2009-05-01
Volume 3, Issue 2

Bloody Good News

Newfoundland and Labrador Provincial Blood Coordinating Program

Special Interest Articles:

- Inter Hospital Transfer Program
- New TSO
- New Product – octaplex®

Individual Highlights:

Inter Hospital Transfer Program Launched

The Inter Hospital Transfer Program has been launched in the four regional health authorities within the province after more than 18 months of validation, document development and training.

This initiative was a collaborative effort between the NL Provincial Blood Coordinating Program and the Ontario Blood Coordinating Network. The project began by searching the market for a shipping container that would be light to use, user friendly and easy to transport. The Laboratory and Field validation protocols were executed successfully and the applicable operating procedures and forms were distributed to the stakeholders. The project is now operational in both Ontario and Newfoundland and Labrador. Effective April 1, 2009 NL hospitals will be reporting monthly on the number of units transferred within each RHA. It is anticipated to experience an overall decrease of 3% in outdated red blood cells over the next year.

Minnesota Thermal Science, a leader in iceless shipping technology, supplies the shipping container. These containers are used by the US military in Afghanistan and other theatres of war. The temperature monitors, Log Tag Analyzers, provided by Global Sensors LLC, are used in each shipment to provide continuous validation of the shipping containers and its contents.

We hope that other provinces will benefit from our collaborative efforts. Visit our website for more information.

New Product – octaplex®

octaplex® is a human prothrombin complex (PCC) indicated for the treatment of bleeding and perioperative prophylaxis of bleeding in acquired deficiency of prothrombin complex coagulation factors. octaplex® is indicated for the reversal of warfarin therapy or vitamin K deficiency when rapid correction of the deficiency is required, (as in urgent surgical procedures).

octaplex® should be administered under the supervision of a health professional experienced in anticoagulation agents and the management of coagulation disorders.

For adult patients, the dose is dependent on the INR before treatment, the extent of the bleeding and the patient's weight. The recommended adult dose is 20-40 IU /kg. The maximum total dose is 120 mL or 3000 IU Factor IX activity. The product is intravenously infused at a rate not exceeding 2-3 mL/min. The INR must be monitored 10 to 15 minutes after administration. Clinical outcomes including thrombotic events should be monitored at 24 hours and day 30.

The correction of the vitamin K antagonist-induced impairment of hemostasis persists for approximately 6-8 hours. However, the effects of vitamin K, if administered simultaneously with octaplex®, is achieved within 4-6 hours. Thus, repeat treatment with human PCC is not usually required when vitamin K is administered.
(There is no pediatric data available).

The patient's pulse rate should be measured before and during the injection. If a marked increase in the pulse rate occurs, reduce the injection speed or the administration must be interrupted. Report any adverse event for any signs of bleeding or thrombosis.

New Products – octaplex® (cont'd)

Do you know the woman who in 1948 co-founded the California Blood Bank System and initiated its reciprocity plan, whereby blood banks could exchange blood and blood credits with each other?

PCC is contraindicated in cases where the PT can be normalized by discontinuing oral anticoagulants or by vitamin K administration. PCC should not be given to patients with a hypersensitivity to any ingredient in the product, including heparin.

octaplex® contains up to 310 IU of heparin and should not be administered to patients suffering from heparin-induced thrombocytopenia (HIT, HITT). octaplex® should not be given to patients with recent coronary syndrome, DIC, severe liver disease and liver transplant. The use of high doses of human PCC has been associated with MI, DIC, venous thrombosis and pulmonary embolism. As there is insufficient data to monitor efficacy of the product, testing of the patients PT/INR is required prior to and after administration of octaplex® to prevent thromboembolic complications.

One package of octaplex® contains a vial of lyophilized powder prothrombin complex a vial of 20 mL sterile water and a Mix2Vial™ transfer set with integrated filter. The product can be stored at room temperature (+2° to +25°C) and has a shelf life of 2 years. The product reconstitutes quickly at room temperature and will appear colourless to slightly blue.

The National Advisory Committee on Blood and Blood Components has released guidelines on the use of octaplex®. The Provincial Blood Coordinating Program has developed guidelines that support the NAC guidelines and provide a summary of the requirements as well as an order form to request product within the hospital.

For more information visit: www.octapharma.com

Protecting a Precious Resource – Calculating Inventory Needs

Welcome to Denise Callahan Ryan, our newest TSO for Eastern Health – (HSC/St. Clare's).

The first transfusion of blood in man was June 15, 1667, on a drowsy and feverish young man. From a lamb, he received about twelve ounces of blood, after which he "rapidly recovered from his lethargy, grew fatter and was an object of surprise and astonishment to all who knew him".

As reported by:
Jean Baptiste-Denis
1640-1704

As Canadians, we are very fortunate to have a blood supply that meets patient health care needs in this country. As with any resource, the responsibility for sustainability rests with the user as well as the supplier. As technologists and managers of the blood inventory within our hospitals, we must use discretion in our ordering and utilization practices. It is incumbent on us to avail of the tools available to manage this precious commodity.

Transfusion laboratories should have established minimum and ideal inventory levels and use performance indicators such as outdate rates and the number of emergency shipments to measure success and challenges.

Forecasting product use can be achieved by reviewing past utilization. One method, the "**Average Weekly Use Estimate**" as described in the AABB Technical Manual, 15th Ed. provides an estimate of usage by ABO and Rh. **NOTE**: It is important to remember when calculating minimum inventories that a buffer for emergencies is included.

1. Calculate RBC usage over a 26-week period.
2. Record weekly usage by ABO group and Rh type.
3. Disregard the single highest usage for each type to correct for weekly variations such as emergencies.
4. Total the number of units for each ABO and Rh type, disregarding the highest week in each column.
5. Divide each total by 25 (total # weeks minus highest week)

This gives the estimate of the average weekly blood usage of each ABO group and Rh type.

The National Blood Data Resource Centre in the US published benchmark data on outdating components in 1999. Outdated allogeneic RBC (non-directed or autologous units) accounted for 4.0%.

Even though we must consider the geography of our province and our industrial sectors, we must be aware that we are not very different from other regions of the country. Northern Canada also faces similar challenges as distant hospitals in Newfoundland and Labrador's in ensuring adequate red blood cell inventories. Let us make sure we do our part to protect this valuable resource.

Canadian Blood Services Role in Transfusion Medicine

There are two blood suppliers within Canada, Héma-Québec in Québec and Canadian Blood Services (CBS) for the other provinces and territories. CBS is regulated by Health Canada and therefore the blood components collected, manufactured and /or distributed by CBS must be compliant with the regulations.

The blood components and blood products must be stored at appropriate temperatures and transfused according to prescribed policies and guidelines. In the event of non-conformance to manufacturing or operating procedures, a system of inventory retrieval / recall / withdrawal, lookback investigation or traceback investigations may be initiated to ensure the safety of the blood supply.

Inventory retrieval / recall/ withdrawal involve identifying and removing from inventory components, from one or more donations, that could compromise the integrity and safety of the blood supply.

A lookback investigation is the process of identifying and contacting recipients of blood components from a donor who, on subsequent donation or testing, is confirmed to have tested positive for the presence of an infectious agent. If the blood donor has tested positive for a transmissable disease the donor is indefinitely deferred and the previous donations from that donor are investigated.

A Traceback investigation is initiated to investigate a report of a transfusion - associated infection in blood recipients who have already received blood components. This investigation is to determine whether any donor who provided blood for that recipient has tested positive for an infectious agent. If the recipient tests positive, then the donors involved would be identified and retested for the appropriate transmissable disease.

Canadian Blood Services collections in 2007-08 consisted of 818,902 whole blood donations, 33,716 plasma products and 48,542 Platelet donations.

CBS also publishes the Clinical Guide to Transfusion to provide valuable support to the Transfusion community at www.transfusionmedicine.ca

Canadian Blood Services programs include: One Match – Stem Cell and Marrow Network, Organ & Tissue, Donation & Transplantation Program as well as the Partners for Life Program. CBS also provides Customer Letters related to various blood products and blood components. CBS also has a Transfusion Medicine site that provides blood component information to assist in providing safe transfusions. For more information visit: *www.blood.ca*

Stem Cells –The ABC's and E's!

I first heard stem cells described as "*the progenitors of life*" by my British instructor when I was a young college student in the early 1970's. My how times have changed and grown in the magnitude of knowledge and application to restore and prolong the quality of life.

Stem cells have the ability to renew and differentiate into mature cell lines and are obtained from both embryos and adults. There are three basic types of stem cell products in the marketplace today: hematopoietic stem cells, neural stem cells and mesenchymal stem cells /pancreatic islet stem cells.

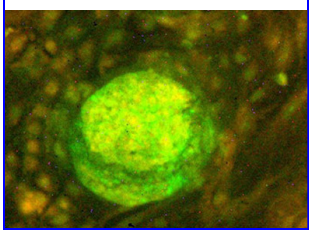
Hematopoietic stem cells are used to regenerate functional bone marrow in various cancers and are valued in treating aplastic anemia, leukemia, lymphoma, sickle cell anemia and other diseases. Neural stem cells differentiate into nerve and brain tissue and are used in the treatment of neurodegenerative diseases such as Parkinson's and Alzheimer's. Mesenchymal stem cells and pancreatic islet stem cells are able to differentiate into bone, cartilage, fat and pancreatic β-cells and are used to treat orthopedic diseases and diabetes.

Then there are the ethics surrounding the applied research and use of stem cells. Embryonic stem cell research has been a contentious topic for many years, but researchers at the National Institute of Health in the US have recently seen a bright light when President Obama overturned a policy restraining embryonic stem cell research. For more on stem cells visit:: Cell Therapy News newsletter@celltherapynews.com

Upcoming Events:

CSTM Conference June 4-7, 2009 in Ottawa

CSMLS National Congress "LABCON 2009" June 20-24, 2009, St. John's, NL



Acute Hemolytic Transfusion Reaction

An Acute Hemolytic Transfusion Reaction (AHTR) occurs when there is increased destruction of transfused red cells occurring within 24 hours of a transfusion (intravascular hemolysis). An AHTR is characterized by gross hemoglobinuria and hemoglobinemia. The reaction is usually precipitated by the infusion of antigen positive red cells to a recipient having the naturally occurring or acquired corresponding antibody. The infusion of plasma products containing high-titer ABO antibodies has also been implicated. Infusion of incompatible blood components, either intentionally or inadvertently is the principal cause of an AHTR. The majority of AHTRs occur because of errors in patient identification, either during specimen collection, specimen processing or blood administration. AHTRs are also caused by laboratory failure to detect clinically significant antibodies or other incompatibilities during pre-transfusion testing. A severe AHTR can be precipitated by as little as 1 mL of ABO incompatible red cells. The onset of symptoms is abrupt, usually within the first fifteen minutes of the infusion. The recipient may experience a wide variety of symptoms including fever, hypotension, oliguria, SOB and DIC. In comatose or anesthetized recipients, the only symptoms may be hemoglobinuria and microvascular bleeding due to DIC. Management of AHTR is mainly supportive. Interventions should be initiated to maintain blood pressure, renal output and hemostasis. Morbidity and mortality is proportional to the volume of incompatible component/product infused.

Answer from Vol 3, Issue 1

Do you know the Mt.Sinai surgeon who developed the citrate method of blood transfusion?

Richard Lewisohn

Case Study #6

A 76 yr. old male, post-op CABG, in CVICU presented with vitals as follows: BP (pre 92/48, post 70/35), T (pre 37.7℃, post 37.8℃), P (pre 115, post 124), R (pre 31, post 38). The patient was being treated with ACE inhibitors. The last dose was given within 36 hours prior to the transfusion.

The first unit of RBC was started at 0130h using a blood warmer, within 5 minutes the BP decreased to 72/37, and the infusion was stopped. The BP increased to 100/50. A second unit was started at 0146h. At 0150h, the BP dropped to 70/35 and the infusion was stopped. The first unit was restarted at 0215h, and the patient was medicated with Benadryl 50mg IV at 0220h, followed by Solucortef 100mg IV at 0230h. Infusion of the first unit RBC was completed at 0250h. At 0315h, the second unit of RBC was restarted after patient was pre-medicated with Benadryl, Solucortef, Levophed and 500ml Pentaspan. BP at that time was 89/40. The infusion of the second unit was completed at 0350h. The patient's BP at 0400h was 119/55 and vital signs remained stable once the transfusion was completed. The adverse transfusion reaction was not reported until following day.

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?

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.

Case Study #5 Interpretation

1. *Severe Allergic / Anaphylactic*
2. *Relationship of adverse event to transfusion – Probable*
3. *Severity of the reaction –Grade 3 (Life threatening)*
4. *Outcome – Not determined*

Newfoundland and Labrador Provincial Blood Coordinating Program

P.O.Box 8700
St. John's, NL
A1B 4J6

PHONE:
(709) 729-5246
(709) 729-6573

FAX:
(709) 729-4009

E-MAIL:
marilyncollins@gov.nl.ca or
lindaorr@gov.nl.ca

We're on the Web!

See us at:

http://www.health.gov.nl.ca/health/bloodprogram/index.htm