Final Report

Survey #2
Blood Inventory Management and Contingency Planning

June 2007
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## The Ontario Regional Blood Coordinating Network (ORBCoN) Team

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### Acknowledgements

Special thanks to the Blood Bank staff at all the participating hospitals for taking the time to answer this survey. Thank you to the Ministry of Health and Long Term Care (MOHLTC) for funding support.
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Executive Summary

Blood Bank Information

» 100 responses to the survey were received in total.
» 57% of Transfusion Services have designated personnel that maintains blood component and blood product inventory 61.5% in Southwest, 53.1% in Central, and 56.1% in Northern and Eastern Region.
» Majority of hospital Transfusion Services are checking their inventory levels once a day.

Reported Inventory Practices

» 93% of Transfusion Services in the province have inventory control practices in place, 100% in Southwest, 93.8% in Central, and 87.8% in Northern and Eastern.

<table>
<thead>
<tr>
<th>Inventory practices being performed</th>
<th>Southwest</th>
<th>Central</th>
<th>Northern and Eastern</th>
<th>Provincial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotating stock to issue oldest first</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Flagging product soon to outdate to facilitate priority for using</td>
<td>84.6%</td>
<td>90.3%</td>
<td>60.5%</td>
<td>77.0%</td>
</tr>
<tr>
<td>Monitoring outdated product by ABO/Rh group and type</td>
<td>80.8%</td>
<td>71.0%</td>
<td>68.4%</td>
<td>73.0%</td>
</tr>
<tr>
<td>Moving older products to a higher-use site</td>
<td>50.0%</td>
<td>32.3%</td>
<td>42.1%</td>
<td>41.0%</td>
</tr>
<tr>
<td>Other</td>
<td>3.9%</td>
<td>6.5%</td>
<td>10.5%</td>
<td>7.4%</td>
</tr>
</tbody>
</table>

» Majority of Transfusion Services in all regions that are moving product to a higher use site, send red cells at 7 days before expiry.
» 90% of departments in the province have policies and procedures in place related to inventory levels, 92.3% of Southwest, 90.6% in Central, and 87.8% in Northern and Eastern.
» 70% of Transfusion Services in the province share (transfer/receive) blood components and blood products outside of their hospital organization.
» 45% of hospitals throughout the province have a Master Surgical Blood Ordering Schedule (MSBOS) in place.
» On average 2 shipments per week are received at hospital transfusion services in Southwest region, 5 in Central, and 1 in Northern and Eastern.
» Average number of STAT shipments per week is 0-1 in Southwest, >5 in Central, and 0-1 shipments in Northern and Eastern region.
» 42% of Transfusion Services in the province feel that they are receiving blood components and blood products too close to expiry. 50% in Southwest, 64.5% in Central, and 19.5% in Northern and Eastern.
» 76% of facilities in the province crossmatch on demand.
28% of Transfusion Services in the province have concerns regarding blood and blood components that are being processed but not used.

16% of laboratories in the province have a laboratory practice in place to issue only ABO specific red blood cells.

68% of Transfusion Services in the province do have an established guideline or SOP to order and issue ABO specific platelets. 70.8% in Southwest, 64.5% in Central, 69.2% in Northern and Eastern.

2% of facilities in the province perform a titre prior to issuing group O apheresis platelets to a group A individual. 0% in Southwest, 6.5% in Central, and 0% in Northern and Eastern.

87% of Transfusion Services throughout the province issue group O Rh negative uncrossmatched red cell in emergency situations.

Contingency Planning

18% of hospitals provincially have a contingency plan in place.
38% of Transfusion Services provincially were not involved in the development of the contingency plan.
Actions taken at hospitals upon initial notification by CBS concerning long term disruption of the blood supply, related to communication: 68% of facilities provincially would notify MAC or CEO, 48% would activate fan list for technical and transfusion medicine staff. Related to product inventory: 94% of facilities provincially would assess the existing blood and blood product inventory, 86% assess to determine immediate critical needs for blood and blood products. Related to ordering practices: 71% of facilities provincially would use a triage protocol for all incoming requests for blood products, 62% would use a single unit RBC transfusion with need reassessment after each unit protocol.
69% of hospitals provincially would share product with nearby hospitals in the event of a shortage.
5% of staff provincially receives annual staff training on planning for a disruption in the blood supply.
88% of facilities in the province take part in mock disaster exercises.
33% of facilities in the province include blood supply considerations in the mock disaster exercises.
46.5% of respondents in the province believe the plan and back up resources to respond safely to disruption in the blood supply are adequate. 59.1% in Southwest, 25.9% in Central, and 54.1% in Northern and Eastern.
In the event of a local disaster affecting a large number of victims (5 or more), which action would be taken at respondents facilities. 100% of facilities provincially notify Laboratory staff and administration, 87% assess existing inventory.
93.5% of respondents provincially believe that a consistent approach to dealing with blood shortages should be adopted by all hospitals across Ontario.

Conclusion

The survey provided useful baseline information about the inventory management practices and contingency plans available at the various Transfusion Services throughout the province of Ontario.
Introduction

The Ontario Regional Blood Coordinating Network (ORBCoN) is an initiative by the Blood Programs Coordinating Office, Ontario Ministry of Health and Long Term Care. This network consists of three regions, using similar geographic divisions to Canadian Blood Services. ORBCoN sites are located in Hamilton (Southwest), Ottawa (Northern and Eastern), and Toronto (Central).

One of the roles of the Ontario Regional Blood Coordinating Network is to research various practices and procedures in use within Ontario Transfusion Services.

This survey was developed and distributed to all hospitals in Ontario with a Transfusion Service in June of 2007. The purpose of this survey was to:

» Obtain baseline data related to policies and procedures being used within Ontario hospitals with respect to inventory management;
» Obtain data pertaining to the availability and use of contingency plans;
» Identify opportunities for development and standardization of practice throughout Ontario where possible;
» To support scarce resources present in the regions served;
» Share information gathered with participants.

This forty nine question survey was developed using an internet tool called Survey Monkey. It was sent out to the hospital Transfusion Services through email with an attached link so that respondents could answer the survey directly online. The completed survey was submitted by various professionals within the Transfusion Service. This report outlines the information collected from the survey answers representing each region individually and combined information to give a provincial scope.
Results

The survey was distributed to all hospitals in Ontario having a transfusion service/laboratory. 100 responses were received in total. Thirty three (33%) responses were received from Central region, 26 (26%) from Southwest region, and 41 (41%) from Northern and Eastern region. (Fig.1)

![Fig.1 Responses by ORBCoN Region](image)

1.0 Blood Bank Information

Respondents were asked if their department has designated personnel who maintain blood component and blood product inventory. (Fig.2)

![Fig.2. Does your department have designated personnel who maintain your blood component and blood product inventory?](image)
Participants were asked how often their inventory levels are checked. (Fig. 3)

The majority of Transfusion Services in the province check their inventory once a day.

**2.0 Blood Bank Tests and Procedures**

The survey asked respondents whether their Transfusion Service has inventory control practices in place. (Fig. 4)

For those who responded yes to the above question, it was asked which inventory control practices are performed at their facility. (Table 1)
“Other” responses to the above question included:

» **Southwest:**
  - Physicians who have ordered blood “to hold” are alerted after 48 hours if blood has not been used. They then call the lab and notify if they still require blood or not. If they do, we advise them that 72 hours is approaching and we would need to resample.

» **Central:**
  - Substitute product policy.

» **Northern and Eastern:**
  - Send units to reference centre for transfusion.
  - Attempt to maintain minimum blood bank supply at all times.
  - If a unit is soon to outdate, double tagging or crossmatching the unit.

For those that stated that they moved older products to a higher use site, the survey asked how many days before expiry Transfusion Services would wait to send the product. (Fig5)

![Graph](image)

**Fig.5 Number of days before expiry units are shipped.**

It was found that the majority of Transfusion Services in all regions send red cells at 7 days before expiry.
Participants were asked whether departments have procedures and/or policies in place related to inventory levels (i.e., ordering, minimum and maximum stock levels, etc.). *(Fig. 6)*

There were 24 hospitals from Southwest, 28 from Central, and 34 from Northern and Eastern that indicated how their inventory levels were calculated, responses included:

- **Southwest:**
  - Based on usage from the last week, month, year.
  - Based on expiry of blood by blood group.
  - Consensus between staff, technical specialists, and manager using statistics resulting in the least amount of wastage.
  - No specific policy in place.
  - Using the AABB method times the number of hours away from the CBS Centre.

- **Central:**
  - Based on usage (historic or daily).
  - Population distribution, size of hospital, and number of deliveries.
  - Calculated weekly inventory based on daily usage.
  - Based on recommendations from CBS a number of years ago.
  - Monitoring stock vs. transfusion usage.
  - How much blood is needed to comfortably last a 24-hour period.
  - As per AABB.
  - Monitor usage and wastage by group on a monthly basis.

- **Northern and Eastern:**
  - Previous usage (daily, weekly, monthly or previous years’ usage).
  - Minimum levels depend on patient demand.
  - Based on transportation schedules, seasonal weather patterns.
  - Number of products needed in order to not double or triple crossmatch.
  - Previously done by CBS.
  - Depends on what is going to outdate in the following week and how much is crossmatched or transfused at the site.
  - Minimum necessary for emergency use.
  - Based on AABB method.
Responses received for the question "What action do personnel at your facility take if you are unable to maintain your inventory at maximum defined levels?" were as follows:

**Southwest responses:**
- Place orders to replenish stocks only if we don’t feel comfortable with our levels.
- No action taken unless inventory drops below minimums.
- Give compatible units instead of group specific.
- Borrow product from another site.
- Depending on severity, notify staff, managers, medical director, or clinical areas.

**Central responses:**
- Try to get blood from another site.
- Contact CBS.
- No immediate action taken, monitor to make sure we don’t fall below minimums.
- Indicate issues on inventory board, and notify senior technologist.
- Electronic notification to physicians, screen orders.
- Notify OR and ER

**Northern and Eastern responses:**
- Notification of wards and departments, laboratory staff, medical director (if minimums are reached).
- Notify physicians and nurses.
- Monitor levels and re-order, obtain stock from another site.
- Use other compatible blood groups, double crossmatch units for patients.
- Nothing until we are unable to maintain our minimum levels.

Respondents were asked if they currently share (transfer and/or receive) blood components and blood products outside their hospital organization (Fig.7)

![Graph showing percentages of respondents sharing blood components and blood products outside their hospital organization](image)

**Fig.7** Do you currently share blood components and blood products outside your hospital organization?
Participants were asked questions related to whether their Transfusion Service has procedures in place for packing, issuing, receiving, and redistributing (Table.2)

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Southwest (n=26)</th>
<th>Central (n=32)</th>
<th>Northern and Eastern (n=41)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packing blood and blood products</td>
<td>Yes 92.3% 0% 7.7%</td>
<td>Yes 90.3% 3.2% 6.5%</td>
<td>Yes 87.8% 2.4% 9.8%</td>
</tr>
<tr>
<td>Issuing blood and blood products to another site</td>
<td>Yes 96.2% 3.8% 0%</td>
<td>Yes 93.3% 0% 6.7%</td>
<td>Yes 85% 10% 5.0%</td>
</tr>
<tr>
<td>Receiving products from other sites</td>
<td>Yes 92.3% 7.7% 0%</td>
<td>Yes 93.8% 0% 6.3%</td>
<td>Yes 87.8% 9.8% 2.4%</td>
</tr>
<tr>
<td>Redistribution of blood and blood products</td>
<td>Yes 62.5% 33.3% 4.2%</td>
<td>Yes 40.7% 48.1% 11.1%</td>
<td>Yes 35% 57.5% 7.5%</td>
</tr>
</tbody>
</table>

Table.2 Procedures in Place

Respondents were asked whether or not their hospital has a Master Surgical Blood Ordering Schedule (MSBOS) in place. (Fig.8)

Fig.8 Does your Hospital have a Master Surgical Blood Order Schedule in place?
Respondents were asked on average how many routine shipments of blood components and blood products were received weekly. (Fig.9)

The average number of shipments per week in Southwest is 2, in Central 5, and in Northern and Eastern 1 per week.

Participants were asked how many **stat** orders for blood components and blood products were filled on average per week. (Fig.10)

On **average** there are 0-1 stat shipments per week in Southwest, >5 in central, and 0-1 in Northern and Eastern region.
The survey asked whether the Transfusion Medicine Service receives blood components and blood products too close to expiry. (Fig 11)

For those who responded that they thought they received blood products and components too close to expiry, it was asked how close to expiry these products/components were. Responses included the following:

» **Southwest**: Out of 24 responses, 50% stated that products were received too close to the expiry date. On average products were arriving 7 days before expiry for RBC and <24 hours before expiry for platelets. Responses indicated that this occurs very rarely to once a week. Out of 15 responses, products this was occurring with most were Platelets 73% (11), red blood cells 20% (3), and both platelets and red blood cells 7% (1).

» **Central**: Out of 31 responses, 64.5% stated that products were received too close to the expiry date. On average the products were arriving 7 to 10 days before expiry for RBC and <24 hours before expiry for platelets. Responses indicated this occurs rarely to very often. Out of 22 responses, products this was occurring with most were Platelets 59%, red blood cells 18%, and both platelets and red blood cells 23%.

» **Northern and Eastern**: Out of 41 responses, 19.5% stated that products were received too close to the expiry date. On average the products were arriving 7 to 10 days before expiry for red cells and <24 hours before expiry for platelets. Responses indicated this occurs rarely to most of the time. Out of 10 responses, products this was occurring with most were 50% platelets and 50% red blood cells.
Participants were asked whether their facility crossmatches only on demand (unless the patient has a clinically significant red cell antibody) (Fig. 12).

From those that responded to the survey, it was determined three quarters of the provinces’ facilities crossmatch on demand.

The survey asked how long Transfusion Services would leave RBC units that have been crossmatched/ assigned/ on hold; before they were put back into regular inventory. (Table 3)

It was determined that the average number of days Transfusion Services keep their red cells crossmatched /on hold is 3 days. The survey asked if there were any concerns regarding the number of blood products and/or components that are being processed but not used. (Fig. 13)
From the respondents that answered yes to the above question, they were asked to specify. Responses received were:

» **Southwest:**
- Too many orders for “on holds” for red blood cells and then not using them.
- FFP ordered before INR/PTT results available.
- Red cells being ordered for surgery and not being used, tying up stock.

» **Central:**
- FFP/FP thawed and not used, received with cracks and leaks.
- Amount of albumin being used.
- Phenotyped, irradiated units not being managed properly.
- Platelets, receiving short dated, ordered and not used (HLA matched).
- IVIG reconstituted and patient doesn’t show up.
- RBC’s being ordered “on hold” for patients with a higher that 100 hgb level.
- Red cells being out of the lab for longer than 30 min at room temperature.

» **Northern and Eastern:**
- Too many RBC crossmatched for surgery and not used.
- FP and FFP defrosted and not used.
- Physicians ordering and not using platelets, request for platelets to be at facility at all time and then not being used.
- Distance from supplier and having units on hand and not using.

A survey question asked whether it is part of laboratory practice to issue only ABO specific RBCs. (Fig.14)
In the province 61% of Transfusion Services interchange with compatible blood groups. It was asked whether the Transfusion Medicine Service has established guidelines or Standard Operating Procedures to order and issue ABO specific platelets. (Fig.15)

It was determined that in Southwest 25% of facilities must notify the Medical Director or Charge Technologist if non ABO specific platelets are issued to a patient. 6.5% of Central and 43.2% of Northern and Eastern facilities must notify in the same situation.

The survey asked respondents if giving group O apheresis platelets to a group A individual, does your facility perform a titre prior to issuing. (Fig.16)
“Other” responses to this question included:

- **Southwest:**
  - Would not occur, titres not performed.

- **Central:**
  - Not routinely done.
  - Remove most of the plasma before issue.
  - ABO incompatible units are volume reduced.
  - Do not perform titres.

- **Northern and Eastern:**
  - Do not give/ transfuse platelets.
  - Only give group specific.
  - Do not perform titres.

A question asked whether the respondents’ Transfusion Service gives uncrossmatched group O Rh negative red cell units in emergency situations. (Fig. 17).

### Fig. 17. Do you give uncrossmatched group O negative red cell units in emergency situations?

<table>
<thead>
<tr>
<th>Region</th>
<th>Yes (%)</th>
<th>No (%)</th>
<th>Other (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southwest (n=24)</td>
<td>95.8%</td>
<td>4.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Central (n=31)</td>
<td>74.2%</td>
<td>0.0%</td>
<td>25.8%</td>
</tr>
<tr>
<td>Northern and Eastern (n=41)</td>
<td>90.2%</td>
<td>4.9%</td>
<td>4.9%</td>
</tr>
<tr>
<td>Provincial (n=96)</td>
<td>87%</td>
<td>11%</td>
<td>2%</td>
</tr>
</tbody>
</table>

“Other” responses to this question included:

- **Southwest:**
  - Rh positive cells may be issued, dependent upon patient’s age and sex as well as supply of Rh negative blood.

- **Central:**
  - If it’s a woman 45 years old or younger.
  - Rh positive if male.
  - Only if there isn’t enough time to do a group.
  - Perform a slide group and Rh and issue group specific uncrossmatched blood.

- **Northern and Eastern:**
  - ONLY in critical situations.
  - Group specific if we can, some physicians request group O Rh positive.
From those that responded that they gave group O Rh negative red cell units, it was determined that the average number of units given before a sample on the patient is obtained in Southwest is 2 units, 2 units in Central, and 1-2 units in Northern and Eastern. Comments to this question included:

**Southwest:**
- As many as needed until we receive a sample.
- Not defined in our policy.
- 4-8 before switching to group O Rh positive.
- Usually request a sample before any blood is given to the patient, situation dependent.
- Switch to group O Rh positive after 4 units depending on the age and sex of the patient.

**Central:**
- 4-6, 1-2 units.
- Situation dependent.
- As few as possible, change to group O Rh positive if it is a male patient.
- Sample obtained prior to issue if possible.
- As many as needed until we can get a sample and change to group specific.

**Northern and Eastern:**
- Depends on the emergency and the amount of bleeding.
- None, blood is collected prior to infusion.
- Give 4 group O Rh negative and then we switch to group O Rh positive.
- No policy concerning this.
- 4-6 units.
- As minimal as possible. Encourage the use of trauma collection kit.

The survey asked respondents what percentage of their inventory makes up their stock of group O Rh negative red blood cells. (Fig.18)
3.0 Contingency Planning

Contingency planning questions were asked to respondents to determine the status of the plans at their facility and also to determine variance between different plans. This part of the survey began by asking if the respondents’ hospital organization has a contingency plan to address disruptions in the blood supply (resulting in the reduced availability of one or more products for >24 hours from the blood supplier). (Fig.19)

“Other” responses to this question included:

» **Southwest:**
  - Currently being discussed.
  - Current SOP directs us to contact other sites in the organization to check inventory levels. Medical Director/ Charge technologist is to be notified if surgeries will be cancelled.
  - Communication would be used if less than minimal numbers of supply is anticipated. We would work together with our other site.

» **Central:**
  - Contingency plan is in development.
  - We have a system set up with other local hospitals.
  - Only have a plan for O negative red blood cells.
  - Needs to be developed.

» **Northern and Eastern:**
  - Borrow from other area hospitals
  - Medical Directors responsibility
  - Depends on product and timeframe

Hospitals were asked when their contingency plan was adopted. (Table 4)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Southwest (N=9)</td>
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<td>0</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Central (N=8)</td>
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<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Northern and Eastern (N=7)</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 4. When was your contingency plan adopted?
“Other” responses received for this question were:

» **Southwest (N=3):**
  - Not available at this time.
  - Being reviewed at present.

» **Central:**
  - No formal plan as yet.
  - Years.
  - Unknown.
  - Not available.

» **Northern and Eastern:**
  - More than 7 years ago.
  - As part of our emergency response plan.
  - Policy has always been in place.
  - If we were in urgent need of blood and we couldn’t get it from CBS, we would get it from another site.

Participants were asked when the plan was last reviewed. (Table.5)

<table>
<thead>
<tr>
<th>Region</th>
<th>N/A</th>
<th>Jan-June 06</th>
<th>July-Dec 06</th>
<th>Jan-June 07</th>
<th>Due July-Dec 07</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southwest (N=10)</td>
<td>4</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Central (N=7)</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Northern and Eastern (N=7)</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 5. Plan last reviewed

“Other” responses included:

» **Northern and Eastern:**
  - The plan is not formal

Participants were asked if their facility’s Transfusion Service was involved in the development of the plan. (Fig.20)

![Fig 20. Was your facility’s Transfusion Service involved in the development of the plan?](image-url)
Upon notification from CBS that a long term disruption to the blood supply exists, action to conserve available blood supplies will be required, what action would be taken at your facility related to communication?

<table>
<thead>
<tr>
<th>Action</th>
<th>Southwest (N=23)</th>
<th>Central (N=31)</th>
<th>Northern and Eastern (N=39)</th>
<th>Provincial (N=93)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan list for technical and transfusion medicine staff activated</td>
<td>60.9%</td>
<td>58.1%</td>
<td>33.3%</td>
<td>48%</td>
</tr>
<tr>
<td>Hospital Emergency Response Team notified</td>
<td>47.8%</td>
<td>45.2%</td>
<td>46.2%</td>
<td>46%</td>
</tr>
<tr>
<td>Regional or LHINS emergency response team notified</td>
<td>13.0%</td>
<td>22.6%</td>
<td>12.8%</td>
<td>16%</td>
</tr>
<tr>
<td>Chair of Hospital Transfusion Committee Notified</td>
<td>52.2%</td>
<td>48.4%</td>
<td>38.5%</td>
<td>45%</td>
</tr>
<tr>
<td>MAC, CEO notified</td>
<td>65.2%</td>
<td>58.1%</td>
<td>76.9%</td>
<td>68%</td>
</tr>
<tr>
<td>Other</td>
<td>39.1%</td>
<td>38.7%</td>
<td>41%</td>
<td>40%</td>
</tr>
</tbody>
</table>

Table 6. Actions taken at hospital level upon initial notification by CBS concerning long term disruption of the blood supply related to Communication.

“Other” responses included:

- **Southwest:**
  - Medical Director of the lab would notify MAC and CEO.
  - Cancel elective surgery.
  - Contact Charge Technologist, clinical areas, Lab Directors, other local hospitals.
  - No plan in place.

- **Central:**
  - We do not have a Transfusion Committee plan in development.
  - Medical Director would be contacted to send out medical staff bulletin.
  - All physicians and nursing staff would be notified, written or verbal.
  - Notification would likely be through the chiefs of the various services affected.

- **Northern and Eastern:**
  - Operating room, emergency, local doctors, oncology departments notified.
  - Medical Director notified for direction.
  - We have no policy in place.
  - Laboratory Director notified, VP of patient services notified.
  - Hematopathologist notified and notifies key clinical areas.
What action would be taken related to product inventory?

<table>
<thead>
<tr>
<th>Action</th>
<th>Southwest (N=23)</th>
<th>Central (N=31)</th>
<th>Northern and Eastern (N=39)</th>
<th>Provincial (N=93)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment of existing blood and blood product inventory</td>
<td>95.7%</td>
<td>90.3%</td>
<td>94.9%</td>
<td>94%</td>
</tr>
<tr>
<td>Assessment to determine immediate critical needs for blood and blood products</td>
<td>87.0%</td>
<td>83.9%</td>
<td>87.2%</td>
<td>86%</td>
</tr>
<tr>
<td>Reporting of critical inventory levels and needs to blood supplier and key external stakeholders</td>
<td>78.3%</td>
<td>83.9%</td>
<td>87.2%</td>
<td>84%</td>
</tr>
<tr>
<td>Modification to ordering practices if required</td>
<td>82.6%</td>
<td>74.2%</td>
<td>66.7%</td>
<td>73%</td>
</tr>
<tr>
<td>Other</td>
<td>13.0%</td>
<td>22.6%</td>
<td>7.7%</td>
<td>14%</td>
</tr>
</tbody>
</table>

Table 7. Actions taken at hospital level upon initial notification by CBS concerning long term disruption of the blood supply related to product inventory

“Other” responses included:

**Southwest:**
- Cancel or postpone non-urgent transfusions.
- Discuss with physicians the needs for elective surgeries.
- No plan in place.

**Central:**
- Cancellation of elective surgeries.
- Request monitored.
- Check with other hospitals about what they have in stock.
- Reporting of critical inventory levels.

**Northern and Eastern:**
- No plan in place.
- Use other hospital as back up.
Modifications to ordering practices?

<table>
<thead>
<tr>
<th>Action</th>
<th>Southwest (N=23)</th>
<th>Central (N=31)</th>
<th>Northern and Eastern (N=39)</th>
<th>Provincial (N=93)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triage protocol for all incoming requests for blood products</td>
<td>56.5%</td>
<td>67.7%</td>
<td>82.1%</td>
<td>71%</td>
</tr>
<tr>
<td>Strict adherence to transfusion triggers for RBC and PLTs</td>
<td>39.1%</td>
<td>45.2%</td>
<td>43.6%</td>
<td>43%</td>
</tr>
<tr>
<td>Single unit RBC transfusion with needs reassessment after each unit</td>
<td>56.5%</td>
<td>74.2%</td>
<td>56.4%</td>
<td>62%</td>
</tr>
<tr>
<td>Peri-operative blood conservation techniques</td>
<td>21.7%</td>
<td>35.5%</td>
<td>7.7%</td>
<td>20%</td>
</tr>
<tr>
<td>Adjusting surgery schedule to select surgeries that are less likely to require blood support</td>
<td>47.8%</td>
<td>61.3%</td>
<td>38.5%</td>
<td>48%</td>
</tr>
<tr>
<td>Adjusting surgery schedule to select patients of blood group available in inventory</td>
<td>21.7%</td>
<td>51.6%</td>
<td>20.5%</td>
<td>31%</td>
</tr>
<tr>
<td>Cancellation of elective surgeries</td>
<td>69.6%</td>
<td>74.2%</td>
<td>43.6%</td>
<td>60%</td>
</tr>
<tr>
<td>Modification of PLT orders to reduce number of units per pool and/or split apheresis units</td>
<td>52.2%</td>
<td>45.2%</td>
<td>18.0%</td>
<td>35%</td>
</tr>
<tr>
<td>Other</td>
<td>17.4%</td>
<td>19.4%</td>
<td>20.5%</td>
<td>19%</td>
</tr>
</tbody>
</table>

Table 8. Actions taken at hospital level upon initial notification by CBS concerning long term disruption of the blood supply related to ordering practices.

“Other” responses included:

» **Southwest:**
  - This would be handled/communicated by our Lab Director to physicians and the Operating Room (OR).
  - No plan in place.
  - Response from the cardiac OR will be to get blood products no matter what the circumstance.

» **Central:**
  - Elective surgeries would be evaluated and also other needs for transfusion.
  - Would take direction from Laboratory Medical Director.
  - Would communicate with hospital/pathologist to determine action.
  - Physician notification.

» **Northern and Eastern:**
  - Adjustment of surgeries would be considered after review with the Medical Director.
  - No formal plan in place.
  - Transfuse ONLY those in medical need.
  - Notification to OR of low inventory.
  - Assessment of hospitals need and coordinate with CBS.
The survey asked whether there was an agreement in place to work with nearby hospitals to arrange for inventory pooling or sharing in the event of product shortages. (Fig 21)

![Fig.21. Do you have an agreement with nearby hospitals to arrange for inventory pooling or sharing in the event of product shortages?](image1)

The survey asked if staff receive annual training on planning for a disruption to the blood supply. (Fig 22).

![Fig.22 Do staff receive annual training on planning for a disruption in the blood supply?](image2)

Currently in the province only 5% of staff receive annual training on planning for a disruption in the blood supply.

The survey asked if the respondents’ facility participates in mock disaster exercises. (Fig.23)

![Fig.23 Does your facility participate in mock disaster exercises?](image3)
Respondents that answered “yes” to participating in mock disaster exercises were asked if the exercises included blood supply considerations. (Fig.24)

Fig.24 Do mock exercises include blood supply considerations?

Respondents were asked if they believed the plan and the back up resources are adequate to respond safely to disruption in blood supply. (Fig.25)

Fig.25 Do you believe the plan and the backup resources are adequate to respond safely to disruption in the blood supply?

Respondents were asked in the event of a local disaster affecting a large number of victims (5 or more), which action would be taken at your hospital (Table.9)
The final question asked whether respondents believe that a consistent approach to dealing with blood shortages should be adopted by all hospitals across Ontario. (Fig.26)

Table 9. In the event of a local disaster affecting a large number of victims (5 or more), which action would be taken at your hospital?

<table>
<thead>
<tr>
<th>Action</th>
<th>Southwest (N=23)</th>
<th>Central (N=31)</th>
<th>Northern and Eastern (N=38)</th>
<th>Provincial (N=92)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notification of Laboratory and Administration staff</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Notification of blood supplier</td>
<td>73.9%</td>
<td>90.3%</td>
<td>86.8%</td>
<td>85%</td>
</tr>
<tr>
<td>Notification of near by hospitals</td>
<td>73.9%</td>
<td>77.4%</td>
<td>81.6%</td>
<td>78%</td>
</tr>
<tr>
<td>Assessment of existing inventory</td>
<td>95.7%</td>
<td>96.8%</td>
<td>97.4%</td>
<td>97%</td>
</tr>
<tr>
<td>Assessment of urgent estimated needs for blood to treat disaster victims</td>
<td>82.6%</td>
<td>93.6%</td>
<td>94.7%</td>
<td>91%</td>
</tr>
<tr>
<td>Triage all other incoming requests for blood and blood products to conserve available inventory for critical use only</td>
<td>65.2%</td>
<td>90.3%</td>
<td>92.1%</td>
<td>85%</td>
</tr>
</tbody>
</table>

The final question asked whether respondents believe that a consistent approach to dealing with blood shortages should be adopted by all hospitals across Ontario. (Fig.26)
Conclusion

This survey answered by 100 transfusion contacts across Ontario provided ORBCoN with baseline information about the inventory management practices and contingency plans available in Transfusion Services. The responses in this survey will help us meet the needs of our stakeholders by:

- Developing a contingency plan toolkit
- Identifying opportunities for development and standardization of practice throughout Ontario
- Developing an inventory management toolkit
- Supporting scarce resources present in the regions served.

Once again, the staff at ORBCoN appreciate the time taken by all who responded to this survey. If you have any questions about this report, please contact your Regional Blood Coordinating Network office in Hamilton, Toronto, or Ottawa (see page 3).
Appendix A

Survey Questions

1-8 Participants information.

9. Does your department have designated personnel who maintain your blood component and blood product inventory?

10. How often do you check your inventory levels?
   - Once a week
   - Once a day
   - Twice a day
   - Three times a day
   - Other (please specify)

11. Does your Transfusion Service have inventory control practices in place?

12. If yes, please check which practices are performed at your facility:
   - Rotating stock to issue oldest first
   - Flagging product soon to outdate to facilitate priority for using
   - Monitor outdated product by ABO/Rh group and type
   - Moving older product to a higher-use site
   - Other (please specify)

13. If you move older products to a higher use site, how many days before expiry are the products? Please specify:

14. Does your department have procedures and/or policies in place related to inventory levels (i.e., ordering, minimum and maximum stock levels, etc)?

15. If yes, how were these levels calculated?

16. What action do personnel at your facility take if you are unable to maintain your inventory at the maximum defined levels?

17. Do you currently share (transfer and/or receive) blood components and blood products outside your hospital organization?

18. Please indicate if you have procedures in place for the following:
   - Packing blood and blood products
   - Issuing blood and blood products to another site
   - Receiving products from other sites
   - Redistribution of blood and blood products

19. Does your hospital have a Master Surgical Blood Ordering Schedule (MSBOS) in place?
20. On average, how many routine shipments of blood components and blood products do you get weekly?

21. On average, how many STAT blood component and blood products orders do you have filled weekly?

22. Does the Transfusion Medicine Service receive blood components and blood products close to expiry?

23. If yes, how close to expiry?

24. Can you estimate how frequently this occurs?

25. Which products does this mostly apply to?

26. Does your facility crossmatch only on demand (unless the patient has a clinically significant red cell antibody)?

27. How many days do you routinely leave RBC units that have been crossmatched/assigned/on hold; before they are put back into regular inventory?

28. Do you have any concerns regarding the number of blood products and/or components (Platelets, RBCs, Cryo, FFP/FP, IVIG) that are being processed but not used? If yes, please specify below.

29. Is it part of your laboratory practice to issue only ABO specific RBC’s?

30. Does your Transfusion Medicine Service have established guidelines or Standard Operating Procedures to order and issue ABO specific platelets?

31. Does a Medical Director or Charge Technologist have to be notified if non ABO specific platelets are issued to a patient?

32. If giving group O apheresis platelets to a group A individual, does your facility perform a titre prior to issuing?

33. Do you give uncrossmatched Group O Rh Negative red cell units in emergency situations?

34. If yes, how many units would you give before you obtain a patient sample?

35. What percentage of your inventory makes up your stock of Group O Rh Negative red blood cells?

36. Does your hospital organization have a contingency plan to address disruptions in the blood supply (resulting in reduced availability of one or more products for >24 hours from the blood supplier)?

37. If yes, when was the plan adopted? (Please provide date as specific as possible for example June 7, 2007.)

38. If applicable, when was the plan last reviewed? (Please provide date as specific as possible for example June 7, 2007.)

39. Was your facility’s Transfusion Service involved in the development of the plan?
40. Upon notification from CBS that a long term disruption to the blood supply exists, action to conserve available blood supplies will be required.

What action would be taken at your hospital upon this initial notification by CBS:

Related to communication?
- Fan out list for Technical and Transfusion Medicine staff activated
- Hospital emergency response team notified
- Regional or LHINS emergency response team notified
- Chair of Hospital Transfusion Committee notified
- MAC, CEO notified
- Other (please specify)

41. Related to product inventory?
- Assessment of existing blood and blood products inventory
- Assessment to determine immediate critical needs for blood and blood products
- Reporting of critical inventory levels and needs to blood supplier and key internal stakeholders
- Modification to ordering practices if required (e.g. reduce number of units per platelet pool)
- Other (please specify)

42. Modifications to ordering practices?
- Triage protocol for all incoming requests for blood products
- Strict adherence to transfusion triggers for red cells and platelets
- Single unit red cell transfusion with needs re-assessment after each unit
- Peri-operative blood conservation techniques
- Adjusting surgery schedule to select surgeries less likely to require blood support
- Adjusting surgery schedule to select patients of blood group(s) available in inventory
- Cancellation of elective surgeries
- Modification of platelet orders to reduce number of units per pool and/or split apheresis units
- Other (please specify)

43. Do you have an agreement in place to work with nearby hospitals to arrange for inventory pooling or sharing in the event of product shortages?

44. Do staff receive annual training on planning for a disruption to the blood supply?

45. Does your facility participate in mock disaster exercises?

46. Do these exercises include blood supply considerations?

47. Do you believe the plan and the back up resources are adequate to respond safely to disruption in blood supply?
48. In the event of a local disaster affecting a large number of victims (5 or more), what actions would be taken at your hospital?

- Notification of Laboratory staff and administration
- Notification of blood supplier
- Notification of nearby hospitals
- Assessment of existing inventory
- Assessment of urgent estimated needs for blood to treat disaster victims
- Triage all other incoming requests for blood and blood products to conserve available inventory for critical use only

49. Do you believe that a consistent approach to dealing with blood shortages should be adopted by all hospitals across Ontario?