2010-05-01
Volume 4, Issue 2

Bloody Good

Newfoundland and Labrador Provincial Blood Coordinating Program

Special Interest Articles:

- Unnecessary Transfusions
- Graft versus Host Disease

Individual Highlights:

New Staff at the Provincial Blood Program

The Provincial Blood Program has had major changes in its staffing complement and we would like to welcome Sharon Linehan and Cheryl Jacobs to the Program.

Sharon Linehan, a Registered Technologist, joined the team in December 2009 to replace Linda Orr as Utilization Technologist. Cheryl Jacobs, a Registered Nurse, is a new member to the team and is the Clinical Coordinator for the program.

Both Sharon's and Cheryl's expertise will round out the services of the program. The learning curves are great so there will be an adjustment period and it appears that both have settled in very well. One of the program objectives is the development of a Transfusion Quality Manual. This manual will include operating procedures for use in hospital Blood Bank laboratories within the province. The Provincial Program will work collaboratively with the Quality Managers for the four regional health authorities to provide a valuable contribution to Transfusion Medicine without duplication of efforts. The Program also includes in it's work plan the development of a Transfusion Best Practice Manual for Nursing. These are the new faces of the Provincial Blood Coordinating Program. We would also like to say a grateful thank you to Linda Orr for all the work she has done during her three years with the program and continued success in her new position.

Standards Updates

The Canadian Standards Association Z902-10 Standards for Blood Components are now available to the Transfusion community. In response to new version of the CSA Standards, the Canadian Society for Transfusion Medicine is currently revising its standards. The CSTM Standards will be available for stakeholder comments in the Fall/Winter of 2010 – 2011.

The CSA Z902-10 Standards vary considerably from the CSA Z902-04 version. A new section has been added on Transfusion service responsibilities regarding blood products use in the facility. This section addresses the receipt, distribution, administration, storage and temperature, home administration and adverse events associated with the use of blood products. As a result documents developed referencing the previous version now require revision, referencing the current version. The timeline for compliance to the CSA Z902-10 standards is 6 months from the approval date.

There are also the ISO Standards that are available for accreditation requirements and guidance information. These include ISO 15189:2007 (E) Medical Laboratories – Particular Requirements for Quality and Competence; ISO 22870:2006(E) Point-of-care Testing (POCT) – Requirements for Safety. For more information on Standards available for hospital laboratories check out the Health Canada, CSA and ISO websites.

New standards continue to emerge as transfusion medicine is regulated and the scope of practice continues to widen. There is more opportunity for patients to receive products in environments other than hospital facilities and safety is the primary concern.

Nancy Heddle is a leader in Transfusion Medicine in Canada as well as internationally. She has been a Manager of the Transfusion Service at McMaster Medical Centre in Hamilton and is currently Director of Transfusion Research Program, and is an Associate Professor at McMaster University. Nancy is an associate editor of the journal *Transfusion* and in 2009, was awarded the International Woman in Transfusion Award. Nancy continues to collaborate with researchers worldwide. Nancy is also an Adjunct Scientist with Canadian Blood Services.

"I cannot give you the formula for success, but I can give you the formula for failure: which is: Try to please everybody."

Herbert B. Swope
Jan 1882 – June 1958

Inter Hospital Transfer - 1 Year Later

April 2009 marked the formal launch of the Newfoundland and Labrador Inter Hospital Transfer Program within the four regional health authorities. Now one year later we are able to report that the program has been a great success. Hospitals within the province receive an average of 20,000 units of red blood cells per year. Historically, the annual outdate rate based on 2006-2007 date has been 13%. As a result of the IHT, the redistribution of red blood cells has resulted in the transfer of 1719 units that would most likely have outdated. This equates to a reduction in the outdate rate by 5 per cent. On a cost per unit basis of $350.00 this equates to a savings or cost avoidance of $601,650.00.

The selected validated shipping containers have stood up well to the transfers that have occurred and are still meeting expectations. A Log Tag analyzer is placed in each container during shipment and therefore continuous temperature monitoring (validation) occurs for each shipment.

The next steps will be to increase the number of red cells shipped within each region and between regions. There will also be initiatives underway to evaluate inventory needs and realign ordering practices to further reduce product loss.

As other provinces begin to revisit how product is transferred within their provinces and regions, it is possible that the national outdate rates of red blood cells will decrease over time, placing less strain on the national and local inventories as better inventory management practices evolve.

Look for our publication on the Inter Hospital Transfer program in the June edition of the Canadian Journal of Medical Laboratory Science.

Contingency Planning for the Blood Supply

Canadians are very fortunate to have a safe and continuous supply of blood components and blood products. As with all good things, there must be a plan in place to address shortages or impacts on that supply, such as a pandemic.

The National Advisory Committee on Blood and Blood Products in conjunction with CBS has developed a national document to address such shortages. The document was distributed to provincial bodies for review and comments. As a result, the Provincial Blood Coordinating Programs and /or Ministries of Health have begun the process to develop provincial plans.

The NL Provincial Blood Coordinating Program has developed and launched the first version of the Emergency Blood Management Plan. To date, we have had our first Core Committee meeting and RHAs have begun the process of developing their region specific plan, aligning with the Provincial Plan.

One of the key elements to the success of any plan is the communications aspect. If there is a breakdown in communications, the best-laid plans will fail. It is crucial that all stakeholders are included in communications to ensure that all can assess every potential impact in totality.

The next meeting of the Core Committee is scheduled for June 7, 2010 at which time discussion will provide us with a timeframe for a simulated exercise to test the Emergency Blood Management Plan.

It takes time to develop a simulated exercise and coordination and communication are key elements of that function.

Recently Ontario presented its first simulated blood shortage involving in excess of 20 hospitals ranging in size from small to medium to large teaching sites. The first analysis has been positive and while the final report has not yet been released, there is indication that communications are key.

Contingency planning for blood components and blood products should be incorporated into Regional Emergency Preparedness Policy and Planning tools. These documents are subject to review on a regular basis as there are varying factors that impact emergency planning on a broader scale.

Be a part of the plan and know how it works in your region.

Transfusion – Associated Graft versus Host Disease

Transfusion-associated graft-versus-host disease (TA-GvHD) is a rare complication of blood transfusions where the mortality rate is greater than 90%. Death usually occurs within one month from overwhelming infections.

TA-GvHD develops when the donor T-lymphocytes initiate an immune response against antigens on the recipient's tissues. In a normal recipient, donor lymphocytes are recognized as foreign and destroyed by the recipient's immune system. However, if a recipient is immunocompromised, or if the donor lymphocyte is homozygous for a HLA type and the recipient is heterozygous for the same HLA type (which can occur if the donor is related to the recipient) the recipient's immune system is incapable of rejecting the immunocompetent donor lymphocytes. This can cause graft-versus-host disease.

TA-GvHD occurs between 4 - 30 days post transfusion. This disease is characterized by fever, skin rash, nausea, vomiting, diarrhea, liver dysfunction and weight loss 10 days post-transfusion. Pancytopenia resulting from hematopoietic failure may often be present approximately 16 days post-transfusion. Bone marrow aplasia is the distinguishing factor in TA-GvHD compared to GvHD that may occur following hematopoietic stem cell transplantation. TA-GvHD is under-diagnosed and not reported because it often presents in patients who have underlying problems and therefore are already seriously ill. Laboratory follow-up tests include CBC, LFT, bilirubin and electrolytes. Diagnosis of TA-GvHD is made by skin biopsy or by examination of the bone marrow. HLA typing of the donor confirms the diagnosis. There is no treatment for TA-GvHD. Immunosuppressive therapies have very little success therefore prevention is critically important. There is no evidence to indicate that the removal of leukocytes from blood components by centrifugation or filtration does not prevent TA-GvHD because there are still viable lymphocytes present to cause this disease. In order to alleviate the risk of TA-GvHD from blood transfusions, the blood components transfused (red cells and platelets) require irradiation to inactivate donor T-lymphocytes.

CSA Standard 11.7.2 (Canadian Standards Association) states: Cellular blood components require irradiation in order to reduce the risk of graft-versus-host-disease in recipient categories that include, but are not limited to:

a) intrauterine transfusion;
b) selected immunocompromised recipients;
c) recipients of cellular blood components known to be from a blood relative;
d) recipients who have undergone hematopoietic progenitor cell (stem cell) transplantation; or
e) recipients of HLA-selected platelets known to be HLA homozygous.

Once established that a patient requires irradiated cellular blood components it is necessary that the patient continue to receive irradiated products for as along as clinically indicated. (CSA Standard 11.7.3)

Unnecessary Transfusions

The unnecessary transfusion of blood components and blood products greatly impact patient safety, inventory supply and demand and thus the health of our nation.

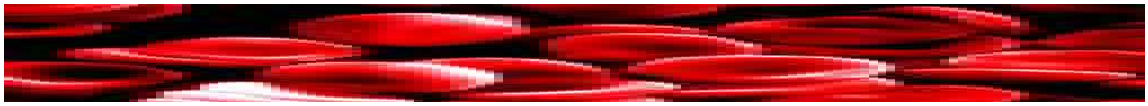
Unnecessary transfusions are generally referred to as the transfusion of blood and blood products when they are not clinically indicated or do not achieve the intended outcome. These transfusions include:

- Transfusing blood and blood products based on laboratory values or ranges (coagulation tests, hemoglobin & platelets) rather than on individual patient needs and symptoms.
- Over ordering blood and blood products, failure to assess the patient's need for subsequent components or products after the initial component or product is administered.
- Transfusing blood components and blood products to achieve a desired clinical effect when the same result could be achieved with blood and blood product alternatives or substitutes such as erythropoietin, saline, iron administration, and blood conservation strategies.
- Transfusions administered because of a lack of knowledge of transfusion medicine.

Unrequired transfusions are unrequired treatments that pose a risk for potential harm. The transfusion of blood components and blood products that are not required, increase exposure to infectious and immunologic disease and acute and delayed adverse events. Excessive transfusions contribute to the depletion of the blood supply. The lack of blood components and blood products deprive those in critical need and present great challenges in times of local/regional shortages, pandemic outbreaks and disasters. The costs associated with blood

Upcoming Events:

- Canadian Society for Transfusion Medicine Annual Conference, Vancouver May 13-16, 2010
- Canadian Society for Medical Laboratory Science – Edmonton, AB, May 29 – June 1, 2010



Unnecessary Transfusions (cont'd)

What makes pulmonary arteries unique among arteries?

a) They do not carry any oxygenated blood

b) They carry only oxygenated blood

c) They branch into smaller arteries

d) They return blood from the lower body to the heart

http://www.pbs.org/wnet/redgold/php/bloodquiz.php

components and blood products, administration and potential transfusion reactions are increased with avoidable transfusions and thus place an increased burden on our already struggling healthcare system.

Strategic directives in reducing unwarranted transfusions and improving transfusion practice involve having knowledge of and compliance with transfusion practice standards and guidelines. Education and in services on appropriate blood component and blood product usage, risks and transfusion alternatives for all staff involved in the transfusion practice are essential. Awareness of and implementation of established quality standards help protect against the risks associated with the transfusion of blood components and blood products. Quality systems provide support to meet national standards. Good transfusion management practices should include the ability to monitor and evaluate the clinical use of blood components and blood products to ensure local, national and global needs are met.

Although reassessment of the need for transfusion and the appropriate utilization of blood components and blood products protect the blood supply, transfusions should reflect the patient's needs to protect the patient's safety and provide the best possible clinical outcome. Dr. John Freedman, a professor of hematology at the University of Toronto states "The best transfusion is the transfusion not given".

Case Study #9

A 43 year old male with leukemia, post bone marrow transplant with Guillain Barré syndrome required IVIG and was ordered 1g/kg of IVIG over 2 days. Pre-transfusion the patient grouped A positive and the antibody screen was negative. The patient's vital signs pre-transfusion were stable and chest x-ray showed signs of pneumonia. The patient had been transfused within the past three months and was not pre-medicated. On day 1 the patient received 800 mLs of IVIG and on day 2 an additional 800 mLs of IVIG was administered.

Post IVIG transfusion, the patient's vital signs remained stable and the patient presented with nausea and vomiting and symptoms of hypoxemia, O_2 sat was 89%. Supplementary O_2 was administered and patient was started on antibiotics. Laboratory results 2 days post IVIG transfusion showed the patient's hemoglobin decreased from 101g/L to 67g/L, total bilirubin increased from 28 µmol/L to 61 µmol/L and LD increased from 164 µ/L to 856 µ/L. The patient experienced hematuria. The blood film morphology indicated increased anisocytosis, decreased platelets and the presence of spherocytes. The post antibody screen was positive for anti-A and the patient had a positive direct coombs.

1. Classify type of reaction

2. What was the relationship of the adverse event to the transfusion?

3. What was the severity of the reaction?

4. What was the outcome of the adverse event?

Case Study #8 Interpretation

1. *Type of Reaction - Tranfusion Associated Dyspnea (TAD)*
2. *Relationship of adverse event to transfusion – Probable*
3. *Severity of the reaction – Grade 1 (Non-Severe)*
4. *Outcome –Minor*

Each newsletter will contain an interesting case study for you to review. The type of adverse event and answers to the questions will be provided in the next edition of the newsletter.

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