CHAPTER 15

IRRADIATED, WASHED AND CMV SERONEGATIVE BLOOD COMPONENTS

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BACKGROUND

Modified or specialty blood components may be useful in specific clinical settings to reduce the risk of transfusion-related harm. This chapter describes the preparation of irradiated, washed, and CMV seronegative cellular blood components (red blood cells and platelets) and the clinical setting in which they are of greatest benefit.

IRRADIATED BLOOD COMPONENTS TO PREVENT TRANSFUSION-ASSOCIATED GRAFT VERSUS HOST DISEASE

CHARACTERISTICS OF TRANSFUSION-ASSOCIATED GRAFT VERSUS HOST DISEASE

Transfusion-associated graft versus host disease (TA-GvHD) is a consequence of transfusion of cellular blood components containing viable T-lymphocytes into a recipient whose immune system is not capable of eliminating these cells. This occurs because the host immune system is either weakened, or does not recognize the infused cells as foreign. When the recipient fails to eliminate the donor lymphocytes, they proliferate and attack recipient tissues. Two populations identified to be at especially high risk of TA-GvHD include:

1. Recipients of products from family members or HLA-matched platelet transfusions, when there are recipient-donor Human Leukocyte Antigen (HLA) similarities.
2. Immunocompromised recipients.

TA-GvHD is a rare but serious transfusion complication with a mortality rate over 90%. Symptoms include fever, maculopapular or erythematous rash, diarrhea, hepatitis and progressive bone marrow failure. Initial signs may

appear eight to ten days post-transfusion and progress to irreversible pancytopenia three to four weeks post-transfusion. Death from bleeding or infection often occurs one to three weeks after initial symptom onset. Diagnosis is based on characteristic pathologic changes on skin biopsy and/or demonstration of donor lymphocytes in recipient tissues using molecular, cytogenetic or tissue typing techniques. Treatment is supportive, and cure has only been rarely reported after rapid hematopoietic stem cell transplantation.[1]

TA-GVHD REDUCTION STRATEGY DURING THE PREPARATION OF BLOOD PRODUCTS

Prevention is the key to reducing mortality related to TA-GvHD. Irradiation of cellular blood components using a gamma-ray source (Cesium-137 (Gammacell 1000) or Cobalt-60), or X-ray source (Raycell) is the only effective technique for the prevention of TA-GvHD. Irradiation inflicts irreparable DNA damage to the T-lymphocytes and prevents them from replicating, thereby preventing TA-GvHD.

The recommended radiation dose is 25 Gy to the central point of the blood pack with a minimum dose of 15 Gy to other parts, with no part receiving more than 50 Gy.[2] All parts of the pack must be irradiated, as even a small amount of lymphocytes found in peripheral tubing may cause TA-GvHD. Time for component irradiation is dependent on the radiation intensity of the source. Commercially available indicator labels are applied to the blood component to verify that an adequate radiation dose has been delivered.

CLINICAL PRACTICE

Leukoreduction (LR) is a pre-storage filtration process applied to cellular blood components. LR alone is an insufficient prevention strategy and TA-GvHD has rarely been reported following the transfusion of LR blood components. The minimum lymphocyte dose capable of causing TA-GvHD is unknown. Risk likely depends more on the degree of HLA similarity between the blood donor and the transfusion recipient than on degree of immunocompromise, as highlighted by a recent systematic review which challenged the prevalent notion that immune status of the recipient is the main determinant of susceptibility to TA-GvHD.[1] This systematic review also showed that fresh blood components (stored for 10 days or less) were much more likely to be implicated in TA-GvHD due to the presence of viable residual lymphocytes; therefore, longer component storage time (21 days or more)[3] may be associated with a lower risk of TA-GvHD.

Cellular blood components must be irradiated prior to transfusion to patients in specified risk groups (Table 1).[4] Other blood components that are frozen without cryoprotective agents (fresh frozen plasma (FFP)/frozen plasma (FP), cryoprecipitate and cryosupernatant plasma) and fractionated plasma products have not been associated with TA-GvHD and do not require irradiation. The British guidelines on irradiated blood components note that no cases of TA-GvHD have been reported after transfusion of cryopreserved red blood cells, and do not recommend irradiation for this component.[5] Canadian Standards Association Z902:20, *Blood and Blood Components*, does not comment on the requirement for irradiation of cryopreserved red blood cells.[6]

Table 1: Cellular blood components requiring irradiation

Blood components to be irradiated prior to transfusion to patients at risk for TA-GvHD
• Whole blood • Washed red cells • Platelets (prepared from whole blood or from apheresis collection
Blood components to be irradiated prior to the transfusion to any patient*
• Labile cellular components from a family member • Granulocyte concentrates* • HLA-matched platelets
* Canadian Blood Services does not provide granulocyte concentrates, but they are available from Héma-Québec (see Chapter 20, *Granulocyte transfusion therapy*).

Irradiation of cellular blood components is considered essential for patients with a well-defined risk for TA-GvHD;[7-9] however, this requirement is debatable for patients with an identified but not clearly defined risk. In 2018, the Irradiation Working Group subcommittee of the Canadian National Advisory Committee (NAC) on Blood and Blood Products developed recommendations for irradiated blood component use in Canada; the NAC recommendations provide the clinical indications for transfusion of irradiated blood components (see Table 2), and identify known immunosuppressive medications likely to increase TA-GvHD risk (see Table 3).[4]

Irradiation of cellular blood components is not considered necessary for patients with HIV infection, recipients of solid organ transplants, or patients with isolated humoral immune deficiency disorders such as hypogammaglobulinemia. Most cases of TA-GvHD reported in infants occurred when intrauterine transfusion was followed by exchange transfusion.[10]

Table 2: Quick reference of clinical indications for irradiated blood component transfusion (reproduced from the National Advisory Committee on Blood and Blood Products, Recommendations for use of Irradiated Blood Components in Canada: A NAC and CCNMT Collaborative Initiative, Appendix A)[4]

Patient Category	Condition
General Transfusion Practice	Blood from first- and second- degree relatives
	HLA-selected/matched platelets
	Granulocyte transfusion
Pregnancy	Intrauterine, fetal transfusion
Neonates	Neonatal exchange transfusion: • Previous IUT, until 6 months after the expected delivery date (40 weeks gestation) • All neonatal exchange transfusions provided it does not unduly delay transfusion
	Neonatal small volume (top-up) transfusions • Previous IUT, until 6 months after the expected delivery date (40 weeks gestation) • Very low birth weight infants (less than1200 g), until 4 months of age • Consult local policies in uncertain situations

Patient Category	Condition
Congenital severe T cell immune deficiency • Until has been proven, and when confirmed present	
Complex congenital cardiac abnormalities: • Until 22q11.2 deletion has been excluded • Confirmed 22q11.2 deletion	
Hematology	Acute leukemia, only in the following situations: • HLA-selected/matched platelets • Donations from first- or second- degree relatives • Current or previous immunosuppressive pharmacotherapy (see Appendix B
	Aplastic Anemia • Patients receiving immunosuppressive therapy with ATG (and/or alemtuzumab)
	Hodgkin's Lymphoma, at any stage
	Non-Hodgkin's Lymphoma treated with purine analogues and related drugs (see Appendix B)
Allogeneic Bone Marrow Transplant	Allogeneic hematopoietic stem cell or bone marrow transplant recipients, • from the time of initiation of conditioning chemotherapy • while the patient continues to receive GvHD prophylaxis • indefinitely if chronic GvHD is present or if continued immunosuppressive therapy is required
	Allogeneic blood transfused to stem cell or bone marrow transplant donors for 7 days prior to and during the stem cell harvest
Autologous Bone Marrow Transplant	Autologous stem cell or bone marrow transplant recipients from the initiation of conditioning chemo/radiation therapy to 3 months post-transplant (6 months if total body irradiation was used in conditioning)
	Patients undergoing harvesting for future autologous reinfusion, during and for 7 days before the bone marrow/stem cell harvest
Solid Organ Transplant	Recipients of alemtuzemab conditioning therapy only

Table 3: Quick reference of potent immunosuppresive medications cited to increase TA-GvHD risk, and for which irradiated component transfusion should be considered (reproduced from the National Advisory Committee on Blood and Blood Products, Recommendations for use of Irradiated Blood Components in Canada: A NAC and CCNMT Collaborative Initiative, Appendix B)[4]

GENERIC name	TRADE Name
Fludarabine	Fludara
Cladribine or 2-CDA	Leustatin
Deoxycoformicin	Pentostatin or Nipent
Alemtuzumab (anti-CD52)	Campath, Lemtrada
Bendamustine	Treakisym, Ribomustin, Levact and Treanda
Clofarabine	Clolar

GENERIC name	TRADE Name
Anti-thymocyte globulin (ATG), rabbit or horse • When used in the setting of severe aplastic anemia only	Rabbit: Thymoglobulin Horse: Atgam
* Note: This list of pharmaceutical trade names may not be exhaustive, due to the nature of branding changes.	

Irradiation irreparably damages the red blood cell membrane, increasing the rate of potassium loss and precipitating hemolysis with decreased red blood cell recovery.[6] The Canadian Standards Association Z902:20, *Blood and Blood Components*, standard 7.12.6 states:

"Whole blood and red blood cells shall be irradiated only up to 28 days after collection and should be transfused as soon as possible. Irradiated whole blood and red blood cells shall be transfused no later than 14 days after irradiation and no later than 28 days after collection."

For neonatal patients who are particularly susceptible to the effects of hyperkalemia, the freshest red blood cells (maximum seven days from collection) should be chosen for irradiation, and irradiation should occur immediately prior to issue if possible. If the component is not used immediately, the transfusion service should have a policy concerning allowable storage time and identify patients for whom previously irradiated units may or may not be used.[6]

For patients at high risk of complications from hyperkalemia (e.g., pediatric cardiac surgery, neonatal top-up transfusion) or those receiving high-volume transfusions (e.g., intrauterine or neonatal exchange), a single-wash procedure of red blood cells including supernatant removal should be performed to reduce potassium levels if more than 24 hours has elapsed since the unit was irradiated (see below).[11, 12]

While some differences in quality parameters have been identified between irradiated and non-irradiated platelet components, these findings have not been significant enough to impact storage guidelines.[13] The expiry of platelet units is not impacted by irradiation.

WASHING BLOOD COMPONENTS TO REDUCE RESIDUAL SUBSTANCES

Cellular blood components may be modified by washing to reduce the level of residual substances (e.g., antibodies, serum proteins such as IgA, additive solutions, potassium, other cellular metabolites or cytokines) that may be harmful for some transfusion recipients. Hospital-based transfusion medicine laboratories that modify or transform cellular components, including washing of red blood cells or platelets, require Health Canada licensure.[14]

WASHED RED BLOOD CELL COMPONENTS

Red blood cell washing is a modification applied to a standard red blood cell component that has undergone pre-storage LR by filtration at Canadian Blood Services. The red blood cells are washed several times with compatible solution, most commonly sterile 0.9% sodium chloride injection USP (normal saline), and then resuspended prior

to transfusion. The volume of fluid required is dependent on the indication for the washed component but typically involves 1–3 litres of wash solution. Washing may be performed manually or by an automated procedure using specialized blood processing equipment, and markedly reduces the levels of plasma proteins, antibodies and electrolytes in the component.[15]

Canadian Blood Services is able to provide washed red blood cells upon request. In 2013, Canadian Blood Services implemented a new closed-system (sterile) automated wash procedure with specialized equipment, where red blood cell units within the first two weeks of storage are washed, then resuspended in 100 ml of SAGM additive solution.[15, 16] This method extends the permissible component storage duration to 7 days post-wash. Depending on the indication and wash procedure, the final components are labelled "Washed Red Blood Cells Leukocytes Reduced" or "Extra Washed Red Blood Cells Leukocytes Reduced (IgA DEF (deficient))." Approximately 2 litres of saline is used in an initial wash; to produce IgA-deficient washed red blood cells, a second wash is performed. Washing is not available at all Canadian Blood Services manufacturing sites, so additional time for site transfer may be required.

The manual red blood cell wash process is considered an open (non-sterile) procedure, and may be performed at licensed tertiary care hospitals in Canada. A spike is inserted into the bag to facilitate transfer of the red blood cells into a transfer bag, followed by centrifugation (the initial transfer is necessary to avoid bursting of the bag, which is not intended to undergo multiple centrifugation steps). The plasma supernatant is removed, and 200–250 ml of sterile wash solution is then added to rinse the cells in the bag, followed by centrifugation and supernatant reduction. This procedure is repeated a minimum of three times for a manual wash. The non-sterile opening of the red blood cell bag increases the risk of bacterial contamination during processing and reduces the expiry time of the final component to 24 hours from the beginning of the wash procedure. Manual wash of red blood cell units is performed within licensed hospital transfusion medicine laboratories only.

If appropriate equipment is available, automated red blood cell wash procedures may also be performed at the hospital setting. Wash procedures and component expiry timelines are dependent on the equipment manufacturer specifications. In general, automated wash procedures performed at the hospital level are non-sterile procedures with component expiry 24 hours from the beginning of the wash of the LR red blood cell product.

Washing by either manual or automated method within a hospital blood bank is labour intensive and adds at least two hours to the processing time of each red blood cell unit. These processes also undergo internal validation procedures and will demonstrate that the component is significantly protein reduced.

Storage conditions and the administration process for washed red blood cells are the same as those for unwashed red blood cells, with the exception of a reduced expiry time. The reduced expiry time depends on whether the washing is completed in an "open" or "closed" system and whether an additive solution was used; viability of washed red blood cells is compromised if the anticoagulant-preservative solution is removed during washing and not replaced.[17] Red blood cell recovery may be decreased by up to 15% due to red blood cell loss during washing.

Risks associated with red blood cell transfusion also apply to the washed component, although the risk of bacterial contamination is slightly higher if an open washing system is used. The incidence of febrile and allergic reactions is reduced due to the removal of white blood cells and plasma from the component.

Historically, patients with documented IgA deficiency were transfused with red blood cells manually washed with a minimum of 2 litres of normal saline ("extra wash") due to the concern of an increased risk of anaphylactic reaction with standard red blood cell components. However, a recent review has shown that the incidence of anaphylactic reaction with red blood cell transfusion in patients with true IgA deficiency is approximately equivalent to that of the general population (about 1:50,000 transfusion events),[18] which suggests that being IgA deficient alone does not increase risk of an anaphylactic transfusion reaction. Individuals with a history of an anaphylactic transfusion reaction should be tested for IgA deficiency and presence of anti-IgA. The majority of practitioners do not recommend testing of patients who are low in IgA for the presence of anti-IgA, in the absence of a history of an anaphylactic[19] (or 2 severe) transfusion reactions (see our publication, Anaphylactic transfusion reactions and IgA deficiency). There is little evidence to suggest that washed red cells should be transfused to[20] IgA-deficient patients in the absence of previous reactions.

The current automated methodology used by Canadian Blood Services for "extra wash" red blood cells has been validated to provide a component that meets the definition of being IgA deficient, containing less than 0.05 mg/dL of IgA protein.[17, 19] Testing in hospitals is only able to determine if washed red blood cells are IgA reduced (IgA less than 0.05 g/L, which is ten times less sensitive than reference laboratory testing).

According to the Canadian Standards Association Z902:20, *Blood and Blood Components*[6], standard 7.5.3.2, washed red blood cells shall be prepared by a method known to retain at least 75% of the red cells that were in the original red blood cells and yield a hematocrit of not more than 0.8 L/L. Standard 11.10 states that persons with a history of severe allergic transfusion reaction, IgA deficiency (less than 0.05 mg/dL or 0.5 mg/L), and confirmed anti-IgA should be transfused with red blood cells–IgA deficient or red blood cells–washed that are validated to show sufficiently low IgA levels (less than 0.05 mg/dL or 0.5 mg/L). Platelets and plasma should be from IgA-deficient donors.[6]

Current indications for washed red blood cells include:[21]

- Washed: Recipient with a history of severe or repeated reactions to blood components (unresponsive to pre-medication)
- Extra Wash (IgA deficient): IgA-deficient recipient with anti-IgA

RED BLOOD CELL ADDITIVE DEPLETION (SINGLE WASH)

Most hospital-based transfusion medicine services that provide washed red blood cells will also provide a "single-washed" or "additive depleted" red blood cell component, where after adding some normal saline into the red blood cell bag, the unit is then centrifuged to remove the plasma supernatant, and resuspended in a small volume of compatible fluid (5% albumin, 0.9% sodium chloride injection USP, or ABO type compatible frozen plasma as appropriate) prior to transfusion to a desired hematocrit. Similar to manually washed red blood cells, these blood components expire within 24 hours and may be requested:

- Prior to neonatal exchange transfusion or massive transfusion in neonatal/pediatric patients to minimize the amount of additive solution and/or potassium in the component.[12]

- To mitigate recurrent moderate or severe medication-refractory febrile or allergic transfusion reactions by removing potentially responsible plasma proteins or cytokines.

WASHED PLATELET COMPONENTS

Platelet components may also be washed to remove plasma and supernatant substances such as antibodies or other serum proteins that may be harmful to some transfusion recipients. Platelets prepared from whole blood donations or harvested by apheresis may be washed using normal saline, or saline buffered with ACD-A or citrate. The washing may be a manual or automated process (dependent on equipment availability).

Washed platelets may be indicated for:

- IgA deficient patients with a documented anti-IgA, when platelets from an IgA deficient donor are unavailable.
- Patients with a history of anaphylactic transfusion reactions of unknown etiology.
- Recurrent and/or severe febrile or allergic transfusion reactions, if not ameliorated by pre-transfusion medications or responsive to plasma reduced platelets.

As there is an increased risk of bacterial contamination and possible metabolic damage to platelets, washed platelets must be administered within four hours of beginning the wash procedure. Since the washing procedure itself takes at least two hours, the timing of the washing procedure with respect to the timing of the transfusion event must be carefully coordinated.

Canadian Blood Services does not currently provide washed platelet components. Therefore, hospitals requiring these components must prepare them in the hospital blood bank. In patients with IgA deficiency and a known history of allergic reaction to blood transfusion, the preferred platelet component would be one collected from an IgA deficient donor, since platelet washing within hospital blood banks cannot be guaranteed to be truly IgA deficient.

There is considerable (up to 20%) platelet loss as a result of platelet activation during washing. However, it has been demonstrated that the viability and efficacy of remaining platelets is not significantly affected.[22]

Due to the high platelet loss associated with washing, plasma volume reduction (platelet concentration) is considered a more suitable option for those situations in which complete removal of plasma by washing is not required, though platelet loss may still occur with this method due to platelet activation.[23] Plasma reduction of platelets may be used prior to transfusion of ABO-incompatible platelets in a shortage situation to reduce the risk of isohemagglutinin-mediated red blood cell hemolysis in platelet recipients, or to volume-reduce platelets for neonatal recipients with very small blood volumes.

CMV-SAFE COMPONENTS TO PREVENT TRANSFUSION-TRANSMITTED CMV INFECTION

CHARACTERISTICS OF CMV INFECTION

Cytomegalovirus (CMV), also known as human herpesvirus-5, is a large, enveloped, double-stranded DNA virus. Primary CMV infection can occur following contact with body fluids (e.g., saliva, breastmilk or urine) of an

individual actively shedding viral DNA, or following blood transfusion (transfusion-transmitted CMV infection; TT-CMV) or transplantation of organs and tissues from donors known to have previously been infected with CMV.[24] In a healthy individual, primary CMV infection is often asymptomatic or results in a mild, non-specific illness similar to mononucleosis. However, in immunocompromised individuals, CMV infection can result in CMV disease, which can include life-threatening pneumonia, hepatitis and colitis. Primary CMV infection in an expectant mother may, in rare cases, lead to congenital CMV in the newborn infant.

Individuals who recover from a primary CMV infection develop an immune response and become CMV IgG antibody positive, or CMV-seropositive, approximately six to eight weeks after contracting the virus. During this window period of seroconversion, viral DNA can rarely be detected in the plasma. The virus then becomes dormant (latent) in the monocyte population of white blood cells and may reactivate at a later time. Therefore, CMV virus is never "cleared" from the body. The prevalence of CMV-seropositive individuals is estimated to be 53% in the Canadian population[25], and ranges from 20% to 100% in adults worldwide.[24] The seroconversion rate among Canadian Blood Services' donors is approximately 0.7% annually.[26] Blood donation during the window period is rare.[27]

CMV REDUCTION STRATEGIES DURING THE PREPARATION OF BLOOD COMPONENTS

In Canada, CMV serologic screening of blood donors was implemented in the mid-1980s. Canadian Blood Services introduced universal leukoreduction (LR) in 1999. This process decreases the leukocyte (white cell) concentration of cellular blood components from approximately 1 x 10^8 to less than 5 x 10^6 leukocytes per unit, removing a significant proportion of cells that could potentially be infected with CMV.[28] Although LR substantially reduces the risk of TT-CMV, it cannot be completely eliminated.[21] [29] **However, all cellular components that are LR are considered "CMV-safe."**

Red blood cells and platelets produced by the buffy coat method are rendered CMV-safe by leukofiltration during component processing (see Chapter 2 of this *Guide*). Platelets produced by apheresis are leukoreduced during the apheresis procedure. Plasma is acellular as a result of the whole blood processing and plasma freezing methods, and is considered CMV-safe without undergoing additional filtration, with no apparent risk of CMV transmission.[30]

None of the present CMV reduction strategies (i.e., serologic screening of blood donors and LR) remove CMV DNA or virions found in donor plasma, such as during the window period when CMV serology is negative, or during CMV reactivation. Additional CMV serologic testing does not guarantee that a CMV seronegative component will truly be "CMV negative." However, the concentration of CMV DNA required to cause TT-CMV infection is unknown[31] CMV DNA has been detected in 0.04% of units labelled as "CMV-seronegative," with recent evidence suggesting that the greatest concentration of CMV DNA is present in the plasma within the first year of seroconversion following primary infection.[27] Nucleic acid testing for CMV DNA is not presently performed by Canadian Blood Services.

CLINICAL EVIDENCE SUPPORTING BEST PRACTICES FOR THE PREVENTION OF TT-CMV

The incidence of TT-CMV was reported to be 10–60% before CMV serologic screening and LR were adopted, and was typically seen three to eight weeks after transfusion of an infected cellular component.[32] Contemporary strategies of reducing TT-CMV include provision of cellular components which are CMV-seronegative *or* LR. Based on test sensitivity and leukoreduction efficiency, each method was found to have an estimated residual risk of CMV transmission of approximately 1.5–3% per transfused recipient.[29] However, in a recent Australian study, the residual risk of TT-CMV from LR red blood cells and platelets (combined) was shown to be much lower: 1 in 13.5 million units transfused.[33] In Canada, the residual risk of TT-CMV is also very low at 1 in 680,000 red blood cell units transfused and 1 in 186,000 platelet units transfused.[34]

Observational studies in allogeneic hematopoietic stem cell transplant (HSCT) patients have not demonstrated any increased risk of TT-CMV with LR and CMV-untested (CMV-safe) cellular components.[35-38] In practice, the risk of CMV reactivation and primary infection from the environment in the immediate post-HSCT period has led to routine monitoring of recipients for CMV viremia, with initiation of pre-emptive treatment if increasing CMV copies are detected. Studies comparing TT-CMV risk of LR components with CMV-seronegative and LR components in intrauterine transfusion and low birthweight infants have not been published. However, transmission of CMV in breastmilk appears to be the greatest risk factor for CMV disease in low birthweight infants.[39]

Provision of CMV-seronegative and LR blood components varies among major transfusion centres internationally.[25,40] The population size needed to perform an adequately powered study to determine whether a combined CMV-seronegative and LR strategy is equivalent to either modality alone is prohibitive, meaning this study will likely never be performed. A recently published systematic review could not favour a specific strategy (single or combined CMV reduction modality) for TT-CMV reduction based on available scientific evidence.[41] As a result, the AABB CMV Prevention Working Group could not make a recommendation regarding the appropriate usage of LR and/or CMV-seronegative blood components.[42]

According to the Canadian Standards Association Z902:20, *Blood and Blood Components*[6], standard 11.6, the transfusion service should have a policy indicating which recipients or categories of recipients are to receive cellular blood components selected or processed to reduce the risk of CMV transmission. Standard 10.9.1.8 states that cellular blood components for intrauterine transfusion shall be processed using a method such as leukoreduction and should be from seronegative CMV-negative donors.[6]

The Canadian National Advisory Committee on Blood and Blood Products (NAC), includes a CMV subcommittee that evaluated available literature on reduction of TT-CMV in the post-LR era. Upon the recommendation of the CMV subcommittee, NAC members (representing all provinces, except Quebec) have agreed that ***CMV-safe (LR) cellular blood products are equivalent in safety to CMV-seronegative and LR blood products for transfusion in all patient populations except for intrauterine transfusion***. Online publication of this consensus statement and references leading to this decision are posted on the NAC website.[43]

NAC's statement regarding appropriateness of use of Cytomegalovirus (CMV) seronegative vs. CMV safe product

Recommendation #1
The National Advisory Committee recommends that CMV safe (leukoreduced) and CMV IgG seronegative products be considered equivalent **except** for Intrauterine transfusion.

Recommendation #2
The National Advisory Committee recommends that Canadian Blood Services stop their current process for testing and provision of CMV seronegative units issued to hospital facilities and develop a new process to maintain a small inventory of CMV seronegative blood components for the sole purpose of Intrauterine transfusion.

Recommendation #3
The National Advisory Committee recommends that Canadian Blood Services explores the feasibility of providing a small boutique inventory of dually tested (seronegative and NAT) CMV negative blood components for the sole purpose of Intrauterine transfusion.

As a result of this recommendation, Canadian Blood Services continues to maintain a small inventory of CMV-seronegative and LR red blood cells and platelet components available only to hospitals which perform intrauterine transfusion.

ADDITIONAL RESOURCES

Transfusion-transmitted cytomegalovirus: Can you confidently abandon CMV seronegative products in the modern era of pre-storage leukoreduction?

This presentation by Dr. Jeannie Callum examines the biology and epidemiology of CMV, history of transfusion-transmitted CMV, and evidence that supports leukoreduction as a sole strategy for CMV prevention in blood and blood components.

- Full slide deck presentation with audio (recorded July 2017, 25:05 minutes)
- Condensed presentation with audio (recorded July 2017, 11:04 minutes)
- Download the slide deck for Dr. Callum's presentation and use for your own presentations.

CONTINUING PROFESSIONAL DEVELOPMENT CREDITS

Fellows and health-care professionals who participate in the Canadian Royal College's Maintenance of Certification (MOC) program can claim the reading of the *Clinical Guide to Transfusion* as a continuing professional development (CPD) activity under Section 2: Self-learning credit. The reading of one chapter is equivalent to **two credits**.

Medical laboratory technologists who participate in the Canadian Society for Medical Laboratory Science's Professional Enhancement Program (PEP) can claim the reading of the *Clinical Guide to Transfusion* as a non-verified activity.

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