Blood modification information

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-IRR

Irradiation

Modified products

- RCSAG-IRR
- RCWB-IRR
- PLTPL-IRR
- PLAP-IRR

Important notes

- Alert the blood bank of patients requiring irradiated blood products
- Ensure that cellular products either have an irradiation sticker or is labeled as irradiated before transfusion is commenced

T-lymphocytes are important mediators in cell-mediated immunity and are capable of mounting an immune response against foreign cell. In an immuno-competent recipient, transfused lymphocytes are prevented from attacking host cells. However, transfusion of viable lymphocytes in cellular blood products to immunologically incompetent patients can result in transfusion associate GVHD (TA-GVHD) unless the T-lymphocytes are inactivated.

Irradiated blood products are exposed in a blood irradiator to γ-rays at a minimum dose of 25Gy. Caesium-137 is used as the source of radiation. This dose of radiation inactivates T-lymphocytes that are nucleated but have minimal effect on the non-nucleated red cells and platelets.

No significant changes in platelet function are observed with irradiation. Irradiated red cells however show an increased rate of lysis and have slightly higher potassium content although this is considered clinically safe. Irradiated red cells have a shelf life of 14 days from irradiation. Platelet shelf life is however unchanged.

Indications

HSC transplants

- Irradiated cellular blood components to be used from the time conditioning is started until complete immune reconstitution
- Recommended minimum of 3 months post-transplant for autologous recipients and 6 months for allogeneic recipients
- Patients planned for autologous stem cell harvest should receive irradiated blood 7 days prior to and during the harvest
- Allogeneic stem cell donors if requiring red cell transfusions should likewise receive irradiated blood

Therapy

- Fludarabine
- Cladribine
- Deocycoformicin
- Anti-thymocyte globulin
- Alentuzumab
- Bendamustine

Disease states

- Hodgkin lymphoma
- Aplastic anaemia
- Congenital cellular immunodeficiencies (e.g. SCID, Di-George)

Components from

- HLA-matched donors
- Directed family donors
- Granulocyte donors
- Red cell and platelet donors for intra-uterine transfusions