

# Canine Blood Transfusion Protocol

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## Introduction

At Animal Medical Center of Highland Village, blood transfusions are infrequently used; however, there are some situations that do call for a blood transfusion. When this case arises, it is important that the process of giving a dog a blood transfusion flows as smoothly as possible. This manual serves as a quick and convenient guide during this essential process. You will find the materials needed, calculations and dosing, and step-by-step instructions on how to give a dog a blood transfusion.



# Chapter 1: Materials





## Chapter 1: Materials

### IV Catheter

- 📍 Locate the IV catheter in the top drawer to the right of the first wet table in the treatment area as shown in Figure 1.2

Note: IV catheters come in different sizes. Choose the correct size based on the size of the dog's vein. Sizes 24 gauge (ga), 22 ga, 20 ga, and 18 ga are shown in Figure 1.1.



Figure 1.1



Figure 1.2

### 1 inch and ½ inch tape

- ✚ Locate ½ inch and 1 inch tape in the top drawer to the right of the first wet table in the treatment area as shown in Figure 1.4



Figure 1.3



Figure 1.4

## Vet wrap

- ✚ Locate vet wrap in the second drawer on the right side of the first wet table in treatment as shown in Figure 1.5



Figure 1.5



Figure 1.6

## Blood Collection Bag

- ✚ Locate blood collection bag in the laboratory area on the top shelf of the cabinet above the autoclave as shown in Figure 1.7

Note: Make sure blood collection bag is in properly sealed package as shown in Figure 1.8.



Figure 1.7



Figure 1.8

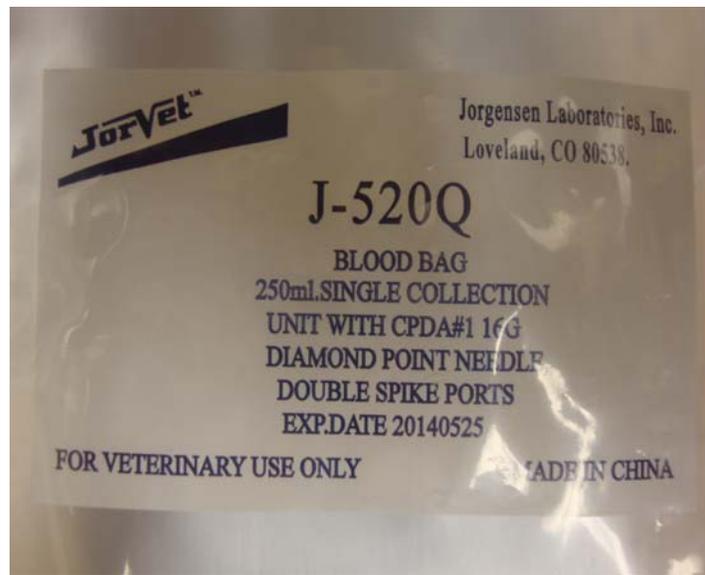


Figure 1.9

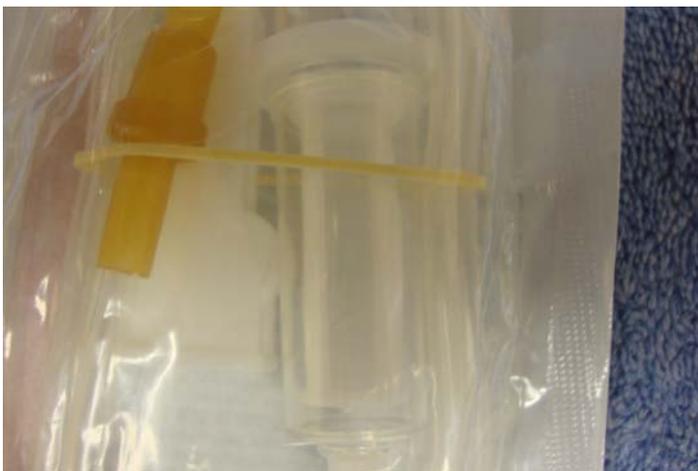
## Blood Administration Set

- ✚ Locate blood administration set in the laboratory area on the top shelf of the cabinet above the autoclave as shown in Figure 1.7

Note: Be certain that you have a blood administration set and not a regular IV line. This can be distinguished by ensuring there is a filter at the top of the line as shown in Figure 1.10



*Figure 1.9*



*Figure 1.10*



Chapter 2: Equations and Dosages

## Chapter 2: Equations and Dosages





## Chapter 2: Equations and Dosages

This section shows all equations and dosages that will be needed during the procedure. These should be figured up before the procedure begins.

### Drops

✚ 10 drops = 1 milliliter (mL)

Note: You cannot use an infusion pump with whole blood because it will damage the red blood cells, so you must calculate how many milliliters the patient is receiving by calculating drops per minute.

### Initial Infusion Rate

✚ 0.25 mL per kilogram (kg) of body weight over a 30 minute period

**Caution: Dog should be watched carefully during this process for any allergic reactions**

### Infusion Rate

✚ If no problems arise in the receiving patient after the initial 30 minutes, the rate may be increased.

✚ The recommended infusion rate is 22 mL/kg per day.

## Total Blood Volume to be Infused

- 1) Total mL donor dog blood in anticoagulant =  $2.2 \times \text{receiving dog's weight (kg)} \times \frac{40 - \text{PCV of receiving dog}}{\text{PCV of donor dog blood in anticoagulant}}$

Note: 2.2 mL/kg of whole blood will raise PCV by 1% when PCV of transfused blood is 40%

## Chapter 3: Instructions for Canine Blood Transfusion





## Chapter 3: Instructions for Canine Blood Transfusion

### Step 1 – Acquire a Blood Donor

1. Determine a dog to use as the blood donor (i.e. Animal Control, employee, client with authorization).
2. Run a complete blood count (CBC) to make sure the dog donating is healthy enough donate either 250 mL or 450 mL of blood.

### Step 2 – Place IV Catheters

1. Take an initial temperature, pulse, respiration rate (TPR).

Note: Initial TPR is important for comparison to TPR after blood has begun to be administered.

2. Place IV catheter in cephalic vein of the patient receiving the blood transfusion as shown in Figure 3.1.



Figure 3.1

3. Place IV catheter in cephalic vein of donor dog. This is needed to replenish the fluids that will be taken from them.

### Step 3 – Prepare Donor

1. Shave hair on left or right side of neck to prepare for obtaining blood from jugular vein as shown in Figure 3.2.

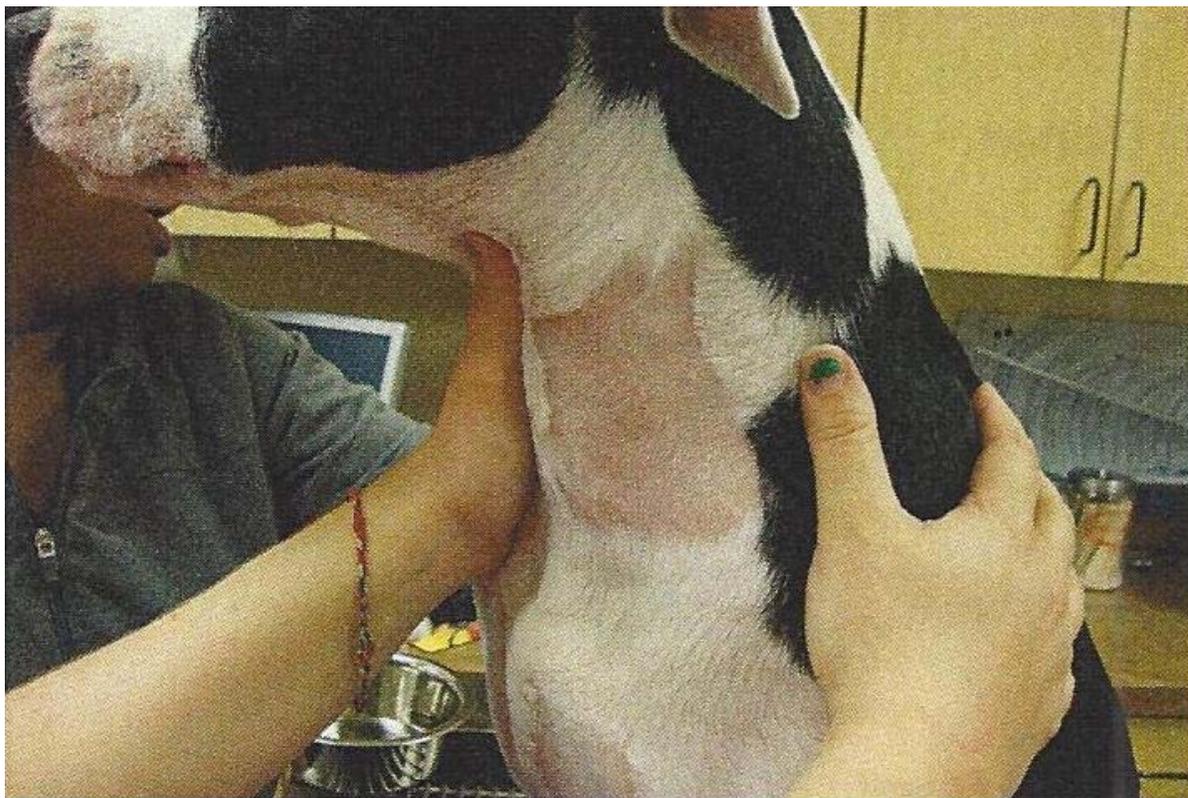


Figure 3.2

2. Clean shaved area with alcohol to sterilize skin for blood draw.

### Step 4 – Collect Blood

1. Open silver packaging containing blood collection bag by tearing horizontally at notch in upper right hand corner as shown in Figure 3.3.

Note: Inside packaging should be a clear bag filled with clear anticoagulant liquid. If there is not liquid in bag, get another bag. Also there should be a clear tube attached to blood collection bag with a sterile, capped needle on the end. If needle is not capped, get another bag.

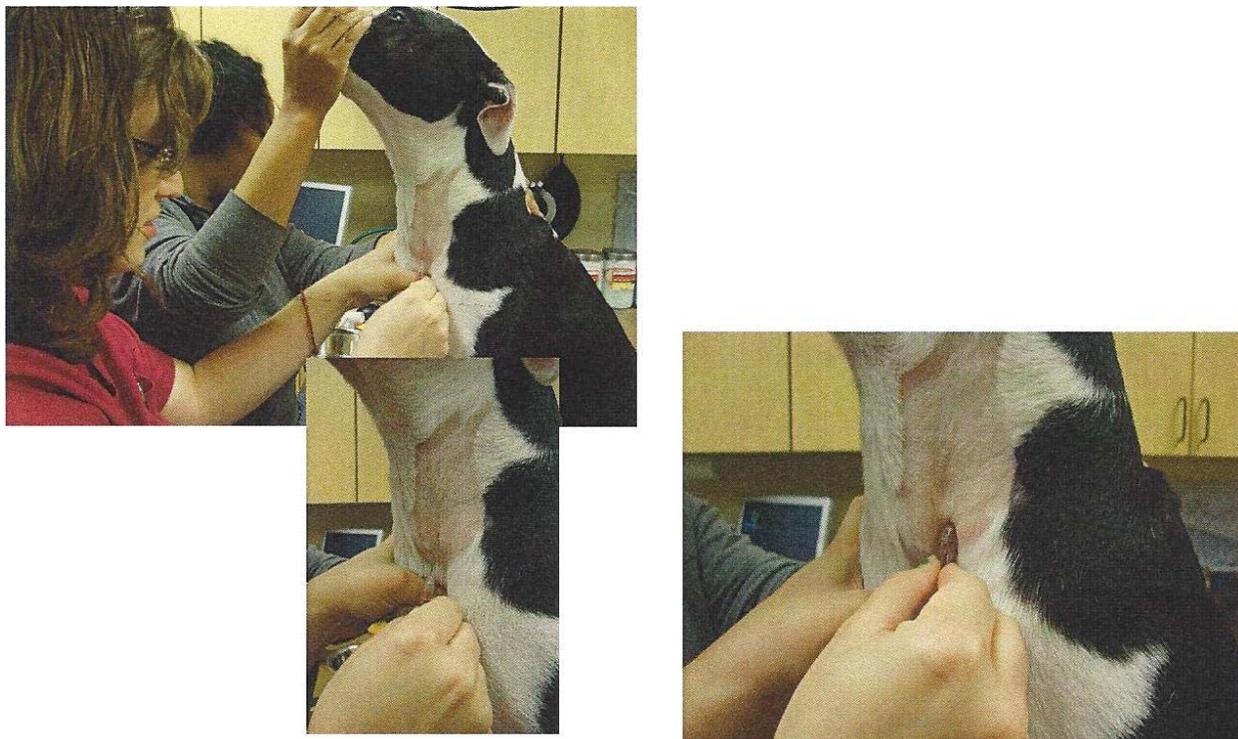


*Figure 3.3*

2. Remove clear plastic cap from top of needle

3. Insert needle into donor dog's jugular vein as shown in Figure 3.4 until blood begins to flow into blood collection bag.

Note: This step requires two people. One person is to restrain the dog so it does not move or bite, and the second is to place the needle into the jugular vein.



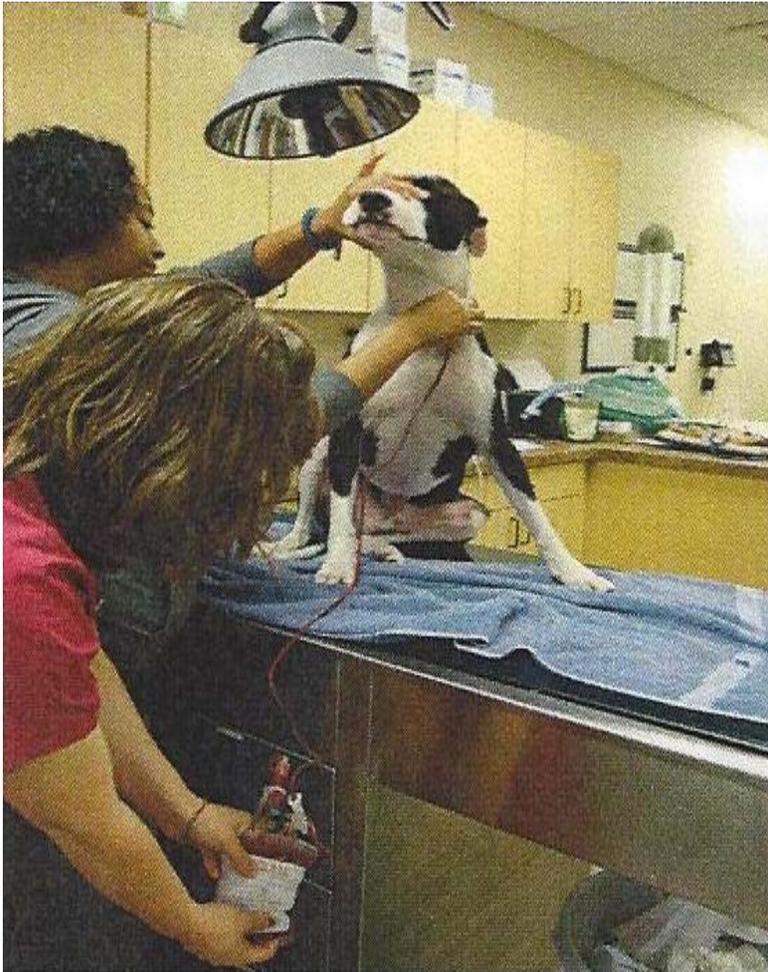
*Figure 3.4*

### Step 5 – Proper Handling

The next step requires three people for safety and proper handling.

- ✚ Person one needs to hold the needle in the jugular vein after blood flow has been established.
- ✚ Person two needs to hold blood bag lower than dog as shown in Figure 3.5.

Note: This person needs to rock blood back and forth to ensure mixture of blood with anticoagulant in blood collection bag.



*Figure 3.5*

- ✚ Person three needs to hold dog to ensure safety of person one and two as well as donor dog.

## Step 6 – Complete Collection

1. Fill the blood collection bag until full as shown in Figure 3.6.

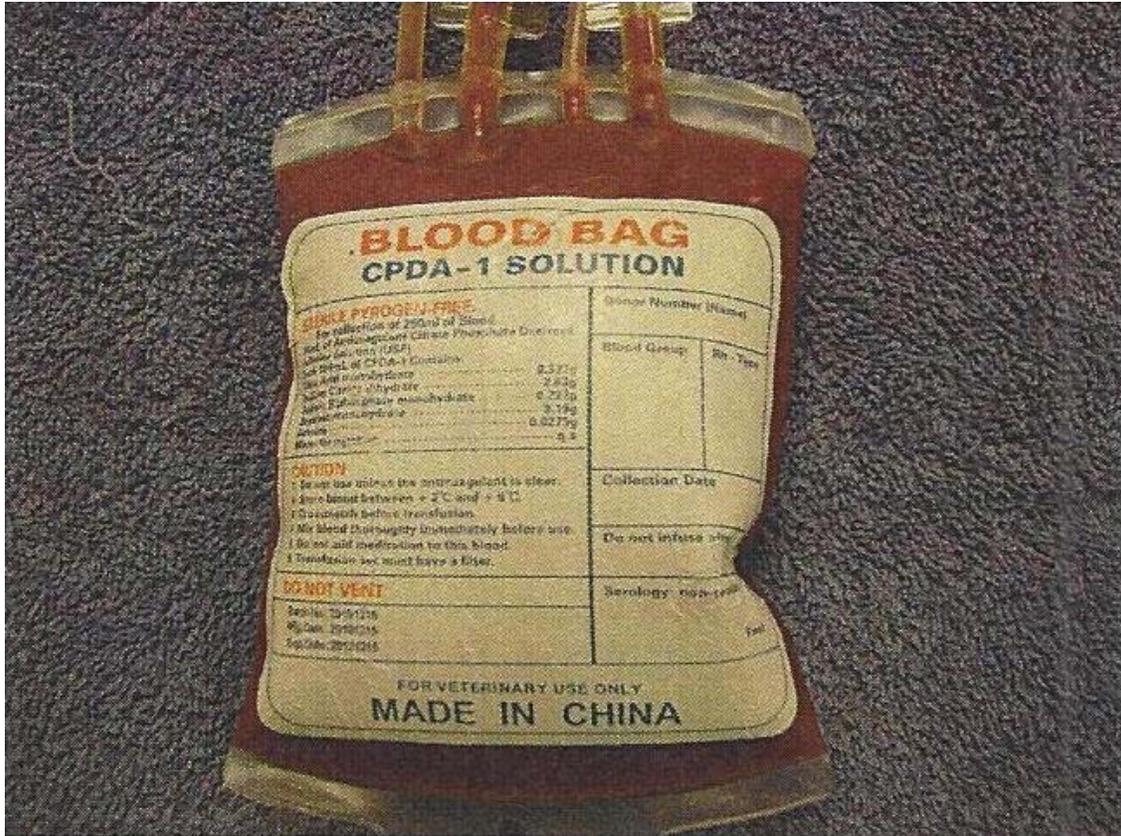


Figure 3.6

2. Remove needle from donor dog's neck.
3. Hold pressure on needle entry point for 2-3 minutes to help clot where needle was.
4. Tie a knot in the line with the needle close to blood collection bag
5. Cut off remaining line leading to needle.
6. Place donor dog on fluids at a maintenance rate to help regenerate red blood cells that were taken.

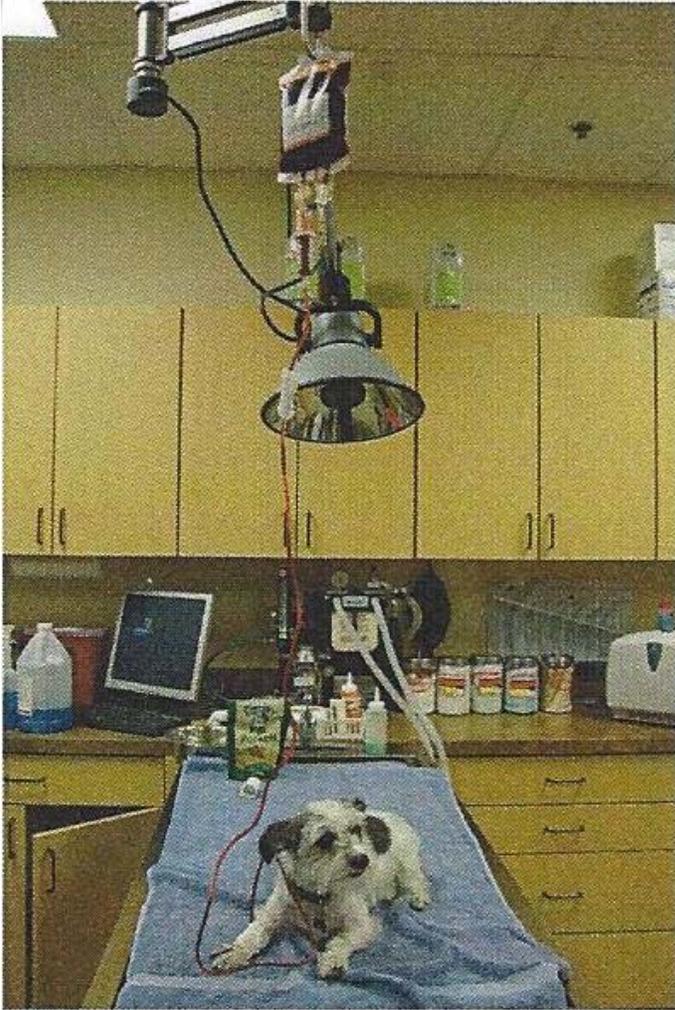
### Step 7 – Connect Patient

1. Connect blood administration set to the blood collection bag.
2. Allow blood to flow through blood administration set to eliminate air in the line.
3. Connect the blood administration line to the receiving patient's IV catheter as shown in Figure 3.7.
4. Secure it in place with vet wrap as shown in 3.7.



*Figure 3.7*

5. Hang blood collection bag above patient to ensure adequate flow as shown in Figure 3.8



*Figure 3.8*

### Step 8 – Start Transfusion

1. Calculate initial infusion rate and set the drip to match this calculation.
2. Take a TPR at 5, 15, and 30 minutes after transfusion has begun.

Note: These TPR's should be used to compare against the initial TPR taken before the blood transfusion.

3. Carefully observe patient for any external reaction symptoms including:
  - Facial swelling
  - Increased respiratory rate
  - Vomiting
4. Alert veterinarian if any of these symptoms along with any change in the TPR are noted.

### Step 9 – Check Bloodwork

1. Check receiving dog bloodwork after first 250 mL of blood has been given to ensure hematocrit is increasing.
2. Veterinarian will then decide if dog can come off transfusion or if they need more blood.
3. If cleared by veterinarian, dog is ready to go home.



## Frequently Asked Questions (FAQ)

### **How do you TPR a patient?**

- Get a temperature rectally with a thermometer.
- Listen to the heart with a stethoscope for six seconds and multiply the number of heart beats heard by ten to acquire a pulse.
- Listen to the respiration and follow the same methods as above.

### **What size IV catheter should be used?**

The size of the catheter used is dependent on how large the cephalic vein is of the corresponding dog. A larger catheter should always be tried before a smaller one because the flow is greater.

### **What if no blood is flowing when I try to get blood from the Jugular vein?**

1. Try moving need at an angle from side to side.
2. Pull needle out and sticking again if no blood.
3. Get another nurse and have them try if you still can not get blood.



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## Picture Sources

Chapter 2 fly page photo:

<http://margaretlarsen.files.wordpress.com/2010/01/hand-writing1.jpg>

Chapter 3 fly page photo:

<http://www.moveoneinc.com/blog/wp-content/uploads/2010/07/blood-donor-dog.jpg>