

## Administration of Blood Products Containing Red Cells

All blood products should be warmed gently to room temperature if time allows. If preferred, products can be warmed to body temperature (37°C) using a warm water bath. Water must be monitored using a thermometer as it must not go above 37°C. Alternatively, you can use a commercial water bath. The product should be protected in a plastic zip lock bag to prevent contamination of the ports.

Products containing red cells should be given through a filter to facilitate removal of any small clots and other debris that may be present. These filters may be present within the lines of blood giving sets or attached separately as an in-line filter (such as hemonate filters - available from PBB) if using a syringe for the transfusion (common with cats and small dogs). Peristaltic type infusion pumps are not recommended for the administration of red cell containing products unless the manufacturer has specifically stated they are safe to do so.

With stable patients, an initial infusion rate of 0.5-1.0 ml/kg/hr should be used for the first 15-30 minutes. During this time the patient should be monitored for any evidence of a transfusion reaction. If no reaction is seen this can be increased to a standard rate of 4-6ml/kg/hr. Please note that the rest of the unit should be delivered within four hours of beginning the transfusion. In an emergency (e.g. severe acute haemorrhage), red cells can be given as fast as necessary. In the past, packed red blood cells required re-suspension with 0.9% NaCl as their PCV was so high that they could not be infused alone. However, as packed red cell products today typically have had a red cell extender (nutrient solution) added, this is less of a problem and resuspension with saline is rarely necessary. Calcium containing fluids such as Hartmanns solution must NEVER be used with blood products.

A number of calculations have been suggested to evaluate the amount of red cells needed:

1) 2ml transfused whole blood/kg recipient weight raises the recipient PCV by 1%

1ml transfused packed red blood cells/kg recipient weight raises the recipient PCV by 1%

$$2) \text{ Dose of donor blood ML} = \frac{\text{TARGET PCV} - \text{RECIPIENT PCV}}{\text{DONOR PCV}} \times \text{KG} \times n$$

KG = Recipient body weight in KG

n = 90 for dogs

n = 60 for cat

These equations should be used as a guide only – when considering how much blood to obtain or administer. Considering at this time that we are often limited in the amount of blood available and that patients often have ongoing losses/concurrent fluid issues that are not accounted for in these equations, they are rarely of practical use except in very small patients where it is possible to raise the PCV too much if a full unit of blood is given – or in very large and very compromised patients where to make a significant difference multiple units of product may need to be administered.

Blood typing prior to administration should be standard procedure and cross matching will be required if a transfusion has been given more than 4 days previously.

### Administration of Plasma Products

Prior to administration, all blood products should be warmed to room temperature if time allows. If preferred, products can be warmed to body temperature (37 °C) using a warm water bath (ensure that water is monitored at not more than 37°C using a thermometer, or use a commercial water bath). The product should be protected in a plastic zip lock bag to prevent contamination of the ports.

Plasma products must be handled with care as they are very brittle whilst frozen and thawed slowly. Plasma products should be given through a filter to facilitate the removal of any debris that may be present. These filters may be present within the lines of blood giving sets or attached separately as an in-line filter (such as hemonate filters - available from PBB) if using a syringe for the transfusion (common with cats and small dogs). Peristaltic type infusion pumps may be used. Please check the suitability of the pump for blood administration and the compatibility/ accuracy of the giving set with the manufacturer prior to use.

An initial infusion rate of 0.5-1.0 ml/kg/hr should be used for the first 15-30 minutes. During this time the patient should be monitored for any evidence of a transfusion reaction. If no reaction is seen this can be increased to a standard rate of 4-6ml/kg/hr. Please note that the rest of the unit should be delivered within four hours of beginning the transfusion. The total dose of plasma necessary will depend on the reason for its administration however in most patients a starting dose of 20ml/kg is recommended – this should represent sufficient plasma proteins to have a beneficial effect for the patient. Patients with rodenticide intoxication, however, may require much larger volumes than this to resolve the coagulopathy.

Blood typing prior to administration should be standard procedure as red cells are required at a later date. Cross matching is not required prior to plasma administration unless dogs have received multiple plasma transfusions in the past and reactions have been recorded