New York State Council on Human Blood and Transfusion Services

GUIDELINES FOR THE

ADMINISTRATION OF PLASMA

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GUIDELINES FOR THE ADMINISTRATION OF PLASMA

INTRODUCTION

Plasma is the liquid, non-cellular portion of blood, and contains water, electrolytes and proteins. Several types of plasma are available for transfusion. All contain coagulation proteins, but in different relative amounts. With rare exceptions, they are all used in treating patients with coagulation deficits.

The usual initial plasma dose for coagulation deficits is 10 - 20 mL/kg, which usually amounts to four to eight units of plasma in an adult. Patients who are actively bleeding or who have consumption of coagulation factors (disseminated intravascular coagulation, or DIC) may require larger doses or repeated treatments. Whenever large volumes of plasma are administered, consideration must be given to the patient's cardiovascular system ability to adapt to the volume load.

When plasma is given prophylactically prior to invasive procedures, the timing of administration should take into account the half-life of the coagulation factor(s) in need of replacement.

I. FRESH FROZEN PLASMA

A. Description

Fresh frozen plasma (FFP) is plasma frozen within six to eight hours of collection (depending on the anticoagulant used), and stored at minus 18 degrees Celsius or lower for up to one year. FFP is prepared either by separation from whole blood or collection via plasmapheresis. A single FFP component unit usually consists of 200 - 300 mL, whereas a plasmapheresis unit may vary from 200 mL to several times that amount. FFP contains all known coagulation and anticoagulant proteins in concentrations found in normal individuals.

B. Indications

1. Prophylaxis associated with invasive procedures in non-bleeding patients with acquired coagulation defects.

   Plasma is appropriate for nonbleeding patients who are at significant risk for bleeding (*e.g.,* due to liver disease) in association with invasive procedures, in association with prolonged coagulation test results, generally prothrombin time

(PT) and/or activated partial thromboplastin time (aPTT) greater than 1.5 times the mean of the reference range. Abnormal coagulation tests *per se* are not invariably indications for FFP. Therapy should be tailored to each specific patient. In addition to any deficiencies, inhibitors should be considered as well.

2. Emergency surgery in a non-bleeding patient on warfarin with a PT greater than 1.5 times the mean of the reference range, whenever time does not permit warfarin-induced factor deficiency reversal with vitamin K. Concurrent administration of vitamin K should be considered depending on the urgency of the case and the specific clinical situation.

3. Prophylaxis in non-bleeding patients with known hereditary coagulation abnormalities.

   Plasma is appropriate for non-bleeding patients with a known, single coagulation factor deficiency for which no specific factor concentrate is available and who are at significant risk for bleeding related to an invasive procedure. Plasma may also be appropriate for non-bleeding patients with a personal or family history of bleeding associated with invasive procedures.

4. Bleeding patients with acquired multiple coagulation factor deficiencies.

   Such patients may include those with liver disease, DIC, trauma, massive transfusion or other medical conditions, as well as those receiving warfarin or similar anticoagulants.

5. Bleeding patients with known, hereditary coagulation factor deficiencies.

   Plasma should be limited to patients for whom clotting factor concentrates are not available.

6. Thrombotic thrombocytopenic purpura (TTP) or other thrombotic microangiopathy (*e.g.*, hemolytic uremic syndrome or HELLP syndrome).

7. Rare indications

   a. factor XIII deficiency, as an alternative to cryoprecipitate;

   b. prophylactic or therapeutic replacement of anticoagulant proteins (*e.g.,* antithrombin, protein C, protein S) whenever specific concentrates are not available; and

   c. CI esterase inhibitor deficiency (life-threatening hereditary angioedema).

II. OTHER PLASMA COMPONENTS

A. Description

1. Liquid Plasma: Plasma prepared from whole blood. It is stored unfrozen at between one and six degrees Celsius, and can be transfused up to five days after the expiration date of the whole blood. Liquid plasma may contain reduced amounts of factors V and VIII.

   Plasma prepared from outdated whole blood contains higher concentrations of potassium and ammonia than plasma initially prepared as FFP.

2. Thawed Plasma: FFP prepared in a closed system, but not transfused within 24 hours after thawing. It can be stored between one and six degrees Celsius and used up to five days after thawing. Thawed plasma may contain reduced amounts of factors V and VIII.

3. Plasma Frozen Within 24 Hours after Phlebotomy: Plasma stored between one and six degrees Celsius, frozen within 24 hours after phlebotomy, and transfused either immediately or up to five days after thawing. If not administered within 24 hours of thawing, such plasma may contain reduced amounts of factors V and VIII.

4. Plasma Cryoprecipitate Reduced (Cryo-poor plasma): Plasma from which cryoprecipitate has been removed. It is deficient in fibrinogen, factors VIII and XIII, and von Willebrand factor.

Note: Each of the plasma components above must be labeled or relabeled prior to storage.

B. Indications for Other Plasma Components

These components have indications similar to those for FFP, including both congenital and acquired deficiencies of the stable clotting factors (including II, VII, IX, X, XI, and XIII), if specific factor concentrates are unavailable or inappropriate.

III. SITUATIONS IN WHICH FFP AND LIQUID PLASMA ARE NOT INDICATED

A. for patients with abnormal coagulation tests due to clotting factor deficiencies, coagulation factor inhibitors, or heparin;

B. for volume expansion;

C. as a nutritional supplement or protein source;

D. prophylactically in massive transfusion in the absence of documented coagulopathy;

E. prophylactically following cardiopulmonary bypass;

F. to promote wound healing; and

G. for patients with hypoglobulinemia.

IV. SPECIAL CONSIDERATIONS

A. Upon completion of thawing, FFP should be either transfused immediately, or stored at between one and six degrees Celsius. When it is administered as a source of labile coagulation factors, FFP should be transfused within 24 hours of thawing.

B. The indications and dosage for autogeneic plasma components do not differ from those for allogeneic plasma.

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