The Hope Line

Fall 2018

Greetings! We hope our referral community had a wonderful summer! This quarter's Hope Line was just too helpful to shorten! Thank you Dr. Deitz in our Internal Medicine service for providing us with such a helpful guide to transfusions. As always, reach out to any of us if we can help in any way with your medicine and/or oncology patients.

Cheers from the Team at SEVO-Med

Transfusion Confusion?

When to transfuse

There is no "trigger" for transfusion; it depends on patient presentation. Animals with a chronic slowly developing anemia may have minimal clinical signs associated with anemia even when the anemia is severe. Animals with more acute onset of anemia may be much more clinical. The need to transfuse red cells should be based on clinical presentation – is the patient lethargic/ataxic? Is the heart rate elevated (>160bpm for a dog)? Is the respiratory rate elevated? However, if the PCV is 10-12%, even if the patient looks good, transfusion should be considered (there is not a lot of wiggle room here!). Additionally, if surgery is anticipated, pre-emptive transfusion should be considered prior to surgery even if clinical signs of anemia are minimal.

What to transfuse

The current trend in veterinary medicine is the use of component therapy. This allows the patient to receive the product they need without receiving the product they don't. In addition, it allows 1 unit of blood to treat several patients. If you are obtaining blood from a blood bank you will have several choices of blood product. Generally, give the product that matches what your patient needs:

Hemolytic anemia	pRBCs
Blood loss anemia	Whole blood
Chronic blood loss anemia (euvolemic)	pRBCs
Rodenticide	FFP +/- pRBCs
DIC	FFP
Liver disease/coagulopathy	FFP
Thrombocytopenia	Whole blood, pRBCs
Hemophilia	FFP, whole blood

FFP: Fresh Frozen Plasma
pRBCs: Packed Red Blood Cells

Notice I did not mention hypoalbuminemia. You need to give LOTS of plasma to correct a low albumin, so this is not recommended. Plasma is also not useful for volume expansion. In addition, there are not many platelets in whole blood so you will not make a big difference in the platelet count when administering this product to thrombocytopenic patients. Platelet rich plasma is an option but is not widely available.

How much to transfuse

The typical dose for pRBCs is 5-10mL/kg
The typical dose for whole blood is 10-20mL/kg
There are also formulas you can use to determine dose based on a target PCV:
1mL/kg of pRBCs will raise the patient PCV 1%
2-3mL/kg of whole blood will raise the patient PCV 1%

$$\text{Blood volume to be transfused} = k \times \text{weight in kg} \times \frac{\text{required PCV} - \text{recipient PCV}}{\text{PCV of donated blood}}$$

k=90 in dogs and 66 in cats

The typical PCV of pRBCs is approximately 70%; this information may listed on the product itself.
Doses for plasma range from 5-10mL/kg.

In the case of anemia, it is not necessary to transfuse to a normal PCV. Generally, a post-transfusion PCV of 20% in cats and 25-30% in dogs is sufficient to alleviate clinical signs without dampening the regenerative response. For coagulopathies, the patient may require additional plasma depending on control of bleeding.

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Transfusion Confusion Continued…

How to transfuse

Typically, blood typing and crossmatching is not required prior to the first transfusion in a dog. If a second transfusion is required, and it has been more than 5 days since the previous transfusion, then crossmatching is necessary.
Cats should always have blood typing prior to transfusion and type specific blood should always be used in cats.
A filter should be used in all cases. Blood should be given over a maximum of 4 hours to avoid bacterial contamination. Blood products should be used within 4 hours of spiking the bag. Warm to room temperature. FFP can be warmed in a warm water bath (<98 degrees). Consider pre-medicating with diphenhydramine 1mg/kg IM prior to administration. Start at very slow administration rates and monitor closely (especially temperature) during the initial administration. We dedicate a technician to the patient for this.

Monitor for transfusion reactions: vomiting, urticaria, collapse, and fever. I generally do not stop a transfusion if the temperature increases by 1-2 degrees. For other reactions, slow down the rate of administration and/or administer diphenhydramine 2mg/kg IM or dexamethasone 0.15mg/kg. If the patient collapses, discontinue the transfusion.
No medications should be given while a transfusion is administered unless for a transfusion reaction. Fluids can be administered during a transfusion if needed but a separate catheter should be used. The only compatible fluid that can be given with blood is 0.9% NaCl (for flushing blood through the line). Obtain PCVs immediately post-transfusion and 4 hours later.

Blood and plasma transfusion can be lifesaving! It is important to remember that in some cases (such as in IMHA) the transfusion buys time and allows the patient to feel better while treatment of the underlying disease is initiated.

Krysta Deitz, DVM, DACVIM

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