

Administration of Plasma Products

STANDARD OPERATING PROCEDURE



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Written By		Reviewed/Approved By	BluePearl Pet Blood Bank BluePearl Medical Quality BluePearl Tech Trainers Dr. Lauren Harris
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Introduction (brief overview)	This Standard Operating Procedure (SOP) outlines the guidelines and protocols for the safe and effective administration of plasma products to animals within BluePearl. The purpose of this SOP is to ensure consistency in the administration process, minimize risks associated with plasma transfusions, and optimize patient outcomes. Adherence to this SOP is essential for maintaining a high standard of care and ensuring the well-being of patients.
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1. Blood type

- Canines: Unlike RBC products, there is no evidence to support the administration of type specific plasma or platelet products, and not all manufacturers differentiate between blood types. DEA 1 Negative dogs CAN receive DEA 1 Positive plasma.
- Felines: Unlike dogs, cats MUST be blood typed and should ALWAYS receive type specific plasma products. Cats with AB blood type can receive type A plasma, if AB is not available. All feline blood types, including type B, can receive type AB plasma.

2. Dedicated intravenous catheter

- A newly placed IVC is preferable but is not required and must be based on assessment of patient's current IVC maintenance and urgency for blood product(s).
- Peripheral and central catheters (lumen/multi-lumen/PICC) are acceptable for plasma product administration. Unlike RBC products, there has been no evidence of catheter associated infection or other complications in human or veterinary patients with plasma product administration through central lines.

3. No medications should be administered during a transfusion.

- If unavoidable, injectable medications should be administered through a separate IVC (or port). Never mix chelating agents (i.e. calcium containing fluids/medications such as LRS and calcium gluconate) with blood products.
- Unless otherwise directed by the doctor, remove food and water during transfusion.
- Medication administration should not prolong the prescribed duration of a transfusion.

4. No other fluids should be administered during a transfusion. If continued IV fluid therapy is deemed necessary during a transfusion, avoid mixing LRS within the same IV catheter or administration set as noted above.

5. **Confirm dose volume** with the patient's clinician (mL/kg, single unit, double unit) High volumes may increase the risk of transfusion associated cardiac overload (TACO).
 - a. 10-20mL/kg is a typical starting dose based on the patient's underlying condition and serial diagnostics as directed (e.g. coagulation testing). This dose can be repeated as needed based on patient's clinical status. When targeting resolution of coagulopathy, diagnostics (PT/aPTT) should be performed immediately following transfusion completion.
 - b. Plasma contains albumin, however large volumes are necessary to increase patient albumin and colloid oncotic pressure and therefore may have limited clinical impact. ~44mL/Kg is needed to increase albumin by 1g/dL
 - c. If a small volume (<60mL) is prescribed, using a blood spike, remove the volume via the appropriate size syringe with strict aseptic technique, clearly label the bag with patient name and a new expiration date of 24 hours. Return to the blood refrigerator.
6. **Choose your product.** Evaluate your inventory and choose the appropriate plasma product.
 - a. There is no need to give blood type-specific plasma to dogs.
 - b. ALWAYS give type-specific products to cats. This is especially important for Type B cats.
 - c. Use the product with the nearest expiration date. Some exceptions may include certain conditions such as sepsis, hemolytic anemia, and liver failure at the doctor's discretion.
7. **Inspect the product** for leakage, hemolysis, discoloration, lipemia and other abnormalities. If deemed unusable, waste product via [Repleni-Trac](#).
8. **Minor Crossmatching**
 - a. Canine: This is not required for plasma transfusions.
 - b. Feline: There is insufficient evidence to suggest that a minor crossmatch is required prior to plasma administration. If the blood type is unable to be determined, a minor crossmatch is recommended.
9. **Always log product out using Repleni-Trac** at the time of dispensing.
10. **Administer plasma at room temperature.**
 - a. Thaw frozen plasma products (FFP, FP) in a controlled 30 – 37°C water bath OR in a medical grade dry plasma thawing system.
 - b. Ensure the product is in a tightly sealed plastic/overwrap bag prior to placing it in a water bath and adequately submerged.
 - c. Medical grade plasma water bath systems are available; however, sous vide cookers are approved for controlled warming of plasma products. Uncontrolled water baths are NOT recommended. Excessive temperatures may alter clotting factor viability.
 - d. Evaluate the product every 5-10 minutes for progress and gently agitate when using a water bath system. Small volumes may thaw in as little as 10 minutes; others may take 30-45 minutes.
 - e. Liquid plasma products (thawed and never frozen) may be warmed at room temperature or briefly placed in a water bath as noted above. Thawed plasma can be refrozen within one hour of thawing with no change to the expiration date.
 - f. Thawed plasma and plasma that has never been frozen have an expiration date of 28 days (thawed) and 32 days (never frozen), when stored in a dedicated, controlled 1 – 6°C, and ideally medical grade, refrigerator.
 - g. Lyophilized cryoprecipitate is typically rested at room temperature for 5 – 10 minutes prior to reconstitution. Using an appropriate water bath as described above may accelerate the reconstitution process.

11. **Limit blood exposure to the air and the environment.** Always maintain aseptic techniques.
12. **Use a filter** for administration of ALL plasma products. Recommendations are the same for both cats and dogs.
 - a. **Blood administration set with in-line filter (170-260- μ m):** Recommended when volumes exceeding 60mL are administered. Similarly, smaller volume in-line filter administration sets are also available, however, but the volume retained in the filter may lead to transfusion of smaller volumes than prescribed. This is a more important consideration for RBC transfusions than plasma.
 - b. **18- μ m micro-aggregate filter (Hemo-Nate filters):** It is recommended to follow manufacturer guidelines and prefilter certain plasma products (FFP, FP, liquid) by drawing blood through the filter prior to administration using the appropriate syringe size. Draw the blood slowly with consistent pressure. *These filters have a volume limit for RBCs, however there is no defined limit for plasma. Always change the filter if there is excessive pressure.* No additional filtration is needed when using this method of pre-filtering. *For cryoprecipitate, filtration during delivery is required* and the filter should be placed at the distal end of the administration set, immediately proximal to the patient. [Hemo-Nate Product Guide](#)
 - c. **150- μ m filter:** The filter can be placed at any point in the infusion line and has a volume limit of 250mL. It should be used if you are not using a blood administration set with an in-line filter (see above). It is ideal for small volume plasma transfusions via a syringe pump. It can also be used on standard fluid lines (i.e. administration sets that do not contain an in-line filter). [IAS SA150](#). Available through HemoSolutions and MILA.
 - d. [Guide to choosing your in-line filter](#)
13. **Administration technique**
 - a. **Gravity flow** with a standard transfusion line (170-260- μ m filter) is acceptable if you are comfortable setting and monitoring flow rates by counting drops/mL, or if rapid administration is necessary. Gravity administration is not preferred in small dogs and cats due to the small volumes transfused.
 - b. **Fluid administration pumps** are commonly used for administration of plasma products. Unlike RBCs, the mechanism (piston, peristaltic, rotary) of the pump does not affect product viability.
 - c. **Syringe pumps** are typically reserved for small volume transfusions (single syringe, <60mL).
14. **Administration rate and duration:**
 - a. A starting rate of 1-2 mL/kg/h for the 1st 15 minutes is typical. There is not strong evidence to suggest starting a transfusion at slower rates decreases the risk of transfusion reactions.
 - b. It is recommended that all blood be administered within 4 hours of removal from the refrigerator regardless of the starting rate; however, there is evidence to suggest that plasma transfusions administered ≤ 12 hours at room temperature are safe.
 - c. The final rate is determined based on volume and the prescribed duration of administration.
15. **Complete a blood transfusion monitoring sheet**
 - a. The sheet should include patient information, patient blood type, blood product details, reason for transfusion, baseline vitals, initial diagnostics when indicated (coagulation testing, PCV/TS, hemolysis, etc.)
 - b. Standardized monitoring sheets can be found in Cornerstone and the [Blood Bank Intranet](#).

- c. It is recommended to monitor temp, heart rate, respiratory rate/effort, and blood pressure during all transfusions. Based on patient status and tolerance, multi-parameter monitors can be used for ease.
 - d. Measure and record the recommended parameters at 0, 5, 15, 30 then every 60 min.
 - e. Be sure that all monitoring is captured via Instinct and/or in the medical record (e.g. scan paper sheets into the patient's record).
 - f. The patient should be visually evaluated throughout the transfusion for signs of reaction such as hives, drooling, vomiting, diarrhea, and increased respiratory rate.
 - g. Alert the doctor immediately of any signs of a transfusion reaction or concerns and document transfusion reactions in the medical record and [Repleni-Trac](#).
 - h. AVHTM/ACVECC [TRACSpack](#) can be purchased that provide algorithms for recognizing and treating transfusion reactions.
16. **Post-transfusion diagnostics** may include coagulation testing, total protein/albumin, PCV/TS if concurrently transfused with RBCs, or none. Testing should be completed at the conclusion of the transfusion to guide additional treatments as indicated and/or directed by the clinician.
17. **Continue to monitor** the patient closely for 24 hours as delayed reactions can occur in that timeframe. There are, however, rare reactions that can present up to 28 days post transfusion. Log all transfusion reactions in Repleni-Trac.