

Pediatric Hematology/Oncology Transfusion Policy Guidelines

Irradiated Blood Products

All pediatric cancer patients will receive irradiated blood products in order to prevent transfusion related graft-versus-host disease.

Filtered Blood Products

All pediatric cancer and sickle cell patients will receive filtered blood products. Filtration is an effective way to eliminate the risk of CMV infection in patients with cancer, and prevents alloimmunization.

CMV Negative Blood Products

CMV negative blood products will be reserved for cancer patients who are documented to be CMV seronegative and are scheduled to undergo a bone marrow transplant. At the time of transplant, these patients are more immunocompromised, and the low level of CMV that may remain in a filtered product can still pose a risk.

Washed Products

Washed blood products will be reserved for patients who have had life threatening allergic reactions in spite of pretreatment with diphenhydramine (1.25 mg/kg) and hydrocortisone (2mg/kg). Washing blood products significantly decreases their lifespan in the circulation and effectiveness.

Erythrocyte Transfusions

Transfusion of packed red blood cells will occur in patients with symptomatic anemia (hemoglobin < 8 with tachycardia).

Asymptomatic patients with chronic anemia should have a lower threshold for transfusion.

Transfusions of PRBC's will be considered in patients with hemoglobin > 8 who are likely to fall lower and require transfusion in the next 1-2 weeks (eg a patient who has recently received high dose chemotherapy who will be discharged from the hospital).

An extended cross-match will be performed on patients who will undergo multiple transfusions over a life-time. These include patients with sickle cell disease, thalassemia, Diamond-Blackfan Anemia, and aplastic anemia.

Dosage: A transfusion of 10cc/kg will increase the hemoglobin 2.5-3.0 g/dl. In patients > 20 kg, the transfusion volume should be rounded to the nearest number of PRBC units (volume of a prbc unit is 240-360 cc's) .

Transfusion time: In uncomplicated patients PRBC transfusions should be infused over 2-3 hours. Faster rates of transfusion may be considered in some settings by experienced physicians.

In patients with slowly developing anemia and Hgb < 5 g/dl, PRBC's should be administered slowly (2ml/kg/hour) until desired Hgb level is achieved. The use of diuretics and exchange transfusion should be considered in patients with signs of heart failure.

Platelet Transfusions

Platelet will be transfused for patients with thrombocytopenia (platelets < 10,000/microliter) or platelet dysfunction and bleeding.

Prophylactic platelet transfusions:

1. Platelets < 10,000/microliter
2. Platelets < 20,000/microliter, and bone marrow infiltration, severe mucositis. DIC, anticoagulant therapy, platelets likely to fall below 10,000 prior to next evaluation, or higher likelihood of bleeding due to local tumor invasion.
3. Platelets <50,000/microliter and DIC, extreme hyperleukocytosis, prior to lumbar puncture, CVL insertion, or major surgical procedure.

Apheresis platelet units will be reserved for those patients likely to receive multiple transfusions in a lifetime, such as patients with aplastic anemia or patients likely to undergo bone marrow transplant, to decrease donor exposure and the risk of alloimmunization.

Starting platelet dose will approximate 1 unit per 10 kg, which is expected to raise the platelet count by 50,000 platelets/microliter. Higher doses can be considered in septic patients, or patients with DIC, or splenomegaly.

Platelet refractoriness will be defined as inadequate rise in platelet counts as measured within 1 hour of platelet transfusion.

Approaches to platelet refractoriness:

1. Make sure platelets are ABO compatible.
2. Ask for fresh units.
3. Test for HLA antibodies and platelet specific allo-antibodies.
4. Consider IVIG (0.5 gm/kg) and Amicar in patients with significant bleeding.

Granulocyte Transfusions:

Granulocyte transfusions will be reserved for neutropenic patients (ANC<500) with life threatening bacterial or fungal infections who are unlikely to recover their neutrophils within a week, or patients with severe neutrophil dysfunction.

Patients should be tested for presence of HLA allo-antibodies prior to first transfusion, and then biweekly throughout course. Patients are frequently alloimmunized, and this can lead to poor increments and severe reactions. In patients who develop alloantibodies, compatible donors should be used.

Dose of neutrophils will be 1×10^9 neutrophils/kg in children with a maximum dose of 3×10^{10} neutrophils in larger patients.

Transfusion time will be 2-3 hours.

Fresh Frozen Plasma:

Indications:

1. Life-threatening bleeding in patient who has received warfarin.
2. Severe liver disease
3. DIC
4. Massive Transfusion
5. Isolated congenital factor deficiency that does not have a safer, more appropriate product.

Dosage: 10cc's/kg of ABO compatible product. Doses as high as 20 cc's/kg can be given to patients with congenital factor deficiency.

Monitoring:

Coagulation studies (PT/PTT) should be performed after plasma infusions, and monitored at least every 12 hours in patients with ongoing transfusions.

Cryoprecipitate:

Indications:

1. Severe liver disease
2. DIC
3. Afibrinogenemia or significant hypofibrinogenemia with other associated indications
4. Von Willebrands -2nd line therapy
5. Factor XIII deficiency

Dose:

Adult(70kg): 10 bags

Child: 1-2 bag/10kg body weight should increase fibrinogen by 60-100 mg/dL

Neonate: 1 bag will increase fibrinogen by >100mg/dL.

vWD: Adult: 10-12 bags q 12 hours

Child 1 bag/6kg q 12 hours

FXIII def: 1 bag/10kg every 7-14 days

Cryoprecipitate should be transfused within 6 hours of thawing, over 2-3 hours.