

**Ontario Blood Shortage
Simulation Exercise
Final Report
August 25, 2010**

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Abbreviations

BPCO	Blood Programs Coordinating Office
CBS	Canadian Blood Services
CDT	Central Daylight Time
COO	Chief Operating Officer
CPWG	Contingency Planning Working Group
DOH	Days On Hand
EDT	Eastern Daylight Time
EST	Eastern Standard Time
HEBMC	Hospital Emergency Blood Management Committee
HEBMP	Hospital Emergency Blood Management Plan
HLS	Hospital Liaison Specialist
MOHLTC	Ministry of Health and Long-Term Care
MSBOS	Maximum Surgical Blood Ordering Schedule
NAC	National Advisory Committee
NEBMC	National Emergency Blood Management Committee
OEBMC	Ontario Emergency Blood Management Committee
ORBCoN	Ontario Regional Blood Coordinating Network
PT	Provincial / Territorial
RBC	Red Blood Cell

Executive Summary

Background: The *Ontario Contingency Plan for Management of Blood Product Shortages*¹ was released and distributed to Ontario hospitals in 2008. In collaboration with Canadian Blood Services, the Ontario Regional Blood Coordinating Network, the National Advisory Committee on Blood and Blood Products, and the Ontario Emergency Blood Management Committee planned and held a simulated blood shortage exercise. The primary objectives of the exercise were to increase awareness of the possibility of a blood shortage, encourage hospitals to establish their hospital specific emergency blood management plans and to measure Ontario hospital readiness to respond to a critical blood shortage event.

The Ontario blood shortage simulation exercise was held on March 10, 2010. The exercise simulated an ‘Amber’ phase red cell inventory shortage. Hospitals across the province had been informed earlier in the year that the exercise would be held, however, the hospitals selected to participate and the actual day of the exercise were not announced in advance. Twenty seven hospitals of varying size and representing all regions of Ontario received notification from CBS on the morning of March 10, 2010 that their site had been selected to participate in the Ontario blood shortage simulation exercise. Participating hospitals were asked to simulate initiation of their Hospital Emergency Blood Management Plan for an Amber phase red cell shortage, to document decisions that would be made to conserve blood and to report on their plan and activities during the simulation. At the end of the exercise, all Ontario hospitals with a licensed transfusion service were notified that the blood shortage exercise had been held and was now completed.

Results: The majority of the 27 participating hospitals reported that they had a plan in place to follow and had activated it within one hour of receiving notification. Activities included:

- reduce expected on hand inventory levels to help reduce overall demand from the blood supplier
- share blood between nearby sites, if needed
- notify hospital staff including the Hospital Emergency Blood Management Committee
- review elective (non-urgent) transfusion requests (surgical and medical) to identify cases for deferral

Lessons Learned: Through this provincial simulated blood shortage exercise, several key lessons were learned:

- CBS fax notification to inform hospitals of a blood shortage was not sufficient
- hospitals that receive blood from other hospitals (and not directly from CBS) fall outside the notification process
- a process is not currently in place to inform paramedic and other emergency services if a critical blood shortage exists
- an estimated 23% of average daily blood use at hospitals could be deferred

- not all hospital staff were aware of their roles / responsibilities if a blood shortage notification is received

Recommendations and Conclusions: Recommendations to address identified deficiencies are included in this report and apply to all stakeholders in the blood system – CBS, Ministry of Health and Long-Term Care Blood Programs Coordinating Office and hospitals. Overall, feedback from all participants in the Ontario blood shortage simulation exercise was favourable and a recommendation was made to plan and hold another simulation exercise within the next year to further refine Ontario hospital preparedness to respond to a critical blood shortage.

Background

The Ontario Ministry of Health and Long-Term Care (MOHLTC), Blood Programs Coordinating Office (BPCO), held a strategic planning session with Ontario hospital representatives in 2006 to set priorities for the provincial blood utilization strategy. One of the priorities identified was to develop a provincial plan to aid in the management of blood during a critical inventory shortage.

In 2007 the Contingency Planning Working Group (CPWG) was established to work on developing a provincial plan. Members included representatives from the blood supplier Canadian Blood Services (CBS), Ontario hospitals, the Ontario Regional Blood Coordinating Network (ORBCoN) and the BPCO. The resulting *Ontario Contingency Plan for Management of Blood Product Shortages*¹ was released electronically to hospital CEOs and hospital transfusion services in January 2008.

To aid hospitals in developing a facility specific plan that would be consistent with the provincial plan, the CPWG created a toolkit that included a PowerPoint presentation about contingency planning to help raise awareness within each hospital about the need for a contingency plan, checklists to help hospitals develop a site specific blood shortage management plan, and templates for internal communication. The Ontario Plan and toolkit were mailed to all 158 hospitals in Ontario with a licensed transfusion service in August 2008.

In fall 2009, the CPWG began to develop a plan for a blood shortage simulation exercise. The main objectives of the simulation exercise were to:

1. Increase awareness of the possibility of a blood shortage (particularly for non transfusion healthcare professionals),
2. Encourage hospitals to develop facility specific plans and test hospital preparedness in the event of a blood shortage, and
3. Test the communications protocol in the event of a blood shortage among the blood supplier (CBS), the MOHLTC, and hospitals.

By November 2009, the CPWG membership and role was expanded to also function as the Ontario Emergency Blood Management Committee (OEBMC). The purpose of the provincial committee in a blood shortage is to work in accordance with the guidelines outlined in the *National Plan for the Management of Shortages of Labile Blood Components* (National Plan)², to ensure that the recommendations of the National Emergency Blood Management Committee (NEBMC) are appropriately communicated to stakeholders within Ontario, and to coordinate provincial activities as required (see Appendix A and B for OEBMC and NEBMC Terms of Reference).

The NEBMC is comprised of the National Advisory Committee on Blood and Blood Products (NAC), CBS representatives and Provincial/Territorial (PT) Blood representatives. In a true blood shortage, the final decision to initiate the National Plan is made by the NEBMC. The blood shortage is identified according to the inventory

level of the affected blood component and the anticipated length of the shortage as either an Amber or Red phase (see Table 1 below for red cell inventory).

Table 1 – Red Cell Inventory Levels for Blood Shortage Levels^{1,2}

RBC Inventory for each phase of Blood Shortage	CBS Days on Hand	CBS # Units on Hand	Per cent Hospitals Target of Optimal Inventory
Green Phase (optimal)	> 72 hours	> 8,900	100%
Amber Phase (serious)	48-72 hours	6,000 – 8,899	50%
Red Phase (critical)	< 48 hours	< 5,999	25%

Key decisions around blood use are critical in ensuring the blood component inventory will be preserved for patients with life threatening needs. Of primary importance is that the national and provincial plans help ensure patients receive equitable care no matter where they are in the province.

The Blood Shortage Simulation Exercise

Preparation and Planning

The simulation exercise was designed to parallel a real blood shortage situation as closely as possible, including the initial declaration of a blood shortage by the NEBMC, communications to individual hospitals by CBS and actions taken by each participating body.

During the planning of the simulation, Ontario hospital transfusion services were informed of the upcoming simulation exercise scheduled to occur in spring 2010. The message was communicated through collaborative hospital site visits with CBS and ORBCoN, various educational events, and the TransfusionOntario website.

A preliminary meeting was held with the Chairperson of the NEBMC to ask if she would participate with the OEBMC to initiate the simulation exercise. Additional meetings were held with CBS senior staff to confirm their willingness to participate, as well as with representatives from the five CBS Blood Centres that provide blood components to Ontario hospitals. The purpose of these meetings was to provide CBS with the details of the Ontario simulation exercise plan and to ensure their collaboration and cooperation in sending out communications to the participating hospital sites. Five CBS Blood Centres provide blood components and products to hospitals in Ontario. They are:

1. Ottawa – serving 47 hospitals/sites
2. Toronto – serving 47 hospitals/sites
3. Hamilton – serving 25 hospitals/sites
4. London – serving 27 hospitals/sites
5. Winnipeg – serving 12 hospitals/sites (in Northwestern Ontario)

In total, the five participating CBS Blood Centres serve 158 hospitals/sites in Ontario. With the support of a statistician, the number of sites selected to participate in the exercise to obtain an appropriate sample size was determined to be at least 25 hospitals (~15%). It was recommended that selection of participating sites should include representation from each region and hospital type (i.e. small, community, and teaching). In addition to the 25 hospitals initially selected, the two ORBCoN hospital sponsor sites were later included as they both expressed interest in participating. A larger number of small hospitals were selected from the Northern and Eastern region because the majority of small hospital sites are in that region. A larger number of teaching hospitals were selected from the Central region for the same reason.

In total, 27 hospitals across all categories were selected. Two of the large teaching hospitals are corporate organizations with multiple (three) sites. One of these sites reported as one corporate organization, the other elected to report separately by site. A total of 29 sites reported results for the exercise. Site selection was performed collaboratively between CBS Hospital Liaison Specialists (HLS) and ORBCoN Regional Coordinators. The identity of the selected sites was not known to those outside of the selection committee, CBS personnel directly involved in notification and the OEBMC

members (see Appendix C for List of Selected Sites and breakdown by type and region).

At the time of the exercise, standardized CBS communication templates were not available to the planning group; therefore communication templates were developed to aid in notification of hospitals. Reporting/log forms were developed to gauge the preparedness of hospitals, including the level of development of their facility specific contingency plans. All communications were sent via fax by the CBS Blood Centres to hospitals within their region. Sending this information via fax follows the current CBS communication protocol for issuing inventory alerts.

The first communication was issued on February 1, 2010, and was sent to all hospitals in Ontario served by CBS. The communication indicated that the exercise would take place in March 2010, and would simulate an Amber phase red blood cell inventory shortage. Hospitals were informed that 25 hospitals would be selected to participate in the simulation exercise and those selected would be notified on the day of the exercise. They were advised that they would be asked to participate in a conference call, simulate initiation of their Hospital Emergency Blood Management Plan (HEBMP), and complete a reporting form. Hospitals were also advised that participation, if they were selected, was mandatory. This communication was sent again on February 24, 2010, as a reminder (see Appendix D for Sample Communication Notices).

The knowledge of the exact date of the simulation, once determined, was restricted to two of the organizers on the CPWG (the BPCO representative and ORBCoN representative).

The Simulation Exercise

The blood shortage simulation was initiated by the MOHLTC BPCO. On Monday, March 8, 2010, a phone call and email communication were made from the BPCO to the Chairperson of the NAC who also serves as chair of the NEBMC. The Chairperson of the NEBMC is responsible for convening the NEBMC in the event of an inventory shortage and the NEBMC determines if the situation warrants a declaration of an Amber or Red phase blood shortage. On the Chair's instruction, the Administrative Assistant to the CBS Chief Operating Officer (COO) sends the communication to committee members and serves as Secretariat for the NEBMC.

The Chairperson of the NEBMC used the Ontario simulation exercise as an opportunity to test the response of the NEBMC and in the afternoon of March 8, 2010, an email was sent to the NEBMC asking them to participate in a teleconference the following day on March 9, 2010, at 2:30 PM EDT.

For this simulation exercise, the NEBMC meeting via teleconference occurred to inform all members that Ontario was initiating an exercise to simulate an Amber level shortage of the red cell inventory. All NEBMC members or their delegate were in attendance. The CBS COO, a member of the NEBMC, was responsible for contacting the

participating CBS Blood Centres, specifically the CBS Site Production Managers and Hospital Liaison Specialists, to initiate the communication process of notifying selected hospitals of the simulation Amber level shortage.

Simultaneously, the Ontario PT Representative, Manager for the Ontario BPCO, initiated a call to convene the OEBMC, on the following day, Wednesday, March 10, 2010, at 1200 EDT, via teleconference.

On the day of the exercise, March 10, 2010, at 0930 EDT, the participating CBS Blood Centres initiated the communication process via fax to the 27 selected hospitals.

All CBS Blood Centres issued the same communication using the templates provided by the CPWG (see Appendix E), with minor modifications to provide specific contact information for the sending CBS Blood Centre. Of note, the Winnipeg blood production centre is in a different time zone (CDT) from the other CBS production sites in Ontario (EDT), as is one of the hospital sites selected to participate in the exercise. This presented a logistical challenge to the coordination of issuing the initial notification to participating sites, which was originally planned to be issued at 0830 EDT and was later delayed until 0930 EDT to accommodate the different zones.

CBS HLS also simultaneously issued an email communication to participating hospital sites. This email was directed to the hospital site Laboratory Manager or Supervisor (primary site contact on the CBS contact list). If CBS did not receive a receipt of confirmation within one hour of the initial fax being sent a follow-up phone call was made in an attempt to confirm that notification of the exercise had been received.

This initial communication contained:

1. **Instructions and action required** – confirmation that they were a participating site in the Ontario simulation blood shortage exercise, that it was a simulation only, and that they were required to initiate their HEBMP, including internal staff notification and convening the Hospital Emergency Blood Management Committee (HEBMC).
2. **Documentation Log for Cancelled Surgeries** – form provided (to be used if no facility specific form was available) to record which surgeries would be considered for deferral or cancellation IF this were a real Amber phase blood shortage.
3. **Transfusion Log** – form provided (to be used if no facility specific form was available) to record transfusion orders and how they would be screened and/or considered for deferral or reduction IF this were a real Amber phase blood shortage.
4. **Agenda for CBS Teleconference** – separate calls within each region to take place at 1100 EDT; agenda provided so that hospitals would know what to expect at the teleconference.

At 1100 EDT, participants on each teleconference call included hospital representatives of participating hospital sites, CBS Production Managers and HLS, and ORBCoN Regional Coordinators. This type of call would occur during a real blood shortage to ensure communication of inventory status (both at CBS on a national, provincial and regional level and at each hospital site) and to identify any critical situations or need for blood components. If needed, hospital sites may be encouraged to share inventory to ensure critical patient care is not compromised. For the purposes of this exercise, the scenario for the exercise and actions hospitals were taking to complete the requested forms were discussed.

At 1200 EDT, a meeting of the OEBMC was held. 20 of 25 members/designates were in attendance. CBS provided an update on hospital notification and response and outlined the simulated reason for the shortage.

At 1300 EDT notification of the Recovery phase of the simulated blood shortage exercise was issued by each CBS Blood Centre via fax to all participating hospitals within their respective regions. Attached to the recovery communication was a reporting form to assess hospital preparedness and to obtain feedback to evaluate hospital response to the exercise. An agenda for a debriefing teleconference was also included (see Appendix F).

At 1400 EDT a communication was faxed by all participating CBS Blood Centres to all hospitals in the province with a licensed transfusion service that the Ontario blood shortage simulation exercise had taken place that day and was now complete (see Appendix G).

Within 24 hours following the exercise, debriefing teleconferences for participating hospital sites occurred. During the debriefing, CBS and hospital participants provided a review of the exercise, commented on things that had gone well, and identified challenges and areas for improvement. Hospitals were asked to ensure all forms had been completed and returned to ORBCoN for analysis. Minutes were taken by the ORBCoN Regional Coordinator at all the teleconferences held during the exercise to aid in the final analysis of the exercise.

Results

Overall, 29 hospital sites representing the 27 participating hospitals submitted reports for the simulated blood shortage exercise. One of the 29 sites failed to return the evaluation form due to conflicting priorities, but did return completed log forms therefore, in total, 28 site evaluation forms were received and 29 transfusion and surgical blood deferral log forms were received.

Hospital Plans (see Figure 1)

Activation: CBS Blood Centres initiated notification by fax distribution of the blood shortage simulation exercise at approximately 0930 EDT.

- 23 of 28 reporting sites logged the time at which their plan was initiated within their own facility. The majority of sites (19 / 68%) activated their plan by 1030 EDT. The times ranged from 0850 to 1600, with a mean time of 1040 and a median time of 0930-0945
- 4 sites had a delayed response due to delayed notification of key personnel

Inventory:

- 20 of 28 sites (71%) reported that they would reduce inventory levels for an Amber phase blood shortage, in accordance with their HEBMP
- 18 of 28 sites (64%) would report their inventory to CBS, in accordance with their HEBMP
- 1 site reported they contacted another nearby site to obtain their inventory levels, as directed by their HEBMP
- 25 of 28 sites (89%) have a process in place to share blood components between sites and 1 site reported their process was in development (see table 2 below)

Table 2 – Hospitals with Redistribution Arrangements

# sites in redistribution/sharing arrangement:	# hospitals reporting
1 other site	6
2 other sites	9
3 other sites	5
4 or more sites	5

Hospital Staff Notification:

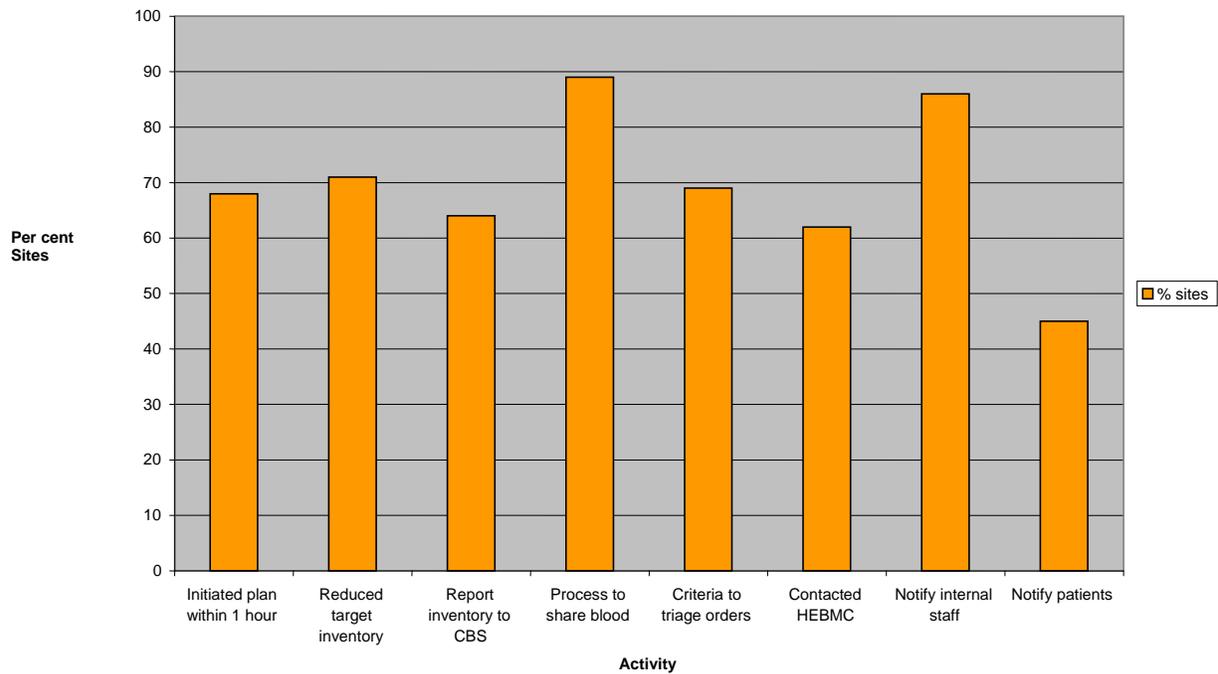
- 18 of 28 sites (62%) initiated contact with their HEBMC, 1 site used their Hospital Transfusion Committee as their HEBMC, 4 sites (14%) reported that they were still in the process of forming their HEBMC, 1 site issued a notification via email to their HEBMC but did not request acknowledgement
- 3 sites (9%) are involved in a large Regional Emergency Blood Management Plan involving a total of 19 hospitals/sites. Notification of the blood shortage exercise was issued to their regional hospital group for information only, stating that they were not required to take any action

- 15 sites (52%) provided the results of their contact with the HEBMC
- The success rate in contacting members to notify them of the exercise ranged from 46% to 100% and the average response rate was 79%
- 1 site reported they held an emergency meeting with their Hospital Transfusion Committee (minutes were provided) that was acting as the HEBMC. At the meeting, the exercise was discussed. There was also discussion around review of the surgical list for the next day and the strategies that would be used to determine procedures that would be considered for deferral if this was a real blood shortage that would continue for a period of time
- 25 sites (86%) reported that internal staff would be notified as part of their HEBMP in an Amber phase shortage and in the recovery of the blood shortage
- 17 sites (58%) provided examples of their Amber and Recovery phase memos. Transfusion screening criteria was incorporated into one memo issued to clinical hospital personnel
- 3 sites (9%) provided examples of their contact lists for staff notification
- 2 sites (7%) indicated they had a specific communication memo for medical staff to inform them of the shortage and that all transfusion requests would be reviewed

Patient Notification:

- 13 of 28 sites (45%) reported that they included patient notification in their plan if surgery or transfusion must be cancelled or deferred
- 1 site (3%) reported they have a process to document any deferral of transfusion in the patient's chart and send a memo to the patient from the surgeon's office, if it is necessary to defer surgery
- 1 site (3%) stated that a nurse would notify patients if a transfusion is to be deferred, the surgeon would notify if a surgery is to be deferred

Figure 1 – Hospitals Plans to Manage Blood Shortage



Surgery Deferral: (see Table 3 and Figure 2)

- 12 of 29 sites (41%) reported that they either did not perform surgery on site or did not have any scheduled for the day of the exercise
- 8 sites (28%) reported that they would have deferred elective surgical procedures that had been scheduled for the day of the exercise: 6 sites (28%) would have deferred between 1 and 4 procedures and 2 sites (7%) would have deferred between 5 and 10 procedures
- In total, 23 surgeries would have been deferred in the event of a real blood shortage, with a total of 51 possible red cell units related to these surgeries
- 1 site (3%) reported that the surgeries they had scheduled were all associated with the use of 2 units per procedure and they would not defer these surgeries in an Amber phase as they are not associated with high blood use
- Another site reported they would not cancel or defer any cardiac surgeries in an Amber phase blood shortage
- 4 sites (14%) stated that the surgeries scheduled for that day were already underway and could not have been cancelled
- 2 sites (7%) reported that a communication would be sent out to operating rooms that the facility Maximum Surgical Blood Order Schedule (MSBOS) would be strictly adhered to. The MSBOS is the number of red cell units, on average, that are required by patients who undergo a certain surgical procedure at that hospital

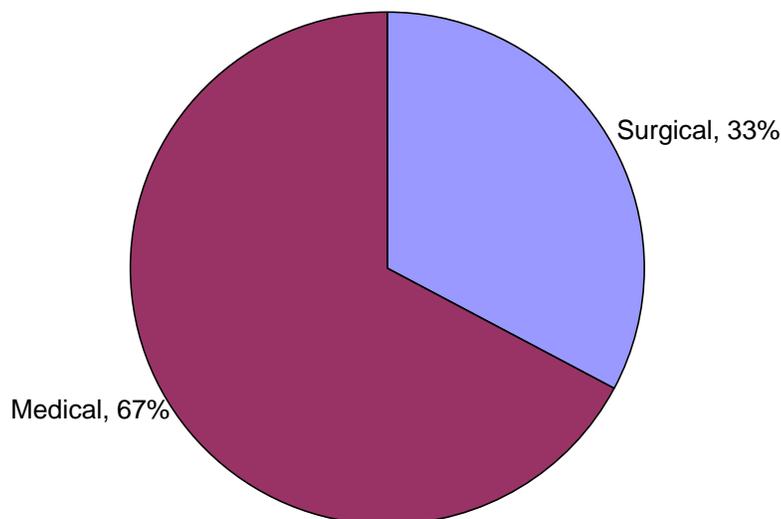
Table 3 – Examples of Surgery Deferrals Listed by Hospitals Participating in Simulation Exercise

• Elective aneurysm repairs	• Elective Orthopedic procedures
• Brain Tumor resections	• Elective Spinal decompression / fusion
• Cardiac arterial bypass graft (non-urgent)	• Knee replacement
• Colectomy	• Elective Hip replacement
• Liver resection	• Transurethral resection prostate
• Mastectomy	• Live donor transplant (risk to healthy donor if they bleed unexpectedly)
• Hysterectomy	
• Cesarean section for placenta previa (non-urgent)	

Transfusion Deferral: (see Figure 2)

- 20 of 29 sites (69%) reported their transfusion request triage results
- Of a total of 181 red cell units requested, 71 units (39%) would have been issued, leaving 110 units remaining in the available inventory pool
- 1 site (3%) reported that they would deny 2 of 6 requests, but did not provide the number of units requested
- 5 sites (17%) had no scheduled transfusion on the day of the exercise
- 1 site (3%) had no triage process in place
- Of the sites reporting the results of their screening process, between 1 and over 20 orders were assessed per hospital/site. One very large hospital reporting on three sites reviewed 54 orders. An average of 6.5 orders were assessed per hospital/site

Figure 2 – Deferral of Red Cells by Category of Request



Lessons Learned

The information provided in this section is largely anecdotal in nature, obtained from the debriefing teleconferences held with representatives of hospitals that participated in the exercise and/or written comments submitted following the completion of the exercise. Therefore, it is difficult to quantify many of the responses and the information should be viewed as observational data only.

Communication

Initial Notification:

The fax notification was initially ignored at three sites as staff removing the memo did not interpret the communication to be important. At four sites (14%) it was reported that the Laboratory Manager was offsite or out of the office. This resulted in a significant delay in initiating the HEBMP at only one site. At one site, the Laboratory Manager was not on site and the fax was placed on his desk for his return. It was acknowledged by the organizers of the exercise that the communication templates used were developed specifically for this exercise and may not accurately reflect the appearance of the communication templates that will be used by CBS in a real blood shortage notification. At the time the exercise was planned, CBS notification templates were not available to the planning group.

CBS Blood Centres reported that it took a long time to fax all participating sites with the required communication and documentation logs. Each CBS site had to fax communications to between two (Winnipeg) and nine (Ottawa) sites. Communication #2 (initial notification of the blood shortage simulation exercise) was six pages, communication #3 four pages. Fax notification occurs sequentially (site one, then site two and so on). The Ottawa CBS site tracked the time it took for each of the fax communications to send to their nine participating hospitals.

- Communication #2 and all related documents took 23 minutes (2.6 min/site)
- Communication #3 and all related documents took 21 minutes (2.3 min/site)
- The final communication sent to all 51 sites serviced by the Ottawa CBS site took 2 hours 15 minutes (2.6 min/site)

CBS Blood Centres reported that they were still sending out the initial faxes when the first sites were attempting to fax back their confirmation of receipt, resulting in a busy signal. CBS personnel did follow up with hospitals by phone if they had not received confirmation of receipt within one hour of the initial fax being sent.

Two hospitals provided feedback that receipt of notification late in the morning prevents deferral of surgeries already in progress. Hospitals would require notification prior to 0700 local time in order to defer any scheduled morning surgeries.

Use of some terminology and acronyms in the communications were not understood by all hospital personnel. For example, some did not understand “DOH” (days on hand) on the CBS form attached to Communication #2.

Satellite Hospitals: In follow up discussions, the question of notification for hospitals that transfuse blood but do not receive their product directly from CBS (and therefore are not on the CBS contact list) was raised. These are very small sites that do not have a transfusion service but receive a small stock of red cell units from a nearby hospital. How these sites should be informed if there is a blood supply shortage and subsequent inventory management is not yet clear.

Other Emergency Services: It was identified that paramedic and other providers of emergency care that access blood components need to be notified if a blood shortage exists.

Inventory Reporting

Reporting to CBS:

18 of 28 hospital sites (64%) reported that they included inventory reporting in their HEBMP. At the time of the exercise, there was no specific form available from CBS for hospitals to provide this information. There were also differences in the understanding of what inventory should be reported to CBS (available versus reserved) or why this information was important to CBS.

The majority of hospitals participating in the exercise reported that they would reduce their required inventory ‘on hand’ to a defined Amber level. The recommendation is that the Amber level would represent less than 3 days of average daily use.^{1,2}

The hospital sites that participated in the blood shortage simulation exercise represent approximately 45% of blood use for the Province of Ontario. A rough estimate of average daily use for the participating hospitals is 687 units of red cells. In total, 161 units of red cells (23% of the average daily use) would have been kept in available inventory as a result of screening requests for surgical and medical transfusions. Reducing target inventory by even one day’s average use would be an additional estimated 687 units for a total of 848 units. Understanding and possibly being able to predict the impact of this response by hospitals to reduce inventory demand will be important for CBS and could aid them in managing the restricted supply.

Hospital Plans

Training:

It was recognized that although hospitals may have a HEBMP in place and/or a Standard Operating Procedure written, not all staff had been trained on the plan and many were not aware of their role and required actions. Some sites had a plan in draft form only, but were able to use this draft to work through the exercise. It was clear that in a true blood shortage it would be important to have the plan finalized and staff trained. Several sites commented that it would be useful to have a checklist made for staff to follow to ensure all required actions were taken and to document the event to allow for good review and follow-up.

Internal Communication:

Internal communication to physicians to notify them either as part of the HEBMC or for general awareness of the blood shortage exercise by email was reported by two large sites as 'not very successful'. Surgeons in the operating room were difficult to reach. Having a contact list created, including contact information (phone, email and pager) to track internal staff contact would be helpful. Posting signage in high blood use areas was also suggested.

Deferral of Transfusions:

Access to the required information to review and make decisions regarding deferral of surgery or transfusion was critical. Also, access to a physician who had the knowledge and authority to support these decisions was required. Having access to the operating room schedules will aid in this endeavor. Screening criteria for triaging transfusion requests made decisions go more quickly and smoothly. One small hospital found that contacting the Vice President of Clinical Services provided an excellent aid in making decisions around reducing possible blood use.

Documentation of Decisions:

The log forms provided for the exercise were acceptable for the exercise, but hospital representatives indicated that they would prefer to use a form that they developed for their own facility to ensure they were recording the information that would be important for them to track and that their staff could be trained and familiar with the document. A few sites reported some confusion over the information to be recorded on the log sheets. Familiarity with facility specific forms would reduce confusion/completion errors.

General

Although representatives of the hospitals that participated in the exercise reported that the timelines were tight, with a lot of activity required between receiving the initial fax, attending teleconferences, and initiating their facility specific communication and triaging

plans, the exercise provided an opportunity to test the function of written plans and procedures and to identify gaps within the plans. Another reported positive result of the exercise was an increased awareness amongst clinical staff at the participating hospitals that the possibility of a blood shortage occurring is real and that it is important to have a plan in place to manage shortages.

Recommendations

Hospitals

1. HEBMPs should be finalized and include:
 - (i) facility specific forms to document decisions regarding deferral of surgery or transfusion requests,
 - (ii) procedure for reporting available and reserved inventory to CBS, and
 - (iii) staff checklist to ensure all steps of the hospital plan are completed in a timely manner.
2. Staff should be trained on the plan.
3. Hospitals should have processes and agreements in place to share inventory between sites if necessary during a blood shortage to ensure life threatening bleeding can be supported with available inventory within a region.
4. Hospitals should consider a method for notifying patients if their surgery or transfusion needs to be delayed due to a shortage of blood. This could include templates of letters, documentation in the patient's chart and/or decision logs.
5. The HEBMC (or equivalent) should be formed in order to improve awareness among clinical staff of actions required within the facility to address blood use if there is a shortage of available inventory. This committee serves to develop an approach for decision making if a blood shortage does occur (agreement on screening criteria for blood component requests and strategies on which elective surgical procedures would be considered for deferral).
6. Each hospital should maintain a contact list of staff, including the HEBMC, that should be immediately notified in the event of a blood shortage. Contact of the HEBMC and/or clinical staff could be improved by use of contact through pagers instead of email/fax. If possible, a delegate or alternate contact name should also be provided. Laboratory Managers and Medical Directors should have delegates that could take action, if required, in their absence.
7. Hospital staff should review the daily inventory summary provided by each CBS Blood Centre to monitor the inventory situation and become familiar with CBS terminology, for example, optimal inventory equivalent to five days of average issues.

Canadian Blood Services

1. Hospital representatives that attended the debriefing teleconferences in all regions requested that a phone call be made in addition to fax and email. It was recommended that CBS also email hospital transfusion service medical directors as many of them have 'smart phones'.
2. The fax providing the notification of a blood shortage should have a title clearly stating that this is an urgent or important communication or be differentiated in some other way from routine fax communications sent by CBS.

3. If fax notification is used, use of multiple fax machines could speed up the process and avoid conflict of outgoing and incoming messages.
4. Improve hospital understanding of CBS procedures during a blood shortage and the expectations of hospitals.
 - Will standardized communication templates be used?
 - Will all hospitals participate in teleconferences or only selected sites?
 - What information do hospitals need to provide to CBS?
 - How will CBS make use of the inventory levels reported by hospitals?
 - Will CBS help to redistribute inventory to sites in need, for example, provide transport?
 - How will allocation decisions of scarce inventory be made if hospitals are already reducing their inventory and deferring transfusions?
 - Will there be opportunity for hospital staff to be trained on these processes?
5. In communications to hospitals, the use of acronyms should be avoided as some hospital personnel are not familiar with CBS acronyms for example DOH (days on hand of inventory).
6. If possible, notification of a blood shortage to hospitals should be done as early in the day as possible. Receiving notification later in the morning means many surgeries are already in progress. However, HEBMPs, including decision criteria, should account for the possibility of a shortage announcement at any time of the day.
7. The teleconferences held during the exercise were coordinated to occur simultaneously. This caused challenges for hospital personnel with responsibility for hospital sites in different regions. Staggering regional calls or selection from multiple time slots within each region could alleviate scheduling conflicts.

Ministry of Health and Long-Term Care – Blood Programs Coordinating Office

1. Avoid the use of acronyms (or, if necessary, clearly define acronyms on first use) in communications to hospitals. If acronyms are used, within any given communication restrict the use of acronyms to two to three that are widely recognized and frequently used (e.g. CBS, MOHLTC). Hospital personnel viewing the communications are not always familiar with less common acronyms such as HEBMC (Hospital Emergency Blood Management Committee).
2. Develop provincial guidance documents to improve standardization of screening criteria for deferral of transfusion and surgeries to be considered for deferral and to help standardize the process across the province ensuring an equitable approach.
3. Include notification of Critical, flight paramedics (ORNGE) and ambulance service in the provincial plan.
4. Provide guidance on notification responsibility of satellite hospitals that receive blood not from CBS but from another hospital.

5. The following should be developed and added to the Ontario contingency planning toolkit:

- templates of forms to document decisions around transfusion and surgery deferral
- template for use to notify patients if transfusion or treatment is to be deferred
- checklist to aid staff in actions to be taken and facilitate HEBMP training
- template of an HEBMC contact list with contact information with space to document the result of contact attempt
- within the provincial plan clarify the importance of hospitals reporting their inventory to CBS

Conclusions

According to the NAC Plan for Management of Shortages of Labile Blood Components², hospitals should have specific action plans ready to implement. This would help ensure the demand for blood will decline, giving CBS time to increase the supply to correct the shortage as well as reserve limited inventory for patients deemed to be most in need.

The Ontario Blood Shortage simulation exercise helped to demonstrate that the level of preparedness in a representative sample of hospitals in the province was high. The consistency of responses and examples of templates indicate that providing hospitals with the Ontario Contingency Planning Toolkit greatly facilitated the development of plans that are consistent with and will coordinate with the NAC plan. The majority of sites did have their HEBMP and HEBMC in place and were able to implement and simulate actions required. The exercise served to encourage sites without HEBMP to develop plans and those with plans to improve the effectiveness of the plan. The exercise also highlighted the importance of collaboration between CBS, ORBCoN, and the BPCO and key partners in hospitals in ensuring an appropriate and consistent response across the province. Importantly, the exercise helped identify some deficiencies with the current provincial plan as well as gaps in hospital plans. It also identified that there is a need for better understanding of the CBS plan relating to hospital communications and allocation of blood components.

The key actions recommended for improvement are:

- clarify CBS communication plan to hospitals for announcing a blood shortage
- clarify CBS role in triaging and allocating blood
- establish hospital inventory reporting process to CBS to provide information in determining the total inventory in the system and where the inventory is located
- hospitals establish a HEBMC with the role to monitor and control blood use during a blood shortage
- hospitals implement a HEBMP and train staff
- establish criteria to defer/cancel elective surgical and medical procedures requiring the affected blood component and implement a documentation process for release and non-release
- review the process around patient notification to establish a more standardized approach
- include a process to notify satellite hospitals and other provincial emergency services

Although the exercise was valuable in assessing Ontario's level of preparedness in the event of an Amber phase shortage, it must be recognized that there were limitations to the exercise. Specifically, the exercise was held over only a brief period of time (0930EDT-1300EDT), not all hospitals in the province participated and details regarding the total number of units that would be conserved to add to the pool of available inventory are difficult to estimate.

Hospitals that participated in this exercise demonstrated that approximately 23% of average daily red cell use would have been deferred and retained in the pool of available inventory. This, in addition to hospitals lowering expectations for inventory held on site (reduce to Amber level), would lessen the pressure on demand for the affected component (in this case red cells). Although data is limited, based on this savings we conclude that the actions taken would likely be sufficient to sustain urgent needs for red cells in the event of a true Amber phase blood shortage lasting several days.

Ontario is still in the early phases of establishing a standardized Ontario provincial contingency plan. The provincial plan, toolkit, and simulation exercise have catapulted Ontario forward in terms of emergency preparedness and awareness, but much of the actions during the exercise were ad hoc and not all sites have firm HEBMP and HEBMC in place. The overall evaluation of this blood shortage exercise was very positive and key benefits included identifying gaps in the process and increasing conservation awareness. Hospitals, CBS and the BPCO all reported that the exercise was helpful in identifying components of the plans (both at the hospital and provincial level) that need added clarification and standardization. The CPWG recommends a follow-up simulation exercise in 2011 to determine progress following the 2010 exercise and gather additional data regarding deferrals, units saved, and the efficacy of the conservation measures over a longer period of time. As a result of holding this exercise, there is no doubt that Ontario hospitals are now better positioned to respond to a blood shortage.

Acknowledgements

The Ontario Emergency Blood Management Committee wishes to express their thanks to all hospitals in Ontario, especially those that participated in this exercise and provided their valuable feedback for this report. In addition, thanks go out to CBS and ORBCoN staff who participated in the planning and execution of this exercise. They were critical to its success. Thank you also to the Chair of the NEBMC, Dr. Susan Nahirniak, and the COO of CBS, Mr. Ian Mumford, who aided in initiating this provincial blood shortage simulation exercise.

References

1. Ontario Contingency Plan for Management of Blood Product Shortages.
MOHLTC; 2008-01-29.
2. National Plan for the Management of Shortages of Labile Blood Components.
NAC / CBS; 2009-09-28.

Appendix A. Ontario Emergency Blood Management Committee Terms of Reference

1. MANDATE

- 1.1 To develop and maintain the provincial blood contingency plan and toolkit for hospitals that addresses shortages of blood in the Province of Ontario due to any type of disruption.
- 1.2 To act as a multidisciplinary advisory group to the Blood Programs Coordinating Office, Ministry of Health and Long-Term Care (MOHLTC), on the implementation and ongoing monitoring of the contingency plan.
- 1.3 To serve as the Ontario Emergency Blood Management Committee (OEBMC) whose purpose is to:
 - 1.3.1 Develop a response plan to minimize the impact of blood shortages;
 - 1.3.2 Work in accordance with the guidelines outlined in the National Plan for the Management of Shortages of Labile Blood Components (National Plan);
 - 1.3.3 Ensure that the recommendations of the National Emergency Blood Management Committee (NEBMC) and resulting national decisions are appropriately communicated within Ontario;
 - 1.3.4 Solicit feedback and on going collaboration on implementation of the National Plan key stakeholders (i.e. Transfusion Medicine specialists, organ transplant, sickle cell and other specialty groups); and Hospital Emergency Blood Management Committees (HEBMC).
 - 1.3.5 Provide the conduit for communications/feedback between the NEBMC and hospitals/HEBMC.
 - 1.3.6 Establish a process to monitor adherence to the Plan in times of blood shortages;
 - 1.3.7 Establish recommendations to manage non-adherence to the Plan in times of blood shortages.

Each OEBMC will work collaboratively as required with the NEBMC and its jurisdiction's HEBMCs.

2. MEETINGS

- 2.1 Meetings will be scheduled as necessary, typically 6-8 meetings per year, or at the call of the Chair. Meetings will take place by teleconference.
- 2.2 Membership marked with an “*” indicates core members or delegate, attendance is required at meetings to address all aspects of the mandate. When a meeting is held with these core members, it will be referred to as the Contingency Planning Working Group (CPWG). Attendance of other members to meetings of the CPWG is optional.

- 2.3 Efforts will be made by **all** members or their delegate, to attend meetings that address section 1. 3 of the Mandate and will be referred to as the Ontario Emergency Blood Management Committee or OEBMC.
- 2.4 All members will be invited to meetings and receive meeting materials and minutes.
- 2.5 The quorum will be the number of members that are present.

3. MEMBERSHIP

- 3.1 Multidisciplinary representation will include the following:
 - Blood Programs Coordinating Office (BPCO)*
 - Canadian Blood Services, Regional Medical Director;
 - Canadian Blood Services, Regional Director of Product and Hospital Services;
 - Canadian Blood Services, Regional Hospital Liaison Specialist*
 - Chief Medical Officer of Health, MOHLTC
 - Emergency Management Branch, MOHLTC
 - Hospital Clinical Consultant*
 - Hospital Transfusion Service Manager*
 - Hospital Senior Administrator
 - National Advisory Committee on Blood & Blood Products (NAC)*
 - Ontario Blood Advisory Committee (OBAC)*
 - Ontario Regional Blood Coordinating Network (ORBCoN)*
 - Ontario Hospital Association (OHA)
 - Ontario Nurse Transfusion Coordinator (ONTraC) Program*
 - Patient Group/Consumer
 - Risk Management*
 - Transfusion Safety Officer*

4. REMUNERATION

- 4.1 Members will not receive remuneration for participation on this working group.
- 4.2 In the event that travel is required to attend in person, relating to business, members will be reimbursed for travel expenses (i.e., transportation, accommodation and meals) incurred due to their participation in this group. An expenses claim form (available from MOHLTC) and original receipts must be submitted to the BPCO. Expenses will be subject to the Government of Ontario's Travel, Meal and Hospitality Expenses Directive.

5. SECRETARIAT

- 5.1 The BPCO will serve as the Secretariat for the CPWG/OEBMC and will:
 - Schedule meetings
 - Develop the agenda in conjunction with the chair
 - Circulate the agenda, meeting materials and any other relevant information
 - Follow up on action items resulting from the meetings

APPENDIX B. National Emergency Blood Management Committee Terms of Reference

Mandate

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

To this end, the NEBMC will:

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

Membership

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

The membership of the NEBMC will include the following:

- CBS officials as determined by CBS and including the following
 - Chief Operating Officer
 - Executive Director, Product & Hospital Services
 - Director, Product & Hospital Services
 - Director, Operations Support
 - Executive Medical Director, Transfusion Medicine
 - Director, Internal Communications
 - Director, Government Relations
 - Director, Media Relations & External Communications
- all NAC members
- all P/T Blood Representatives
- Québec Ministry Representative (to be determined)
- Héma-Québec Representative (to be determined)

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

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

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

Meetings/Quorum

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

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

Communications and Support

Secretariat

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

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

NAC Members

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

P/T Representatives

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

Evaluation

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

Appendix C. List of Participating Hospitals

#	Hospital Category	Region	Site Name
1	Community	Central	Grey Bruce Health Services – Owen Sound site
2	Community	Central	St. Joseph’s Health Centre
3	Community	Central	The Credit Valley Hospital
4	Small	Central	Campbellford Memorial Hospital
5	Small	Central	Lakeridge Health Services – Bowmanville site
6	Small	Central	West Parry Sound Health Centre
7	Teaching	Central	St. Michael’s Hospital
8	Teaching	Central	Sunnybrook Health Sciences Centre
9	Teaching	Central	University Health Network
10	Community	Northern and Eastern	Queensway Carleton Hospital
11	Community	Northern and Eastern	Thunder Bay Regional Health Sciences Centre
12	Community	Northern and Eastern	Timmins and District Hospital
13	Small	Northern and Eastern	Blind River District Health Centre
14	Small	Northern and Eastern	Dryden General Hospital
15	Small	Northern and Eastern	Glengarry Memorial Hospital
16	Small	Northern and Eastern	Perth & Smiths Falls District Hospital – Perth site
17	Small	Northern and Eastern	St. Joseph’s General Hospital
18	Small	Northern and Eastern	West Nipissing General Hospital
19	Teaching	Northern and Eastern	The Ottawa Hospital
20	Teaching	Northern and Eastern	Kingston General Hospital
21	Community	Southwest	Chatham Kent Health Alliance – PGH
22	Community	Southwest	Grand River Hospital
23	Community	Southwest	St. Mary’s General Hospital
24	Small	Southwest	Haldimand War Memorial Hospital
25	Small	Southwest	Hanover and District Hospital
26	Small	Southwest	Chatham Kent Health Alliance – Sydenham Campus
27	Teaching	Southwest	London Health Sciences Centre – University Hospital

Appendix D. Communication #1: Notification of Blood Shortage Simulation March 2010

PLEASE POST THIS COMMUNICATION IN A PROMINENT LOCATION IN THE TRANSFUSION MEDICINE LABORATORY FOR ALL STAFF

 <p>Canadian Blood Services it's in you to give</p>	<h3>Blood Shortage SIMULATION Exercise</h3>	 <p>Ontario</p>
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Notification:

A blood shortage SIMULATION Exercise will take place in March 2010

To: All Hospitals in Ontario with a licensed Transfusion Service

Date: 2010-02-01 @ 2:00pm

On behalf of the Ontario Emergency Blood Management Committee (OEBMC), in partnership with Canadian Blood Services and the National Emergency Blood Management Committee (NEBMC), we are conducting a review of preparedness of Ontario hospitals in the event that a blood shortage is declared. The *Ontario Provincial Contingency Plan for Management of Blood Shortages* and the *Contingency Planning Toolkit* was provided in early 2008 to assist hospitals in this regard.

A **Simulation Exercise** is being planned for March 2010 to simulate the event of a national blood shortage being called. This event would be announced as an Amber Phase shortage according to the National Advisory Committee "*National Plan for the Management of Shortages of Labile Blood Components*". The objective of this exercise is to evaluate the "state of readiness" of Ontario hospitals to respond to such an event.

A cross section of Ontario hospitals (25 sites) will be chosen to participate. On the day of the Simulation Exercise, CBS will send a fax (Communication #2) to the 25 selected sites informing them that they have been selected to participate and will be requested to:

- ◆ **Join a conference call** hosted by their local CBS Hospital Liaison Specialist to discuss what actions / documentation will be requested (for example: list of surgeries for cancellation, documentation logs of transfusion, communication fan out lists and examples of communications).
- ◆ **Simulate an initiation** of their *Hospital Emergency Blood Management Plan*.
- ◆ **Complete a reporting form** and return it to the Ontario Regional Blood Coordinating Network (ORBCoN).

More details will be provided to selected sites in Communication #2 (i.e. teleconference information, instructions on how to fill out forms, etc.).

Participating sites will be asked to test their communication cascade according to their Hospital Emergency Blood Management Plan, as well as document what actions would be taken. **However, NO surgery should be cancelled or any blood product issuing be restricted as part of this Exercise.**

Should your site be selected to participate, you will be contacted on the day of the simulation, not before. Your hospital's participation in this exercise is mandatory.

It is anticipated that this paper based exercise will provide us with information to make revisions to the *Ontario Provincial Contingency Plan for Management of Blood Shortages and Toolkit* and assist Ontario hospitals to better prepare for a real blood shortage.

The information gathered will be reviewed by the OEBMC and the Ontario Blood Advisory Committee. All hospitals will receive a summary of the findings and any recommendations for improvement.

If you have any questions regarding this communication, please contact:

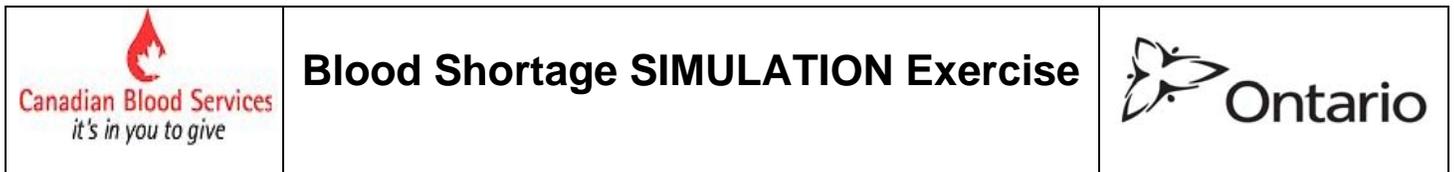
Wendy Owens, ORBCoN Regional Coordinator, Northern and Eastern Region:
Email: wowens@ottawahospital.on.ca Tel: 613-798-5555 ext 19740

Or

Ahmed Coovadia, Canadian Blood Services Hospital Liaison Specialist, Central Region
Email ahmed.coovadia@blood.ca Tel: 416-313- 4452

Thank you on behalf of the OEBMC.

Communication #1: Notification of Blood Shortage Simulation March 2010 – Reminder



Notification:	REMINDER that a Blood Shortage SIMULATION Exercise will take place in March 2010 – Is your Hospital ready?
Sent To:	Ontario Hospitals with a licensed Transfusion Service
Sent On:	Feb 24, 2010 @ 8:30 am EST
Sent From:	Canadian Blood Services (CBS), on behalf of the Ontario Emergency Blood Management Committee (OEBMC)

Please Post This Communication In A Prominent Location In The Transfusion Medicine Laboratory For All Staff.

On behalf of the OEBMC, in partnership with CBS and the National Emergency Blood Management Committee (NEBMC), we are conducting a review of the preparedness of Ontario hospitals in the event that a blood shortage is declared. The *Ontario Provincial Contingency Plan for Management of Blood Shortages* and the *Contingency Planning Toolkit* was provided in early 2008 to assist hospitals in this regard.

A **Simulation Exercise** is being planned for March 2010 to simulate the event of a **national Amber Phase red cell shortage** being called according to the National Advisory Committee’s “*National Plan for the Management of Shortages of Labile Blood Components*”. The objective of this exercise is to evaluate the state of readiness of Ontario hospitals to respond to such an event.

A cross section of Ontario hospitals, 25 sites, will be chosen to participate. On the day of the Simulation Exercise, CBS will send a fax to only these 25 sites informing them that they have been selected to participate and these sites will be requested to:

- 1) **Simulate initiation** of their *Hospital Emergency Blood Management Plan (HEBMP)*.
- 2) **Join a conference call**, hosted by the regional CBS Hospital Liaison Specialist and Ontario Regional Blood Coordinating Network (ORBCoN) Regional Coordinator, to discuss actions and documentation required for the exercise (i.e. list of surgeries that would be *considered* for cancellation, transfusion and documentation logs).

3) **Complete a reporting form** after the Simulation and return it to ORBCoN.

Note:

Participating sites will be asked to test their communication fan out according to their *HEBMP*, as well as document what actions would be taken IF this was an actual blood shortage. **However, NO surgery should be cancelled or any blood product issuing be restricted as part of this exercise.**

Should your site be selected to participate, you will be contacted on the day of the simulation, and not before. Your hospital's participation in this exercise is mandatory.

It is anticipated that this paper based exercise will provide us with the information required to assist Ontario hospitals in being better prepared to respond to a real blood shortage and to make revisions to the *Ontario Provincial Contingency Plan for Management of Blood Shortages and Toolkit*.

The information gathered will be reviewed by the Ontario Contingency Planning Working Group (part of the OEBMC), the Ontario Blood Advisory Committee (OBAC) and the Ministry of Health and Long-Term Care. All hospitals will receive a summary of the findings and any recommendations for improvement.

If you have any questions regarding this communication, please contact:

Wendy Owens, ORBCoN Regional Coordinator, Northern and Eastern Region:
Email: wowens@ottawahospital.on.ca Tel: 613-798-5555 ext 19740

Or

Ahmed Coovadia, Canadian Blood Services Hospital Liaison Specialist, Central Region
Email: ahmed.coovadia@blood.ca Tel: 416-313- 4452

Thank you on behalf of the,

Ontario Emergency Blood Management Committee

Appendix E. Communication #2: Notification to Selected Sites

	Blood Shortage SIMULATION Exercise Communication 2 of 4	
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Notification: Your hospital has been selected to participate in the Ontario Blood Shortage SIMULATION exercise. Participation in this exercise is mandatory

Sent To: 25 Ontario hospitals selected to participate.

Sent On: **March ##, 2010 @ 0930 EST**

Sent From: Canadian Blood Services (CBS), on behalf of the Ontario Emergency Blood Management Committee (OEBMC)

THIS IS NOT A REAL BLOOD SHORTAGE BUT IS A SIMULATED SHORTAGE TO TEST HOSPITAL EMERGENCY PLANS ONLY.

Purpose of Simulation Exercise:

To test the provincial and hospital contingency plans to manage blood shortages.

Simulation Scenario:

The national red cell Inventory has been designated to be in “Amber Phase” due to extremely severe weather that has resulted in blood delivery challenges. In this SIMULATION exercise, the red cell inventory levels are not anticipated to correct for at least 3 to 5 days.

Actions Required:

1. Ensure the Laboratory Manager (or designate) and Medical Director (or designate) review this communication. Sign and return to CBS as soon as possible.
2. Simulate the initiation of your *Hospital Emergency Blood Management Plan* according to ‘Amber Phase’.
3. **DO NOT TAKE ANY ACTIONS SUCH AS CANCELLING SURGERY OR RESTRICTING THE ISSUING OF BLOOD.**
4. Proceed with your communication fan out protocol to test the response of your own Hospital Emergency Blood Management Committee. Document who was contacted, level of response, if a meeting was convened and if so, who was able to attend. You will be asked to provide this on a reporting form that will be sent to you with the next

communication. **DO NOT NOTIFY PATIENTS AS PART OF THIS SIMULATION EXERCISE.**

- Document what actions would be taken **IF** this was a real blood shortage situation using the documentation and transfusion logs developed by your own facility, or use the templates attached to this communication, if no facility form exists. Instructions and examples appear on the log sheets.

NOTE: In the event of a real shortage, it is recommended, for ethical as well as liability reasons, that wherever possible, decisions resulting in deferral or cancellation of transfusion should be documented.

- Have a representative from your site attend a teleconference **today @ 11:00 EST**, which will be hosted by your regional CBS Hospital Liaison Specialist and ORBCoN representative to discuss inventory status and to answer any questions you may have regarding the Simulation Exercise. **Be prepared to report your red cell inventory levels for this call.**

****Please ensure your site has representation on this important conference call.**

Teleconference #: XXX-XXX-XXXX Passcode: #####

- Following the end of this Simulation Exercise, you will be asked to complete a Reporting Form that will be provided to you in the next communication (to be issued once a 'Recovery Phase' is announced).

I have reviewed this communication with:

Laboratory Manager/Designate No Yes Time: _____

Medical Director/Designate No Yes Time: _____

and have confirmed with them that they understand the purpose of this simulation exercise as well as the actions required by our site to participate in this simulation exercise.

Name (please print)

Signature

Date: _____

Time: _____

Return this signed fax to:
Canadian Blood Services **XXXXXXX** Region

Fax number: **(xxx) xxx-xxxx**

 Canadian Blood Services <i>it's in you to give</i>	Blood Shortage SIMULATION Exercise Communication 2 of 4	 Ontario
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Documentation Log for *Cancelled* Surgeries

(use this form if no facility specific form is available)

Instructions for completion: To complete this log sheet, record what surgeries would be considered for deferral or cancellation **IF** this were a real Amber Phase blood shortage.

DO NOT actually cancel any surgery or issuing of blood for this exercise. This is a 'paper based' Simulation Exercise only.

DO NOT record patient names on this logsheet for this exercise.

Date: _____ Version: ONSIMEX 2010 Feb Page _____ of _____

Surgical type	Number procedures cancelled	Elective or Emergency	Estimated # units per Surgery	Adverse patient outcome (describe any occurrences)
<u>EXAMPLE:</u> 1. Orthopedic – Revision Hip Replacement	4	Elective	2	Pain, mobility restrictions, rescheduling homecare etc.
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Please return completed form to ORBCoN NE office: Fax 613-761-4600 or scan and email to wowens@ottawahospital.on.ca

<p style="margin: 0; font-size: small;">Canadian Blood Services <i>it's in you to give</i></p>	<h2 style="margin: 0;">Blood Shortage SIMULATION Exercise</h2> <h3 style="margin: 0;">Communication 2 of 4</h3>	
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Transfusion Log (use this form if no facility specific form is available)

Instructions for completion: To complete this logsheet, record transfusion orders and record how they would be screened and / or considered for deferral or reduction **IF** this were a real Amber phase blood shortage.

DO NOT actually defer or reduce any transfusions for this exercise. This is a 'paper based' simulation exercise only. This form provides an example of how to document triage decisions made during a blood shortage.

DO NOT record patient names on this log sheet for this simulation.

Triage MD Name _____ Signature: _____

Date: _____ Version : ONSIMEX 2010 Feb Page: _____ of _____

Patient Type (service)	Products ordered	# ABO Compatible Units in Inventory	Products Issued	Relevant Laboratory Results	Adverse Patient Outcome (describe any occurrences)
Example: 1. Oncology	2 units red blood cells	6	0 unit	90 g/L	none
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

Please return completed form to ORBCoN NE office fax 613-761-4600 or scan and email to: wowens@ottawahospital.on.ca

 <p>Canadian Blood Services it's in you to give</p>	<h2>Blood Shortage SIMULATION Exercise</h2> <h3>Communication 2 of 4</h3>	 <p>Ontario</p>
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Agenda for CBS Teleconference

Meeting:	Blood Shortage Simulation Exercise – Red cell Inventory in Amber Phase	Date:	March ##, 2010
Teleconference:	Toll Free # Pass code: # Local #	Time:	11:00 am EST

Attendees:	
<ul style="list-style-type: none"> Regional CBS Production Manager Regional CBS HLS Regional CBS Medical Director 	<ul style="list-style-type: none"> Participating Hospital Representatives Regional ORBCoN Representative

Time	Item and Details	Lead
10 min	1. CBS Update <ul style="list-style-type: none"> Reminder that this is a Simulation only, blood orders and surgeries should not be cancelled Reason for Shortage and Current CBS inventory Status Instruct Selected Sites to: <ol style="list-style-type: none"> Initiate <i>Hospital Emergency Blood Management Plans</i>, if you have not already done so Initiate communications fan out protocol and track members contacted for Reporting Form (i.e. number of members contacted, number responded, was committee convened, number attended) Complete Documentation & Transfusion Logs as if it were a real shortage 	Regional CBS HLS
10 min	2. Selected Site Update <ul style="list-style-type: none"> Current inventory levels, include all inventory (i.e. reserved, crossmatched units) Report inventory using Order Request Form What actions taken, if any (i.e. redistribution, reduction of target inventory levels) 	Selected Sites
10 min	3. Next Steps <ul style="list-style-type: none"> Notification of Recovery Phase Complete and return Reporting Form (Evaluation of the Blood Shortage Simulation Exercise) Send in other supporting documentation: <ul style="list-style-type: none"> Transfusion and Documentation Logs List of Surgeries that would be cancelled Transfusion Guidelines used to screen requests 	All

	<ul style="list-style-type: none"> ○ Communications Memos ● Attend follow up teleconference (next day) for a debriefing ● Questions/Comments 	
	4. Adjourn Meeting	

 <p>Canadian Blood Services <i>it's in you to give</i></p>	<p>Blood Shortage SIMULATION Exercise Communication 2 of 4</p>	
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Region Inventory Call

Date: _____ **Time:** _____

Chair: _____

Daily Statistics

National

O Pos DOH ___
O Neg DOH ___
A Pos DOH ___
A Neg DOH ___
B Pos DOH ___
B Neg DOH ___
AB Pos DOH ___
AB Neg DOH ___

Daily Statistics

CBS Site

O Pos DOH ___
O Neg DOH ___
A Pos DOH ___
A Neg DOH ___
B Pos DOH ___
B Neg DOH ___
AB Pos DOH ___
AB Neg DOH ___

CBS Update				By:
Hospital	Name of Contact	Current Inventory Status	Current Utilization Patterns	Other Information/Comments

Additional Discussions:

-
-
-

Next call:

Appendix F. Communication #3: Notification of Recovery

	<h3>Blood Shortage SIMULATION Exercise</h3>	
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Notification: Now in RECOVERY PHASE of Ontario Blood Shortage SIMULATION exercise.

Sent To: 25 Ontario hospitals selected to participate.

Sent On: **March ##, 2010 @ 1:00pm EST**

Sent From: Canadian Blood Services (CBS), on behalf of the Ontario Emergency Blood Management Committee (OEBMC)

THIS IS NOT A REAL BLOOD SHORTAGE BUT IS A SIMULATED SHORTAGE TO TEST HOSPITAL EMERGENCY PLANS ONLY.

Simulation Scenario:

The National Inventory has been now designated to be in “**Recovery Phase**” for red cell inventory.

Purpose of Simulation Exercise:

To test the provincial and hospital contingency plans to manage blood shortages.

Actions Required:

8. Ensure the Laboratory Manager (or designate) and Medical Director (or designate) review this communication. Sign and return to CBS as soon as possible.
9. Simulate the Initiation of your *Hospital Emergency Blood Management Plan* (HEBMP) according to ‘**Recovery Phase**’.
10. Proceed with your communication fan out protocol to test the response of your own Hospital Emergency Blood Management Committee according to **Recovery Phase**.
11. Ensure documentation logs provided to you with communication #2 (or your facility equivalent) have been completed.
12. Complete the reporting form attached to this communication.
13. Return all completed log sheets, reporting forms and requested communication examples to the ORBCoN Northern and Eastern Regional office via fax: 613-761-4600 or scan and email to: wowens@ottawahospital.on.ca.

14. Ensure a representative from your site attends a final teleconference with your CBS Hospital Liaison Specialist and ORBCoN representative to debrief on this simulation exercise. This call will be held:

(Day following exercise) (call in: XXX-XXX-XXXX passcode: XXXXX#).

This call, along with the completed reporting forms, log sheets and communication examples will aid in the evaluation of this exercise.

Following analysis of these documentation logs and reporting forms, and feedback received on the debrief conference call, a report will be written and provided to all hospitals in Ontario.

I have reviewed this communication with:

Laboratory Manager/Designate No Yes Time: _____

Medical Director/Designate No Yes Time: _____

and I confirmed with them that they understand the purpose of this communication as well as the actions required by our site to participate in this recovery phase of the simulation exercise.

Name (please print) signature

Date: _____

Time: _____

Return this signed fax to:

Canadian Blood Services **XXXXXXX** Region

Fax number: **(xxx) xxx-xxxx**

Evaluation of the Blood Shortage Simulation Exercise

Instructions: The Ontario Contingency Planning Working Group recently notified your hospital of a “**Blood Shortage Simulation Exercise.**” We are sending out this reporting form to obtain feedback from participating sites in order to gather information on hospital preparedness and actions required as a result of the notification. This will help assess the impact of the ‘simulated shortage’ at each facility. This information will help to evaluate the functioning of the Provincial blood shortage management plan and indicate any need to make revisions for improvement for future situations.

Site and Event Information			
Name of facility:			
Date Emergency Blood Management Plan activated: (initial notification of blood ‘shortage’ exercise)		Date:	Time:
Impact Analysis: Please indicate what actions your hospital plan directs in the event of an “Amber phase” blood shortage notification.			
1. Inventory levels reduced to Amber levels	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
2. Notify CBS of any inventory available to other sites if required	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
3. Does your facility have a process for sharing blood components/products?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
4. What site(s) would you contact if you required additional product(s) and CBS could not provide you with product(s)?			
5. Elective high blood loss surgical cases cancelled (simulation - on paper only - provide list as attachment).	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
6. Are screening criteria used to screen all blood requests? (provide as attachment)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
7. Document decisions around deferral of procedures / transfusions (please send in Documentation and Transfusion log sheets with patient names removed)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
8. Other actions taken (please attach details)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Actions Taken			
9. Hospital Emergency Blood Management Committee notified	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
10. HEBMC contact results	# contacted	# reached	
11. In a real blood shortage would internal hospital staff be notified? (provide example of Communication Memo as attachment)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
12. In your plan, are patients notified (if yes, please provide a brief explanation in comments section below of how this would be done)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
13. In a real blood shortage, would internal hospital staff be notified of a recovery of the blood shortage?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA

Other comments (i.e. Keys lessons learned, suggestions for improvement, barriers encountered in developing / implementing your hospital plan)

Appendix G. Communication #4: Exercise is Completed

	<h3>Blood Shortage SIMULATION Exercise</h3>	
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Notification: Blood Shortage SIMULATION exercise is now complete.

Sent To: All Ontario hospitals with a licensed Transfusion Service.

Sent On: **March ##, 2010 @ 2:00pm EST**

Sent From: Canadian Blood Services (CBS), on behalf of the Ontario Emergency Blood Management Committee (OEBMC)

On behalf of the OEBMC, we would like to inform you that earlier today a **simulation** of a blood shortage was held. Several sites (25) from across the province were contacted this morning to inform them their site was selected to participate in the exercise. A short while ago, these sites received notification that the simulation is now in recovery phase.

At this time, we wish to thank those at the selected sites and Canadian Blood Services that have participated in this Simulation Exercise. We greatly appreciate your time and commitment to helping us develop a robust provincial plan to manage blood inventory in the event of a real blood shortage and tools to better assist Ontario hospitals in this regard.

By testing out the communication paths proposed in both the National and Provincial plans, it will allow us to make any necessary revisions and ensure, should it ever be necessary, the notification of a critical blood shortage will occur rapidly and in a clear manner.

Holding mock exercise simulations such as this one is a very useful way to increase awareness of roles and responsibilities during a crisis situation and we encourage all hospitals to plan and hold such exercises at their own sites.

Following the evaluation of this simulation, a final report will be shared with all hospitals in the province.

If you have any questions or comments regarding the exercise, please contact:

Wendy Owens, ORBCoN Regional Coordinator, Northern and Eastern Region:
 Email: wowens@ottawahospital.on.ca Tel: 613-798-5555 ext 19740

Thanking you on behalf of OEBMC.

Ontario Emergency Blood Management Committee (OEBMC) Membership (March 2010)

#	Title	First Name	Last Name	Position	Organization
1	Ms.	Durhane	Wong-Rieger	President & CEO & <i>Chair of OEBMC</i>	Anemia Institute for Research & Education
2	Dr.	Morris	Blajchman	Medical Director	Canadian Blood Services, Hamilton
3	Mr.	Ahmed	Coovadia	Hospital Liaison Specialist	Canadian Blood Services, Toronto
4	Mr.	Jon	Fawcett	Hospital Liaison Specialist	Canadian Blood Services, Hamilton
5	Dr.	Barbara	Hannach	Medical Director	Canadian Blood Services, Toronto
6	Dr.	Peter	Lesley	Medical Director	Canadian Blood Services, Ottawa
7	Ms.	Valerie	Paulson	Hospital Liaison Specialist	Canadian Blood Services, Regina
8	Mr.	Rob	Romans	Regional Director of Product and Hospital Services	Canadian Blood Services, Toronto
9	Ms.	Denyse	Tremblay	Hospital Liaison Specialist	Canadian Blood Services, Ottawa
10	Ms.	Kathleen	McShane	Transfusion Safety Officer	Hospital for Sick Children, Toronto
11	Dr.	Fiona	Ralley	Director, Perioperative Blood Conservation Program	London Health Sciences Centre, University Hospital, London
12	Ms.	Susan	Bilhete	A/Project Coordinator, BPCO	Ministry of Health and Long-Term Care, Toronto
13	Mr.	Phil	Graham	A/Director, Emergency Management Branch	Ministry of Health and Long-Term Care, Toronto
14	Ms.	Tiffany	Jay	A/Director, Public Health Planning & Implementation Branch	Ministry of Health and Long-Term Care, Toronto
15	Mr.	Dai	Kim	A/Manager, BPCO & Ontario Provincial/Territorial Representative on NEBMC	Ministry of Health and Long-Term Care, Toronto
16	Ms.	Ramona	Muneswar	Sr. Policy and Business Analyst, BPCO	Ministry of Health and Long-Term Care, Toronto
17	Mr.	Chad	Zentner	Laboratory Manager, Nunavut Provincial/Territorial Representative	Qikiqtani General Hospital , Nunavut Ministry of Health and Social Services
18	Ms.	Karen	Sequeira	A/Director, Patient Safety & Clinical Best Practice	Ontario Hospital Association, Toronto
19	Ms.	Katherine	Luke	Program Manager	Ontario Transfusion Coordinator Program, Toronto
20	Ms.	Kate	Gagliardi	Regional Coordinator	Ontario Regional Blood Coordinating Network, Hamilton
21	Ms.	Deborah	Lauzon	Regional Coordinator	Ontario Regional Blood Coordinating Network, Toronto
22	Ms.	Wendy	Owens	Regional Coordinator	Ontario Regional Blood Coordinating Network, Ottawa
23	Ms.	Mary Sue	Lessard	Laboratory Manager	St. Joseph's General Hospital, Elliot Lake
24	Dr.	John	Freedman	Transfusion Medicine & Ontario Representative on the National Advisory Committee on Blood & Blood Products	St. Michael's Hospital, Toronto
25	Dr.	Jeannie	Callum	Director, Transfusion Medicine & Ontario Representative on the National Advisory Committee on Blood & Blood Products	Sunnybrook Health Sciences Centre, Toronto

Appendix H. Timeline Table

Activity	Comments	Target Date
Develop scenario for Blood Shortage Simulation Exercise	Define objectives, number of participants, length, scope	August 2009
Finalize plan	Confirm scenario and scope for exercise	October 2009
Develop Communication Plan	Create templates to communicate messaging to hospital participants	November 2009
Select Sites to participate	Jointly selected by Regional CBS HLS and ORBCoN Coordinators	December 2009
First Communication sent to Ontario hospitals to announce exercise, send reminder 1-2 weeks prior to exercise	CBS sites fax message to all hospitals in Ontario	February 2010
Initiate and hold exercise	Initiate through NEBMC	March 2010
Review reports returned from participating sites		April 2010
Analyse data and create draft report	Include recommendations for CBS, Hospitals, MOHLTC	May 2010
Finalize report and review by CPWG		August 2010
Format report and distribute, post to website	Upon approval from MOHLTC BPCO	September 2010
Revise Ontario Contingency Plan for the Management of Blood Product Shortages	Revisions to be reviewed by CPWG members and presented to Ontario Blood Advisory Committee	November 2010
Distribute version 2.0 of Ontario Plan	Distribute to hospital personnel	January 2011

Appendix I. Comparison Table of Criteria Used to Screen Red Cell Requests

Hospital	Bleeding Patient		Non-bleeding Patient		All Patients
	Transfuse at Hgb (g/L) if active bleeding	Transfuse at Hgb (g/L) if impaired Cardio-pulmonary	Transfuse at Hgb (g/L) if active bleeding	Transfuse at Hgb (g/L) if impaired Cardio-pulmonary	Transfuse at Hgb (g/L)
1	< 70	80-100	<60	70-100	
2					<70
3	70-90		<70	70-90	
4					<70
5	70-100	80-100	60-70	70-100	
6					<70
7					<70
8					Not defined
	Inpatients		Outpatients		
9	< 60 no risk factors	<70 with risk factors, < 80 with Cardiac symptoms	<70		

Other comments (common to multiple sites):

1. Consider alternatives to transfusion
2. Transfuse one unit and reassess before giving another
3. No crossmatches in advance of need (no 'hold')
4. No storage of red cells in satellite locations
5. Single units will not be reserved for neonates
6. review all requests where hemoglobin is > 70g/L
7. switch Rh Negative patients to Rh Positive (except females with child bearing potential)