ABO/Rh in Platelet Transfusion

ABO antigens on platelets
- ABO antigens on platelets are intrinsic as well as adsorbed from the plasma.
- Lewis, Ii, P, Pk and Cromer are also found on platelets, but antibodies to these antigens do not seem to affect platelet survival.

ABO considerations for platelet transfusion
- ABO-identical and ABO compatible platelets (group A platelets, group AB recipient) result in a higher CCI than ABO-incompatible platelets. Therefore, these platelets should be selected for transfusion, especially when a significant amount of red blood cells (>2 mL) is present in the platelet component.
- ABO antigens on platelets should be compatible with the recipient plasma, and the donor plasma, in which the platelets are suspended, should be compatible with the recipient red cells. This is especially important for high-risk patients such as pediatric patients and those patients receiving long-term platelet support.
- In urgent situations, most facilities have protocol to provide platelets of any ABO type.
- When a patient is massively bleeding, selecting the least incompatible platelets for transfusion seems unimportant.
- Many institutions select platelets without regard to ABO due to inventory management, lack of ABO compatible platelets, and decreased platelet supplies.
- Group O recipients may have a lower increment when given Group A platelets than when group identical platelets are selected.

Rh considerations for platelet transfusion
- Platelets do not have Rh. However, residual red cells in a platelet unit do carry Rh antigens.
- D immunization can result when Rh-positive platelets containing red cells are transfused to an Rh-negative patient.
- Rh-negative female patients still in their reproductive years should receive Rh-negative platelets.
- Rh immune globulin (RhIG) should be administered if Rh-negative platelets are not available when a transfusion of Rh-positive platelets is necessary. A single dose should provide protection for at least 15-30 random donor platelet units, providing bloody platelets are not administered.

Out of group platelet transfusions
A platelet transfusion is more akin to a whole blood transfusion. There are several considerations:
1. ABH antigens on platelets could be target by the recipient’s isoagglutinins.
2. ABO antibodies in the plasma of the platelet component could cause hemolysis of the recipient’s red cells.
3. Immunologic effects could result from incompatible platelet transfusions.

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<td>Group A Donor</td>
<td>Platelets has A antigen</td>
<td>Some donor group A platelets are destroyed by the recipient’s ABO antibodies. Approach:</td>
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<td>Group O Recipient</td>
<td>Recipient plasma has anti-A, -B, -AB, which can destroy donor A platelets</td>
<td>Use group A_2 donor platelets because A_2 donors do not express detectable A antigens on their platelets.</td>
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**Example** | **Explanation** | **Approaches**
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Group O Donor | Plasma in the platelet unit contains anti-A, -B, AB, which can destroy recipient red cells. | - Avoid using Group O platelets with high-titer ABO antibodies.  
- Limit the amount of incompatible plasma, especially for neonates and patients undergoing long-term platelet support.  
- Usually, this is not a major problem, except when a large volume of ABO-incompatible platelet transfusions is given or the donor plasma has high-titer isoagglutinins:  
  - Positive DAT can occur (anti-A and anti-A,B from plasma in unit can coat the recipient’s A red cells)  
  - Hemolysis of recipient red cells could occur if the platelet component contains high-titer incompatible ABO antibodies.  
  - The amount of incompatible ABO antibody transfused is dependent on the concentration of antibody and the volume of product transfused. Group O plasma products have a higher concentration of ABO antibodies than either group A or B.  
  - Group A Recipient | Recipient red cells carry A antigens |