

Transfusion Medicine and the Blood Bank at VHUP

Transfusion medicine is a relatively new field in veterinary medicine and blood transfusions are becoming an increasingly important treatment modality. They are the number one tissue transplant procedure in humans and animals. Donna Oakley, VHUP head nurse and blood bank coordinator, provided an overview of transfusion medicine and the canine blood donor program at the Veterinary Hospital of the University of Pennsylvania.

She mentioned that the first reported canine blood transfusion was performed in the late 1800s by surgically attaching the artery of one dog to the vein of another. Today blood is transfused through IV catheters and, in most cases, whole blood is not administered, just the required specific components of blood.

Blood is composed of a liquid portion, the plasma, and a cellular portion consisting of different cell types: red blood cells carrying oxygen; white cells serving as a defense mechanism producing antibodies and locating, engulfing, and destroying foreign material; platelets with strong adhesive properties facilitating clotting. Plasma consists of water, salt and proteins (albumin, clotting factors, etc.). A unit of blood can be separated into its different components, allowing treatment of specific diseases with specific blood products.

For example, a red cell transfusion may be needed if an animal has become anemic due to *Babesia canis* (a protozoa) infection or from heavy flea infestation. Red cells are also needed for the crisis management of hemolytic anemia before the dog can receive drugs to correct its over-reactive immune system. Clotting factors are administered if an animal has a bleeding episode due to von Willebrand's disease. By using these specific components, exposure to volume overload and the incidence of transfusion reactions can be greatly reduced.

Blood for any transfusion is crossmatched to determine whether donor and recipient are compatible. It is thought that dogs have as many as 13 different blood groups, however, as Ms. Oakley pointed out, it is possible that many more groups will be discovered as the study of canine blood continues. Three groups cause the most severe reactions due to incompatibility. Two types of transfusion reactions



Collecting blood from a donor

can occur: immune mediated reaction where the body destroys red cells because of antibodies present in the recipient; and non-immune mediated reaction which occurs when the blood products being transfused are defective, due to an improperly collected, stored or administered product. Both reactions are severe and can occur for up to three weeks after the transfusion, requiring close monitoring of transfusion patients. At VHUP all blood and blood products are stored in state-of-the-art refrigerators and freezers designed to keep the required temperatures at all times. All blood transfused here is passed through special filters to remove clots or other debris.

Ms. Oakley briefly mentioned some blood transfusion alternatives reducing adverse transfusion reactions: concentrated hemoglobin transfusion or a hormone treatment that stimulates production of red blood cells; preoperative autologous donation where, prior to elective surgery, the animal donates its own blood which is available later if needed; acute normovolemic hemodilution for long procedures where blood loss is anticipated. This last alternative involves removing multiple units of blood which are replaced by intravenous fluids to dilute the blood prior to surgery. Post-operatively, the patient is transfused with its own blood, eliminating the chance of transfusion reaction to a foreign donor.

VHUP performs between three and six transfusions daily. Blood is always needed and three years ago a program was initiated where students,

faculty and staff brought in their dogs to donate blood. Soon it was realized that these animals could not meet the demand, and Donna Oakley reached out to dog clubs and breeders in the tri-state area. Today almost 500 dogs are enrolled in VHUP's canine blood donor program. These animals are brought to VHUP regularly to give blood to help sick patients.

Canine donors must be at least one year of age and should not be older than 10 years. They must weigh at least 50 pounds and cannot be on medication other than heartworm preventive. When they come to VHUP, a complete blood count and heartworm test are performed to ensure adequate health status. The collection process takes about five minutes. The animal is placed on its side on a table. The owner is usually present, helping to keep the dog in position. Blood is collected from the jugular vein and removed by means of a pump to speed up the process. According to Ms. Oakley, dogs don't mind the collection process, though some get a bit impatient for having to remain still for the five minutes.

After the pint has been collected, the dog is taken from the table, offered a light meal and water. It also receives a blood donor ID card and the owner is instructed to limit exercise for 24 hours. Six weeks later the dog can again donate blood.

The program at Penn's Veterinary School is the largest in the country. Ms. Oakley hopes that soon owners and their dogs will not need to travel to VHUP as the School will be obtaining a mobile unit to serve as a blood collecting station on wheels. It will be equipped with an exam table, cooling unit, microhematocrit centrifuge, hemoglobinometer, gram scale, and other blood collecting and processing equipment. The mobile blood unit will enable VHUP's transfusion medicine specialists to visit large breeding kennels and kennel club-organized blood drives in outlying areas where blood can be collected from canine donors, making the donation of blood much more convenient for dogs and their owners.

The acquisition of the vehicle and its equipment is made possible through the generous donations of the Bernice Barbour Foundation, Dr. Daniel Bleicher, Officer Dan Buckley, Chester Valley Kennel Club, Delaware Valley German Shepherd Dog Club, Devon Dog Show Association, Mr. and Mrs. Peter Nero, Penn Ridge Kennel Club, Penn Treaty Kennel Club, Southern New Jersey German Shepherd Dog Club, and Mrs. Ferdinand White.

Roger Caras Honored



The Maryland Veterinary Medical Society held a "roast" for Dr. Roger A. Caras in Baltimore in October. At the end of the evening Dr. Caras was lauded for his many contributions to wildlife, animal welfare, and the veterinary profession at large. Dean Andrews presented the School's Centennial Medal to Dr. Caras. Following is the laudation, composed by Dr. Donald A. Abt, that was read during the presentation:

"Distinguished spokesman for and champion of all animal life, large and small, domestic or wild, traveling the world over to share your love and devotion for animals with your fellow human beings through authorship of highly respected and widely read books and magazine articles; notable radio and television presenter; tireless personal contributor of talent, time and energy to a legion of worthy organizations dedicated to the well being of animals; and wise counselor to those in need. World traveler from the plains of Africa to the islands of Greece, to the Far East, to Prince William Sound and even to the South Pole, to identify but a few of the sites where your concern for animals and society has drawn you.

From each location, you brought back a new and vital appreciation for and understanding of the fragile balance within which our non-human neighbors live. Your eloquent voice then focused our attention, with clarity and respect, on the needs and

plight of those deserving our concern. You have brought constructive awareness of our responsibilities to all segments of our society.

In particular, you have served the School of Veterinary Medicine at the University of Pennsylvania with great distinction both as a member of its Board of Overseers and as a deeply involved participatory member of the adjunctive faculty. As an Overseer, you have provided your fellow Board members with the interactions of animals and mankind thereby facilitating enlightened decisions crucial to the advancement of the School. As a teacher, you have paved the way for essential broadening of our students' horizons. Your course dealing with the diverse interactions of veterinary medicine and society became a bench mark to which others aspired as it led our students into uncharted waters. The ever-increasing requests for enrollment were a testament to the value of your contribution and signified the forethought you exhibited by seeking the opportunity to present such a course. What was once unorthodox has now become common place through your concerns and gift of sharing. To share oneself through the education of our youth is truly a noble gift.

In recognition of your extensive contributions to our School and the veterinary profession at large, we are honored to present you this, the Centennial Medal of the School of Veterinary Medicine."