

DATE:	2022 May 2
TO:	Provincial – Acute Care sites, Physicians and Nurse Practitioners especially Maternal Fetal Medicine, Neonatal Intensive Care Units (NICU), Paediatric Intensive Care Units (PICU), Special Care Nurseries(SCN), PICU/NICU/SCN Nursing Staff, Anesthesia and Perfusion.
FROM:	Alberta Precision Laboratories (APL) Transfusion and Transplantation Medicine Program (TTM)
RE:	Transfusion Medicine Changes to Blood Component Processing

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Key Messages

- Routine irradiation of cellular components without patient-specific approved indications will no longer be provided.
 - For neonates, routine irradiation, or its equivalent*, is now recommended for all cellular components until the neonate is **14 days of age**, or has been excluded for risk of severe combined immune deficiency (SCID) with newborn screening.
 - This will decrease the practice of routine irradiation until 4 months of age in the Calgary and South Zone but will increase the need for irradiation in Central, North and Edmonton Zone, which previously only irradiate for specific indications.
 - After 14 days of age, non-irradiated red blood cells (RBC) will be provided unless there is an alternate specific indication requiring irradiation (see irradiation policy posted on [Blood Selection Policies, CMV Negative & Irradiated Blood | Alberta Health Services](#)).
- Washing of blood components will no longer be routinely available. Washed platelets will **NOT** be available under any circumstances. Washed red cells will be for only extenuating circumstances with Transfusion Medicine Physician consultation.
- Further concentrated/ Volume reduced platelets and red cells are no longer recommended as routine practice but may be available with consultation for specific circumstances.
- Platelet dosing in neonates and pediatric patients should be 10-15 mL/kg (prior to manipulation) up to a maximum of 250 mL (minimum volume of a standard adult unit).

Implementation Dates

- **May 3rd, 2022** – South Sector and North Zone Sites
- **September 15th, 2022** – Edmonton Zone Sites (new irradiator required first)

Background

- Irradiation of cellular blood components is performed to eliminate the proliferative ability of residual lymphocytes in blood components to prevent Transfusion Associated Graft Versus Host Disease (TA-GVHD). Irradiation does not alter the infectivity or immunogenicity of blood components. Irradiation has the side effect of significantly increasing the potassium in red cells over time and shortens the shelf life of blood components. Previous practice in Alberta's South Sector provided irradiated components to all neonates up to the age of 4 months until the risk of SCID could be more easily assessed, whereas the North Sector only provided irradiated products to those with identified risk factors. With the introduction of newborn screening for SCID in Alberta, confirmation of risk can be provided within the first 14 days of life and removes the risk of irradiation for those patients who do not require it. With fewer units requiring irradiation, the transfusion service should now be able to perform irradiation within 24 hours, further minimizing the risk of hyperkalemia.

*In circumstances where irradiated units are not readily available, and the patient has a specific risk for TA-GVHD, red cell components greater than 14 days of age will be substituted (lymphocytes in units >14 days have been shown to be non-proliferative). National projections are to have all blood components undergo



pathogen inactivation by the end of 2025. The current mechanisms for pathogen inactivation also inactivate the ability of lymphocytes to proliferate and will eliminate the need for irradiation completely. This process of psoralen treatment has restrictions on the ability to do component manipulations such as further concentration or aliquotting.

- Any manipulation of cellular blood components increases the risk of contamination and decreases the quality of cellular elements. The process of centrifugation for either further concentration or washing activates the platelets while still in the bag. Washing of platelet components is currently not recommended by Health Canada or Canadian Blood Services. Washing of RBC also impacts quality and has paradoxically been shown to increase potassium, but can be considered in extenuating circumstances for severe, refractory allergic / anaphylactoid reactions. Washing of blood components does not change the risk of infection and does not prevent the recipient from antibody sensitization (red cell or HLA). Further concentration / volume reduction of RBC and platelets may be required in specific circumstances, such as intrauterine transfusion or in the process of reconstituting whole blood for intrauterine / neonatal exchange transfusion, or as patient specific requirements in consultation with transfusion medicine. However, once psoralen treated pooled platelets (PPPT), aka pathogen reduced platelets, are the main component of inventory, further concentration of these products can no longer be provided regardless of indication.
- Dosing recommendations of 10-15 mL/kg in the literature for platelets and red cells in neonates and pediatric patients refers to unmanipulated component dosing. In the past, platelets and red cell aliquots may have been provided as the post-manipulation volume. If that were the case, this correction to dosing practices may alter the post transfusion increment.

How this will impact you

- **Patients that are less than 14 days of age will receive RBC that have been irradiated within 24 hours, or their equivalent,* whether or not there is a specific request by the prescriber. If RBC irradiated within 24 hours are unavailable, RBC that are older than 14 days will be provided to prevent TA-GvHD.**
- Communication of the specific indication for irradiation to the transfusion service **will be required** for any patient greater than 14 days of age, including those with abnormal SCID newborn screen, significant cellular immune defect, or history of intrauterine transfusion.
- Do not place orders for platelets to be washed.
- Transfusion medicine consultation is required for requests to wash or volume reduce RBC.
- Requests for 10-15 mL/kg will be applied to pre-manipulated cellular components

Action Required

- See TM14-15.01.001 Use of Irradiated Blood Components Policy
[Blood Selection Policies, CMV Negative & Irradiated Blood | Alberta Health Services.](#)

Questions/Concerns

- Dr. Susan Nahirniak Medical Director, APL Provincial Transfusion and Transplantation Medicine Program, Transfusion Medicine, susan.nahirniak@aplabs.ca
- Joanna McCarthy, Calgary Regional Tech III APL Transfusion Medicine 403-944-8466, joanna.mccarthy@aplabs.ca
- Dr. Davinder Sidhu South Sector, Transfusion Medicine Lead, Davinder.sidhu@aplabs.ca
- Dr. Ghazala Radwi North Sector, Transfusion Medicine Lead, Ghazala.Radwi@aplabs.ca

Approved by

- Dr. Susan Nahirniak Medical Director, APL Provincial Transfusion and Transplantation Medicine Program, Transfusion Medicine, susan.nahirniak@aplabs.ca