BLOOD PRODUCT UTILIZATION

Who gets what & when

BLOOD PRODUCT UTILIZATION

Blood given only when necessary
Specimen for crossmatch required
Specimen for crossmatch MUST be properly identified
- Name of patient
- Unit Number
- Date
- Initials of phlebotomist on tube & requisition

Why not to give blood?
- Volume Expander
- For specific number (except as related to procedures)
- To patients with religious objections to blood transfusions

BLOOD PRODUCT UTILIZATION

Autologous blood best
If autologous blood not available, then blood from the general donor pool is next safest
Designated donors to be discouraged strongly

BLOOD PRODUCT UTILIZATION

Whole blood - Virtually never used
Platelets
Fresh frozen plasma
Cryoprecipitate
Packed RBCs
Concentrates

Irradiation - To prevent graft vs host disease - Kills lymphocytes in transfused unit
BLOOD PRODUCT UTILIZATION

Leukodepletion Filtration
- Removes WBCs
- Decreases sensitization
- Prevents CMV spread
- Mostly done at point of processing at present
- All products currently given here are leukodepleted

20,000 figure comes from acute leukemia data, & consists of 1 poorly done study
- In aplastic anemia patients, not infected, CNS bleeding did not increase until platelets < 5000

CMV-Negative Products
- 50% of population CMV Negative
- CMV Negative blood reserved for:
  - Neonates
  - Transplant Patients
    - Allogeneic Bone Marrow Transplant
    - Heart/Lung/Liver/Pancreas/Gut Transplants
    - Autologous Bone Marrow Transplant
    - Renal Transplant
  - If CMV Negative Products not available, leukodepletion filtration as good for removing CMV

Platelet Transfusions - Prophylactic
- If not febrile, < 10,000/µl
- If febrile, < 20,000/µl

Platelets
- Used for patients with thrombocytopenia
  - < 20,000 prophylactically, or
  - < 50,000 & bleeding or in need of a procedure

Platelets - Exceptions to 10,000 rule
- ITP, TTP, Myelodysplastic syndromes, or aplastic anemia
  - Platelets for bleeding or procedures ONLY
- Platelets with known thrombocytopenia may require platelets even with normal count
  - Patients who have received Reopro® may require double dose
- In general, for patient in ER, use platelets only for bleeding problems
BLOOD PRODUCT UTILIZATION

**Platelets - Special Needs**
- Single donor platelets – Mostly for leukodepleted units; most of what is now given
- Random donor platelets – rarely used anymore
- HLA Matched platelets - only for sensitized patients
- Platelet Cross-Match

**Fresh Frozen Plasma**
- For repletion of clotting factors
- TAKES ½ HOUR TO THAW!
- Usual dose for adult is 4-6 units (2 units virtually useless)
- Should not be used for volume resuscitation alone
- Only good for 4-6 hours

**Cryoprecipitate**
- Fraction of blood that doesn't dissolve on thawing at 4° C
- Rich in fibrinogen, fibronecin, factor VIII, von Willebrand factor
- For correcting hypofibrinogenemia, treating von Willebrand disease
- Also used in renal dysfunction to correct uremic thrombocytopenia

**Packed Red Blood Cells**
- Used to increase oxygen carrying capacity
- Transfuse for symptoms, not for number
- No blood/hemoglobin substitute currently available

**Massive Bleeding/Hemodilution**
- Usually surgical bleed
- Try to tailor products to studies - esp PT, fibrinogen, platelet count; based on fact that 30% of normal value of any clotting factor is ordinarily hemostatic
- FFP for PT > 21 seconds
- Platelets for count < 50,000
- Cryoprecipitate for fibrinogen < 100
**PT Dilution Curve for Current PT Reagent**

- **HEMOSTATIC**
- **NON-HEMOSTATIC**
- **Current Plasma Transfusion Audit Guideline = 40% Plasma Factors**
- **Old Plasma Transfusion Audit Guideline = 1.5 mean**

**Current reagent (PT ISI=1.31)**

**Old reagent (PT ISI=2.079 pre-1998)**

**DILUTIONAL COAGULOPATHY**

**Treatment**

- **Guided by numbers:**
  - Platelets - 6 unit packs; 1 pack should raise count of average sized adult by 40,000-50,000
  - FFP - 4 units at a time minimum; sometimes 6-8 units depending on coags & volume of bleeding
  - Cryoprecipitate - For raising fibrinogen quickly, & in cases of fibrinolysis
  - Factor concentrates - To be avoided if possible b/o high risk of DIC

**BLOOD PRODUCT UTILIZATION**

- Used in exsanguination
- Prefer Type specific (takes 5 minutes)
- If no time for typing, O positive should be used for males & females beyond childbearing years; O negative reserved for females of childbearing years
- Crossmatching is done retrospectively

**Factor Concentrates**

- Hemophilia A
- Hemophilia B
- Von Willebrand disease
- Factor XI deficiency (Israel only)
- Recombinant Factor VIII
- Other clotting factor deficiencies

**BLOOD PRODUCT UTILIZATION**

- Small volume of administration
- Safest products on market RE: viral disease transmission
- Exact product to be used depends on patient’s deficiency
- **ALL REQUIRE HEMATOLOGY APPROVAL!**
BLOOD PRODUCT UTILIZATION

Designated vs Random Donors

- Donor pool safer than designated donors:
  - Greater than 90% of donor pool is repeat donors, eliminating window period for many tests
  - > 95% of designated donors are first time donors
  - People are not always honest RE: risk factors