

## Electronic Crossmatch

**E**lectronic crossmatch has started at St. John's hospitals. This is a convenient, efficient and safe process of providing compatible red blood cell units without direct serological testing of the recipient's plasma when mixed with donor red blood cells.

The electronic crossmatch allows any patient with a previous blood group, no history of antibodies and a negative antibody screen to be crossmatched instantaneously to an inventory of red blood cells units that have been regrouped to confirm the blood group of the donor and ensure compatibility.

The electronic cross match process is as follows:

1. A type and screen is performed on the patient's blood sample using the automated blood bank analyzer.
2. If the screen is negative, the blood bank technologist will check the patient's history for:
  - A previous blood group that matches the current blood group. In the event that no previous group is on file, a second blood sample is drawn. If the blood groups on the two samples match, the patient is eligible for electronic crossmatch.
  - Any previous antibodies. This must be negative, meaning the intended recipient does not have any active or previous red blood cell antibodies.
3. Once the check is complete, the patient can be electronically cross matched to any compatible unit in the blood bank inventory. All red cell units in inventory are regrouped and entered into the Laboratory Information System for this purpose.

The electronic cross match has already demonstrated time savings. When used for patients meeting the electronic crossmatch criteria, the wait for completion of a crossmatch is no longer necessary in the event that additional red cell units are required. Electronic crossmatch is especially beneficial during emergency transfusion situations; it also reduces the workload of the Blood Bank technologist.

Since implementation, Blood Bank staff have indicated great satisfaction with the 'new' process.



# Fast Facts on Blood Donation

- Four types of transfusable products can be derived from blood: red cells, platelets, plasma and cryoprecipitate.
- A single donation can potentially help up to three patients.
- Donors can donate either whole blood or specific blood components. The process of donating specific blood components is called apheresis. Apheresis is withdrawal of blood from a donor's body, removal of one or more blood components such as plasma or platelets, and transfusion of the remaining blood back into the donor.
- One transfusion dose of platelets may be one apheresis donation of platelets or a pooled platelet unit, the platelets derived from four whole blood donations. One donation must be from a male donor.
- Most donated red blood cells must be used within 42 days of collection.
- Donated platelets must be used within five days of collection – new donations are constantly needed.
- Plasma and cryoprecipitate are stored in frozen state and can be used for up to one year after collection.  
([www.blood.ca](http://www.blood.ca))

## Case Study 24

What type of reaction did the recipient experience?

- A four (4) year old chemotherapy patient received a platelet transfusion. The recipient had known pre-existing allergies to milk, egg, peanuts, and tree-nuts. He is prescribed an Epi-pen for emergency use.
- Pre-transfusion vital signs were: BP 105/55, heart rate 70, respirations 32/minute. During transfusion, the recipient experienced respiratory distress characterized by wheezing, cough and increased respiratory rate. Vital signs: B/P 90/40, heart rate 140, respirations 64/minute. The recipient also developed periorbital edema.
- The transfusion was stopped. The recipient was medicated with antihistamines, epinephrine, Ventolin nebulizer and provided supplemental oxygen. Symptoms resolved.

Type of Reaction – Severe allergic



## The Lab Technologist's Role in Detecting Leukemia

When a physician informs a patient that he/she has a serious illness such as leukemia, the news is 'life altering.' It is the physician who plays a major role in the diagnosis and treatment of disease; however, other health care professionals make significant contributions to the information that leads to the final diagnosis. At the onset of symptoms, most individuals will seek medical attention. Diagnostic testing is completed as applicable and diagnosis is determined.

Leukemia is a type of cancer affecting the blood and bone marrow. Hematology is the study of the physiology of the blood. Not surprisingly, hematology laboratory technologists are very involved in the process of diagnosing leukemia.

Depending on symptoms, and particularly if there is suspicion of a 'blood' condition, the physician will order a complete blood count or CBC, to measure of the number of red cells, white cells, platelets, and the hemoglobin level of the patient's blood. The CBC is reviewed by the hematology laboratory technologist. Depending on results from the automated hematology analyzer, a microscopic

review of the blood smear is completed, to further identify abnormalities. These criteria include low or elevated white blood cell count, low hemoglobin, low or elevated platelet count, or disproportionate white blood cell populations. The automated hematology analyzers also detect abnormalities in white blood cells and trigger review of a blood smear.

Once the smear is made and stained, it is reviewed microscopically by a hematology laboratory technologist. The red cells, white cells and platelets are evaluated for size, shape, number and maturity. The findings are reviewed and interpreted by a Hematologist or a Hematopathologist.

Findings from a blood smear evaluation are not always diagnostic in isolation, and more often indicate the presence of an underlying condition and its severity. Often there is a need for further diagnostic testing. The smear results are taken into consideration along with the results of the CBC and other laboratory tests, as well as the individual's clinical signs and symptoms. A blood smear may be used to help diagnose and/or monitor numerous conditions affecting blood cell populations.

# Zika Virus

The Zika virus is a single stranded RNA virus of the Flaviviridae family transmitted primarily by the Aedes mosquito. Zika is named after the Zika Forest in Uganda where it was first discovered in 1947. In 1952, the first human cases of Zika were detected and since then, outbreaks of Zika have been reported in tropical Africa, Southeast Asia, and the Pacific Islands. More than half a century later, in May 2015, the Pan American Health Organization (PAHO) issued an alert regarding the first confirmed Zika virus infection in Brazil. On February 1, 2016, the World Health Organization (WHO) declared Zika virus a Public Health Emergency of International Concern (PHEIC).

Many Zika infections are asymptomatic or mildly symptomatic. Common symptoms include low grade fever, conjunctivitis, maculopapular rash, muscle and joint pain, and other body aches lasting two to seven days.

Modes of transmission of Zika virus, other than by infected mosquitos, have been documented. Zika can be spread from pregnant mother-to-fetus, through sexual transmission, and through blood transfusion. Zika is suspected to be linked to a surge in cases of infant microcephaly, a condition in which babies are born with undersized skulls and brains. As a result, pregnant women have been advised to prevent mosquito bites and to avoid travel to infected areas.

While the risk of a Canadian donor transmitting the Zika virus to a blood recipient is very low, Canadian Blood Services has implemented control on blood donations in response to the global Zika outbreak. Potential donors who have travelled outside of Canada, the continental United States and Europe are now temporarily ineligible to give blood for three weeks. The 21-day waiting period also applies to cord blood and stem cell donors who have travelled to affected areas.

## Adverse Transfusion Reactions

Transfusion reactions are a diverse group of adverse physiological reactions to the transfusion of blood component(s) or blood product(s). Symptoms usually present during or shortly after transfusion. Symptoms of an acute reaction occur within 24 hours. Delayed reaction symptoms occur greater than 24 hours following transfusion.

In the event that symptoms of a transfusion reaction occur, perform the following actions:

1. Stop the transfusion;
2. Infuse 0.9% sodium chloride;
3. Assess vital signs;
4. Perform clerical check:
  - Confirm the recipient's identity and blood component or plasma product;
5. Notify the prescriber; implement appropriate treatments as prescribed;
6. Notify Transfusion Medicine Laboratory (Blood Bank):
  - Return of un-transfused component or product may be required;
  - Serological testing may be ordered; and
7. Complete documentation:
  - Health record;
  - Issue/transfusion card; and
  - Facility transfusion reaction report form.

We want to hear from you to help us improve Bloody Good News! Please complete the survey at: [www.surveymonkey.com/r/QGKQ557](http://www.surveymonkey.com/r/QGKQ557)

**In the next issue...** how healthcare providers choose the best red blood cells for transfusions.

### Newfoundland and Labrador Provincial Blood Coordinating Program

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

Tel: 709.729.5246 / 729.6573 / 729.5250

E-mail: [daphneosborne@gov.nl.ca](mailto:daphneosborne@gov.nl.ca)  
[melissaleonard@gov.nl.ca](mailto:melissaleonard@gov.nl.ca)

For reference documents including policies visit:  
[www.gov.nl.ca/health/bloodservices](http://www.gov.nl.ca/health/bloodservices)

## Component Modification

Leukoreduction is the process of removing leukocytes from whole blood prior to storage. The process is used to prevent transfusion transmission of cytomegalovirus (CMV), human leukocyte antigen alloimmunization, platelet refractoriness, and febrile non-hemolytic transfusion reactions.

Irradiation of red blood cells and platelets is the process of directing a dose of 25 Gy at the central portion of the container holding the cellular units. The dose of irradiation is a widely recognized method to prevent Transfusion Associated-Graft Versus Host Disease (TA-GVHD). The radiation damages the DNA of T cells within the cellular component, preventing T-cell engraftment which could lead to the usually fatal TA-GVH Disease.

(Gehrie, E.A., Chandler, J. and Snyder, E. (2016). Clinical and technical aspects of blood administration. In T.L. Simon, J. McCullough, E.L. Snyder, B.G. Solheim, and R.G. Strauss (Eds.), Rossi's Principles of Transfusion Medicine (5th Ed.), (pp 23-29). Chichester, UK: Wiley Blackwell.)