



Oklahoma Blood Institute
TRANSFUSION TRIBUNE
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HOW IS CRYOPRECIPITATE MADE?

Cryoprecipitate is made when a unit of Fresh Frozen Plasma (FFP) is thawed at 1-6° C and a white precipitate forms, which is the cryoprecipitate. A single unit is approximately 10-15 ml. It must be frozen to -18°C within one hour and has a shelf life (frozen) of one year. On average, a single unit of cryoprecipitate contains >80 units of Factor VIII:C, >150 mg fibrinogen: ~20-30% of Factor XIII, and 40-70% of the original vonWillebrand's factor present in the initial unit of FFP. Cryoprecipitate does NOT contain all of the coagulation factors as in 24hr Plasma or FFP.

New Pooled Cryoprecipitate Product

OBI has a new pooled cryoprecipitate product, which consists of 5 single cryoprecipitate units that have been pooled into one product. This new pooled product is approximately 100 ml and contains > 400 units of Factor VIII and > 750 mg of fibrinogen.

INDICATIONS FOR CRYOPRECIPITATE

Cryoprecipitate may be indicated in the treatment of patients with acquired or congenital fibrinogen deficiency or a deficiency of Factor XIII. If virus-inactivated concentrates are not available, cryoprecipitate can be used in patients with hemophilia A or vonWillebrand's Disease. It is also used in the treatment of DIC; however, it should not be used as the only treatment because it does not contain Factor V. Cryoprecipitate can be mixed with thrombin to form a gel (fibrin glue), which can be used to aid in local surgical hemostasis. Cryoprecipitate can also be used to treat bleeding secondary to uremia; however, desmopressin (DDAVP) should be tried first because of its lack of potential transfusion associated disease. Desmopressin acetate is a drug that causes the release of stored Factor VIII:C, vonWillebrand's factor, and plasminogen activator from endothelial cells and macrophages. The mechanism of action is not completely understood. It is used to treat congenital platelet function disorders and some cases of hemophilia A and vonWillebrand's Disease (not type IIB.) DDAVP has also been reported to decrease bleeding in some patients after cardiac bypass surgery and in patients with uremia. DDAVP cannot be used continuously as it will deplete the stores of coagulation factors.

Dosage

The dose of cryoprecipitate is variable and depends on the clinical condition of the patient. Generally, the dosage is one single bag of cryoprecipitate for every 10 kg of body weight or

one new pooled product/50 kg. A formula for calculating the units of Factor VIII needed is shown as an example.

$$\# \text{ units Factor VIII} = \frac{\text{PV} \times (\text{desired level \%} - \text{initial level \%})}{100}$$

$$\text{Bags of Cryo} = \frac{\# \text{ units of Factor VIII}}{80 \text{ or } (400)^*}$$

PV = Plasma vol. (ml) = 40 mL/kg x body weight (kg)

% = level of Factor VIII

* = use 400 for OBI's pooled component

ADMINISTRATION

Cryoprecipitate must be given through a standard blood filter. Cryoprecipitate can be infused as rapidly as the patient can tolerate the volume change. Once cryoprecipitate is thawed, it must be stored at room temperature and used within six hours (or four hours if pooled.) Treatment responses should be monitored by appropriate laboratory tests and evaluation of the clinical condition. Crossmatching of cryoprecipitate is not needed. ABO compatibility is preferred but not necessary. RH type does not need to be matched.

INDICATIONS FOR CRYOPRECIPITATE

- Fibrinogen replacement
- Factor XIII Deficiency
- Control of bleeding due to Factor VIII:C deficiency or vonWillebrand's Disease when factor concentrates are not available.

FACTOR VIII CONCENTRATES

These preparations can be made with recombinant technology or derived from human plasma and all are subject to viral inactivation techniques. The number of units of Factor VIII contained in each vial is stated on the product label. Factor concentrates are available through the pharmacy.

TRANSFUSION REACTIONS

Allergic reactions are the most common type of transfusion reaction seen with cryoprecipitate and symptoms include urticaria, wheezing, chills and fever. Rarely hypotension or anaphylaxis can occur, usually in patients with IgA deficiency who have developed antibodies to IgA. Whenever a transfusion reaction is suspected, the unit should be stopped and a transfusion reaction work-up begun. All suspected transfusion reactions must be reported to the blood bank.