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Corene started at the Alta Vista Animal Hospital in 2004 as a Veterinary Technician in the Internal Medicine Department, working in Cardiology with Dr. Eric de Madron. This year, Corene was the very first technician in Canada to obtain her Specialty designation in Internal Medicine in the discipline of Cardiology. Corene has a Doberman and four cats that keep her busy when she's not working.

The Importance of Blood Pressure Measurement for Technicians

Blood pressure measurement is quickly becoming a popular diagnostic and monitoring parameter in veterinary medicine. The information it provides can be invaluable, providing clues to the patients' hemodynamic status at any given point in time. The task of obtaining a blood pressure reading generally falls to the veterinary technician or assistant and, with practice and technical consistency, can become a fairly easy skill to master.

Blood pressure is defined as "a function of cardiac output and peripheral vascular resistance." In other words, blood pressure is dependent on how much blood the heart is pumping out with each beat and the stiffness or flexibility of the blood vessels (arteries) receiving the freshly pumped blood. The higher the volume of blood being pumped and/or the stiffer the vessels, the higher the blood pressure will be. A normal value for feline and canine patients, like humans, is around 120/80.

In a hospital setting, a patient's blood pressure is expected to be a little higher due to stress, often settling around 140/90 or so. A blood pressure of 150-180mmHg systolic and 95-120mmHg diastolic constitutes mild-moderate hypertension. Consistent readings of 180/120 or

greater, considered severe hypertension, is always due to an underlying medical condition, and will lead to organ damage if left untreated.

The organs generally affected by hypertension include the brain, eye, kidney and heart, with the most common clinical manifestations being sudden blindness, polyuria/polydipsia, abnormal heart sounds or rhythms, epistaxis, and behavioural or neurological signs.

Conversely, hypotension is defined as a consistent systolic blood pressure reading of less than 60mmHg or a mean pressure reading of less than 70mmHg. Organ perfusion is severely compromised if the mean arterial pressure (MAP) falls below 50mmHg for longer than 10-20 minutes, often resulting in damage or failure of the kidneys or brain.

There are 2 methods of obtaining an accurate blood pressure reading: Oscillometric and Doppler.

1. Non-Invasive Oscillometric blood pressure monitoring requires the use of a blood pressure cuff which can be placed over the radial artery, brachial artery, or the median caudal artery. It is imperative that the width of the cuff be 30 to 40 percent of the circumference of the

extremity being used. If the cuff size is too large, the reading will be falsely low and if too small, the reading will be falsely high.

The Non-Invasive Oscillometric method is the simplest way to obtain a reading and can provide a systolic, diastolic, and mean arterial blood pressure reading that is displayed on a monitor.

The machine extension is attached to the cuff and the machine is set to take at least 3 consecutive readings, preferably 2 minutes apart (to allow the artery time to recover). These readings are then averaged to provide a reliable result.

The Non-Invasive Oscillometric method has both advantages and disadvantages. It is great for spot readings on anxious animals, as it can easily be done in an exam room with a client, and is also favorable for stable anesthetized animals, giving a new reading and heart rate every 2 minutes. However, this method is unable to reliably read blood pressures on smaller animals (i.e. "weak signal" error) and it will not give a reading for severely hypotensive patients or perform well when the patient is experiencing arrhythmias.

2. The Doppler method is per-

formed by placing the blood pressure cuff on an extremity as described above for the Non-Invasive Oscillometric approach. The Doppler crystal is then placed proximal to the cuff, over the shaved palmar common digital (forelimb), median caudal (tail),

or the dorsal metatarsal arteries. The cuff is attached to a manometer and inflated until the pulse can no longer be heard. The pressure is slowly released until the pulse can once again be heard. At that point, the reading on the manometer is

the patient's systolic reading. With practice, the diastolic value can be obtained by further releasing cuff pressure and listening for a change in flow sound from a short and pulsatile sound to a continuous "swishing" sound.



Use of Cardell (Oscillometric) and Cuff placement



Doppler Method and Foreleg Cuff placement

Although the Doppler method is a bit more cumbersome, the results are considered to be more accurate than the Non-Invasive Oscillometric method, especially in dealing with small animals or patients with lower blood pressures.

However, the Doppler method is unable to detect systolic blood pressures of less than 30mmHg. The noise of the unit can increase patient stress, and the surrounding noise level or electrical interference can cause additional frustration.

Reliable blood pressure monitoring provides vital clues to a patient's health status and should be included as an integral part of every physical exam.



Doppler Method: Hind leg cuff placement



Cuff Size Measurement