In contrast to red cells and plasma, platelets do not have to be ABO compatible (plasma of the donor compatible with red cells of the recipient) when administered to larger children. However, some recommend using ABO-identical platelets whenever possible and if not possible, using ABO-compatible platelets when they are available. This is especially important when considering the transfusion of group O platelets to group A recipients. ABO-incompatible plasma from incompatible platelets can coat the recipient’s red cells, causing a positive direct antiglobulin test (DAT) result. Even with a positive DAT, clinically significant hemolysis is generally rare. However, there have been reports of hemolysis caused by the transfusion of high-titer anti-A to patients who have received multiple platelet transfusions (such as those undergoing chemotherapy or marrow transplantation) or have received larger plasma volume apheresis products. Although transfusion of platelets with a major incompatibility, such as transfusion of group A platelets to a group O patient, is acceptable, the response is decreased because of increased clearance of the transfused platelets.

Infants should be transfused with ABO-compatible platelets whenever possible, because of their small blood volume. If the platelets available are those that have a minor ABO compatibility (ie, incompatible plasma) are not available, then one might choose to use platelets with a low titer of the incompatible isohemagglutinin or volume-reduced platelets. Volume reduction requires centrifugation of the component, and there are data that indicate this extra manipulation can lead to platelet activation. In the absence of definitive data on its effects on posttransfusion recovery, volume reduction should not be considered routine practice. Because all platelet units contain a small number of red cells, they should be Rh-compatible with the recipient to prevent the development of anti-D in D-negative recipients. In practice, development of anti-D is not common following transfusion of D-positive platelets to D-negative recipients, but if D-positive platelets are administered to a D-negative patient, Rh Immune Globulin (RhIG) can be used to prevent immunization. One full dose of RhIG can protect the transfusion recipient for up to 15
mL of D-positive red cells or 30 mL of D-positive whole blood. Therefore, this dose can be used for transfusion of 30 units of D-positive platelets (each containing about 0.5 mL of red cells). Also, using the maximum allowable red cell content of 2 mL, a dose of RhIG would protect the recipient for at least 7 units of apheresis platelets. However, modern apheresis equipment collects platelet units with substantially less red cell content. Indeed, one report found that apheresis platelets contained less than 1 μL of red cells and did not cause Rh sensitization in pediatric oncology and marrow transplant patients. RhIG is available as either an intramuscular or intravenous preparation. The intravenous form is convenient when high doses of RhIG are necessary, thus avoiding multiple intramuscular injections, or when intramuscular injection would cause injury. Although many institutions offer immune prophylaxis in this setting, it is important to note that the package insert for RhIG does not address its use in premature infants. In addition, infants under 4 months of age rarely form alloantibodies. When used, RhIG should be administered within 72 hours of exposure, although it may provide protection beyond this time frame.

**Dose and Administration**

When calculating the dose of platelets for a child, 5 to 10 mL/kg of either a platelet or apheresis platelet unit should result in a 50,000/μL to 100,000/μL increase in platelet count (Table 5). As an alternative to dosing platelets by volume, some institutions instead use equivalent units. This is an attempt to make a standard dose, either based on apheresis or WBD units, which is based on the number of platelets in that dose. Because the volume of platelet units varies and the concentration of apheresis platelets varies, the volume of doses may vary despite having an equivalent number of platelets. For children over 10 kg, a dose of 1 platelet unit per 10 kg should increase the platelet count by approximately 50,000/μL. This response can be blunted if the infant or child is septic, febrile, bleeding or has disseminated intravascular coagulation (DIC) or other evidence of consumptive coagulopathy. For small infants, 1 platelet unit is sufficient.
It is important to account for the dead space of the tubing and administration set, which can be considerable (30 mL or more). Volume reduction of platelet concentrates usually is not necessary, because using the recommended dosages of platelets that have not been volume-reduced should yield an adequate increase. In addition, centrifugation may cause activation of the platelets, resulting in a less efficacious product, as well as a 33% reduction in recovery.83,84

Platelets should be transfused through a standard 170- to 260-micron blood filter. For the transfusion of a single platelet unit, an 80-micron filter may be used. The smaller filter is ideal for these smaller-volume transfusions because it has less tubing and, therefore, less dead space.

**Aliquots**

If the blood supplier provides only apheresis platelets, it may be necessary to prepare aliquots for pediatric transfusion. Bags and syringes used for small-volume RBC transfusion must be used for platelet aliquots because there are no systems specifically designed for platelets.58 Even though the pH of platelets dispensed in a syringe can be maintained for 6 hours, the component should be transfused as soon after dispensing as possible, but no later than 4 hours.22(p51),87 Blood manufacturing facilities cannot create aliquots because there are no systems approved by the FDA for this purpose. Aliquots must be created in the transfusion service, using a sterile connecting device that splices and reanneals tubing, thus preserving the sterility of the product.58 One report showed that storage of aliquots of leukocyte-reduced, bacterially screened apheresis platelets in polyolefin storage bags resulted in the maintenance of acceptable pH for 6 days, but all platelets products are approved only for a 5-day shelf life.88

**Platelets Leukocytes Reduced**

Platelets can be leukocyte-reduced at the time of manufacturing by the collection facility, in the transfusion service laboratory, or at the bedside. Apheresis Platelets Leukocytes Reduced col-