



## **Appropriate Use of Group O RhD Negative Red Blood Cells to meet AABB Standards Requirements**

**Hospital transfusion services should have policies and procedure in place to deal with the appropriate use of O- red blood cells (RBC) and to describe when patients should be switched to RhD positive RBCs to avoid depletion of the O- supply** (required by current AABB standards). These criteria are common practice in large and small U.S. institutions and are supported by the AABB (Association Bulletin #19-02), and are similar to the guidelines of the United Kingdom National Health Service and the Australian Red Cross Blood Services.

The importance of ABO compatibility in RBC transfusion was recognized over 100 years ago. ABO incompatible transfusions can have devastating consequences because anti-A and anti-B antibodies form naturally without previous exposure to RBCs and can cause intravascular hemolysis. In emergencies, RBCs may be needed before the patients ABO type is known. Group O RBCs are the “universal donor” RBC type, given to avoid ABO-incompatible transfusion until ABO typing can be completed.

RhD antigen compatibility is clinically less important, especially for patients who are not Rh-negative women of child-bearing age. For one, antibody formation requires exposure to the antigen which takes approximately 3 months to form. Secondly, this antibody leads to extravascular hemolysis, which is typically slower and less clinically significant. The major importance of anti-RhD antibody is its role in hemolytic disease of the fetus and newborn, in which antibody crosses the placenta to destroy RhD positive fetal RBCs.

Blood type O RhD negative (O-) is considered the “universal donor” type because it averts both of the above problems and can be given to any patient regardless of ABO or Rh type. However, emergency use of O- RBCs does not guarantee compatibility because unexpected antibodies to other RBC antigens may sometimes be present. Despite efforts to supply them, the demand for O- RBCs can exceed the frequency in the donor population. Approximately 11% of the blood collected at KBC is O- while only roughly 8% of our donor population provides this blood type. Conserving O- RBCs for the patients who need them most is good practice. Transfusion of O- RBCs should be restricted to the most appropriate situations.



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### Absolute indications

- Women of child bearing age (up to 45-50 years of age) or younger for emergency transfusion or known O- blood type
- O- patients with known anti-D

When emergency transfusion is indicated and the patient's blood type is unknown, it is common practice to give O- RBCs to women of child bearing age or younger as indicated above; O+ RBCs should be used for all other patients with conversion to the patient's blood type as soon as possible. Some hospitals will also give a limited number of O- RBCs to pediatric male patients switching to O+ RBCs depending on the O- RBC inventory.

For scheduled transfusions, or when the patient's blood type is known, O- patients should receive O- RBCs except in the event of large volume transfusions (typically defined as 4-6 or more units) or when O- RBCs are in short supply. In these circumstances, strong consideration should be given in converting the patient to receiving O+ RBCs. Exceptions include patients who fit the absolute indications above or those with known long-term transfusion needs.