

GUIDELINE: INDICATION FOR RED BLOOD CELL TRANSFUSION

In late 2010 the blood supply in the U.S. is considered the safest in history. With nucleic acid probe testing the risk of HIV transmission is 1:2.1 million units while Hep C is 1:1.8 million units. A risk of a fatal acute immune mediated hemolytic transfusion reaction remains at approximately 1 in 600,000 units, most commonly caused by clerical errors. Fluid overload and immune suppression are other important considerations in addressing the risks and benefits of transfusion therapy.

There is no absolute level of hemoglobin for which transfusion is reflexly indicated. In healthy persons a shift to anaerobic metabolism occurs at hemoglobin levels of 7.5g/dl or lower. Gradual development of anemia leads to a number of compensatory adjustments that maximizes tissue oxygen delivery. These include decreased oxygen affinity of hemoglobin due to increased 2,3-diphosphoglycerate, increased cardiac output and decreased plasma pH. Patients with co-morbid problems such as CHF, coronary artery disease, peripheral vascular disease and ischemic cerebral vascular disease may have symptoms of poor tissue oxygen delivery with hemoglobins as high as 10 that may be improved by blood transfusion. As with any guideline, risks and benefits must be weighed for each individual patient using one's experience and clinical judgment.

1. Whole blood is no longer given. Blood components (rbc, platelets, fresh frozen plasma) are given separately according to the clinical situation.
2. Blood products should be leukodepleted. This is done routinely at the time of donation in Ventura County. If blood has not been leukodepleted a leukocyte filter can be used at the time of administration. Leukodepletion of blood decreases CMV transmission, alloimmunization and cytokine mediated febrile non-hemolytic transfusion reactions.
3. Only radiated products (2500 rads) should be given to recipients if they are 1st or 2nd degree relatives of the donor and to severely immuno-suppressed patients (bone marrow transplant recipients, leukemia/lymphoma patients on aggressive chemotherapy). This is done to prevent graft vs. host disease which is a highly lethal complication of transfusion in these settings.

4. Asymptomatic patients with a treatable diagnosed cause of anemia should not be transfused. This includes B12, iron and folate deficiency as well as autoimmune hemolytic anemia. It is appropriate to consider transfusion in any anemic patients with significant symptoms related to compromised tissue oxygenation.
5. Significant hemorrhage with hypotension and/or orthostasis is an indication for transfusion.
6. The goal of transfusion is to alleviate symptoms or restore blood volume. The goal is not to achieve a normal hemoglobin. Do not overtransfuse.
7. The rapidity of transfusion depends on the clinical situation but generally should not be longer than 4 hours per unit. Lasix should be used prophylactically for patients at risk for fluid overload. Tylenol given before transfusion will decrease the frequency of benign cytokine mediated fever.
8. In an emergent situation where immediate transfusion can be life saving O negative blood can be given after screening the recipient for unexpected red cell antibodies. This carries a very low risk of major hemolytic transfusion reaction.
9. If massive transfusion is needed (>10u/24 hrs) frequent monitoring of platelet count and coagulation studies is recommended. Appropriate use of platelet transfusion and FFP to correct clotting abnormalities should be accomplished.
10. In autoimmune hemolytic anemia severely symptomatic patients (hemoglobin usually <5), should be transfused with the "best matched" blood available. This has a low risk of a significant transfusion reaction. No patient with AIHA should suffer severe morbidity or death from tissue hypoxia for fear of a hemolytic transfusion reaction.
11. Patients on chronic transfusion therapy will develop iron overload with eventual organ dysfunction. They should be started on iron chelating therapy with subcutaneous deferoxamine early or oral deferasirox in their treatment (before more than 10 units have been transfused). The ferritin level is an accurate guide to organ iron storage.