

UCDHS GUIDELINES FOR ADULT TRANSFUSION
(Patient Care Standards, XIII-12, Attachment 5)
(Approved by Medical Staff Executive Committee 11/06)

I. Packed Red Blood Cells (Whole blood is not available for adults)

- Massive transfusion > 8 units/24hr with active bleeding ^{1,2,3,4}
- Symptomatic anemia in a normovolemic patient, regardless of hemoglobin level
- Acute blood loss > 20% of estimated blood volume ^{5,6,7}
- Acute blood loss with evidence of inadequate oxygen delivery ^{8,9}
- Hemoglobin <8g/dL unless a reason for an alternative hemoglobin target is documented, e.g., patients with cardiovascular or severe pulmonary disease may require higher hemoglobins, while young otherwise healthy trauma patients may tolerate hemoglobins considerably below 8g/dL. ^{10,11,12}

II. Platelets^{13,14} (**Plateletpheresis containing 3×10^{11} platelets/mm³**)

A. Prophylactic

- <10 - 20K/uL in patient with production defect
- <50K/uL with impending invasive procedure
- Patients with either coagulation defects, sepsis, or platelet dysfunction may require transfusions at platelet counts greater than 50K

B. Bleeding Patients

- Diffuse microvascular bleeding, e.g., in a patient with DIC or massive transfusion, and platelet counts of <50K/uL or laboratory values unavailable
- Diffuse microvascular bleeding following cardiopulmonary bypass or extracorporeal membrane oxygenation or with intra-aortic balloon pump and platelet count not yet available or <100K
- Bleeding in a patient with a qualitative platelet defect, regardless of platelet count

III. Fresh Frozen Plasma^{13,14}

- INR > 1.5 times the upper limit of the normal value in a non-bleeding patient with scheduled invasive procedure

- Diffuse bleeding in a patient whose coagulations studies are not yet available or with documented INR or PTT>1.5 times the upper limit of normal
- Warfarin therapy with major bleeding or invasive procedure imminent, and insufficient time to respond to vitamin K therapy
- Selective congenital and acquired factor deficiencies
- TTP

IV. **Cryoprecipitate** ^{13,14}

- Invasive procedure or diffuse bleeding and fibrinogen 100mg/dL.
- von Willebrand's disease unresponsive to 1-deamino 8- D-arginine vasopressin (DDAVP), or in selected patients and hemophilia A.
- Factor I dysfunction and diffuse bleeding or scheduled for an invasive procedure
- Fibrin Glue production

V. **Granulocytes**

- Bacterial or fungal infection unresponsive to 48 hrs of appropriate antibiotics in patients with either transient marrow hypoplasia and neutrophil count <0.5 K/uL or with severe neutrophil dysfunction

VI. **Special Components**

A. **Leukocyte-Reduced Components** (Note: Prestorage leukocyte reduction is currently common practice for red blood cells and platelets)

- Prevention of non-hemolytic febrile transfusion reactions
- Prevention or delay of WBC alloimmunization and platelet refractoriness in selected patients requiring repeated transfusion on a long term basis.
- Prevention of CMV infection in CMV negative recipients in an urgent setting if CMV negative components are not available (see #2 below)

B. **CMV Seronegative** ^{15,16,17}

- All intrauterine transfusions
- CMV seronegative pregnant women prior to parturition.
- CMV seronegative recipients of organ or bone marrow (stem cell) transplants

- from seronegative donors
- CMV seronegative patients with HIV
- CMV seronegative allogeneic bone marrow or solid organ transplant candidates awaiting transplantation.

C. Irradiated Blood Components

- Bone marrow transplant recipients, autologous and allogeneic
- Acute leukemia
- Chronic lymphocytic leukemia
- All intrauterine transfusions and subsequent exchange transfusions in newborns
- Lymphoma (both Hodgkin's and non-Hodgkin's)
- Congenital immunodeficiency disorders (cellular or combined)
- Transfusion of blood components from blood relatives
- HLA-Matched blood components selected by typing or platelets selected by crossmatching
- Patients treated with fludarabine or 2-CDA
- Directed Donation

D. Washed Red Cells and Platelets

- History of anaphylactic or severe unexplained reaction to blood components
- Neonatal alloimmune thrombocytopenia when the mother is the donor for the fetus or the newborn
- Paroxysmal nocturnal hemoglobinuria

E. Frozen-Deglycerolized Red Blood Cells

- IgA deficiency with documented anti IgA antibodies
- Provision of rare blood type for phenotype matching
- Autologous donation of rare units
- Strong HLA I and HLA II antibodies in a patient with prior severe transfusion reaction.

F. HLA Matched or Crossmatched Platelets

- Documented platelet refractoriness with the presence of anti-HLA or platelet specific alloantibodies.

References:

¹Arch Pathol Lab Med, Vol. 122: Practice Parameter for the Use of Red Blood Cell Transfusion. February 1998

²Anesthesiology, Vol. 84, #3: Practice Guidelines for Blood Component Therapy. March 1996

³NIH Publication: Transfusion Alert. Indications for the Use of Red Blood Cells, Platelets, and Fresh Frozen Plasma, NIH Publication No. 93-297, 1993

⁴Transfusion Medicine Review, Vol. 16, No.3: Transfusion Triggers: A Systematic Review of the Literature. July 2002

⁵The American Journal of Surgery, Vol. 159: Elective Surgery without Transfusion: Influence of Preoperative Hemoglobin Level and Blood Loss on Mortality. March 1990

⁶Transfusion, Vol 39: Lowering the hemoglobin threshold for transfusion in coronary artery bypass procedures: effect on patient outcome. October 1999

⁷The American Journal of Surgery, Vol. 174: A Prospective, Randomized Trial Limiting Perioperative Red Blood Cell Transfusions in Vascular Patients. August 1997

⁸New England Journal of Medicine, Vol. 346, No.10: Correspondence to “Transfusion in Elderly Patient with Myocardial Infarction.” March 7, 2002

⁹New England Journal of Medicine, Vol. 345, No. 7: Blood Transfusion in Elderly Patients with Acute Myocardial Infarction. October 25, 2001

¹⁰New England Journal of Medicine, Vol 340, No. 6: A Multicenter, Randomized, Controlled Clinical Trial of Transfusion Requirements in Critical Care. February 11, 1999

¹¹ Crit Care Med 2001, Vol. 29, No. 2: Is a low transfusion threshold safe in critically ill patients with cardiovascular disease?

¹²Chest/119/6/June 2001: Do Blood Transfusions Improve Outcomes Related to Mechanical Ventilation?

¹³Current Opinion in Hematology 2001, 8:387-391: Transfusion triggers for blood components

¹⁴JAMA, Vol. 271, No. 10: Practice Parameter for the Use of Fresh-Frozen Plasma, Cryoprecipitate, and Platelets. March 9, 1994

¹⁵Blood Safety and Surveillance, Marcel Dekker Publ., 2001, Chpt 14: Transfusion-Acquired Cytomegalovirus Infection: Approaching Resolution

References (cont):

¹⁶Transfusion, Vol. 41: Prevention of posttransfusion CMV in the era of universal WBC reduction: a consensus statement. April 2001

¹⁷Publication from AABB, #97-2: Prevention of Primary CMV Transmission. April 23, 1997

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