

## **Update guideline and strategy for platelet transfusion**

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Platelets are the most challenging blood products because of the high cost, short shelf life and higher risk for bacterial contamination and adverse transfusion reactions. Interest in reducing platelet transfusions has evolved in recent years.

Issues in the field of platelet transfusion are 1) prophylactic platelet transfusion in oncology, 2) management of platelet refractoriness, 3) platelets as therapy for patients on antiplatelet medications with intracranial hemorrhage (ICH), and 4) ABO incompatible platelets

### **1. Prophylactic platelet transfusion in oncology**

Platelet count threshold :  $10 \times 10^9$  cells/L

: effective for the prevention of spontaneous bleeding in otherwise stable oncology patients

### **2. Platelet refractoriness**

Immune refractoriness by antibody to HLA or human platelet antigen (HPA)

- HLA-matched platelets (or at least lacking the antigen for the known antibody)
- Cross-matched platelets

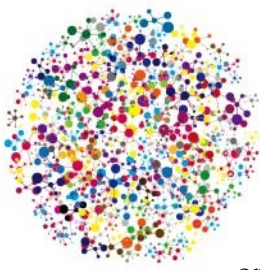
### **3. Intracranial hemorrhage and platelet transfusion**

- Conflicting or neutral evidence regarding a benefit from platelet transfusion.

### **4. ABO incompatible platelet transfusion**

The importance of ABO compatible platelet transfusions is less well established, and ABO plasma incompatible platelet transfusions are routinely given. However, transfusions of ABO nonidentical platelets may cause patient harm.

- Transfusion of major ABO incompatible platelets  
: decreased response to platelet transfusion, and higher alloimmunization
- Transfusion of minor ABO incompatible platelets  
: hemolytic transfusion reactions
- AABB : Have a policy concerning transfusion of components containing significant amounts of incompatible ABO antibodies
- CAP : Have a policy to prevent the administration of ABO incompatible donor plasma in platelets given to infants'
- Solutions :
  - (1) Volume reduction  
: increases spontaneous activation and impairs ADP-induced aggregability of platelets
  - (2) Provide products that do not contain 'high-titer' anti-A or anti-B  
: nearly all reactions were caused by high-titer anti-A or anti-B (>1000 AHG titer)



- or high-titer and high volume (>400 AHG with >200 ml of plasma)
- (3) Platelets stored in platelet additive solution (PAS)
  - ; reduces plasma in the platelet product by 65%, compared to standard issue platelets

<Terminology for apheresis PLT transfusion ABO and D compatibility>

Patient ABO and Rh				
Product ABO	Group O	Group A	Group B	Group AB
Group O	Identical	Low-titer Plasma- incompatible Cellular- compatible	Low-titer Plasma- incompatible Cellular- compatible	Low-titer Plasma- incompatible Cellular- compatible
Group A	Plasma- compatible, cellular- incompatible	Identical	Plasma- compatible, cellular- incompatible	Plasma- compatible, cellular- incompatible
Group B	Plasma- compatible, cellular- incompatible	Plasma- compatible, cellular- incompatible	Identical	Plasma- compatible, cellular- incompatible
Group AB	Plasma- compatible, cellular- incompatible	Plasma- compatible, cellular- incompatible	Plasma- compatible, cellular- incompatible	Identical
Product D	D+		D-	
D+	D identical		D major mismatch	
D-	D compatible		D identical	

The AABB developed a clinical practice guideline on appropriate use of platelet transfusion in adult patients.

< Clinical Recommendations >

[1] Hospitalized adult patients with therapy-induced hypoproliferative thrombocytopenia

\*\* Recommendation 1 :

The platelets should be transfused prophylactically to reduce the risk for spontaneous bleeding.

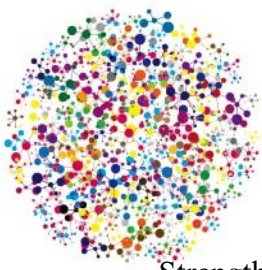
- Platelet count :  $10 \times 10^9$  cells/L or less
- Dose : A single apheresis unit or equivalent.
  - Greater doses are not more effective,
  - Lower doses equal to one half of a standard apheresis unit are equally effective.
- Grade : strong
- Strength of recommendation : moderate-quality evidence

[2] Adult Patients Having Minor Invasive Procedures

\*\* Recommendation 2:

Prophylactic platelet transfusion for patients having elective central venous catheter placement

- Platelet count : less than  $20 \times 10^9$  cells/L.
- Grade : weak



- Strength of recommendation : low-quality evidence

\*\* Recommendation 3:

Prophylactic platelet transfusion for patients having elective diagnostic lumbar puncture

- Platelet count : less than  $50 \times 10^9$  cells/L.
- Grade : very low
- Strength of recommendation: weak

[3] Adult Patients Having Major Elective Nonneuraxial Surgery

\*\* Recommendation 4:

Prophylactic platelet transfusion for patients having major elective nonneuraxial surgery

- Platelet count : less than  $50 \times 10^9$  cells/L.
- Grade : very low
- Strength of recommendation: weak.

\*\* Recommendation 5:

Routine Prophylactic platelet transfusion for patients who are nonthrombocytopenic and have cardiac surgery with cardiopulmonary bypass (CPB).

The AABB suggests platelet transfusion for patients having CPB who exhibit perioperative bleeding with thrombocytopenia and/or with evidence of platelet dysfunction.

- Grade : very low
- Strength of recommendation: weak

[4] Adult Patients Receiving Antiplatelet Therapy Who Have Intracranial Hemorrhage (Traumatic or Spontaneous)

\*\* Recommendation 6:

The AABB cannot recommend for or against platelet transfusion for patients receiving antiplatelet therapy who have intracranial hemorrhage (traumatic or spontaneous).

- Grade : very low
- Strength of recommendation: uncertain.