

CRYOPRECIPITATE: Cryoprecipitate consists of the frozen precipitate from one unit of fresh frozen plasma. Units of Cryoprecipitate (usually ordered as one unit for each 10 Kg of patient weight) are thawed and pooled together, and the pooled product must be transfused within 4 hours after pooling. Some blood collection centers also provide “pre-pooled” Cryoprecipitate units, which have been pooled following collection, prior to freezing.

Cryoprecipitate is almost only given to treat fibrinogen deficiency, acquired or congenital, or for Factor XIII deficiency.

A Blood Bank Pathologist must be on-call at all times, and can be reached through the Blood Bank.

CRYOPRECIPITATE definitions: Cryoprecipitate consists of the proteinaceous precipitate collected from one unit of fresh frozen plasma after thawing at 4° C and centrifugation. The overlying plasma (Cryo-reduced plasma) is decanted, and the unit of Cryoprecipitate is frozen within one hour for storage. One unit of Cryoprecipitate has a volume of approximately 15 mL, and must contain at least 150 mg fibrinogen, but usually contains about 250 mg fibrinogen per unit. One unit of Cryoprecipitate also contains 40 to 60 IU of Factor XIII, and at least 80 IU of Factor VIII, and 80 to 120 IU of von Willebrand factor.

Due to the plasma component, Blood Banks will usually pool and dispense Cryoprecipitate which is ABO-compatible with the recipient's RBCs; however, depending on Blood Bank inventory and anticipated hospital needs, the Blood Bank may need to include ABO-incompatible units. Because of the small amount of plasma (15 mL) per unit, recipient hemolysis in these cases will be subclinical. Neonates, and in most cases all infants, 4 months or less, are always provided ABO-compatible Cryoprecipitate.

The thawed and pooled product of Cryoprecipitate must be transfused within 4 hours after being pooled. Unused Cryoprecipitate which is kept at room temperature can be returned to Blood Bank inventory, but will continue to outdate 4 hours after pooling. Single units, which are not pooled, can be thawed and kept at room temperature for up to 6 hours. Cryoprecipitate is considered to be an acellular blood product, so requests for Special Attributes do not apply.

CRYOPRECIPITATE dosages and indications: The usual dosage of Cryoprecipitate for adults is one unit for each 10 Kg of patient weight, which are pooled by the Blood Bank, and transfused over 1 to 2 hours via a standard 180 to 260 micron filter. Most often a dosage of 10 pooled units is given, which provides approximately 2500 mg of fibrinogen. The dose can be 20 pooled units if the patient's fibrinogen is less than 50 mg/dL. The usual dosage for infants and children is 5 to 10 mL/Kg, and usually 5 mL/Kg for preterm and term neonates. Transfusion of Cryoprecipitate must be completed within 4 hours after pooling by the Blood Bank. Drugs or medicines must NOT be infused via the same intravenous line during the transfusion.

Cryoprecipitate is almost only indicated to treat fibrinogen deficiency, whether quantitative [hypofibrinogenemia (congenital or acquired)] or qualitative (dysfibrinogenemia). Hypofibrinogenemia is most often acquired, secondary to acute loss by massive hemorrhage or due to inadequate production due to liver disease. Cryoprecipitate is recommended for patients with fibrinogen less than 100 mg/mL, or less than 120 mg/mL if there is associated bleeding or the patient is on ECMO. One unit of Cryoprecipitate per 10 Kg of body weight will raise plasma fibrinogen by approximately 50 mg/dL, unless there is continued bleeding or consumption, e.g. DIC. The plasma half-life of fibrinogen is about 4 days. Excessive fibrinogen (higher than 800 to 1000 mg/dL) can potentiate fibrinolytic bleeding diatheses by competitively interfering with the extension of fibrin polymerization reactions.

Factor XIII deficiency may be acquired, i.e. with isoniazid therapy, or it may be congenital (rare). One unit of Cryoprecipitate per 10 to 20 Kg may be given every 3 to 4 weeks because of the long half-life of Factor XIII (about 10 days); however, if acquired inhibitors to Factor XIII are present, plasmapheresis, and possible immunosuppression, is recommended. Recombinant factor XIII is now available, but is in limited supply.

Cryoprecipitate is no longer the treatment of choice for hemophilias A or B, nor for type I von Willebrand's disease, because recombinant or plasma-derived Factor VIII products, such as Humate P, which contain von Willebrand factor, are now available. There is evidence that uremic thrombocytopathy may be ameliorated with supplemental von Willebrand factor, but Cryoprecipitate should only be considered after hemodialysis treatment and administration of DDAVP (which raises intrinsic von Willebrand factor levels).

Cryoprecipitate is available for surgical use as topical sealant; however, commercially available fibrin sealants are replacing this usage of Cryoprecipitate.

CRYOPRECIPITATE contraindications and hazards: Cryoprecipitate is a plasma subfraction, so the potential risks and hazards of Plasma (i.e. TRALI, hypersensitivity, anaphylaxis) can occur (see **Transfusion Reactions**). Due to the much smaller quantity of plasma (approximately 15 mL) in each unit of Cryoprecipitate, the risk of such immune-mediated complications is less. Large volumes of ABO-incompatible Cryoprecipitate may cause the patient to develop a positive DAT, and, rarely, mild hemolysis. As noted above, high levels of fibrinogen (higher than 800 to 1000 mg/dL) can potentiate fibrinolytic bleeding diatheses.