

PRACTICE GUIDELINE

Effective Date: 2-17-04

Manual Reference: **Deaconess Trauma Services**

TITLE: BLOOD AND BLOOD PRODUCT TRANSFUSION (Reference to the Massive Blood Transfusion Protocol)

PURPOSE: To provide guidelines for the transfusion of blood and blood products in the trauma patient.

DEFINITIONS:

1. Packed red blood cells: A blood product that contains red blood cells with most of the plasma eluted off. The average hematocrit of PRBC's is 70%. Each unit of PRBC's (220 ml) will raise the hematocrit by about 3%.
2. Fresh frozen plasma: A blood product that contains fresh components of plasma, including colloid proteins and clotting factors.
3. Platelets: A blood product that contains primarily platelets suspended in a small amount of plasma drawn from a single donor. Each unit of plateletpheresis (six units of random platelets) will raise the count by approximately 60,000.
4. Cryoprecipitate: A blood product component of plasma that primarily contains Factor VIII, Factor V and fibrinogen. This is the best blood product for treatment of low fibrinogen (<150 mg/dL).

GUIDELINES:

1. Resuscitation in the ED will begin with lactated ringers solution infused through large-bore IV catheters. In hypotensive patients, 2000 ml should be administered as rapidly as possible.
2. Upon initiating resuscitation, send blood sample to the Blood Bank for immediate type and cross. If blood requirements will be excessive, initiate the massive blood transfusion protocol.
3. In most situations, lactated ringers may be administered until type and cross-matched blood is available. However, situations will arise when O-negative or type-specific blood will be necessary.
4. O, Rho(D) negative blood is available immediately as emergency release. Due to limited supply of O-negative blood, consider O, Rho(D) positive blood for males and sterile or post-menopausal females.
 - a. Indications:
 - i. Only used in cases of severe life-threatening hemorrhage not expected to respond to crystalloid resuscitation; can almost always wait until type-specific blood is available.
 - ii. Obvious major bleeding during transport with subsequent impending cardiac arrest due to anemia (not hypovolemia).
 - iii. Major bleeding in the trauma room resulting in hypotension requiring transfusion prior to availability of type-specific blood.

- b. Risks: about 1.3% of all patients will have a clinically significant antibody other than anti-D. These patients are at risk for delayed hemolytic transfusion reaction.
- 5. Uncross-matched, ABO, Rho (D) compatible blood: available in 10 minutes after sample received in the Blood Bank; requires signed release form.
 - a. Indications:
 - i. Hypotensive; hematocrit <25% prior to availability of cross-matched blood.
 - ii. Hypotensive; obvious source of ongoing bleeding prior to availability of cross-matched blood.
 - iii. Hypotensive with need for immediate laparotomy/thoracotomy.
 - b. Risks: same as above, but prevents depletion of O-negative blood supply.
- 6. Type and cross-matched: Four units available in 35 minutes after sample received in the Blood Bank.
 - a. Indications:
 - i. Usual transfusion indications.
 - ii. Blood loss does not stop immediately after the patient arrives in the hospital. Occult hemorrhage into contusions, hematoma, fractures will continue.
 - b. Risks: Same as routine cross-match.
- 7. Cell-saver:
 - a. Chest tubes with exsanguinating hemorrhage.
 - i. Set up cell-saver compatible chest drainage system.
 - b. Abdominal or chest injuries with exsanguinating bleeding.
 - i. Call OR.
 - ii. Make sure that operating room charge nurse is aware that cell-saver system and technician will be needed.
- 8. Fresh frozen plasma: available in 15-20 minutes after sample received in the Blood Bank.
 - a. Absolute indications:
 - i. Patient with serious bleeding injury who is anticoagulated on Coumadin.
 - ii. Documented coagulopathy due to dilution or DIC.
 - iii. Consider administration of 4 to 8 units as ordered by physician as soon as it is available.
 - iv. Consider simultaneous PRBC administration with massive blood transfusions.
 - b. Relative indications:
 - i. Elevated PT/PTT.
 - ii. Refer to Massive Blood Transfusion Protocol.
- 9. Platelets: available in 30-45 minutes after sample received in the Blood Bank.
 - a. Absolute indication: evidence of bleeding with a platelet count <50,000.
 - b. Relative indications:
 - i. Potential bleeding with platelet count <20,000.
 - ii. Massive transfusion with non-surgical bleeding before the platelet count can be obtained.

- iii. Consider giving one unit of platelet pheresis or six units of platelets as ordered by physician after every tenth unit of PRBC's in massive transfusion.
10. Cryoprecipitate: available 15-20 minutes after sample is received in blood bank.
- a. Absolute indication: non-surgical bleeding with fibrinogen <100 mg/dL.
 - b. Relative indication: non-surgical bleeding after massive transfusion before a fibrinogen level can be obtained.

REFERENCES:

- Critical Care Policy and Procedure Manual, A – 13: AUTO TRANSFUSION
- Deaconess Trauma Guideline Manual, AUTO TRANSFUSION OF BLOOD USING THE PLEUROVAC CHEST DRAINAGE SYSTEM.
- Deaconess Hospital Policy and Procedure Manual 40-55 (June 2, 2008 version), MASSIVE BLOOD TRANSFUSION.
- Deaconess Hospital Blood Bank Policy and Procedure Manual BB 2.7B (May, 08 version), MASSIVE BLOOD TRANSFUSION PROTOCOL.
- Deaconess Hospital Laboratory Policy and Procedure Manual, BLOOD USAGE REVIEW PROGRAM.

REVIEWED DATE	REVISED DATE
JAN 05	2-19-07 Hospital P&P
JAN 06	JAN 08
JAN 07	5-16-08 Blood Bank Policy
	6-2-08 Hospital P&P