Criteria for Transfusion – Adult Patients
UNC Medical Center
Chapel Hill, NC

The following criteria represent institution consensus indications for the transfusion of blood and blood components. Such guidelines:

- Cannot substitute for clinical judgment and the need for flexibility in practice.
- Should not be considered a mandate to transfuse or not to transfuse.
- Will serve as the basis for the focused review of transfusion practices.

Prior to the administration of blood or blood components, the indications, risk, and benefits of a blood transfusion and possible alternatives must be discussed with the patient and documented in the medical record. The standard consent form (the Request and Consent for Procedure – HIM#248s) includes the transfusion of blood. Should a patient receive a transfusion alone, the transfusion itself can be indicated as the procedure. Consent should be obtained with the Request and Consent for Procedure (HIM#248s) by the patient's Licensed Independent Practitioner (LIP).

IT IS RECOMMENDED THAT TRANSFUSIONS SHOULD BE DOCUMENTED IN THE PATIENT'S CHART AS TO INDICATIONS AND OUTCOME. SPECIFIC NOTATIONS MUST BE MADE WHEN EXCEPTIONS TO THESE CRITERIA EXIST.

Red Blood Cells

General information:

The purpose of red blood cell transfusion is to provide oxygen-carrying capacity and to maintain tissue oxygenation when the intravascular volume and cardiac function are adequate for perfusion. Red cell transfusion should only be employed when time or underlying pathophysiology precludes other management (e.g., iron, erythropoietin, folate, etc.).

Except in emergent cases, the patient's hemoglobin should be determined prior to transfusion and within 24 hours after transfusion if the patient remains hospitalized.

General Criteria for Transfusion of Red Blood Cells:

1. RBC transfusion is unnecessary in hospitalized, hemodynamically stable patients unless the hemoglobin concentration is < 7 g/dL.

2. In patients with acute MI or unstable myocardial ischemia, RBC transfusion can be considered at hemoglobin concentration < 8 g/dL.

3. RBC transfusion is appropriate for patients with acute hemorrhage or hemorrhagic shock.

4. In the absence of acute hemorrhage or severe anemia, RBC transfusion should be ordered and administered as a single unit.

Unacceptable indications for red blood cell transfusions

1. To increase wound healing

2. Mere availability of predonated autologous blood without an acceptable medical indication (see above criteria for transfusion of red blood cells)

Special red cell preparations and indications:

Whole Blood

Whole blood is unavailable since oxygen carrying capacity plus volume repletion can be obtained from red cells plus colloid or crystalloid replacement. Storage of whole blood precludes the production of components and thus is not the most effective use of donated blood.

Frozen red blood cells

All indications for red blood cells and one or more of the following:

1. Rare or uncommon red cell phenotypes required
2. Autologous blood that cannot be stored beyond the liquid shelf life (by request of ordering LIP)
3. IgA deficient blood products required because of anti-IgA antibodies

Intraoperatively/Postoperatively Salvaged Red Cells

In the immediate (<24 hours) postoperative period, hemoglobin values may be misleading. Intraoperative and postoperative salvaged blood should be transfused as clinically indicated using above guidelines.

Platelets

General information:

For patients suffering from or at significant risk of hemorrhage due to thrombocytopenia and/or platelet dysfunction.

General Criteria for Transfusion of Platelets (Adults):

1. Recent (within 24 hours of request) platelet count $\leq 10 \times 10^9$/L (for prophylaxis in a stable, non-febrile patient), or $\leq 20 \times 10^9$/L for prophylaxis with fever (in last 24 hours) or instability or in an outpatient

2. Recent (within 24 hours of request) platelet count $\leq 50 \times 10^9$/L involving:
   documented bleeding, rapidly decreasing platelet count, or planned invasive or surgical procedure

3. Documented platelet dysfunction (e.g. abnormal PFA or TEG, platelet function tests, drug-induced, or history) with any of the following:
   a. petechiae
   b. purpura
   c. bleeding
   d. invasive or surgical procedure

4. Neurosurgical patient with platelet count $< 100 \times 10^9$/L

5. Reversal of tPA in patient with hemorrhagic transformation of a stroke

When possible, the patient's platelet count should be determined prior to transfusion and within 24 hours after transfusion if the patient remains hospitalized. In cases where a platelet dysfunction is suspected platelet function tests should be obtained in a similar manner and/or documentation of the absence or resolution of bleeding should be provided. In specific cases, if clinical indications warrant, exceptions to these guidelines can be arranged in consultation with Transfusion Medicine.

Unacceptable indications for platelet transfusion

1. Prophylactic transfusion in TTP, HIT, HUS or ITP unless the patient is suffering a life or organ threatening bleed.

2. Extrinsic platelet dysfunction such as renal failure, hyperproteinemia, or von Willebrand disease.

Fresh Frozen Plasma (FFP)

General information:

This component contains adequate levels of all soluble coagulation factors except those provided by platelets. FFP is indicated for the correction of multiple or specific coagulation factor deficiencies or for the empiric treatment of TTP.

General criteria for the transfusion of fresh frozen plasma:

For the treatment or prophylaxis of multiple or specific coagulation factor deficiencies (PT and/or PTT > the upper limits of normal and/or documented specific coagulation factor deficiency). FFP is also indicated in those patients with a suspected coagulation deficiency (PT/PTT pending) who are bleeding or at risk of bleeding from an invasive procedure.

When possible, the patient's coagulation parameters (such as PT/PTT or specific coagulation factor analysis) should be determined prior to transfusion (within 24 hours of) and within 24 hours after transfusion if the patient remains hospitalized.

Acceptable indications for the transfusion of FFP may include:

Congenital deficiencies of or Acquired deficiencies related to:
Anti-thrombin
Warfarin therapy
Factors II, V, VII, IX, X, XI
Vitamin K deficiency
Plasminogen or antiplasmin
Liver disease
Massive transfusion
Disseminated intravascular coagulation

*Other plasma products may be issued when FFP is ordered; these include Plasma Frozen Within 24 hours (FP24) and Thawed Plasma.

Unacceptable criteria

For nutritional supplementation
For volume replacement

Cryoprecipitate

General information:

Cryoprecipitate is a cold insoluble fraction of FFP and each bag contains approximately 80-100 units of factor VIII and 150-250 mg of fibrinogen. Cryoprecipitate also contains factor XIII and von Willebrand factor.

General criteria for the transfusion of cryoprecipitate:

1. For the treatment or prevention of bleeding associated with certain known or suspected clotting factor deficiencies that can specifically be corrected with cryoprecipitate (such as von Willebrand factor, Factor XIII, or fibrinogen < 150 mg/dl). In those cases in which the clotting deficiency is suspected, coagulation assays should be pending.

2. Acceptable indications for the transfusion of cryoprecipitate may include:

    a. von Willebrand disease
    b. Factor XIII deficiency
    c. Hypofibrinogenemia
        Fibrinogen <150mg/dL in non-pregnant patients
        Fibrinogen <200 mg/dL in pregnant patients
    d. Dysfibrinogenemia

3. Bleeding associated with renal failure or certain platelet dysfunctional disorders may also benefit from cryoprecipitate.

When possible, the patient's coagulation parameters (such as PT/PTT, fibrinogen, specific coagulation factor assay, etc.) should be determined prior to transfusion (within 24 hours) and within 24 hours after transfusion if the patient remains hospitalized.

Fibrin glue

General information:

Fibrin glue is a preparation of fibrinogen. When applied topically with an equal volume of bovine thrombin it has adhesive or hemostatic/sealant properties.

General criteria for the use of fibrin glue:

For the treatment of surface oozing, the maintenance of tissues in tight apposition to each other or the sealing of leaking spaces.

Note: This is not an FDA licensed product. At UNC Hospitals cryoprecipitate is used as fibrin glue.

Granulocyte Concentrates

1. Severe infection unresponsive to antimicrobial therapy and absolute neutrophil count less than 0.5×10^9/L (500/µl) in a patient with a chance of marrow recovery.

TRANSFUSION OF GRANULOCYTES MUST BE ARRANGED IN CONSULTATION WITH A TRANSFUSION MEDICINE PHYSICIAN.

Special Considerations for Transfusion

1. Cytomegalovirus: All allogeneic cellular products available at UNC are leukocyte reduced and are considered CMV safe.

2. Irradiation: A minimum irradiation dose of 2500 cGy to all cellular blood products – red blood cells, granulocytes and platelets.

    a. Severely immunodeficient patients who are at risk of developing transfusion-associated graft versus

host disease (TA-GVHD)

b. Patients with hematologic malignancies

c. Bone marrow transplant recipients

d. Congenital immunodeficiencies affecting cellular immunity

e. If blood donor and recipient are relatives

f. Granulocyte transfusions

Once ordered, Transfusion Medicine will continue to provide irradiated blood products for a particular patient until requested to discontinue this service.

3. Leukocyte Reduction: All products are leukocyte reduced unless contraindicated.

4. Washed Blood Products: All indications for red cells or platelets as previously indicated in addition to severe allergic/anaphylactic reactions to plasma-containing blood products (e.g., those with the need for IgA-deficient red cells and platelets).

Other Blood-Derived Products Include:	Questions regarding these products can be directed to:
Intravenous Immune Globulin (IVIG)	Hospital Pharmacies
Normal Serum Albumin (NSA)	Hospital Pharmacies
Hepatitis B Immunoglobulin (HBIG)	Hospital Pharmacies
Rh Immune Globulin (RhIG)	Transfusion Medicine Service
Varicella Zoster Immune Globulin (VZIG)	Hospital Pharmacies