Better Safer Transfusion (BeST) Program – Victoria

Report on the blood storage and handling survey 2005
Introduction

Adequate transportation, handling and storage of blood and blood products has an important impact on the safety and quality of transfused blood products. Anecdotal reports suggested that there is variation in product transport and storage in Victorian hospitals, particularly in regional centres and smaller metropolitan private hospitals.

The Better Safer Transfusion (BeST) Advisory Committee identified a need to determine current storage and handling practice in regional centres and smaller metropolitan private hospitals in order to identify opportunities for improvement.

The references used for best practice were:


Survey aims
To improve the safety of transfusion by promoting appropriate storage and handling of blood and blood products (red blood cells and fresh frozen plasma).

1. Identify current storage and handling practices in the surveyed sample.
2. To identify any barriers to the implementation of best practice storage and handling practices in Victorian hospitals.

Method

A survey proforma was forwarded to 15 regional and smaller metropolitan private hospitals and pathology providers in Victoria. A copy of the proforma and related information sheet is attached. (Appendix 1). Organisations were selected to ensure a suitable mix of blood product provider systems.

A letter was forwarded to the Chief Executive Officer of each organisation, requesting return of the survey within 4 weeks. An expert working group of the BeST program reviewed the returned data.

Results and conclusions

1. General Information
The return rate was 86 per cent (13 sites). Nursing and/or scientific staff completed the survey.

77 per cent of these hospitals transfused blood products more than once per week. 92 per cent stored blood products for greater than 4 hours.
2. Storage and Handling of Red Blood Cells (RBC)

A designated blood fridge ensures blood products are stored at correct temperature, are not contaminated through storage with other substances and restricts access to authorised staff. This supports adequate record keeping and reduces the risk of errors, such as collection of wrong blood products.

**Results:** All hospitals used a designated blood fridge to store RBC upon initial receipt in the hospital.

**Responsibility for management of designated blood fridge** includes the need for knowledge of maintenance of the fridge for optimal function.

**Results:** 15 per cent hospitals either did not know who was responsible for the designated blood fridge and/or did not carry out required maintenance.

**Recommendation:** All hospitals should identify the person with responsibility for management of designated blood fridges, including preventative maintenance and calibration.

Limiting the number of designated blood fridges increases the likelihood that designated blood fridges will be monitored and managed appropriately.

**Results:** 85 per cent hospitals had a single designated fridge. One hospital had three designated blood fridges.

**Recommendation:** The minimum number of fridges be used as designated blood fridges outside of pathology and be labelled ‘blood fridges only’.

**Temperature monitoring** of fridges is important to ensure fresh red cell products are maintained at the required 2° to 6° C.

**Results:** All hospitals surveyed indicated that fridges are temperature-monitored.

**Fridges need to be alarmed** so that operational failure is apparent and staff can then take action in the event of any such operational failures.

**Results:** All hospitals had fridge temperature alarms. 15 per cent had local alarms only (rather than central alarms).

The survey did not determine alarms location. It is important that alarms are located in an area that is staffed at all times.

**Recommendation:** Designated blood fridges with only local alarms should be located in areas that are staffed at all times.

In the event of a refrigeration failure it is important that an emergency plan is enacted immediately so that the integrity of the fresh blood products is maintained by storage at 2° to 6° C.

**Results:** 85 per cent of hospitals had an emergency plan.
8 per cent of hospitals did not state whether they did or did not.
8 per cent of hospitals did not have a plan, however the fridge had battery back up. (Battery backup may only last for a short period and is only an effective protection against refrigeration failure due to interruption of power supply).
In Australia standards for blood refrigeration are prescribed by NATA\textsuperscript{2} and ANZSBT\textsuperscript{1} for designated blood fridges in laboratories and Australian Council on Healthcare Standards (ACHS) for designated blood fridges in other locations within hospitals\textsuperscript{4}.

Results: All hospitals were aware of the existence of the NATA standards, although only 15 per cent were aware of the ACHS accreditation standards.

Recommendation: All hospitals need to be aware of all of the relevant Australian Standards for designated blood fridges.

O Negative Blood for emergency supply of blood

Only 8 per cent of donors in the population have O Negative blood type\textsuperscript{5}. It is important to ensure this rare and valuable resource is managed carefully.

Results: 92 per cent of hospitals had O Neg packed red cells on-site for emergency.

Of these sites (12), 67 per cent kept 2 Units
- 8 per cent kept 3 Units
- 17 per cent kept 4 Units
- 8 per cent kept 10 Units

Of the hospitals with 2 units onsite as emergency reserves there access to O Neg offsite reserves could be delivered within time frames of 1-2 mins to 4 hours. One had no access to offsite O Neg reserves. Of the two hospitals with 4 units onsite as emergency reserves, one had no access to offsite O Neg reserves and one had access to offsite O Neg reserves within 20 minutes.

The hospital with 10 units in the emergency reserve had access to offsite O Neg reserves within one hour.

On average such emergency O Neg had been used 2.9 times in the last two years (range 0 to 10 times).

3. Storage and Handling of Fresh Frozen Plasma (FFP)

Results: Thawing FFP in a water bath was common practice. In 30 per cent of organisations FFP thawing occurring in clinical areas outside the laboratory. No reliable conclusions can be drawn from the data about the numbers who receive product on wards, frozen versus thawed, or from which supplier whether ARCBS or pathology on or off-site.

Recommendation: FFP should be thawed under controlled conditions by appropriately trained staff. There needs to be local policies and procedures governing the use and maintenance of equipment used to thaw FFP.
4. RBC and FFP Storage and Handling

It is essential to be able to trace products entering and leaving storage fridges so that individual donated blood products can be traced to individual transfused patients.

Results: All hospitals maintain a record of products entering and leaving storage fridges.

5. Transport

5.1 General information

Transport of products to hospitals occurs by a variety of means. Careful control of product temperature and preventing damage to these products during transport is important.

Results: The data confirms a complex system of transport arrangements with:

- 1 plane only
- 2 train only
- 1 Private Pathology Courier (PPC) only
- 1 Red Cross Courier (RCC) and Private Pathology Courier

The remainder used 2 or more of RCC, PPC, train, bus, and taxi.

77 per cent (10 of 13) organisations assessed temperature on arrival. Two hospitals recorded occasions when blood products were out of temperature range on arrival.

Recommendation: packaging and transit times need to comply with guidelines. Temperature assessment on receipt of transported blood products should be considered for those deliveries at higher risk.

5.2 Reporting of unacceptable products.

Products received not at the correct temperature, must be reported, quarantined and/or returned to supplier.

Results: 54 per cent of respondents were aware of these required practices.

6. Variables impacting hospitals ability to correctly store and handle blood products.

The following four variables ranked most highly as negatively impacting hospital’s ability to adequately store and handle blood products were:

- distance from blood product supplier
- staff education
- staffing levels and mix
- lack of clinical governance, such as the absence of a transfusion committee

Distance from blood product supplier requires larger inventories to cover times of unexpected high demand that increases the potential for blood product expiry and wastage. Evidence-based inventory based on time of transit from blood product supplier and hospital type would help hospitals manage local blood supplies.
Staff education and staffing levels and mix are matters for the bodies responsible for clinical governance of transfusion within hospitals.

**Summary**

There would appear to be a reasonable understanding of basic blood product storage and handling procedures in the survey respondents. There is room for improvement in terms of

1. Ensuring availability of an emergency plan in the event of refrigeration failure
2. Fresh frozen plasma packaging and transport
3. Handling and use of O Negative red cell units
4. Education about refrigeration standards and storage and handling accreditation requirements.

Oversight of transfusion issues such as storage and handling should occur within the hospitals clinical governance framework. This will include having transfusion issues as a standing agenda item on an existing quality review committee or having a transfusion committee that reports into the hospitals clinical governance framework.

**References**


4. ACHS 2006 EQIP 4 Blood: The system for prescription, sample collection, storage and transportation and administration of blood and blood components ensures safe and appropriate practice.

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Blood Storage and Handling Survey

Background

Adequate transportation, handling and storage of blood and blood products has an important impact on the safety and quality of blood products. Evidence suggests that there is variation in how products are transported and stored in hospitals, particularly for Victorian regional centres and small metropolitan private facilities.

The Better Safer Transfusion Program wishes to work with Victorian hospitals to ensure that products are transported, handled and stored appropriately.

The BeST Advisory Committee has identified the need to conduct a survey to determine current practice.

Audit aims

To improve the quality of care provided to patients by ensuring the appropriate storage and handling of blood and blood products (Red Blood Cells and Fresh Frozen Plasma).

Objectives

i. To identify current storage and handling practices
ii. To identify barriers (if any) to the implementation of appropriate storage and handling standards in hospitals.

Methodology

The proposed methodology involves the completion of a survey of current storage and handling practices at your hospital.

All results will be kept confidential.

A designated member of hospital staff will complete the survey and return to the BeST secretariat. The BeST secretariat will coordinate the survey, taking responsibility for the distribution of the survey tools, data entry and analysis, and will collaborate with the BeST advisory committee in formulating the report.

Time frame

Please return the survey form by 17 June 2005.
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Blood Storage & Handling Survey

This survey has been designed to be completed with minimal effort and should take no longer than 15 minutes. Please tick responses and add detail where possible or appropriate. 
This survey is not a critical assessment of your facility and will not compromise your ability to access blood products.

General
1. How often (approximately) do you transfuse blood or blood products (red cells, platelets, plasma, plasma derived products etc) in your facility?
   - Never  
   - <6 x /year  
   - less than 1/week  
   - greater than 1/Week

2. Do you store blood and blood products for periods greater than 4 hours?  YES NO

Storage and Handling of Red Blood Cells (RBC)
3. What equipment do you use to store RBC upon initial receipt in the hospital?
   - Designated Blood Fridge  
   - Esky  
   - General Use Fridge  
   - Other

4. If you use an Eskey, how may RBC units do you usually store at one time?  

5. If you store RBC in an esky or other container (which is not a fridge) do you monitor the temperature of blood products?  YES NO

6. If you use a fridge to store RBC, who owns the fridge?  Hospital  Private Pathology  Don’t Know

7. Does the fridge receive preventative maintenance?  YES NO

8. Are there any other fridges where blood or blood products are stored such as theatre, Emergency Department or wards.
   - YES (please list)  1. …………………………….. A designated Blood Fridge?  YES NO (please circle)  
   - 2. …………………………….. A designated Blood Fridge?  YES NO (please circle)  
   - 3. …………………………….. A designated Blood Fridge?  YES NO (please circle)  

   - NO

9. Are all your fridge(s) temperature(s) monitored?  YES NO

10. Who is responsible for temperature monitoring of the fridge(s)?  Hospital Staff (other than Pathology)  Pathology Staff  Don’t know

11. Do you have fridge alarms?  LOCAL  CENTRAL  NONE
Better Safer Transfusion Program
Blood Storage & Handling Survey

Red Blood Cells (continued)
12. Do you have an emergency plan for refrigeration failure? YES NO
13. Do you have an O negative blood supply on-site for emergency use?
   YES If Yes, how many units? & kept in which fridge(s) referred to in question 8? NO
14. Do you have access to O negative blood off-site for emergency use (even if you have an on-site supply)?
   YES If Yes, how long does it take to access (minutes/hours) NO
15. How many times in the last 2 years have required emergency O negative units? (insert no. of times)

Storage and Handling of Fresh Frozen Plasma
16. Do you receive/transfuse Fresh Frozen Plasma (FFP)? YES NO (Go to Qn.24)
17. Do you receive FFP thawed or frozen?
   Thawed Frozen Both Thawed & Frozen
18. Who supplies your FFP? (Please tick one or more responses)
   ARCBS Pathology on-site Pathology off-site Other
19. If you receive FFP frozen, how do you store it? Freezer Dry ice Other
20. If you store FFP in a freezer, is it temperature monitored? YES NO
21. If you store FFP in a freezer, do you have an emergency plan for freezer failure? YES NO
22. If you receive FFP frozen, who is responsible for thawing it?
   Pathology Ward Staff Other
23. If you receive FFP frozen, how do you thaw it?

RBC and FFP
24. If you store products in a fridge, do you maintain a register of products entering and leaving the fridge?
   Yes NO Don’t know

Transport
25. How are blood and blood products transported to your facility? (tick all appropriate ones)
   Red Cross Courier Private Pathology Courier Voluntary Drivers
   Taxi Bus Train Plane Other
26. Is the blood product temperature assessed on arrival? YES NO (If NO, go to Qn.31)
27. Is blood product temperature ever unacceptable on arrival? YES NO (If NO, go to Qn. 31)
28. How often is the product temperature unacceptable? (% of delivery occasions)
   <1% (Rarely) 1 to 20% (sometimes) 21 to 50% (commonly) >50% (more often than not)
29. Is this more frequent with certain modes of transportation?
   YES If Yes, which ones? NO

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Other information

30. What do you do when you have temperature unacceptable blood products?
   - Use them as normal
   - Report
   - Return to supplier

31. Are you aware that there is a Standard for blood refrigeration?  YES    NO

32. Do you know whether you have any accreditation requirements pertaining to blood and blood product storage?  YES  If Yes, what are they?             NO

33. Which, if any, of these variables impacts negatively on your ability to appropriately handle and store blood and blood products (if possible please rank in order of impact where 1 = MOST negative impact and 9 is LEAST negative impact)?
   - Availability of information on standards
   - Staff education
   - Staffing levels and mix
   - Executive support
   - Lack of clinical governance (eg transfusion committee)
   - Financial constraints
   - Distance from blood product supplier
   - Storage facility size and type
   - Other

Can you provide examples for illustrative purposes?

Organisation/Respondent Details

34. Hospital code

35. Respondent’s position held

36. Who is/are the pathology service(s) that provide you with blood products (excluding ARCBS)?

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