
**ONTARIO 2018
BLOOD SHORTAGE
EXERCISE REPORT**



2018

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Executive Summary

A new version of the Ontario Contingency Plan for Management of Blood Shortages (Ontario Plan version 3) was distributed to hospitals in February 2017. To test the changes made in this version of the plan, a simulation exercise was held. Blood shortages are defined in degree of severity using a colour coded terminology, where Green Phase denotes optimal levels of inventory, Amber Phase non-urgent patient need may be impacted and Red Phase would be used in a critical shortage of blood inventory where the limited stock would be used only for life threatening need.

The scenario for this Ontario wide exercise was a Red Phase red blood cell shortage. All hospitals in Ontario were asked to participate. Several orientation sessions were held for hospital personnel to help prepare them for the exercise.

The Ontario Emergency Blood Management Committee (OEBMC) was convened May 15th prior to notification being sent from Canadian Blood Services (CBS) to hospitals on the morning of May 16th. Notification to hospitals by CBS was by fax and email. The exercise ran for approximately 30 hours and hospitals were asked to simulate triage of red blood cell orders for this period. As part of the exercise, the Ministry of Health and Long-Term Care tested the provincial emergency management communication tool (EMCT) for potential use in blood shortage emergencies. On the afternoon of May 17th, CBS sent a notification to hospitals to signal the end of the exercise.

One hundred and seventy-three individuals representing 139 hospitals responded to a post-exercise survey to report their participation and provide feedback on the exercise. Forty-five per cent of respondents were members of their hospital's Emergency Blood Management Committee. Ninety-four per cent of respondents said that their hospital has a plan to guide them during a blood shortage and 78% of these had been updated to the current version of the Ontario Plan.

Seventy-nine per cent of hospitals have a plan for redistribution of components during a blood shortage. Respondents provided a list of actions they would take to decrease the use of the affected component. Forty-eight per cent of respondents reported the results of their simulated triage decisions. The amount of red blood cell use that would have been deferred represented 75% of average use in the same time period.

CBS notification of hospitals by fax resulted in delays for some sites. CBS is currently looking for ways to improve this. Use of the EMCT caused confusion as most participants in the exercise were unaware of the tool's existence previously. Eighty-three per cent of hospital respondents indicated they are planning to hold a debrief at their site to identify areas where improvement was needed. Eighty-eight per cent of respondents reported their hospital does not plan to hold their own exercise and 91% said they found this provincial exercise very helpful.

Areas for improvement that were identified following this exercise included:

- CBS notification process should ensure all hospitals receive notifications in a timely and consistent manner
- All Ontario hospitals with a transfusion service should have a plan for the management of patient care in the event of a blood supply shortage consistent with the recommended components as provided in the Ontario Contingency Plan for Management of Blood Shortages including a process for redistribution and reporting inventory to CBS when requested
- Internal hospital communication plans (in the event of a blood shortage) require regular review and updating
- Need to engage more physicians in the awareness and preparedness for a blood shortage
- Need to define how recommendations and guidance from the OEBMC would be provided quickly and efficiently to hospital clinicians tasked with triaging to ensure a consistent approach will be taken
- Need to clarify the use of the EMCT in a blood shortage

Several recommendations were identified as a result of this exercise. They appear on page 16 of this report.

Background

Blood components and products are provided to hospitals in Ontario by Canadian Blood Services (CBS). Hospital transfusion service laboratories stock sufficient inventory to ensure that, should their demand be higher than average, they will be able to provide blood for their patients. This 'cushion' also provides protection from the occasional low inventory periods at CBS, again, ensuring there is sufficient stock to continue with normal operating activity.

In order to support hospitals in the event a severe blood supply shortage, plans have been developed to guide healthcare professionals in the management of a limited supply to minimize negative impact on patient outcomes. The Ontario Contingency Plan for the Management of Blood Shortages (1) was first created and issued to hospitals in 2008. Shortly after this, a National Plan (2) was released in 2010. These plans have both been updated following simulation exercises and review. The most current version of the National Plan can be found on <http://www.nacblood.ca/resources/shortages-plan/index.html> and the Ontario Plan http://www.health.gov.on.ca/en/pro/programs/emb/plan_blood_shortages/. Both of these plans make use of a coloured phase terminology to denote the severity of an inventory shortage. Green phase indicates optimal inventory levels which allow for normal operational activity. Amber phase indicates that inventory levels have become low and hospitals may need to reduce their target inventory levels and, if prolonged, may need to reduce the use of the affected blood component. Red phase indicates a critically low inventory level and blood use is to be reserved only for life saving measures.

Recommendations in each of the above plans are that each hospital that manages blood components or products should have a facility specific blood shortage management plan to outline details of actions to be taken should notification of a blood shortage be received from CBS. Hospital plans should provide guidance on who to notify, who will be responsible for managing inventory, who will triage blood orders and how communication updates should flow to include all relevant stakeholders. The Ontario Regional Blood Coordinating Network (ORBCoN) provides a toolkit (3) to help hospitals develop their plan and ensure it incorporates required elements. http://transfusionontario.org/en/documents/?cat=emergency_blood

In order to ensure plans will function as intended, testing them out through simulation exercises is a valuable activity. According to the responses received following a provincial exercise held in 2014, most hospitals (96%) reported that they do not plan and hold their own internal blood shortage exercises (4). Therefore, the Contingency Planning Working Group, the sub-committee of the Ontario Emergency Blood Management Committee (OEBMC) that developed and maintains the Ontario Contingency Plan for Management of Blood Shortages is tasked with organizing and running simulation exercises periodically.

Method

Previous blood shortage simulation exercises were held in Ontario in 2010 and 2014. In 2018, following the release of version 3 of the Ontario Plan, a third simulation exercise was held to test out changes made to the Plan and to give hospitals another opportunity to test out their own internal blood shortage management plans.

A small working group was created to develop the scenario and agenda for the 2018 Ontario Blood Shortage Exercise. The working group included representation from CBS, the Ministry of Health and Long-Term Care (MOHLTC), ORBCoN and hospitals. A detailed work plan was created to help manage the preparation.

The scenario for the exercise simulated a sudden and critical drop in available red cell inventory in Ontario due to a reported contamination of the red cell additive solution (Saline-Adenine-Glucose-Mannitol or SAGM) that affected red cells only. Hospitals were informed that approximately half of their in-house inventory, and essentially all inventory at the CBS supply centres servicing Ontario hospitals was affected. The simulated shortage lasted approximately 30 hours, until realistically, additional inventory could be brought in from other unaffected CBS blood centres and distributed to hospitals.

In order to help hospital participants prepare for the simulation exercise, several orientation sessions were held. The objectives, expectations and basic scenario of the exercise, were reviewed and there was opportunity for hospital stakeholders to ask questions of those planning the exercise. A question and answer document was subsequently posted on the transfusionontario.org website to further share dialogue from these orientation sessions.

<http://transfusionontario.org/en/download/questions-answers-preparing-ontario-blood-shortage-simulation-exercise/>

Emergency Management Communication Tool

One of the changes included in version 3 of the Ontario Plan was the use of the communication tool introduced by the Health System Emergency Management Branch of the MOHLTC. The tool is named Emergency Management Communication Tool (EMCT). For more information on EMCT copy and paste this link into your browser to watch a short video [9-minute overview video](#).

EMCT was implemented to provide an effective path to rapidly share information on emerging events province wide. Emergency management personnel in hospitals across the province are linked into this tool and can disseminate information throughout their own facility using the hospital's internal communication tools as needed during an emergency situation. The 2018 Ontario Blood Shortage Exercise planners decided to use this opportunity to help increase awareness of this tool among hospital stakeholders. It provided a chance to test the tool out to help determine its usefulness during a blood shortage situation. EMCT users were informed ahead of time that the tool would be used for the blood shortage exercise. The names of EMCT users at each hospital were provided to the transfusion service personnel to help develop a connection between these individuals. It was hoped that communication between EMCT users and transfusion service staff would occur prior to the exercise to encourage them to communicate during the exercise. At the time of the exercise, 14 of the approximately 155 hospitals in the province had not yet signed onto the EMCT system.

Communication to Hospitals

A letter was issued from the MOHLTC to Local Healthcare Integrated Network (LHIN) CEOs. The letter informed them that a province wide simulation exercise to test plans to manage a blood supply shortage would be held and that all hospitals were encouraged to participate. LHIN CEOs then distributed this letter to hospital CEOs within their LHIN. Similar messaging was also issued by ORBCoN to hospital transfusion service contacts.

The exercise was originally planned to take place in early March 2018. However, CBS was in Green Phase Advisory (lower than optimal stock levels – generally short term) for group O Rh negative red cells in late February/early March. In order to focus on managing the situation and to allow for the inventory level to recover, it was requested that Ontario delay holding the blood shortage exercise. A second date of mid May was selected. LHIN CEOs, Hospital CEOs and hospital transfusion service contacts were notified of this delay.

Evaluation of the Exercise

To gather feedback on participants' experience of the exercise, three brief online surveys were created using LimeSurvey. One targeted members of the Ontario Emergency Blood Management Committee, one was directed to hospital participants and one was developed to collect feedback from CBS participants. The surveys were distributed the day after the end of the 2018 Ontario Blood Shortage Exercise (May 18, 2018). Hospital surveys were distributed to transfusion service contacts and were forwarded within each hospital as desired. The CBS survey was distributed to the Hospital Liaison Specialists and supply chain supervisors/managers as well as the representative on the exercise planning working group. Again, it was suggested that the survey could be forwarded to others within CBS who had participated. The survey targeting the Ontario Emergency Blood Management Committee was sent to all committee members. The surveys were closed on June 28, 2018.

Results – Hospital participants

Respondents

One hundred and seventy-three (173) surveys were returned representing 139 hospital sites. One hospital reported that they did not participate in the exercise as they only stock minimal inventory. Respondents represented largely Transfusion Service personnel. The most common role reported of those responding was Laboratory Manager (26%) then Laboratory Supervisor (22%). A large number of respondents reported in the 'Other' category. Of these, the majority were Charge or Senior Medical Laboratory Technologists. Physicians (Pathologists, Hematologists), Laboratory Directors, Quality Management, Risk Management and Pharmacy personnel also responded. Forty-five per cent (45%) of those that completed the hospital survey, when asked what role they played in a blood shortage, were members of their Hospital Emergency Blood Management Committee (HEBMC), 10% were Chairpersons of their HEBMC and 11% reported they were a member of their hospital triage team (for management of blood shortages). There was also a long list of those who reported the role they played at their hospital during a blood shortage. This included predominantly laboratory coordinator, but also regional coordinator, management of communication, member of their hospital transfusion committee, policy development and management of inventory.

Hospital Emergency Blood Management Plan

Details of Hospital Plan

Ninety-four per cent (146/156) of respondents that answered the question stated that their hospital has a Hospital Emergency Blood Management Plan. Of those who reported they have a plan, 114 (78%) had updated it to reflect version 3 of the Ontario Contingency Plan for the Management of Blood Shortages. Seventy-five per cent (110/146) said they have been trained on the changes to version 3 of the Ontario Plan and 82% (120/146) said that their staff have also been trained on these changes.

Almost 100% of hospital respondents said that they have defined red blood cell (RBC) inventory levels for all phases of a blood shortage.

Hospitals reported actions that would be taken in the event of a Red Phase RBC shortage (refer to figure 1).

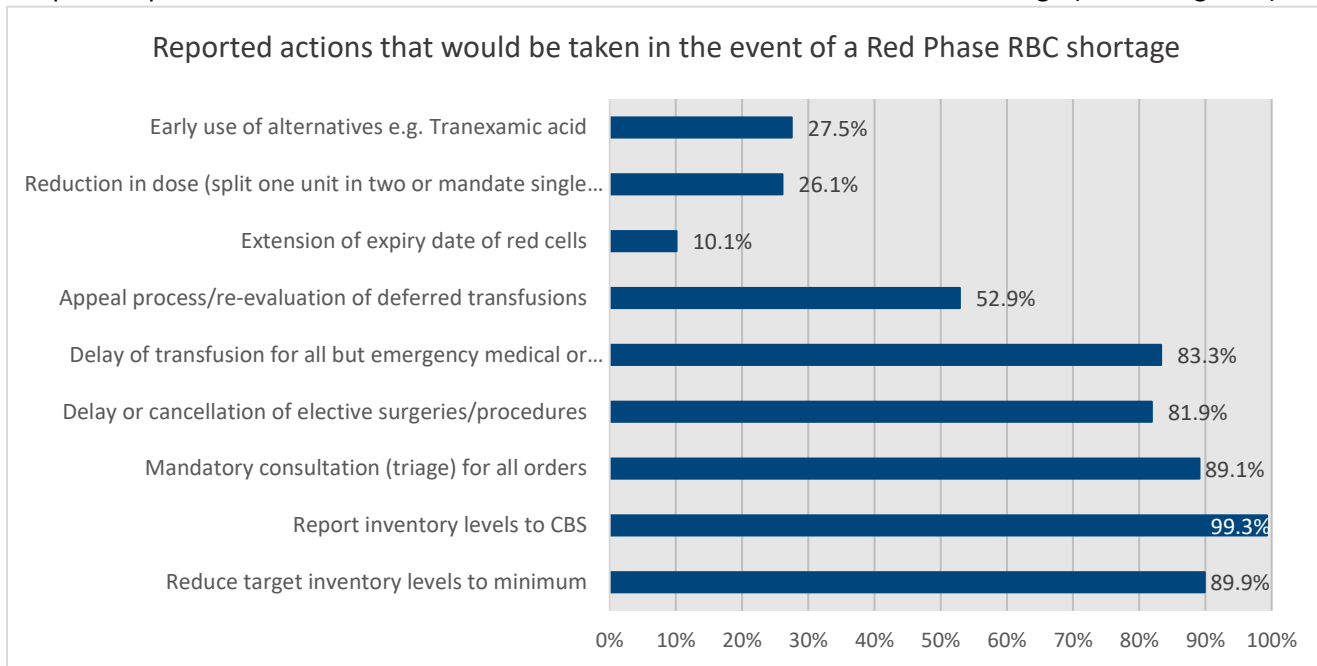


Figure 1: Reported actions by participating site that would have been taken in the event of a Red Phase RBC shortage.

Triage

Eighty-seven percent (87%) of respondents reported that they had identified which individuals at their hospital would perform triage of blood requests during a blood shortage and 74% involved these individuals in the exercise. If someone responded that they have not identified individuals to perform triage at their hospital, the question was asked - who would be performing this task?

Answers varied but the most common response was Chief of Staff or Chief of Surgery. Laboratory Manager and Laboratory Technologists and attending physician were also reported. Several respondents indicated the triage role would be assigned at the time of the shortage through the Emergency Blood Management Committee.

Approximately half of those who responded to the survey (48.5%) indicated that decisions were simulated around which blood requests would be cancelled or deferred. A question was asked about the number of red cell transfusions that would have been deferred over this 30-hour period. The total reported was 931 units. The median number of units deferred per site was 6 (minimum 0, maximum 250). Eighty-five percent (85%) of these deferrals were documented.

Based on 2017/18 figures, approximately 41 red blood cell units are transfused (on average) each hour in Ontario. Over a 30-hour period therefore, average estimated use would be approximately 1,236 units. In this exercise, the deferred red cell transfusions reported would represent approximately 75% of average use.

In a real blood shortage situation that results in patients' surgeries or treatment being deferred, there should be a plan in place to recall them once the event has ended and the hospital is able to return to normal operational activity. Therefore, we asked in the survey if hospital plans included this step. Forty-two percent (42%) answered they did include this step while 38.0% said their plan did not include this. The remainder of those who answered the question reported they do not have an Emergency Blood Management Plan for their hospital.

Inventory Management

When survey respondents were asked if their hospital had a plan for redistribution if it was required during a blood shortage, 79% responded they had a plan, 18.6% responded they did not have a plan and 2% did not answer. When

hospitals were asked how redistribution would be facilitated, 45% stated they would contact the local hub site within their LHIN and 75.2% that they would contact the closest hospital that stocks red cells (this question allowed for selection of more than one option).

Hospitals were compliant in reporting their inventory to CBS when asked to do so during this exercise. Eighty-six percent of Ontario hospitals reported their inventory to CBS in the required time frame.

Internal Communication

Respondents were asked if the Emergency Blood Management Plan at their hospital includes a notification list and communication plan. The majority (83.7%) of those who answered this question stated that it does. Approximately 15% of those who answered this question stated that they do not have an Emergency Blood Management Plan.

We asked hospitals how they notified individuals in their hospital to notify them of a blood shortage situation. A variety of answers were received including pagers (11.6%), overhead announcement (5.4%), email (86.8%) and telephone (53.5%). In addition to these listed options other modes of notification were:

- Fax
- Memo
- Post message on intranet
- Text
- In person (either by verbal notification or hand delivery of memo)

Several respondents indicated they make use of their hospital locating service to support the notification process.

Respondents were asked if their hospital had an Emergency Blood Management Committee as is recommended in both the Provincial and National Emergency Blood Management Plans. Only 65.9% reported that they have such a committee and 34.1% stated they do not. Of those who answered that they have such a committee, 84.7% involved their committee in this exercise. We then asked at what stage of a blood shortage would their Emergency Blood Management Committee be notified. See table 1 below for the responses:

At what phase of a shortage would the HEBMC receive notification?	Percentage (%)
Red	67.1%
Amber	51.8%
Green	2.3%
Recovery	43.5%
All phases	32.9%

Table 1 Phase of notification for Hospital Emergency Blood Management Committee

A variety of individuals were notified as part of this exercise (refer to figure 2 below):

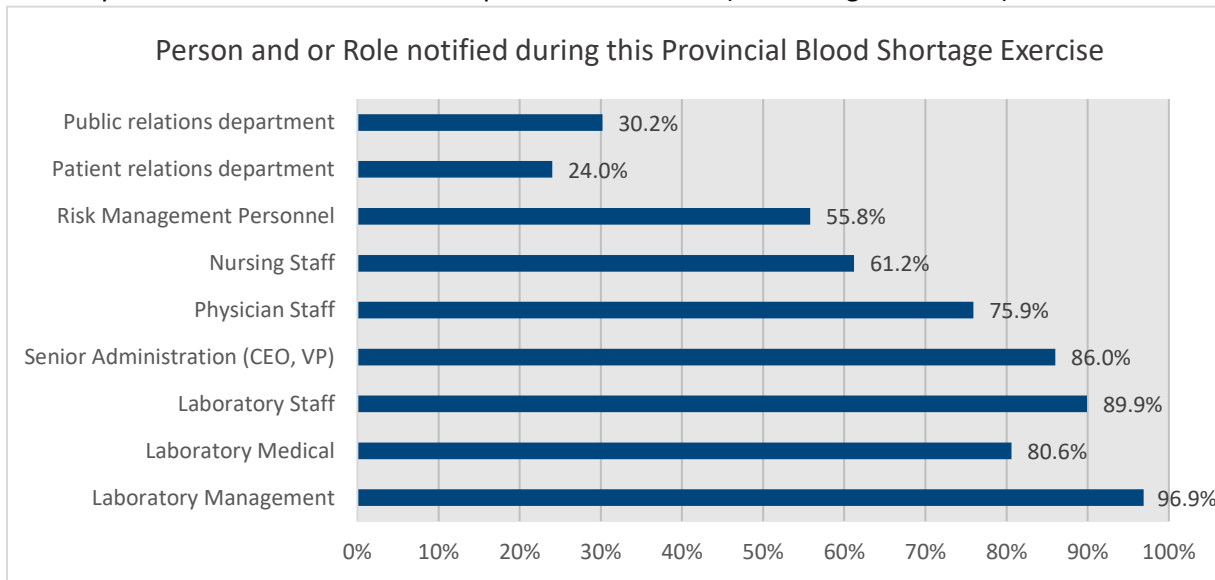


Figure 2: Persons/roles reported by participating sites to be notified during the Provincial Blood Shortage Exercise.

Many other roles were reported in addition to the above. These included Transfusion Committee, Hospital Emergency Blood Management Committee, Pharmacy, Ethics, Emergency planning group, Finance and Midwives.

Communication and the Exercise

Pre-exercise

Several orientation sessions were held in the month prior to the exercise to help clarify for hospitals the purpose and objectives as well as to provide the opportunity for them to ask questions. Eighty-three percent (83%) of respondents answered that they participated in the orientation sessions.

During the Exercise

Hospital notification was performed by CBS Ottawa, Brampton and Winnipeg blood centres. As per the Ontario Plan, notification to hospitals is by fax with a follow up email. Following the notification that the exercise had begun, the Hospital Liaison Specialist team at CBS facilitated teleconference calls to provide hospitals with an opportunity to provide feedback and ask questions. These teleconferences were held for the three CBS blood centres participating in the exercise and were held approximately four hours after notification of the exercise had been issued. Attendance by hospital representatives was high (89.9% of survey respondents indicated they participated in the calls). A range of individuals participated including Transfusion Service Medical Directors, Laboratory Managers, Supervisors and staff, members of the Hospital Emergency Blood Management Committee and Senior Administrators. The participants on the call, however, were predominantly Laboratory Managers and Supervisor Technologists.

Feedback from hospitals received during the post notification teleconference was that fax notification for some sites was delayed depending where on the sequential fax number list each hospital was. More significant delays were reported from hospitals served by the Brampton site, likely related to the number of hospitals serviced by Brampton. Hospitals requested that a phone notification would be preferred. Currently, CBS does not have the ability to make a phone call to each facility should a blood shortage occur and even if they attempted to do so this would also result in lengthy delays depending on if your site was first on the phone list or last.

Emergency Management Communication Tool

The mock exercise generated awareness of the Emergency Management Communication Tool (EMCT) but most seemed uncertain of its role/use in a blood shortage exercise. EMCT user lists were outdated. Currently EMCT users in hospitals are emergency planners and senior administrators. EMCT can send users notifications of new messages, but there can be internal process-related difficulties related to these notifications. Coordination among EMCT users within the organization is necessary to ensure that if any one of the users in a given “role” is online and sees the message that the information is relayed appropriately. By design, the system sends notification of new messages (via email or text) only when no individuals for a given “role” are active in the system when the message is sent.

EMCT users have to be ‘online’ to view information, which may not be realistic for many of those directly involved with managing blood requests and blood inventory during a shortage. EMCT is limited to non-clinical messages.

Eighty-seven percent (87%) of those who responded to the survey indicated that they were aware of EMCT. Although a list of the EMCT registered users at each hospital was sent out to transfusion medicine contacts at the hospitals, only 70.8% of respondents stated that they had been informed of them. Fourteen answered that their hospital had not yet subscribed to use the EMCT. Of the 80 people who answered they had been informed of the EMCT users at their hospital, 65 (81%) actually contacted them. For those who did not get in touch with the EMCT users at their site, they provided a variety of reasons including:

- Contact was made by someone else in the hospital (Laboratory Manager most often)
- This was just a simulation exercise
- EMCT users actually contacted them first
- Unclear how the tool would be used in this exercise
- EMCT not yet fully functional at site

Respondents were asked how they thought the EMCT would be used at their hospital during a blood shortage. The majority of answers indicated that it was unclear how EMCT would be useful during a blood shortage. But some did provide some suggestions. See list below:

- Help to manage blood with area hospitals
- Aid in communication within the hospital
- Help internal hospital staff keep abreast of the event/situation through monitoring of ‘tickets’
- Relay any information received on the site to the transfusion medical lead and emergency committees
- Perhaps EMCT would be useful in mass casualty events with communication to transfusion medicine
- It would be incorporated into emergency command centre at hospital
- EMCT is part of overall hospital emergency management so would help bring together senior staff to make decisions as needed
- Help to coordinate with other sites re: patient transfers

There also seemed to be some confusion over the purpose of EMCT during a blood shortage. Some answered they thought the tool could be used for triage of patients, notifying other sites if the hospital was not accepting patients, facilitating redistribution of blood between hospitals and replacing CBS as the primary source of communication to hospital transfusion services.

Debriefing on Exercise

Ninety-nine (83%) of those who responded to the survey reported that they would hold some sort of review following their participation in the exercise.

We asked, in the survey, if hospitals held their own simulation exercises around blood shortages. Over 88% responded they have not. One hundred and seven (90.7%) of those who completed the survey answered they felt participation in

this 2018 provincial blood shortage exercise was helpful in identifying gaps within their own Hospital Blood Shortage Management Plans. One hundred and five of these people took the time to provide comments on what key learning points or gaps they identified. To see this list, refer to Appendix A. The majority of responses focused on communication (notification list and/or process) and the importance of clarifying responsibilities for those involved in managing such a situation. There were also several comments recognizing the time commitment needed to assess blood orders and make triage decisions on blood use and the importance to factor this into their plan and staff awareness.

Some concerns were raised around the standardization of practice and if all sites would apply the same rigour to triage decisions in the event of a true blood shortage. One site even commented that through this exercise, the staff recognized they might be able to improve on routine use of blood.

Several comments were made around the challenges of engaging clinical staff to participate in this blood shortage exercise.

Finally, we asked hospitals for any final comments and we received 116. Refer to Appendix B for the list of these comments. NOTE: where they occurred, we removed any identifying information.

A large number of respondents indicated that they felt the exercise was beneficial and these exercises are important to help prepare for a real event. A few recommended these exercises be held annually.

Several comments revealed issues with the notification process and a few questioned the use of phase terminology in the notification memos. Several commented that daily updates from CBS would be helpful in a real situation.

Results – Canadian Blood Services participants

Twelve responses were received from CBS participants. Respondents included the following roles - Hospital Liaison Specialist, Customer Service and distribution Manager, Business continuity and Medical Director. All reported that a primary role for them during a blood shortage was communication to hospitals.

All respondents reported that their CBS site has a plan to follow in order to manage a blood shortage and they are aware of the National Blood Shortages Plan. Most (91.6%) were aware of the Ontario Plan for Management of Blood Shortages.

Refer to table 2 for actions that would be taken during a Red Phase shortage.

Action to be taken during a Red Phase Shortage	Percentage of respondents
Review inventory reported by hospitals to be their Red Phase inventory	54.5%
Review inventory numbers actually reported by hospitals on the day of the event	63.6%
Determine how to fill hospital orders	54.5%
Other*	18.2%

*other included answering hospital questions and communication

Table 2 Actions to be taken by CBS during a Red Phase Shortage

Nine of twelve (81.8%) answered that CBS has identified which individuals will perform assessment of hospital blood requests during a blood shortage and 77.8% of these were able to participate in the exercise.

All respondents indicated that they participated in the post notification teleconference with hospitals. Seven of the twelve were involved in sending out the notification to hospitals. Of these seven, only one respondent felt that the process went smoothly. When asked why the notification process did not go smoothly, most comments referred to the

delays in receiving the fax notification (several hours) or problems with receipt of attachments (some hospital email will not accept .doc format) and that some hospitals wanted a phone call and/or confirmation of receipt. Some hospitals did not receive their fax notification while others received multiple copies or emails.

When asked how the process could be improved, answers included that an electronic solution is needed or that multiple fax lines could help improve it. The importance of ensuring attachments are in a format that hospital email will accept (e.g. .docx or pdf) would lessen the incidence of email failure.

All CBS respondents that answered the question (8/12) said that their site has an emergency blood management committee however, CBS elected not to convene these committees during this exercise. Respondents reported that these committees do have a notification list and communication plan is in place. During this exercise, CBS production and distribution managers, medical personnel, business continuity, risk management and government relations and senior management all received notification.

Seven of the eight who answered the question participated in the orientation sessions. The same number answered that they felt that participating in the exercise helped to identify gaps within their own plans. Some key learning points are as follows:

1. Need to improve process to notify hospitals (faster, more equitable)
2. Need to make it clear who hospitals should direct any questions to during such an event
3. Recovery notice did not get sent out to some hospitals
4. Some questions arise on CBS teleconference that are more patient related – out of scope of CBS – needs to be a better way to either redirect or help manage these issues

Overall comments focused on the importance for hospitals to comply with inventory reporting, particularly during a blood shortage and the need for hospitals to have a chance to discuss more clinical issues. Final comments indicated that they felt the exercise went well and that this type of simulation is a good way to test the system and identify areas for improvement.

Results – Survey responses from Ontario Emergency Blood Management Committee members

Fifteen responses were received from OEBMC members. All 15 answered they were familiar with the National Blood Shortages Plan but only 11 were familiar with the changes made in version 3 of the Ontario Blood Shortages Plan. Of the 14 who answered, all responded that they felt it was useful to receive National and Provincial inventory status updates for the committee during a blood shortage event. Many comments were received regarding this inventory reporting.

Comments included the following themes:

1. Having this information would help the committee make decisions and recommendations around hospital use of the components affected by the shortage
2. The information could inform on trends (worsening or improving)
3. Would be helpful to have CBS representative who could interpret/present the information on the inventory report
4. Recommend report could be provided day by day to monitor hospital usage and also possibly need for site to site transfers

Fourteen of fifteen indicated they attended the OEBMC call and twelve felt the members were representative enough to provide input for the whole province. One person commented that there was a concern (raised on the CBS post notification call) that hospitals may still require some venue to discuss patient related issues.

Twelve of those who responded said they thought that the information flow from CBS was adequate. Two commented on the issues with the fax notification (delays for some hospitals) and the fact that 12 hospitals serviced out of the Winnipeg site did not receive notification of recovery signaling the end of the exercise. Fourteen members answered that they felt the communication from the Ministry was adequate and no comments were received on how it could be improved.

When asked overall about the communication process for this exercise, only one person commented on an improvement which was that it would be helpful for a letter to be sent to each Hospital Emergency Blood Management Committee (HEBMC).

Key learning points from this exercise included:

1. There is a need to identify a communication method for hospital emergency blood management committees
2. Need clarification about messaging from OEBMC to hospitals and who is responsible
3. May be a gap in providing direction to hospitals on triage during a Red Phase (i.e. Triage tool for massively bleeding patients not be enacted but something else would be needed)
4. OEBMC Chair needs a back-up (CBS notification list had not been updated to include the change in OEBMC Chair/PATB Manager)
5. Need for better understanding by OEBMC members of their role during a blood shortage and how clinical recommendations will be communicated to hospitals (EMCT is not the vehicle)
6. Purpose/use of EMCT during a blood shortage needs better definition

Final comments received from OEBMC members were that the exercise was worthwhile and raised awareness at the hospital level. Some problems were identified with the use of the EMCT (notification delayed and not consistent between users, purpose needs to be clarified). There was also consensus that there is a need for a separate call or a part of the CBS call to give hospital representatives an opportunity to ask clinical and practical questions on how to manage the blood shortage.

To see a comparison table of results from the 2010, 2014 and 2018 Ontario Blood Shortage exercises, see Appendix C.

Discussion

Several themes emerged during this exercise. Overall, the exercise itself ran smoothly as planned and participants found it helpful in identifying gaps within their own plan. The biggest challenges occurred in communication.

Communication

Notification by CBS – As with the 2014 exercise, fax communication issued from CBS to hospitals proved to be problematic. The expectation from hospitals is that all sites should receive notification at approximately the same time. With the use of fax technology, which uses a sequential dialing system, significant delays occur between those at the beginning of the contact list and those at the end of the list. The longer the list, the longer these delays will be. To address this, CBS has begun to investigate alternative solutions for notifying hospitals and are currently trialing an automated third party system. While this would still make use of fax technology, the system would have the capability of sending out faxes to multiple sites simultaneously.

One CBS facility did not notify hospitals in one region of the province of the recovery phase, and as a result, these hospitals were not aware of the end of the exercise. There should be some process in place to ensure this would not happen in a real blood shortage situation. CBS is looking to resolve this issue.

It was recognized that email communication can be problematic. Like any organization in today's world, hospitals face threats frequently from spam and insecure links that can violate security of information. As a consequence, many have augmented their firewall and will not accept certain types of documents as attachments in email messages (e.g. .doc). As this is rapidly evolving for so many organizations across the province, it is almost impossible to ensure email communication will get through to all intended recipients 100% of the time. While email may be a back-up form of message distribution, it should not be the sole method.

CBS calls – Hospitals reported that a variety of staff attended the call held during the exercise. The list included not only laboratory personnel but medical and senior administrators. Each hospital should have their own policy, however it may be prudent to identify a point person or position whose responsibility is to attend the daily status update teleconferences with CBS and then that person can relay pertinent information to the rest of the team. HEBMC members, Medical Directors and Senior Administrators would likely have other responsibilities to fulfill. Frequency of CBS calls will be commensurate with the severity of the situation however, they would most likely hold at least one per day to provide updates to all hospitals.

EMCT – One of the objectives of this exercise was to increase awareness around the EMCT. This was achieved (87% of those who responded to the survey indicated they were aware of this tool) however, the role EMCT would play in adding value to a blood shortage situation remains to be clarified. Many respondents expressed confusion over the intended use by the Ministry. It is important to note what EMCT is NOT designed for and that is the sharing or distribution of any patient related or clinical information. It is also NOT meant to replace CBS as the primary means of notifying hospitals of a blood shortage.

Further discussion is needed within the OEMBC group for broad principles, and within hospitals along with LHINs and the ministry regarding the propagation of information from the emergency-management side of things to the clinical/operational side of things.

Overall, EMCT use during the exercise was minimal. The ministry player relayed initial notification of the simulated blood shortage to 198 "roles" in the health system. Only one other "role" actively added any information into EMCT pertaining to the situation, though the system confirms that a handful of others actively interacted with the information ("ticket"). For the remainder, several possibilities exist:

- incorrect users in the system, therefore organizations did not properly receive the information via EMCT
- one correct user in the organization/role received the information in the system but did not meaningfully engage with it and share within their organization
- correct users received notification of the incoming ticket but only reviewed it via their email notification
- correct users received the information within EMCT but did not properly set themselves up to receive email/phone notification

From the system log perspective alone we cannot determine which of these occurred in any given organization.

Internal hospital communication – many comments on lessons learned at hospitals through participating in this exercise focused on contact lists and the importance of ensuring they are kept up to date. In addition to this, it is also very important to ensure the communication loop is closed. Once anyone or any group is notified of the situation for whatever phase, it is crucial that they also then receive notification if the situation changes or is resolved in order to close the loop.

Several sites indicated they would be discussing the exercise with other hospital sites in their region. Responses made it clear that there is an increase in working collaboratively to respond to these situations. There also seems to have been more participation by senior administration compared to previous exercises. Several comments were made on the fact that the exercise brought to light the need to update plans to the most recent version of the Ontario Plan. The majority of hospitals (78%) did indicate that they had updated their plan to incorporate changes made to the Ontario Plan (released February 2017).

Clinical conference call to discuss recommendation/guidelines - One suggestion that was made by several participants was that it would be helpful for physicians and those involved in triage decisions to be able to participate on a conference call where discussions around patient management could take place. While CBS calls need to focus on inventory issues, there should be another forum where clinical staff could ask questions and receive feedback from other clinicians. This would also serve to encourage consistency of approach and ensure equitable care of patients.

Deferral of transfusion/triage

Both National and Provincial Blood Shortage Plans reinforce the importance of documenting any deferral or cancellation of transfusion therapy during a blood shortage. The Ontario Toolkit provides templates

http://transfusionontario.org/en/documents/?cat=emergency_blood.

This exercise demonstrated that a significant amount of blood (estimate of 75% of average use of red cells in the province) could be conserved through these deferral decisions. This action could be a critical step in preserving dwindling supplies to ensure there would be sufficient supply to provide blood to those with life threatening need.

Triage – Wherever possible, hospital plans should identify whose responsibility it is to perform triage at each phase of a shortage. Those assigned this duty should have a process to follow and guidelines to ensure decisions are equitable. It is good policy to include in the process some way to audit triage decisions either during or after the event to help ensure guidelines are followed. A high percentage of hospitals indicated they have individuals identified that would perform this triage function (87%). Several comments were received regarding the fact that triaging blood orders is time consuming. Hospital planning should recognize this to ensure sufficient resources will be allocated.

Assigning someone to triage at the time of the shortage could be problematic as those individuals may not be aware of the appropriate process to follow. Also, the attending physician may impose bias in decision making. It should be acknowledged, however, that at small hospitals, the pool of potential physicians available to triage will be limited and may need to be assigned as the event unfolds. The Laboratory Manager or Laboratory Technologist should not be tasked with the responsibility of making deferral decisions. This should be a physician responsibility. Several comments referred to the lack of engagement of physicians at their hospital related to this exercise. Efforts need to be made to ensure participation by physicians in future exercises.

One issue that is often raised during blood shortage exercises and events is “How do we know if all hospitals are following similar criteria regarding surgery deferrals and therapeutic transfusion deferrals?”

The OEBMC convenes early for any blood shortage situation and discusses recommendations on how hospitals should triage. It is recognized that each situation will likely be different, so it is very difficult to come up with guidance recommendations to cover all scenarios. It was felt that there is adequate representation of clinical expertise from across the province for this committee to make recommendations during any blood shortage event. The critical piece is how this information will then be shared with all hospitals in a timely way. Email communications would be issued from the MOHLTC to emergency planners in the LHINs and hospitals. ORBCoN could also provide information to hospitals, however as ORBCoN does not provide 24-hour 7-day a week coverage, there is a gap that needs to be addressed. Guidance recommendations on how to make deferral decisions from the OEBMC should help to ensure hospitals are all following the same practice so that care for Ontario patients will be equitable within the province.

Another suggestion for a venue to share this information was that messages from OEBMC could be distributed to HEBMC (and/or Transfusion Committees) via the laboratory during a blood shortage. This is a potential use for the EMCT that could be used as a vehicle to inform hospital personnel that recommendations from the OEBMC are available and direct where they may be found. It would most likely be used as an adjunct to email communication to the hospital committees managing the blood shortage for their hospital. This reinforces the importance for hospitals to establish their internal communication protocols including the link between EMCT users, the laboratory and the emergency management committee.

Concerns around physician liability – Related to deferral decision and triage of transfusion needs is the concern of physicians about liability. Extensive review of the National Plan by ethicists was undertaken and the Ontario Plan is largely based on this National Plan. Correspondence with the College of Physicians and Surgeons of Ontario on this issue supports the use of guidelines and existing approved plans as well as documentation of decisions made in patient's charts. Physicians carry liability for all of the decisions they make. Use of accepted evidence-based guidance documents provides a better safeguard than choosing not to use them and having to explain why they were not used. Consideration should be given to review of the Ontario Plan for ethics, legal and risk management opinion.

Inventory Management

Hospitals that participated in this blood shortage exercise indicated that they have defined their inventory levels for the various phases of blood shortages. This alone, would result in a significant contribution to conserving supply. Hospitals are compliant with reporting their inventory to CBS when requested to do so. During the blood shortage exercise, 86% of hospitals in the province submitted their inventory levels using the CBS reporting system.

A larger percentage of hospitals reported that they have plans in place to redistribute blood components in a shortage (79%) compared to just 58% in 2014. The exercise held in 2014 addressed a platelet shortage so the data may be difficult to compare. The 2014 responses could just indicate redistribution of platelets rather than red cells. While all hospitals should include plans to redistribute red cells it is likely not reasonable for small sites to include a plan to redistribute platelets or other components they would rarely have in stock.

Recommendations

Hospitals

1. Hospitals that do not have a hospital emergency blood management plan should develop a contingency plan and have a process in place for training and review. This plan should contain all components as recommended in version 3 of the Ontario Contingency Plan for Management of Blood Shortages.
2. Hospital personnel should review their internal communication plans to ensure they are adequate, including timely dissemination of communication to appropriate staff and identified roles.
3. Hospital plans should include a plan for redistribution of blood components.
4. Hospital laboratories should be reporting their inventory to CBS on a regular basis, especially when requested to do so (for example during a Green Phase Advisory) to aid CBS in the management of blood supply fluctuations.

CBS

1. CBS should standardize the internal notification process across all CBS blood centres.
2. CBS resolve hospital notification issues identified in this and past exercises.

MOHLTC/OEBMC

1. In between full Ontario blood shortage exercises (which are held approximately every four years), conduct a simplified provincial exercise without documentation to test communications to ensure messaging reaches the appropriate people in reasonable timelines.
2. MOHLTC should clarify how the EMCT would provide added value to hospitals during a blood shortage.
3. MOHLTC should clarify the communication flow of OEBMC guidance recommendations to relevant hospital personnel.
4. During a blood shortage, MOHLTC/OEBMC to facilitate a call for clinicians to ask questions and share issues.
5. There should be a review of the Ontario Plan by a Medical Ethicist to alleviate concerns over physician liability. In addition, legal or risk management review should be considered.

References

1.	Ontario Emergency Blood Management Committee. Ontario Contingency Plan for Management of Blood Shortages v3. ; 2016.
2.	National Advisory Committee on Blood & Blood Products and Canadian Blood Services. The National Plan for Management of Shortages of Labile Blood Components. ; 2015.
3.	Ontario Emergency Blood Management Committee. Ontario Hospital Toolkit for Emergency Blood Management. ; 2016.
4.	Ontario Emergency Blood Management Committee. transfusionontario.org. [Online].; 2014 [cited 2018 November 30. Available from: http://transfusionontario.org/en/download/report-on-ontario-blood-shortage-exercise/ .

Appendices

Appendix A: Comments on Key Learning Points or Gaps Identified by this Exercise

1. need for mechanism for mass paging for notification of HEMBC
2. If Chief of Staff not available - designating a second in command for communications with Laboratory Director.
3. Physicians would like a few questions added to the triage - is Pt symptomatic for anemia, pre-Op or post-OP surgery. During a shortage- is there a protocol for when to stop transfusing a MTP before inventory is utilized on one patient. IE 20 could be used for MTP.
4. need to firm up notification process for Medical Day patients. need to develop communication plan for general RN/physician staff (currently communication plan really only targets members of HEBMC and Transfusion Med Dept staff)
5. More specific instructions for bench MLT staff, updated contact list
6. E-mail still remains major mode of communication for this type of situation internally.
7. TM medical director has much more clarity about how to escalate involvement by senior management and emergency response team in case of a real blood shortage. EMCT is supplementary; not at point where it can be the sole tool for communication. We did not post messages to EMCT during this mock shortage, and maybe there is the possibility that it could be used that way in real life situations.
8. updated the contact list telephone numbers of persons to be reached.
9. importance of communication and the need for a facility plan
10. Communication needs to be expedited at all levels including CBS notification of Hospitals.
11. Physician engagement needs to be enhanced.
12. EMCT was of no use to the lab staff as we do not have rights to use it.
13. Communication between other hospitals in area.
14. Helped to clarify who was initially responsible at each level.
15. Email distribution lists made are only made to contact people for internal email addresses.
16. Corrections to the distribution lists have been made.
17. E-mail is not the best communication tool
18. The individual responsible for triaging product requests is not available 24h. There is a question of who will provide this role after hours and whether regular staff (if chosen to triage) would feel comfortable making recommendations on who should/should not get transfused.
19. Method of notification. include Physician Administration Assistant in notification. -who is on EMCT
20. There is not enough staff working in TM on a day shift to handle this exercise. Additional staff would have to be brought in to do notification and management will be doing that including notifying pathologist.
21. Notification to affected areas/heads of departments went unnoticed. Need to follow up with phone call, or request a call back to ensure notification was received.
22. Need to test plan locally. Challenge with physician participation
23. The lab has a very detailed plan, however the Hospital's emergency planning committee procedures around this particular type of emergency are weak and/or non-existent. Also there is a huge gap between email and fax notification; this would be problematic if a shortage was initiated during non-office hours (M-F 8-4). Multiple duplicate emails were also received.
24. The need to update our HEBMP and to form a HEBMC.
25. We may need a "code" developed for supply chain emergencies.

26. Communication from internal EMCT was non-existent, did not receive communication from CBS about conference call. Will look to have an internal emergency plan.
27. More clarification around notification process is required. Lack of education for management staff
28. Fortunate to have partner hospital blood provision plan
- Who should actually be notified?
 - updates via email
 - initial notification of COO's and Senior Leadership for all three hospitals
- Blood group on Lab documentation logs
- to assist EBMC in approving transfusions based on current Red Phase Inventory Levels
- Add Type and Screen and XM info on OR list
- Assist Lab and EBMC in approving transfusions
- Emergency Operation Centre to include notification of CIO to be responsible of communication to the public
- EBMC coverage
- How to provide 24/7 coverage
 - Who will make decisions during off-hours
 - What will this coverage look like? i.e. pager, tcon
- Notification Memos
- Used tool kit templates for exercise
 - Clarify verbiage and make specific to Hospital
- Prioritization of the recall of patients whose surgery/procedure/treatment was delayed as a result of a blood shortage
- Add this to EBMP
29. EMCT communication delay. TM staff not familiar with hospital policy
30. Delay in notification email (9am) from CBS vs Fax (10:30). Internal delay using email to contact individuals for the HEBMC. We need to expand on the process for delaying OR's -subgroup of the HEBMC. Review of blood orders needs to be 24 hours a day - who is available (on call) to perform this task.
31. Confirming the process outlined in our plan.
32. It is a challenge to engage clinical staff to participate and take the idea of a blood shortage seriously. 2 out of the 6 clinical physician members attending the mock HEMBC meeting. When reviewing the red cells orders for triaging, the 2 physicians that attended wouldn't deny any order without speaking to the ordering physician. If this was a real blood shortage, it would be a very time consuming process. There are no transfusion limits for bleeders. One of the HEMBC members felt this needed to be added to our protocol.
33. Key individuals to contact is not clear.
34. We do not have HEMBC or Triage team. There is no communication between our facility EMCT team & the Transfusion Medicine Lab.
35. 1) Greater hospital participation in developing and knowledge of the HEBMP.
2) Staff training required.
3) Communication strategies to be clarified and streamlined.
4) Patient notification process to be revamped.
36. Although the lab has written the procedure, the clinical side of the process needs to be more actively involved.
37. A heightened need to better engage clinicians in the exercise is apparent
38. We need to check our fax regularly. We changed how we report our inventory. We are going to use the orders to present to our transfusion committee-inform physicians of choosing wisely guidelines
39. Making sure contact information for all key players is available and correct.
40. Some alterations to the wording in our memos. Addition of names to the original contact list.
41. We were not notified at the end of the exercise. When this survey came out I contacted ORBCoN and was told it was complete the day before. we continued screening and would have potentially denied 8 more transfusions.

42. Can the notifications that we receive from CBS have a section to fill in our hospital information before we fax it back. Otherwise how does CBS know who is sending the response back.
43. Overall, good learning experience.
44. We do not have a specific code for a blood shortage. Our Lab manager will be taking this to our Leadership committees. We became aware that more work is needed at our specific site.
45. We found our stakeholder contact list was outdated. Will add details for teleconference to our plan for HEBMC meeting as it is difficult to get all in attendance in short notice. Triaging all red cell requests can be very time consuming- may consider calling in extra MLT staff in a real RBC shortage.
46. We do not have a specific code for blood shortage. Lab Manager taking this to Leadership to see where it fits in with our codes. However we discovered we need to develop these better at our own site.
47. Internal lab processes performed well. Communication to admin is challenging but not insurmountable. Not all TM staff have ability to report site inventory into CBS website. Need to increase numbers who are registered. Need a plan for clinical fanout if we need to retrieve released units. We are a hub site for the LHIN - still not clear on how we would prioritize requests from LHIN partners (without knowing if these requests have been rigorously triaged). We assume all triage rules across the province are similarly rigorous - but is this really the case? Our hub site is also a neonatal site, and most triage algorithms prioritize releasing product for this population. We worry about endangering our supply for our most vulnerable patients. We have identified that ROUTINE transfusion practice could be optimized - even when we're not in a simulated shortage! Excited to launch the QIP soon.
48. Total lack of participation (or even inquiry) by our Medical Staff (HEBCMC) is our biggest gap therefore NO learning about the review process in a real shortage.
49. Our communication plan needs to be updated as the Lab is responsible for letting everyone know rather than a fan out. Also the physicians only use personal emails and none of them opened any emails about the simulation so had no idea it was even going on, despite several notifications.
50. we plan to hold a debriefing session to evaluate the communication failures and look for opportunities to improve and update our policies and procedures.
51. Our EBMP has an Incident Management team to make decisions in life threatening situations the identity of who these members are has not been disclosed to the Blood Bank or the Blood Bank Medical Director who is off site.
52. notifications to physicians. communication from CBS
53. Notifying only HEBMC is not enough, we identified that more people required to be notified,
54. may be all physicians. E mail communication is not enough for effective and timely communication, we decided to use hospital switchboard calling HEBMC along with emails.
55. Communication plan needs to be more detailed. Tracking log needs to be more detailed.
56. we have identified several shortfalls and are currently working on: templates, communication, policy, training
57. It was identified that our Transfusion lead was not aware of Version 3 - work has initiated to ensure all elements are clearly defined in our procedure. Identification of who will be contacted to approve transfusions during an RBC shortage has begun to ensure the appropriate team members are part of this decision making process.
58. Better communication needed. Unavailability of key staff. Incomplete policy.
59. Manual needs updating
60. we learned about the EMCT group which we did not know existed before this exercise
61. Thought we were prepared - had not made changes in relation to version 3 and no HEBMC formed. Need to create. Also need a tool to make sure that those contacted during a blood shortage respond/acknowledge the critical issue at hand and a timeline for response to the fan out.
62. TBD - haven't had a chance to review with our committee yet
63. We identified areas for improvement with our command centers availability to a phone. We are confirming our transportation readiness for transporting patients or products. We identified the need for more efficient communication to Chiefs of Service. We identified a need to assess the Critical process.

64. Key points keeping all the committee members updated on the process, because there can be a lot of turnover of members. Having up to date communication within our LIHN on triaging and redistribution plans.
65. Fax came late to the department. Only email to management. In a real emergency I would think the actual department should be notified first via fax or other avenue
66. Need to have an alternative plan on how to reach EBMC as emails were not very effective for only about one third responded back. Involve the communication officer. Need to develop more around the Triage team. The plan is to convene the EMBMC in the fall to do a table top exercise and review all cases we had for this mock.
67. Notifications and communications are sometimes late arriving. When an email is received it should be acted on because faxes were delayed.
68. We are a small site without surgical services; the only impact an actual blood shortage would have on our site is for emergent patients coming by ambulance that require blood. Rare booked blood transfusions performed on site.
69. We identified someone who should be on the contact list. Contact list needs to be a part of the procedure and not a separate document. We need to add something about VBacks to the procedure to identify possible upcoming blood needs.
70. Contact list was out of date!
71. In preparation for the exercise, our EBMC did not include a number of key players. They have now been added.
72. We also discovered our contingency plan within our TM manual did not fully match our contingency plan in the Contingency manual.
73. We did not have a EBMC.
74. Updated checklists required
75. how to manage notification to personnel.
76. Not all lab staff had access to CBS inventory reporting website. We have now made a generic login so all lab staff can report our inventory to CBS daily and during blood shortages as required.
77. I really believe that a receipt of notification should be sent to CBS acknowledging receipt of notification.
78. Updating of contact lists... First time triaging whether units should be given or not through TM Director.
79. We would require a more formalized triage team should this occur.
80. Need to finalize HEBMC and triage committee. Need to develop a summary of triage criteria for triage committee, as they will not have time to go through extensive documents at the time, even if those triage members have read those previously.
81. improved communication. convene team. more simulation with actual OR list review
82. Emergency plan was out of date. EMCT users had to be updated prior to exercise
83. Better system of communication to EBMC members this time.
84. need an additional alert other than email for convening the HEBMC
85. The key contact for CBS was away on the second day. Laboratory Manager was added to the emergency contact list at CBS. The staff notification email to the executive team will have the content in the body of the email rather than as an attachment. We will ask for verification that the email notification was received
86. Made us really examine our process and procedure. Needed updating with change in leadership roles. Presented us with scenarios that we had not thought of in the original development. Even steps front line staff were required to do for communication- not everyone has the same access, needed more detail.
87. There was only the Triage Officer but no triage team formed before this exercise. No fax machine with direct line designated for transfusion medicine service to receive the CBS notification.
88. Initial communication via fax from CBS was delayed at our all sites. EMCT was delayed several hours.
89. require additional staff trained on the EMCT program. development of a new code specific for blood shortages. transfusion medicine to explore the possibility of obtaining split products regionally if required
90. All MLTs were assigned to read all the SOPs, forms and exhibits relating to the HEBMP previous to the mock exercise. A Blood shortage plan competency training quiz still needs to be done. Communication processes need improvement. The

HEBMP was completely rewritten based on the Ontario Contingency Plan Version 3 and the Ontario Hospital Toolkit for Emergency Blood Management and in doing so this mock exercise ran much more smoothly than the one held in 2014.

91. Need to ensure AlertFind notification not blocked by Firewalls; specific responsibilities of individuals on fan-out list needs greater clarification
92. Communication
93. We identified who will be responsible for communicating to surgeons who may be effected by this shortage
94. We are a very small hospital with limited inventory so much of the exercise did not apply. No OR/Surgeries to defer or scheduled transfusions. Because of our size and patient needs, it doesn't seem necessary to involve all levels of management. It would make more sense for the lab to inform only those who would be affected, if any. Also, redistribution is not possible for our site at this time.
95. Unable to modify our form to include SIMULATION- updated form
96. That CBS would not be emailing in recovery
97. Process for bring the Triage/Emergency Team together.
98. How to bring the HEBMP committee together.
99. Identified addition required for recovery phase. Identified necessity of around the clock decision maker. Communication clarification requirements.
100. It was a good refresher but being a small community hospital where there are no surgical procedures performed and no blood products are used on routine bases, most parts of this exercise does not apply to us.
101. Pharmacy was not included in pre-notification list. Lack of accountability of physician participation in the clinical triaging portion of the exercise.
102. CBS fax approach is not effective. We don't have a plan for rapid identification and recall of products that are contaminated...partly because product ID is all CBS would be able to provide us, and partly because we would have to manually find each product ID.
103. Need an online tool that helps hospitals and CBS connect.
104. How to deal with surgeries already underway.
105. the need to periodically update contact list

Appendix B: Final Comments

1. good learning experience to highlight gaps in communication, difficulty in coordinating HEBMC in short notice
2. These drills are helpful.
3. Although this was a lot of work on my part (as Charge of Transfusion), I must admit that this exercise was needed to be able to validate the quality of our Emergency Plan for shortages. It also was needed as a teaching/awareness aid for all staff. We had participation from many members of HEBMC. Surgical support for exercise was particularly good.
4. Repeat every year please
5. EMCT - could messages be pushed to designated recipients - my understanding from our liaison officer is that he needs to log onto the system to retrieve it in real time, otherwise there is a delay in receipt.
6. The review exercise will take place later with the Transfusion Medicine Committee members for discussion. I must say that I thought a phone call would have been to us. If it happened during the night or week-end, not sure how fast the notification would have been seen. In my opinion, it would recommend a phone call. This is very important when it happens and a lack of communication could potentially cause additional stress of laboratory staff if they should see the memo at a later time.
7. Thank you
8. Exercise was good trial of our blood shortage plan insofar as exposing small gaps in our communication strategy. Solidified our resolve to upfront designate a specific triage physician to manage blood product deferral.
9. Good job!
10. Communication of Red Phase: our CEO never received the notification (but our CNO did). Had this exercise (or an actual event) taken place on a weekend and the CNO out of range (which is quite common for people camping on weekends), the lab MLT on call would have remained unaware of the shortage until the next weekday.
11. went great however I only received an email which I in turn only notified staff 1 hr after the email was sent. Would much prefer a fax notification.
12. All went well here.
13. large time gap between email and fax notification
14. It is very difficult to get active participation in the Blood Shortage Simulations
15. Good exercise. Very helpful.
16. These exercises are very helpful
17. Excellent exercise and finally raising awareness to Senior Administration
18. It makes it very difficult to book a Mock IMS meeting without much notice. In the future it would be helpful to know the exact date of the mock event so we can anticipate and book the key player's calendars to be able to run an exercise with full participation
19. Good exercise. I agree that paper-exercises are less disruptive, but then all of the sites I help administrate didn't seem to take the Hospital involvement as seriously as they could have to test processes. Note: I am not aware of how many transfusions would have been deferred since I have not seen the completed paperwork yet.
20. elective surgeries would have been cancelled.
21. We will be comparing our response with partner hospitals within our partnership to learn from each other.
22. Valuable exercise
23. Good exercise!
24. The mock was a good learning exercise. However, notification via EMCT was extremely delayed and there wasn't a lot of information included in the ticket. Since CBS would never consider using EMCT during a real blood shortage, it was unrealistic to ask hospitals to develop/edit current blood shortage plans to account for this mode of communication. Our EBMP was written based on direct email/fax to Blood Banks. To prepare for this exercise, there was a rush to edit our current policy to reflect the involvement of EMCT.

25. Thanks!
26. Excellent learning opportunity. I think this should be identified as a Code Orange, external disaster would be CBS inability to supply blood. Code Orange would be paged overhead, more effective way to immediately trigger a response.
27. We did not conduct our own mock exercises prior to this one; however, we did participate in prior 'mocks' initiated by CBS.
28. Staff outside the laboratory don't take the idea of a blood shortage seriously. I don't know how we would reduce our usage by 70% if it really happened.
29. CBS did not notify us when the exercise was complete.
30. Please include Don't know or Unknown as options if this survey is done again
31. We will discuss the blood shortage exercise at the Blood Conservation & Transfusion Committee.
32. Feedback for CBS:
There was some confusion re: phase terminology and definitions used.
 - 1) Red Phase 50% inventory --> our plan mirrors the framework @ 25% inventory levels.
 - 2) Green Recovery --> there is no Green Recovery phase
 Communication each AM might have been helpful to continuity and communication about blood shortage status.
Not all of us who were receiving CBS shortage notifications received an email about this survey.
33. Although many people were notified during the simulation, almost none confirmed receipt of the message or email notification.
34. The simulation was very useful to prepare. This situation could happen.
35. Very helpful in identifying a few gaps in our plan.
36. Notification was poorly handled. Better process needed.
37. Thanks for this - very helpful! Communication was an issue but I feel in a real shortage there would have been more contact with CBS!?
38. We have not held a review as of yet. This will be done at our next Transfusion Committee meeting in June.
39. This simulation proved beneficial for our site, made us more confident and comfortable in the event that the real situation ever occurs.
40. This was a great learning experience. We are now working on the site specific gaps at our own Hospital.
41. This was a great exercise and revealed gaps. We will be working on our own site specific procedures.
42. The # of red cells deferred is a PERCENTAGE (i.e., 62%) of all red cell orders received across all hospital sites - not a # of units.
43. The TMS lab side of the exercise worked well, BUT whether we could perform during a real shortage - still unknown - entire process NOT tested until clinical staff participates.
44. Our Blood shortage procedure is currently being updated to reflect the changes made to version 3
45. The internal Lab process seems to be the best set up but outside the lab needs work. I appreciate the comment on the CBS call about handling products that are being transfused at the time of the recall and how to deal with them. I think the responsibility for physicians needs to be better educated. Everyone needs to know their role.
46. early on, I did not receive the email from CBS that the exercise had begun.
47. Not all staff at our hospital have access to scan and email those on the EBMP List should this exercise have occurred after hours the notification would need to be faxed to approximately 25 persons.
48. we are going to review data concerning simulation
49. This exercise helped us to better prepare for the real crisis. We are now better prepared if we have to face real shortage.
50. Communication from CBS by fax was delayed, alternative way of communication should be sought. The term "GREEN PHASE (RECOVERY SIMULATION)" is not standard term. We interpreted it as a RECOVERY and simulated return to GREEN over the next 20 hours before terminating the exercise.
51. thank-you for the learning opportunity.
52. The mock exercise was excellent and was a valuable test of our procedures.

53. A welcomed exercise which highlighted our gaps and the importance of Senior management involvement.
54. Good exercise. We have a lot of work to do. Want to give staff increased confidence for the possibility of a real time situation.
55. This was a great exercise; I hope this is something that will be done on a periodic basis (e.g. every 2 years).
56. We think this was a great drill to inform everyone of the gaps.
57. The communication from CBS was not sufficient as far as the MOCK exercise. No follow up teleconference when called the green phase. Don't understand why it was delayed so much and then it took a long time for CBS to call first teleconference. If this was a real shortage hopefully a teleconference would be called by CBS sooner to help hospitals understand the situation better.
58. Review was held with all regional labs
59. This was a great exercise! Thanks for co-ordinating.
60. As a smaller site within a region, we had a few meetings prior to the exercise. This was very helpful to ensure we were all on the same plan.
61. We now have an EMCT and have improved our policy.
62. our main concern is being to notify group in a timely manner
63. Will require all lab staff to complete the training checklist and quiz found in the EBM toolkit. Need to update the notification table/contact list for our institution.
64. Exercise was a success.
65. our hospitals had a sub committee of the IMS team for this exercise. This team had all key stakeholders and was very effective. We reviewed inventory, surgeries, elective transfusions in queue. We did realize that we would require a more stringent Triage and would base it on the toolkit provided by ORBCON.
66. Blood (component) shortage is a fluctuating problem, depending on the cause and factors like (platelets) expiring. Some patients can be deferred today but may then be worse tomorrow, others can be deferred and given iron. It is difficult to make firm criteria for deferral of transfusion
67. important to have an annual mock exercise for continuous quality improvement
68. This was a great learning experience and I feel that our facility has a good sense of what needs to be done if this were to be a real emergency.
69. Did prepare list of scheduled surgical procedures and transfusions. Would have used this to triage transfusion requests in event of real emergency
70. Very helpful process. Made us do a more in-depth review. Would support the process being repeated.
71. The exercise was ended from red phase directly to green phase, without going through the recovery phase. However, in reality, there must have been a recovery phase. So, to make the exercise more realistic, we decided by ourselves to go through a 24-hour recovery phase before going back to a green phase.
72. This survey response is for all three sites of our Hospital, as our policy and procedures are standardized.
73. Updates and a wrap up meeting with CBS would have been beneficial.
74. Daily morning updates of ongoing shortages and reassertion of phase status by CBS would be helpful. CBS terminology used were somewhat confusing. Green Recovery is not in our policy. The red phase 50% inventory levels was communicated while the framework and the HEBMP states 25% inventory for red phase. There was no final teleconference between CBS and hospitals. Feedback from both parties would be appreciated.
75. The exercise was a very useful tool to refresh the processes required for blood management in a shortage
76. This was a great way to show where our gaps were in our plan. I think another mock exercise would be beneficial to ensure our gaps have been addressed.
77. Good review!
78. The exercise was very helpful in ensuring we were prepared
79. Mock exercise was very helpful and an excellent opportunity to identify what worked well and the gaps that need to be addressed.

80. Excellent Mock Exercise.
81. As we were not able to involve physicians in the exercise, we were not able to test that part of the plan.
82. Very helpful
83. Process is more standardized and expectations are clear.
84. We keep only two O Pos and Two O Neg PRBC units on hand all the times for emergency purpose only. We do not perform surgeries or deliver babies on routine basis.
85. Thank you for the exercise.
86. Communication: received by email and fax at the start of the exercise but only by fax for the end. There was significant delay in communication to those sites that are at the end of the list.
87. Our hospital is quite small and our inventory levels really do not change much between GREEN and RED phase, also we do not have surgery, so all transfusions would be a true emergency (life or death), on RED phase
88. good exercise to have, helps to ensure an up to date process

Appendix C: Table of comparison – Ontario Blood Shortage Exercises - Recommendations*

Recommendation	2010	%	2014	%	2018	%	Comments
Hospital plans should be finalized	✓		✓	92	✓	94	
Hospital plans should be updated to most current version					✓	78	
Staff should be trained on blood shortage plans	✓		✓	57	✓	82	
Processes for redistribution should be in place	✓		✓	58	✓	79	
A process for notifying patients should be in place	✓	45		80	✓	NA	
A hospital committee should be in place to manage blood shortages	✓			65	✓	66	Some smaller hospitals don't have a separate committee but use an existing committee such as the Transfusion Committee
Individuals should be identified to triage blood requests during a shortage	✓		✓	89	✓	87	
A process should be included in the hospital plan to recall patients whose surgery was deferred during a blood shortage			✓	43	✓	42	
A contact list should be maintained to notify internal personnel of a blood shortage	✓		✓	82	✓	84	
Hospitals should report their inventory to CBS when requested	✓	64	✓	47	✓	86	
Deferral of any transfusion/surgery should be documented	✓	3	✓	63	✓	85	
Hospital plans should better define actions needed during recovery phase of a blood shortage			✓		✓	NA	
Hospitals should hold a review of the exercise			✓	80	✓	83	
CBS implement a process to ensure timely notification of the blood shortage to each hospital that receives blood components and products from CBS One of three key areas for improvement identified by CBS following 2014 exercise	✓		✓		✓		No. Still long delays and contacts not updated – NOTE CBS is currently looking at automated technology as a solution
CBS inventory/situational update teleconferences should be held for all regions of the province and at different times in case people need to attend more than one	✓						CBS now holds three calls to cover all regions in the Province
CBS should develop templates for notification to hospitals			✓				Standard templates are now in use

CBS to develop checklist or toolkit to provide support for CBS staff to ensure processes are followed consistently One of three key areas for improvement identified by CBS following 2014 exercise			✓		✓	This may still need development. Recovery notice not issued from one site
CBS provide more guidance in Recovery Phase notification i.e. continue restriction in use for 48 hours			✓		✓	No guidance provided in communication
Find a solution to collect hospital inventory data 'visible inventory' One of three key areas for improvement identified by CBS following 2014 exercise			✓			Yes. CBS created a portal for hospitals to report inventory
MOHLTC communications should be clear (avoid acronyms)	✓					Yes
MOHLTC maintain blood shortage plan and update as needed			✓		✓	Yes – ongoing
MOHLTC need to clarify roles and responsibilities re: communication internally, with MEOC and with hospital stakeholders One of two key areas for improvement identified by MOHLTC following 2014 exercise			✓			Yes. A communication flow chart was developed and included in v3 of the ON Plan
Define 'trigger points' for inventory where Provincial Blood Office (PATB) will be notified			✓			Yes
Provide guidance to hospitals on triage decisions/criteria to ensure equitable actions will be taken across province			✓		✓	Yes. OEBMC met and discussed – developed key points to be communicated to hospitals
Develop 'one-pager' documents to provide awareness of roles for MD, RN and MLT hospital staff			✓			Yes. One-pagers for MDs, RNs, and MLTs were included in the v3 toolkit
Clear and concise communication from MOHLTC to stakeholders is needed. Develop templates for use in emergency blood shortages. One of two key areas for improvement identified by MOHLTC following 2014 exercise			✓			Yes. Templates were used for the 2018 exercise
Clarify how communication/guidance will be provided from the OEBMC to hospital triage teams			✓		✓	No. the information was not shared with hospitals (due to writ period) There needs to be a plan for how communication should be sent out following the OEBMC meeting
Clarification of actions required for Recovery Phase is needed Provided as feedback from OEBMC following 2014 exercise			✓			Yes. Clarification that, upon receiving a Recovery notice, hospitals must continue to reduce use for a period

							(suggested 48 hours) until there is a stable return to Green Phase (included in v3 of ON Plan)
Provide guidance on notification responsibility for sites that provide blood for transfusion to other (Administrative) sites	✓						Yes. ORBCoN provided this as an update during site visits 2011-12 and will ensure it is mentioned in the Disp/Adm Toolkit (revisions due 2019)
Expand access to the ORBCoN Platelet Web Application			✓	16		NA	All hospitals now have access
MOHLTC clarify internal communication process (PATB/MEOC/use of EMCT)			✓		✓		Confusion over how the EMCT tool is to be used for a blood shortage situation and what value is added for the system
Include notification of CritiCall, ORNGE, EMS for exercise	✓						No. A decision was made not to include this in the scope of the exercise but to consider for next exercise
Hold another blood shortage exercise 2-3 years			✓		✓		This will be discussed by OEBMC – frequency to be determined
Include templates for documenting decisions in next ON Plan Toolkit	✓						Included in toolkit v2 and 3
Provide a template for patient notification	✓						Included in toolkit v2 and 3
Provide a training checklist in toolkit to facilitate training of staff	✓						Included in toolkit v2 and 3
Provide a template/example of contact list for internal hospital notification	✓						Included in toolkit v2 and 3
Reinforce importance of hospitals to report inventory to CBS during a shortage when asked to report	✓		✓				Included in toolkit v2 and 3

*NOTES:

1. The 2010 exercise only involved 27 hospitals.
2. The 2014 exercise involved a shortage of platelets and notification was sent to all Ontario hospitals. It started as an Amber Phase and progressed to Red Phase before resolving to Recovery Phase.
3. The 2018 exercise involved a shortage of red cells and notification was sent to all Ontario hospitals. It initiated as a Red Phase, lasting approximately 30 hours before the Recovery notification was issued.
4. “✓” indicates this was a recommendation following the exercise
5. “%” result indicates the per cent of hospitals responded to this in a post exercise survey