

**Criteria for Transfusion**  
**University of North Carolina Hospitals**  
**Chapel Hill, NC**  
**(Adults)**

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

- (1) cannot substitute for clinical judgment and the need for flexibility in practice;
- (2) should not be considered a mandate to transfuse or not to transfuse;
- (3) 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 Authorization for Operation or Other Procedure – HD 107) 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 Authorization for Operation or Other Procedure (HD 107) by the patient's physician.**

**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.)

General Criteria for Transfusion of Red Blood Cells:

1. Hgb < 7 g/dl in an asymptomatic patient.
2. Hgb < 10 g/dl in cases of increased risk of ischemia - pulmonary disease, coronary artery disease, cerebral vascular disease, etc. Exceptions to this include patients demonstrating loss of autoregulation from cerebrovascular and spinal cord dysfunction.
3. Acute Blood Loss Resulting In:
  - a. estimated or anticipated blood loss  $\geq$  15% of total blood volume (750 ml in 70 kg male)
  - b. diastolic blood pressure  $\leq$  60 mm Hg
  - c. systolic blood pressure decrease  $\geq$  30 mm Hg
  - d. oliguria/anuria
4. Symptomatic anemia resulting in:
  - a. tachycardia (> 100 beats/minute)
  - b. mental status changes
  - c. electrocardiographic signs of cardiac ischemia
  - d. angina
  - e. shortness of breath, light headedness or dizziness with mild exertion

5. Transfusion for a regular predetermined therapeutic program such as for bone marrow suppression for PNH, hemoglobinopathies, severe hypoplastic/aplastic anemia, etc or for a study approved by the Institutional Review Board.

When possible, the patient's hemoglobin should be determined prior to transfusion and within 24 to 36 hours after transfusion if the patient remains hospitalized.

#### Non acceptable indications for red blood cell transfusions

1. to increase wound healing
2. mere availability of predonated autologous blood without an acceptable medical indication

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, 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.
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 stable, non febrile patient), or  $\leq 20 \times 10^9/L$  for prophylaxis with fever (in last 24 hours) or instability.
2. Recent (within 24 hours of request) platelet count  $\leq 50 \times 10^9/L$  involving:  
documented hemorrhage or rapidly falling platelet count

planned invasive or surgical procedure

3. Documented platelet dysfunction (e.g. prolonged bleeding time  $\geq 1.5$  X the upper limit of normal, TEG, platelet function tests, drug-induced, or history) with:
  - 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/HUS, or ITP.
2. Extrinsic platelet dysfunction such as renal failure, hyperproteinemia or von Willebrands 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/HUS.

#### 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 III Warfarin therapy  
factors II, V, VII, IX, X, XI, Vitamin K deficiency  
plasminogen or antiplasmin Liver disease  
Massive transfusion ( $>1$  blood volume in 24 hours)  
Disseminated intravascular coagulation

### 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's factor.

### General criteria for the transfusion of cryoprecipitate:

1. For the treatment or prevention of bleeding associated with certain known or suspected clotting factor (von Willebrands, Factor XIII or fibrinogen) deficiencies (an elevated bleeding time or fibrinogen < 150 mg/dl or other specific coagulation factor assay documented deficiency). 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 Willebrands disease
  - b. Factor XIII deficiency
  - c. Fibrinogen deficiency (congenital or acquired)
  - 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 of 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.

### Special Considerations for Transfusion

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

## 2. Irradiation

A minimum irradiation dose of 2500 cGy to all cellular blood products -- red blood cells, white blood cells, or platelets.

- a. Severely immunodeficient patients in whom transfusion associated GVHD (TA-GVHD) disease is a threat. This includes some children with congenital immunodeficiency and children significantly immunosuppressed such as children who are undergoing bone marrow transplant and all children on chemotherapy.
- b. Patients with hematologic malignancies undergoing chemotherapy.
- 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. Transfusion of Leukocyte Reduced Red Blood Cells and/or Platelets

**All allogeneic cellular products available at UNC are leukocyte reduced.**

#### 4. Transfusion of Washed Blood Products

All indications for red cells or platelets as previously indicated and severe allergic reactions to plasma-containing blood products including the need for IgA-deficient red cells and platelets.

#### Other Blood Derived Products

Other blood-derived products available include:

Intravenous Immunoglobulin (IVIG)  
Normal Serum Albumin (NSA)  
Hepatitis B Immunoglobulin (HBIG)  
Rh Immunoglobulin (RhIG)  
Varicella Zoster Immunoglobulin (VZIG)

Questions regarding these products to:

Hospital Pharmacies  
Hospital Pharmacies  
Hospital Pharmacies  
Transfusion Medicine Service  
Hospital Pharmacies