

FIBRIN GLUE

1.0 INTRODUCTION

Cryoprecipitate is a blood product that has a high concentration of fibrinogen, fibronectin, von Willebrand factor and factor XIII. It also contains all other plasma proteins. It can be clotted with thrombin to form a tough adhesive coagulum that has been found to be clinically useful as a fibrin glue.

2.0 NATURE OF FIBRIN GLUE PRODUCT

Fibrin glue contains the fresh blood product – cryoprecipitate. Cryoprecipitate has not been subjected to disinfection procedures and has a similar level of risk for transmission of infectious viral agents as other fresh blood components, such as fresh frozen plasma. As each pack of cryoprecipitate is prepared from only one donor and has not been manufactured from a large pool of plasma donors the risk for transmission of a clinically significant infection such as Hepatitis B or C, or HIV, is very small.

Informed consent should be obtained before surgical procedures in which fibrin glue is likely to be required.

Bovine thrombin is a bovine protein solution. It should not be used if there is a known allergy to bovine proteins. The manufacturer's information insert should be consulted for other relevant information.

Exposure of the recipient to bovine thrombin may lead to production of a bovine thrombin antibody. If formed, this antibody will persist and permanently interfere with the thrombin clotting time test.

3.0 COMMON INDICATIONS FOR USE OF FIBRIN GLUE

- Sealing potential leaks in dura mater.
- Assisting with haemostasis on large traumatised bleeding surfaces in life-threatening conditions, eg liver trauma, and occasionally in cardiac surgery, or where it is not easy to secure haemostasis as with leaking vascular suture lines.
- Middle ear and microsurgical procedures where there is difficulty in securing critical structures in the desired position.

4.0 INSTRUCTIONS FOR PREPARATION

Fibrin glue is for topical use only – NOT for intravenous injection

You will need:

- Cryoprecipitate: The Blood Bank can provide bags of cryoprecipitate for use in making fibrin glue. Each bag contains approximately 100 ml cryoprecipitate at a minimum concentration of fibrinogen of 7.5g/L (average 14 g/L). Obtain from your Blood Bank.
- Topical Bovine Thrombin (Thrombostat Parke Davis): 5000 units, supplied with a 5ml diluent bottle. Obtain from your Hospital Pharmacy.
- Fibrinolytic inhibitor: either tranexamic acid or epsilon aminocaproic acid (injectable solution) as a stabiliser for the fibrin glue. Obtain from your Hospital Pharmacy.

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- Calcium gluconate for injection or calcium chloride for injection. Obtain from your Hospital Pharmacy
- Saline diluent for the thrombin, fibrinolytic inhibitor and calcium: Either a 50ml bag of 0.9% saline or a sterile mixing bag and saline 0.9% for IV use.

5.0 METHOD

5.1 Obtain Cryoprecipitate From Blood Bank

Send a standard blood product request form to the Blood Bank requesting one bag of Cryoprecipitate for fibrin glue. Note: if the blood group of the patient is not known, send blood specimens for a Group and Screen.

5.2 Prepare Diluted Thrombin Reagent (thrombin + calcium + fibrinolytic inhibitor)

Prepare solution immediately before use. Discard if not used within 6 hours. Use either a 50ml bag of saline or a sterile solution mixing bag. If using a sterile mixing bag, first add 50 ml normal saline 0.9%, then make additions as below.

5.3 Label a 50 ml Bag of Saline: Thrombin Solution NOT For IV Infusion.

5.4 Add To Saline

- Fibrinolytic inhibitor (use a tuberculin syringe to add)

Either tranexamic acid (Cyclokapron, 100 mg/ml)	0.3 ml
Or epsilon aminocaproic acid (Amicar, 250 mg/ml)	0.4ml

- Calcium

Either calcium chloride 10% (14mM/10ml)	1 ml
Or calcium gluconate 10% (2.2mM/10ml)	6 ml

- Thrombin for topical use (Thrombostat) (5000 units/5 ml)

Dissolve with the diluent provided by manufacturer

5.5 Two different fibrin glue products can be made, either

FAST CLOTTING fibrin glue	-	clots in 5-10 sec
Or SLOW CLOTTING fibrin glue	-	clots in 20-40 sec.

The surgeon must indicate which product is to be produced. Physical strength of fibrin glue produced by the slow and fast clotting thrombin solutions will be similar.

For FAST CLOTTING fibrin glue - add thrombin	1.0 ml
For SLOW CLOTTING fibrin glue - add thrombin	0.15 ml

5.6 Mix thoroughly with not less than 20 inversions of bag to mix.

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6.0 TO APPLY FIBRIN GLUE TO TISSUE:

- The usual method for application is a special dual barrel syringe dispenser; available from Micromedox (USA). NZ agent: Medtel. If not available, see instructions below:
- Two syringes of the same size are required.
- Fill one syringe with the cryoprecipitate and the other with diluted thrombin. Put the same volume in each syringe. Do not mix the two solutions in the same syringe or they will clot.
- Mop the wound surfaces dry if frank blood or other fluid is visibly present. If blood is oozing from the surface it will be necessary to use fast clotting fibrin glue and to treat only small areas at any one time, or possibly apply over the top of other absorbable pro-haemostatic materials that have been applied to limit bleeding.
- Using the dual syringe driver, dispense/squirt equal volumes of the cryoprecipitate and diluted thrombin mixture at the surgical site. Similar volumes of the two solutions must always be dispensed together to ensure clotting occurs efficiently.
- Manual mixing will be needed if a dual barrel device is not available. In this case, slow setting fibrin glue should normally be used and care is needed to dispense equal amounts of the two solutions.

7.0 MICROMEDIX SYRINGE DISPENSERS:

5ml syringes, 1:1 ratio	SA-3305
10ml syringes, 1:1 ratio	SA-3310

8.0 DUAL TIP DEVICES FOR MICROMEDIX DISPENSERS

Cannulas:

26ga, 5.7cm, malleable	SA-3605
26ga, 8.3cm, malleable	SA-3610
26ga, 17.8cm, malleable	SA-3612
20ga, 5.1cm, malleable	SA-3615
20ga, 10.2cm, malleable	SA-3618
20ga, 17.8cm, malleable	SA-3619
20ga, 26.7cm, malleable	SA-3620

Dual spray tip:	SA-3660
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