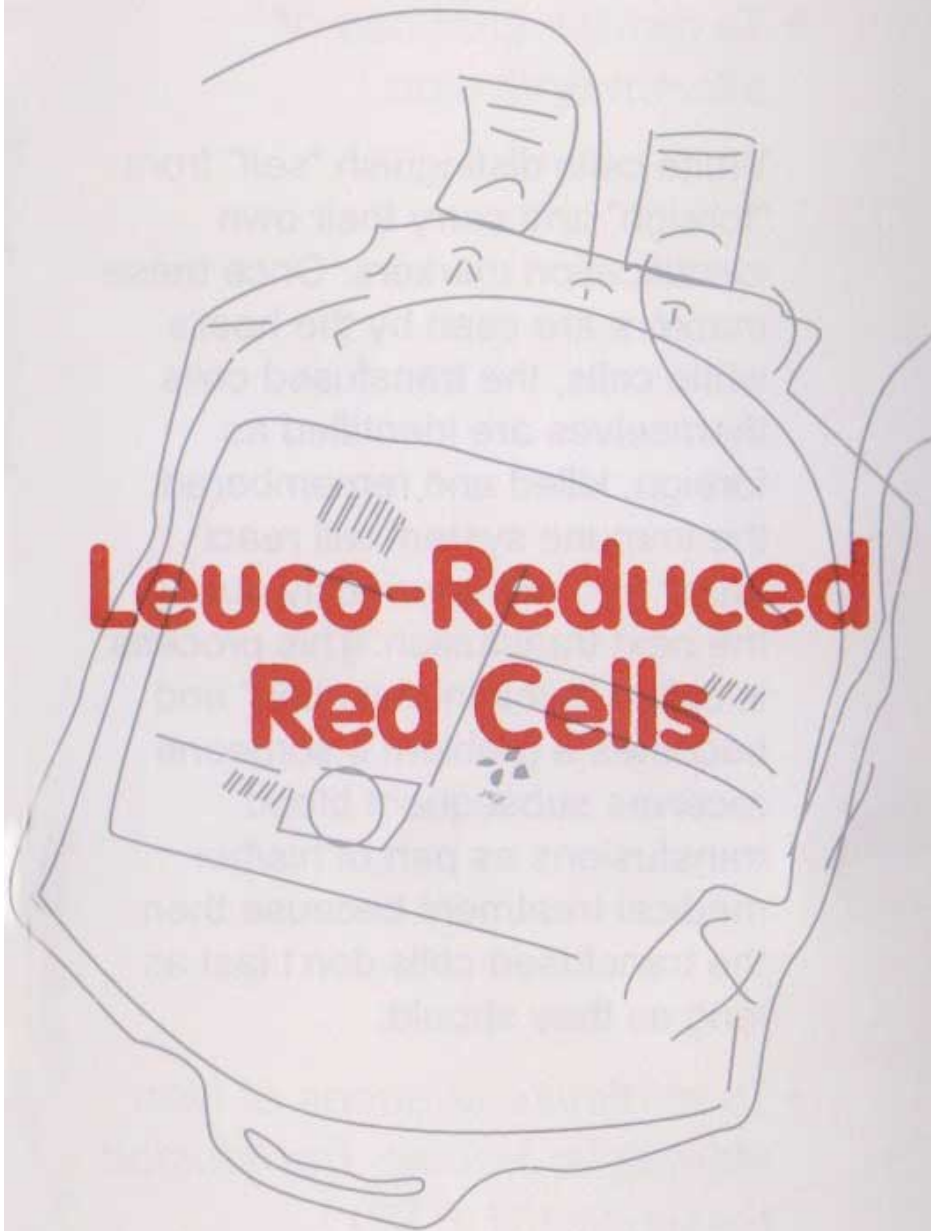


Leuco-Reduced Red Cells



Importance of Leuco-Reduction:

*There are several reasons
why it is so important
to remove the white blood cells :*

▶ To reduce chances of alloimmunisation :

White cells distinguish "self" from "foreign" and carry their own identification markers. Once these markers are seen by the host's white cells, the transfused cells themselves are identified as foreign, killed and remembered: the immune system will react faster and more viciously during the next transfusion. This process is called "alloimmunisation" and becomes a problem if someone receives subsequent blood transfusions as part of his/her medical treatment because then the transfused cells don't last as long as they should;

▶ To minimize chances of Non Hemolytic Febrile Transfusion Reaction (NHFTR) :

Finally, because white blood cells have to obliterate foreign material, they are full of destructive enzymes (cytokines). Removing WBC would reduce the amount of cytokines & HLA antigen present on them, which are largely responsible for NHFTR;

- ▶ *To reduce chances of transmission of viral infections :*

Unlike red blood cells and platelets, white cells have a nucleus containing DNA and they can multiply and divide. Viruses, such as cytomegaloviruses, HTLV etc. need nucleated cells to live. They target white blood cells as a good home. Removing the white blood cells from the blood also removes a large amount of the viruses carried within these cells;

- ▶ *To reduce chances of Graft v/s Host Disease (GvHD) :*

If transfused into a immunocompromised host, they can nest in bone marrow, divide & react against the host;

Indications of Leuco-Reduced Red Cells:

- ▶ To reduce allo-immunization to leukocyte antigens in multiply transfused patients like leukemia, aplastic anemia, immuno-suppressed and immuno-deficient patients, multiparous women, patients undergoing bone marrow transplantation.
- ▶ To reduce NHFTR mainly in multiply transfused patients.

- ▶ To reduce transmission of leukocyte transmitted diseases like CMV, EBV and HTLV-1
- ▶ To reduce TRALI(Transfusion Related Acute Lung Injury)

Techniques of Leuco-Reduction:

1. Buffy coat removal
2. Filtration-Bedside

Advantage of Buffy Coat Removal:

1. Simple technique
2. Cost effective procedure
3. Reduction in leukocyte > 80%

Degree of Leuco-Reduction by Buffy Coat Removal:

Residual WBC ($< 5 \times 10^6$)

Dosage effect:

Same effect as the RBC unit (1 unit increases Hct by 3% and Hb by 1 gm%)

Transfusion criteria:

ABO & Rh compatible unit.

References:

1. AABB technical manual; 13th edition
2. Blood Transfusion in Clinical Medicine P.L.Mollison
3. Blood Banking and Transfusion Medicine-Basic Principle And Practice Hiller-Silberstein-Ness-Anderson
4. Modern Transfusion Therapy Janice P. Dutcher The clinical use of Blood (WHO)

Leukocytes (WBC) are present in varying concentrations in all cellular blood components. These can lead to alloimmunisation and other complications.

However, a variety of specially prepared blood products such as leukocyte-reduced red cells are now available to prevent or reduce the adverse effects of contaminating leukocytes.

Depending on the method, leukocyte reduction may be carried out at the Blood Center shortly after or during collection (pre-storage), after storage but before issue (post-storage) from the Blood Center, or at the bedside.



प्रथमा

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