Apheresis Platelets

How Supplied:

Only leukocyte-reduced apheresis platelets are supplied by Versiti**.** These platelet products are considered equivalent to 4-6 pooled, whole blood-derived platelets.

Pathogen-Reduced (PR) Platelets

- Post-collection manufacturing involving amotosalen plus ultraviolet-A light treatment that inactivates DNA replication in cells and prevents replication of bacteria, viruses and protozoa, and donor lymphocytes.
- Platelet content of 3.0 x 10^{11} or greater
- Platelets are suspended in 100% plasma
- Volume is specified on product label and generally ranges from 205-350 mL
- **Expiration is 5 days**

Large Volume Delayed Sampling (LVDS) Platelets-7D

- Apheresis platelet that has 16 mL removed **48 hours or longer** after collection for aerobic and anaerobic cultures that are then incubated for at least 12 hours and if negative platelet labeled for distribution.
- Platelet content of 3.0 x 10^{11} or greater
- Volume is specified on product label and generally ranges from 180-350 mL
- **Expiration is 7 days**

Large Volume Delayed Sampling (LVDS) Platelets-5D

- Apheresis platelet that has 16 mL removed **36 hours or longer** after collection for aerobic and anaerobic cultures that are then incubated for at least 12 hours and if negative platelet labeled for distribution.
- Platelet content of 3.0 x 10^{11} or greater
- Volume is specified on product label and generally ranges from 180-350 mL
- **Expiration is 5 days**
- Expiration can be extended up to 7 days if secondary bacterial detection testing performed **at hospital**

Low-Yield Apheresis Platelets

- PR or LVDS Platelet that contains 2.6 to 2.9 x 10^{11} platelets
- Provides an adequate hemostatic platelet dose (See **Low Yield Platelets: Safety and Efficacy for Patient Care**)
- Volume is specified on product label and generally ranges from 180-350 mL
- Expiration is based on the manufacturing method

Utilization Review Guidelines:

Platelets are administered for the prevention or treatment of bleeding in patients with thrombocytopenia or platelet function defects. Documentation of the indication(s) for a transfusion episode and special circumstances for transfusion that take place outside these guidelines is recommended.

Best Practice:

- Transfusion to a platelet count of >50,000/µL is generally recommended in actively bleeding patients.[1]
- Prophylactic transfusion in non-bleeding patients is based on underlying condition, bleeding risk and clinical judgement.
- When indicated, a single dose of platelets (one unit Apheresis Platelets) should be given followed by re-assessment to determine the need of additional doses.[1]

Indications:

Therapeutic

1. Active bleeding ***and*** platelet count <50,000/µL or presumed/known platelet function defect
2. In the setting of massive transfusion support for patients who are hemorrhaging

Prophylactic

1. Hematology/oncology patients:[1-5]
    - Platelet count <10,000/µL in stable patient
    - Platelet count <20,000/µL ***and*** presence of risk factor for bleeding (h/o bleeding, infection/sepsis, disseminated intravascular coagulopathy)
2. Surgical/invasive procedures:[1,6]
    - Platelet count <100,000/µL for central nervous system (CNS), eye, airway, or other areas where there is high risk of microvascular bleeding[7]
    - Platelet count <50,000/µL for non-neuraxial surgery procedures[2]
    - Acquired or congenital platelet function defect
    - Open heart surgery and cardiopulmonary bypass ***with*** perioperative bleeding and thrombocytopenia (platelet count <50,000/µL) and/or platelet dysfunction[8]
3. Interventional radiology procedures:[9]
    - For patients undergoing procedures associated with low bleeding risk (e.g. non-tunneled or tunneled venous catheter placement and removal, paracentesis, thoracentesis), consider platelet transfusion if platelet count <20,000/µL
    - For patients undergoing procedures with a high risk of bleeding (e.g. solid organ biopsies, gastrostomy or gastrojejunostomy tube placement, epidural injections, nephrostomy tube placement, transjugular intrahepatic shunt placement), consider platelet transfusion if platelet count <50,000/µL

Contraindications

1. Platelet transfusion is generally contraindicated, unless there is a life-threatening bleed, in thrombotic thrombocytopenic purpura, hemolytic uremic syndrome or heparin-induced thrombocytopenia.[7]
2. Prophylactic platelet transfusions are generally not indicated for patients with chronic, stable, severe thrombocytopenia (i.e. aplastic anemia or myelodysplasia) or immune thrombocytopenia (ITP). Platelet transfusions for bleeding episodes are more appropriate.[2]

Dosing Recommendations:

- Transfuse 1 unit of SDP and reassess to determine adequate rise in platelet count.

Expected Outcomes:

1. Platelet count increments after transfusion of a single unit of SDP in a non-bleeding adult is highly variable and ranges from 15,000-50,000/µL based on patient's clinical condition and Illness, patient size, and platelet dose.[10]
2. Lower post-transfusion platelet count increments may be seen in oncology patients.[11,12]

Comments:

Patients on Anticoagulants/Antiplatelet Therapy

- The role of platelet transfusion for patients on antiplatelet therapy with intracranial hemorrhage and a normal platelet count is unknown. In the PATCH study,[13] the transfusion group trended towards worse outcomes compared to the non-transfused group. However, evidence to support or refute the practice is limited. The decision to transfuse platelets should be an individual clinical decision since the efficacy of such practice is unknown.[14]
- For patients on anticoagulation (e.g. heparin or direct oral anticoagulants), a platelet threshold of <50,000/µL for *prophylactic* transfusion may be considered.[15]
- Recommendations for stopping anticoagulation and/or antiplatelet medication prior to invasive procedures vary and are dependent on the clinical status of the patient, including risk for thrombosis and bleeding; procedural bleeding risk; and pharmacological characteristics of the drug being held.[9]

Platelet Function Testing

- Platelet function tests may help assess the level of platelet inhibition and timing of surgical procedure.[8,16] The availability of platelet function testing varies by institution. Platelet Function Assay (PFA)-100, VerifyNow, thromboelastography (TEG) and rotational thromboelastometry (ROTEM) are some of the assays that could be considered in the assessment of the platelet contribution to hemostasis.[8,17,18]
- Platelet function defects should be documented by abnormal laboratory assessment of platelet function; or presumed due to hypothermia, medications that inhibit platelet function, or mechanical devices that affect platelet function.

Adjunct Therapy

- Consider the administration of desmopressin (DDAVP) in addition to administration of platelets to control refractory bleeding in patients with uremia, cardiopulmonary bypass-induced platelet dysfunction, or type I von Willebrand disease.[7-9]

Dosing Strategy in Oncology Patients

- In the PLADO trial[11] no difference in bleeding outcomes was noted in adult hospitalized patients with hematologic malignancies undergoing chemotherapy or stem cell transplantation whether they received low-dose, standard-dose or high-dose platelet transfusions. The higher dose strategy provided no additional hemostatic benefit. Either low-dose or standard-dose platelet transfusion strategy is recommended for patients receiving myelosuppressive chemotherapy and requiring prophylactic platelet transfusions.
- Two controlled trials studied prophylactic (platelet count <10,000/μL) versus therapeutic (only when bleeding occurred) platelet transfusion strategy in patients with hematologic malignancies. While reduced platelet transfusions occurred in the therapeutic group, the incidence of bleeding was higher. These results support the continued use of prophylactic platelet transfusions in patients with hematologic malignancies receiving chemotherapy.[19,20]
- A recent retrospective study in adult, oncology outpatients who received 1 vs 2 units of apheresis platelets for prophylaxis showed that while the transfusion with 2 units temporarily increased the patient's post-transfusion platelet count, it did not impact the interval between subsequent outpatient transfusions.[21]

Platelet Refractoriness

- Patients with an inadequate rise in 10 minute to 1-hour post-transfusion platelet count (e.g. absolute increment of <10,000/μL) on two separate ABO-compatible transfusion events may benefit from further investigation for platelet refractoriness (i.e. HLA antibody studies).[2,12]
- In patients with platelet transfusion refractoriness and the presence of significant HLA antibodies (calculated Panel-Reactive Antibody of 20% or higher), consider selection of HLA-matched or crossmatched platelets.[2,7]
- Contact your Versiti Hospital Relations Specialist for information on availability and/or ordering process for HLA-matched or crossmatched apheresis platelets.
- There is no evidence that HLA-alloimmunized patients benefit from use of random apheresis platelets (non HLA-matched or non-crossmatched) for *prophylactic* platelet transfusion unless an increase in post-transfusion platelet count increment is seen. It is generally recommended that such patients be transfused for bleeding events only.[2]
- In the event of unexpected or active bleeding (e.g. trauma or surgery) when HLA-matched platelets are not available or in limited supply, random apheresis platelets may provide temporary hemostatic benefit. It is best to transfuse random apheresis platelets and reserve HLA-matched platelets (if available) for use once bleeding is controlled.[12]

- Other causes of platelet transfusion refractoriness include:[12]
    - Massive bleeding
    - Fever
    - Sepsis
    - Hypersplenism/hepatomegaly
    - DIC (Disseminated Intravascular Coagulopathy)
    - Transplant regimens
    - Drugs (such as antibiotics)
    - TTP (Thrombotic Thrombocytopenia Purpura)
    - Effects of storage on platelets

Pathogen Reduced Platelets

- Multiple randomized controlled studies exist comparing the efficacy of pathogen-reduced to conventional platelets. A 2017 Cochrane review of 12 clinical trials with 1,981 patients concluded that pathogen-reduced (PR) platelets do not increase the risk or mortality, clinically significant bleeding or serious adverse events when compared to conventional platelets. However, increased platelet transfusion requirements and risk of platelet refractoriness has been documented with PR platelets.[22]

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Additional Resources:

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