



- These practice guidelines have been developed by a cross functional group of physicians, management, and staff to advance the safety and quality of care for the patients receiving blood transfusions.
- When applying these guidelines, practitioners must use their training, experience, judgment, and a patient's specific clinical information to make optimal decisions on the patient's behalf.
- These guidelines cannot substitute for clinical judgment or the need for flexibility in practice and should not be considered a mandate to transfuse or not to transfuse.

Initiation of Transfusion

- Prior to the administration of blood or blood components, informed consent is **required** and should include a discussion regarding the risks, benefits, and alternatives to allogeneic blood transfusions.
- Transfusion therapy, in certain situations, can be inappropriate and may pose unnecessary risks, while offering little or no benefit to patients. Risks include but are not limited to:
 - Host immune response to transfusion
 - Transmission of infectious agents
 - Volume overload
 - Transfusion-related acute lung injury (TRALI)
- Providers **MUST** document reasons for transfusion very clearly in the patient's medical record.
 - Documentation is especially important when a transfusion is administered in exception to the recommended guidelines.
- When feasible, clinicians are encouraged to consult with the transfusion service if a situation falls outside of standard guidelines.
 - The OSU UH and East Blood Banks are staffed 24/7 and can be reached at the numbers below:
 - OSU UH Blood Bank
 - 614-293-8467
 - OSU East Blood Bank
 - 614-257-2064
 - The Transfusion Medicine attending on service can be paged to your location anytime by calling the OSU UH Blood Bank at 614-293-8467.

Packed Red Blood Cells

Clinical Indications for Adult Transfusion of Red Blood Cells (RBC):

- Only one packed RBC unit should be transfused at a time with re-evaluation of the patient's condition and hemoglobin level before further transfusion, unless dictated otherwise by patient's clinical condition.
- In many scenarios, restrictive strategies are at least as beneficial to patients, if not superior to more liberal approaches.

Active Bleeding

- Hemorrhagic shock with life threatening bleeding, where explicit transfusion protocols are activated, such as the Massive Transfusion Protocol
 - No Hgb threshold
- Active, non-life threatening bleeding and Hgb < 8 g/dl

Bleeding Risk

- Preoperative assessment of surgical bleeding risk:
 - Hgb < 10 g/dl if intraoperative bleeding is expected to be life-threatening
 - Hgb < 8 g/dl if intraoperative bleeding is not expected to be life-threatening

Anemia

- Asymptomatic
 - Hgb < 7g/dl for asymptomatic, hemodynamically stable inpatients
 - Cardiovascular Disease: Hgb < 8g/dl for asymptomatic inpatients with evidence of preexisting cardiovascular disease or complication
- Symptomatic
 - No Hgb threshold in the setting of acute blood loss or symptomatic, otherwise unexplained anemia, manifested by one or more of below:
 - Tachycardia or hypotension (e.g., diastolic pressures < 60 mmHg, systolic pressures reduced by 30mmHg, especially if unresponsive to fluids).
 - Other evidence of inadequate oxygen delivery, increased oxygen extraction, reduced central venous or tissue oxygen saturations, elevated lactate, or elevated laboratory indicators of organ failure.
 - Otherwise-clinically manifested cardiovascular failure related to anemia.

Special Conditions - Exempt from Thresholds

Note: The presence of certain clinical conditions warrants maintaining a hemoglobin level higher than normally acceptable for an otherwise healthy, asymptomatic anemic patient; therefore patients in the following scenarios may fall outside of the stated guidelines.

Hematology/Oncology patients, including any of the following populations:

- Hematology/Bone Marrow Failure or Bone Marrow Transplant (BMT) patients
- Thalassemia or other congenital anemia patients
- Sickle cell disease patients
- Patients on protocols for various blood exchange procedures
- Oncology patients
- Acute leukemia patients
- Patients on Extracorporeal Life Support (ECLS)
 - [OSUWMC Extracorporeal Life Support \(ECLS\) Guideline](#)
 - [ELSO Patient Care Practice Guidelines](#)
- Patients on [chronic transfusion protocols](#)

Platelets

Clinical Indications for Adult Transfusion of Platelets:

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

Active Bleeding

- Recent (within 24 hours of request) platelet count < 50,000 u/L involving a:
 - Documented hemorrhage
 - Rapidly falling platelet count
 - Planned invasive or surgical procedure
- Neurosurgical patient with a platelet count < 100,000 u/L

Thrombocytopenia

- Recent (within 24 hours of request) platelet count < 10,000 u/L (for prophylaxis in stable, non-febrile patient)
- Recent (within 24 hours of request) platelet count < 20,000 u/L for prophylaxis with fever (in last 24 hours) or instability

Platelet Dysfunction

- Documented by a prolonged bleeding time > 1.5 X the upper limit of normal, ROTEM, platelet function tests, documented anti-platelet drugs, or history with:
 - Petechiae
 - Purpura
 - Bleeding
 - Planned invasive or surgical procedure

If Patient Not Responsive to Platelets

- Routinely check post-transfusion platelet count within 1 hour after completing a platelet transfusion.
- Repeated poor responses may indicate immune refractoriness.
- Consult the Transfusion Medicine Service (UH 3-8467) (East 7-2064) in anticipation of need for human leukocyte antigen (HLA) matched or cross-matched platelets.

Fresh Frozen Plasma (FFP), Thawed Plasma

Clinical Indications for Adult Transfusion of Plasma:

- 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.

Active Bleeding

- Massive transfusion to replace diluted and consumed coagulation factors
- Hemorrhage in the setting of:
 - Severe liver disease
 - Disseminated intravascular coagulation (DIC)
 - Vitamin K depletion
- PTT > 60 seconds, exclude:
 - Lupus anticoagulant
 - Heparin
- INR > 1.5
 - **There is no evidence an INR < 1.5 reduces risk of hemorrhage.**
- ROTEM indicated deficiency

Other

- INR > 1.5 with planned invasive procedure
 - **There is no evidence an INR < 1.5 reduces risk of hemorrhage.**
- Fibrinogen < 100 mg/dL

Note: Plasma products should not be used for nutritional supplementation or volume replacement.

Cryoprecipitate

Clinical Indications for Adult Transfusion of Cryo:

- Cryo is a cold insoluble fraction of FFP.
 - Each bag contains approximately 80–100 units of factor VIII and 150–250 mg of fibrinogen.
 - Cryo also contains factor XIII and von Willebrand's factor.
 - It is usually indicated when correction of fibrinogen-related coagulopathy is needed but the volume of FFP cannot be tolerated.
- When possible, the patient's coagulation parameters (such as PT/PTT, fibrinogen, specific coagulation factor assay, etc.) should be determined within 24 hours prior to transfusion and again within 24 hours after transfusion if the patient remains hospitalized.

Fibrinogen Deficiency

- Fibrinogen < 100 mg/dL and bleeding, invasive procedure, or volume overload
- Fibrinogen < 150 mg/dL with suspected DIC or congenital deficiency
- ROTEM indicated deficiency

Clotting Factor Deficiencies

- Factor XIII deficiency
- von Willebrand disease

Other

- Bleeding associated with renal failure or certain platelet dysfunctional disorders may also benefit from cryo

Massive Transfusion Protocol

- These guidelines are not applicable to situations requiring the massive transfusion of blood products.
- The initiation of an MTP requires the involvement of an attending in the clinical situation and their approval.
 - Call the blood bank (UH 3-8467 or East 7-2064) for information.
 - See “Massive Transfusion Protocol [MTP]” on page 8 of the [Blood and Blood Products in the Perioperative Department](#) policy.

Cytomegalovirus (CMV) Negative Blood Products

Note: All allogeneic cellular products available at OSU are leukocyte reduced. Leukocyte reduced products are considered CMV safe for most patients.

- Blood products that are collected from known CMV negative donors and have been determined to be CMV negative after testing are provided for:
 - CMV sero-negative allogeneic (related or unrelated donor) HPC recipients.
 - CMV sero-negative acute leukemia bone marrow transplant candidates.
 - CMV sero-negative heart and lung transplant recipients and candidates.
 - CMV sero-negative (or unknown) pregnant women.
 - All low-birth-weight neonates.

Note: All liver, kidney, and pancreas transplant candidates receive leukocyte-reduced blood components (CMV safe).

Irradiated Blood Products

Note: Irradiated blood products are indicated for the prevention of transfusion associated graft versus host disease in certain circumstances. A minimum irradiation dose of 2500 cGy is directed to all irradiated cellular blood products -- red blood cells, white blood cells or platelets.

- **Donor categories:**
 - Product donated by family member
 - Product from HLA-selected donor
 - Products from directed donors whose relationship to recipient’s family has not been established
- **Pediatric practice**
 - Intrauterine transfusions (IUT)
 - Exchange or simple transfusion in neonates if prior IUT
 - Congenital immune deficiency states

Other considerations:

- Acute leukemia or Hodgkin disease
- Allogeneic or autologous hemopoietic progenitor cell (HPC) transplant recipient
- Allogeneic HPC donor 7 days prior to, or during, HPC harvest
- History of treatment with purine analogues and related drugs
 - Fludarabine
 - 2CDA (Cladribine®)
 - Deoxycoformycin (Pentostatin®)
 - Clofarabine (Clolar®)
 - Bendamustine (Treanda®)
 - Nelarabine (Arranon®)
- History of treatment with alemtuzumab (Campath®, MabCampath® and Campath-1H®) (anti-CD52)
- Patients on anti-thymocyte globulin (ATG)
- Patient with congenital immunodeficiencies affecting cellular immunity
- Granulocyte transfusions

OSUWMC Resources

- [OSUWMC Cardiac Surgery Intraoperative Hemostasis and Transfusion guideline](#)
- [OSUWMC Liver Transplant Transfusion algorithm](#)

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Quality Measures

- Proportion of units prepared and not transfused:
 - PRBC
 - FFP
 - Platelets
- Inappropriate blood utilization:
 - PRBC
 - FFP
 - Platelets
- Frequency with which Hgb/HCT rechecked prior to transfusion of second unit of PRBC in the setting of non-emergent transfusion

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Guideline Approved

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