Patients policy].

Inventory is being monitored at the national level and updates will be provided regarding recovery of supply or further restrictions.



Urgent: Notification of Blood Shortage

To: [Enter name of Chairpersons of Transfusion Committee, Emergency Blood Management Committee, CEO and Chief of Staff]

From: [Enter name of Medical Director of Transfusion Service and Chief of Pathology/Laboratory services]

cc: [Enter – as applicable – name of Department Heads for Anesthesia, Surgery, Critical Care, Emergency, Trauma, Hematology, Medicine, Obstetrics/Gynecology, Oncology, and Radiology, Directors of Laboratories, Nursing, Risk Management, Emergency Management, Communications / Public Relations, Patient Relations Officer.]

Date: [Enter date] Time: 'Optional'

Re: **Recovery Phase Shortage**

Canadian Blood Services inventory levels for [Enter name of blood component / product here] have steadily improved and have now reached a stable level.

As a result, critical blood product conservation strategies may be lessened. Inventory levels on site will improve over the next few days back up to optimal levels.

Slow resumption of practice should adhere to:

- Elective medical and surgical procedures/transfusions deferred because of the blood shortage may be slowly resumed on the basis of urgency/priority to aid in recovery of blood inventory levels.
- Current transfusion guidelines will be strictly adhered to as described in [Ontario's Clinical-Practice-Recommendations March 2025 final.pdf](#)

If you have any feedback regarding this recent shortage and how it was managed, please contact [Enter title here] at [Enter the contact number desired].



Urgent: Patient Notification of Blood Shortage

Date: Date

Canadian Blood Services (supplier of blood to Ontario hospitals) is experiencing a shortage of [Enter name of Blood Component/Product here].

'Optional' The shortage is the result of [Enter the reason for the shortage here].

As a result, it is necessary to postpone non-urgent blood transfusions and reschedule some non-urgent surgical procedures.

We would like to assure you that Canadian Blood Services (CBS), as well as our hospital blood transfusion service, are taking all possible actions to improve and conserve the blood inventory.

We understand that this may be inconvenient and concerning, and we appreciate your patience and understanding at this time.

Once inventory levels have stabilized, your physician will arrange re-scheduling of your procedure if still required.

Should you have any questions regarding this notice, please contact your physician's office.

More information may also be available on Canadian Blood Service's website: www.blood.ca



Canadian Blood Services



4. Training and Competency

4.1 How to Respond in a Blood Shortage – Information for Physicians, Nursing and MLT's

Physicians and Nursing

In the event of a blood shortage, hospitals will be notified by Canadian Blood Services (CBS). If the shortage is severe, it will impact patient care. Depending upon the etiology of the shortage, it could affect one or more components and products. Each hospital in Ontario should have a comprehensive plan for the management of blood shortages. This information is intended as a quick reference. Please refer to your hospital-specific plan for more details, including the way in which physicians/nurses are involved in decision-making during a blood shortage at your institution

Red Blood Cell Shortage

Shortage Phase	Impact on Physicians	Impact on Nursing
Green Phase Advisory		
Potential to move into a shortage situation	Usually, no impact outside of the Hospital Transfusion Service (HTS) but indicates there is a possibility a shortage will be declared.	
Amber Phase		
National supply of blood components does not meet demand	- You will receive a message according to your hospital’s policy informing you about the shortage and which component/blood group is affected. - CBS and Ministry of Health (MOH) will be involved in providing directions to hospitals.	
Actions	- Use restrictive hemoglobin thresholds as defined by National Advisory Committee on Blood and Blood Products (NAC) guidelines for Red Blood Cell transfusions in Children and Adults in Shortage Situations. - All orders for the affected blood component will require approval by the HTS, according to NAC guidelines - Switching ABO or Rh Groups: the transfusion laboratory may need to provide red cells of a compatible but different Rh and/or ABO group for your patient. - Elective surgeries/medical procedures requiring the affected component may need to be deferred as per directive to hospitals. - Patients and their families should be notified of any deferral or cancellation of their treatment	- More restrictive hemoglobin thresholds will be implemented. - All orders for the affected blood component will require approval by HTS, according to NAC guidelines. - Elective surgeries/medical procedures requiring affected component may need to be deferred as per directive to hospitals - Switching ABO or Rh Groups: the transfusion laboratory may need to provide red cells of a compatible but different Rh and/or ABO group for your patient.



Red Phase

This level of shortage indicates a <u>critical supply shortage</u>	- You will receive a message according to your hospital's policy informing you about the shortage and which component/blood group is affected. - CBS and MOH will be involved in providing directions to hospitals.
Deferral of Elective Transfusions/Procedures – hospitals may be directed by the MOH to defer or cancel elective use of the affected blood component to preserve the supply for life-threatening situations.	- Use restrictive hemoglobin thresholds as defined by National Advisory Committee on Blood and Blood Products (NAC) guidelines for Red Blood Cell transfusions in Children and Adults in Shortage Situations. - All requests for affected blood components will need to be approved by HTS physician or committee, as per hospital policy. - For patients with massive hemorrhage a triage physician or team at your hospital will follow a national guidance document to aid in decision making regarding eligibility. - Elective surgical/medical procedures requiring the affected component will need to be deferred. - Patients and their families should be notified of any deferral or cancellation of their treatment - Document any deferred or cancelled transfusions/surgical/medical procedures in the patient's medical record, along with any alternative therapies provided/offered. - Deferred/cancelled transfusion decisions are also tracked by the HTS/hospital committee. - Restrictive hemoglobin thresholds will be implemented. - All orders for the affected blood component will require approval by the HTS physician or committee, as per hospital policy. - For patients with massive hemorrhage a triage physician or team at your hospital will follow a national guidance document. - Elective surgeries/medical procedures requiring the affected component may need to be deferred as per directive to hospitals

Recovery

Blood inventory levels have begun to increase and are expected to be maintained at a level that would allow gradual resumption of normal transfusion activities	- Your hospital will be notified once the supply shortage has been corrected. - Measures to minimize blood use may continue for a period of time to avoid falling back into shortage. - Elective use of the affected blood component will normalize slowly. - Affected patients may need to be recalled. - You may be asked to participate in a review of the blood shortage experience to assess how well your hospital responded.
--	---



Platelet Shortage

Shortage Phase	Impact(s) on Physicians	Impact(s) on Nursing
Green Phase Advisory		
Potential to move into a shortage situation	Usually, no impact outside of the hospital transfusion service but indicates there is a possibility a shortage will be declared.	
Amber Phase		
National supply of blood component or product does not meet demand	- You will receive a message according to your hospital’s policy informing you about the shortage and which component/blood group is affected. - CBS and MOH will be involved in providing directions to hospitals.	
Actions	- Use restrictive platelet thresholds as defined by National Advisory Committee on Blood and Blood Products (NAC) guidelines for Platelet transfusions in Children and Adults in Shortage Situations. - All platelet orders will require approval by the HTS, according to NAC guidelines - Elective surgeries/medical procedures requiring platelets may need to be deferred as per directive to hospitals. - Patients and their families should be notified of any deferral or cancellation of their treatment - Platelet doses may be split at sites with this ability. - Use pharmacologic options (e.g. tranexamic acid, thrombopoietin mimetics).	- More restrictive platelet count thresholds for transfusion will be used. - All orders for the affected blood component will require approval by the HTS, according to NAC guidelines. - Elective surgeries/medical procedures requiring platelets may need to be deferred as per directive to hospitals. - Lower volume platelet doses may be issued. - Use of pharmacologic options may increase (e.g. tranexamic acid, thrombopoietin mimetics).
Red Phase		
This level of shortage indicates a <u>critical supply shortage</u>	- You will receive a message according to your hospital’s policy informing you about the shortage and which component/blood group is affected. - CBS and MOH will be involved to provide direction to hospitals.	
Deferral of Elective Transfusions/Procedures – hospitals may be directed by the MOH to defer or cancel elective use of platelets, to preserve the supply for life-threatening situations.	- Use restrictive platelet thresholds as defined by National Advisory Committee on Blood and Blood Products (NAC) guidelines for Platelet transfusions in Children and Adults in Shortage Situations. - All requests for platelets will need to be approved by HTS physician or committee, as per hospital policy. - Elective surgical/medical procedures requiring platelet transfusion will need to be deferred. - Patients and their families should be notified of any deferral of cancellation of their treatment. - Document any deferred or cancelled platelet transfusions/surgical/medical procedures in	- More restrictive platelet count thresholds for transfusion will be used. - All orders for the affected blood component will require approval by the HTS, according to NAC guidelines. - Elective surgeries/medical procedures requiring platelets may need to be deferred as per directive to hospitals.



	the patient's medical record, along with any alternative therapies provided/offered. • Deferred/cancelled platelet transfusion decisions are also tracked by the HTS/hospital committee.	
Recovery		
Platelet inventory levels have begun to increase and are expected to be maintained at a level that would allow gradual resumption of normal transfusion activities.	• Your hospital will be notified once the supply shortage has been corrected. • Measures to minimize platelet use may continue for a period of time to avoid falling back into shortage. • Elective use of platelets will normalize slowly. • Affected patients may need to be recalled. • You may be asked to participate in a review of the blood shortage experience to assess how well your hospital responded.	



Medical Laboratory Technologists

In the event of a blood shortage, hospitals will be notified by CBS. If the shortage is severe, it will impact patient care. Depending upon the cause of the shortage, it could affect one or more components and products. Each hospital in Ontario should have a comprehensive plan for the management of blood shortages. This information is intended as a quick reference. Please refer to your hospital-specific plan for more details, including the way in which technologists are involved in documentation and communication at your institution.

Some of the implications for MLT are listed below:

Situation	Impact(s)
Green Advisory Phase Notification	- Usually, no impact outside of the HTS - CBS will send notification to your HTS providing details on the shortage. - You may be asked to forward notification to others at your hospital. - Report daily inventory by blood group into the CBS hospital portal if not already routine practice
Amber Phase Notification – National supply of blood component or product does not meet demand.	- CBS will send notification to your HTS providing details on the shortage. - You may be asked to forward notification to others at your hospital. - HTS will reduce the target inventory of product held on-site - Inventory orders will be sent to CBS to maintain stock at your defined Amber Phase levels. - Report daily inventory by blood group into the CBS hospital portal - Participate in teleconferences with CBS as required
All orders for the affected blood component or product will be reviewed	- HTS medical director to approve component for issue following established criteria for Amber Phase. (see NAC Guidelines) - Document all transfusion decisions using a log sheet (see Documentation Logs) - Further direction may be provided by NEBMC or OEBMC.
Amber Phase Platelet shortage	Platelet doses may be split at sites with this ability. This requires HTS medical director approval.
Red Phase Notification This level of shortage indicates a <u>critical supply shortage</u> . (In addition to Amber phase impacts).	- Continue to send orders to HTS medical director to approve component for issue following established criteria for Red Phase (see NAC Guidelines) - A triage team at your hospital will review all requests and prioritize decisions around massively bleeding patients.
Deferral of Elective Transfusions/Procedures – action in a shortage will be to defer elective procedures requiring blood and reduce elective transfusions.	Document all transfusion decisions using a log sheet (see Documentation Logs).



Recovery Notification

- Your hospital will be notified by CBS once the supply shortage has been corrected.
- Measures to continue to minimize blood use may continue for a period of time to avoid falling back into shortage.
- Elective use of the affected blood component/product will normalize slowly.
- You may be asked to participate in a review of the blood shortage experience to assess how your hospital responded.

Plasma Protein Products these shortages are rare and may include factor concentrates, IVIG, albumin. Manufacturing problems may result in a supply shortage.

For immunoglobulin shortages – refer to the [National Plan for Management of Shortages of Immunoglobulin \(Ig\) Products](#), and when available the provincial Ig shortages plan.



4.2 Blood Shortage Training Checklist

Laboratory staff should be trained on their Hospital Emergency Blood Management Plan (HEBMP) to ensure they are familiar with required roles and responsibilities during a blood shortage. This training checklist provides a template for hospitals to ensure all components of a blood shortage are understood and training is documented.

Employee Name:		Training date:	
Employee Job Title:			
Type of Training:	☐ Initial Training	☐ Annual Assessment	☐ Retraining
Document Review:			
☐ Hospital Emergency Blood Management Plan/Policy ☐ Laboratory procedure for Emergency Blood Management			

Skill	Key Areas of Assessment	Trainer's Initials	Date
1. Define all 5 inventory / blood shortage phases	Differentiates the different blood shortage phases including Green, Green Phase Advisory, Amber, Red and Recovery		
2. Describe the initial notification and communication as defined by HEBMP	Recognizes the specific communication from the blood supplier notifying Green Phase Advisory, Amber, Red and Recovery Phase of a blood shortage.		
	Demonstrates the appropriate procedure for notifying transfusion medicine manager and others (includes documentation of notification)		
3. Manage inventory during a blood shortage	Explains why hospital target inventory levels require adjustment in response to blood shortage notification *Including when to recall units in satellite storage/release on-hold blood components.		
	Locates policy for inventory levels for blood shortage phases.		
	Demonstrates use of CBS hospital portal inventory reporting to report blood component inventory (Red cells and platelets)		
4. Manage blood order requests during a blood shortage	Locates the facility guidelines/ SOP that would be used during a blood shortage		
	Identify the correct forms to document blood order requests and decisions taken during a blood shortage		



5. Explain the purpose of a blood shortage exercise	Explains how evaluating shortage exercises helps improve hospital communication and policies.		
---	---	--	--

Personnel	Signature	Date
Trainee completed competency quiz		
Trainee		
Trainer		
Laboratory Manager		



4.3 Blood Shortage Plan Competency Training Quiz

Below are examples of questions that can be used to assess the competency of laboratory staff regarding blood shortage management following training on the Hospital Emergency Blood Management Plan (HEBMP).

Competency Questions (single answer only):

1. What blood components/products may be affected in a shortage?
 - a) Red blood cells
 - b) Platelets
 - c) IVIG
 - d) All of the above
2. Which of the following could cause a national blood shortage?
 - a) A new infectious agent (pandemic)
 - b) Decrease in demand from hospitals
 - c) A snowstorm affecting one blood centre
 - d) A multi-person vehicle accident
3. Which organization will notify the Hospital Transfusion Service of a blood supply shortage?
 - a) Ministry of Health
 - b) Canadian Blood Services
 - c) Hospital Transfusion Committee
 - d) Public Health Department
4. The NAC Emergency Framework for rationing blood:
 - a) Is intended during Red Phase shortages only
 - b) Is intended for massively bleeding patients only
 - c) Is only used if NEBMC recommends
 - d) All of the above
5. What inventory management action would be taken upon receiving notification of an Amber Phase blood shortage?
 - a) No action is required - this is routine
 - b) Notify the operating room that all surgery is on hold until further notice
 - c) Reduce inventory levels for affected component according to hospital policy
 - d) Notify medical day care unit that all transfusions are on hold until further notice
6. What inventory management actions apply to any phase blood shortage?
 - a) Apply inventory target levels according to hospital policy
 - b) Adhere to transfusion guidelines and screen all orders for the affected component



- c) Report inventory levels on hand to CBS daily
- d) All of the above

7. What is among the roles of the Hospital Emergency Blood Management Committee (HEBMC)?

- a) To liaise with CBS during a blood shortage
- b) To provide hospital clinical staff with guidance during a blood shortage
- c) To liaise with the provincial Minister of Health during a blood shortage
- d) To inform CBS of a blood shortage

8. Documentation of decisions regarding deferral or cancellation of transfusion during a blood shortage is required.

- a) True
- b) False

9. What action should hospitals take if notification of a Green Phase Advisory is received?

- a) No action is required
- b) Return inventory to CBS as defined by hospital policy
- c) Report hospital inventory to CBS daily
- d) Notify hospital Chief of Surgery immediately

10. What is the primary purpose of a review of a blood shortage event?

- a) Pinpoint personnel who did not follow the correct procedure
- b) Identify opportunities to improve the hospital plan
- c) Ensure 100% of contacts were notified of the blood shortage
- d) Ensure recovery to Green Phase is complete

Employee Name:	
Date Complete:	
Trainer Name:	
Date Reviewed	
Score:	

Retain documentation of competency in the employees' training file.



4.4 What You Need to Know About Management of Blood Shortages

This is a PowerPoint presentation that has been designed with the key elements of what hospital staff need to be aware of when trained on the management of blood shortages. This presentation can be adapted to suit hospital specific training needs.



Inspiring and facilitating best
transfusion practices in Ontario.

What You Need to Know About Management of Blood Shortages

Helping Hospitals Prepare...



Acknowledgements

The Ontario Regional Blood Coordinating Network (ORBCoN) gratefully acknowledges funding support provided by the Ontario Ministry of Health. The views expressed in this publication are those of the authors and of ORBCoN and do not necessarily reflect those of the Ontario Ministry of Health or the Government of Ontario.

We appreciate and acknowledge the work being done by the Transfusion Service staff at Ontario hospitals.

Revisions

The entire toolkit has been revised to include updated information included in:

- Version 4.0 of the Ontario Contingency Plan for the Management of Blood Shortages
- The National Plan for the Management of Shortages of Labile Blood Components, Revision date 2025.11.07

Major formatting and restructuring of the Toolkit have occurred to provide as a full PDF and editable documents.

New sections included in Version 4.0 of the toolkit include:

1. Hospital Contingency Phase Self Assessment Tool
2. Triage in Massively Bleeding Patients – Corporate Hospital Policy
 - a) Patient Triage Record
3. Excel formatted documentation logs. Separate worksheets in single Excel file for Transfusion Orders (all components) and Triage Tracking
4. Platelet Tips for Inventory Management in Shortages (Platelet TIMS)
5. NAC Guidelines for RBC and Platelet Transfusions during shortages
6. Notification tree with notification log
7. Memo Template for Triage in Massively Bleeding Patients

Content removed from the Toolkit includes:

1. Summary Table: Actions to be Taken during Phases of a Blood Shortage
2. Planning a Blood Shortage Exercise – Checklist
3. Documentation Log: Deferred/Cancelled Surgeries during a Blood Shortage
4. Documentation Log: Platelet Orders during a Blood Shortage

