

# Vetamac Vapors

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*This issue of Vapors will be an overview of the methods used to measure blood pressure during anesthesia. Previous issues of Vapors may be found on our website at [www.vetamac.com](http://www.vetamac.com).*

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## The Measurement of Blood Pressure

Before Doppler and oscillometric monitors were used in veterinary medicine, palpating the peripheral artery was the only means of noninvasively assessing blood pressure. This assessment of pulse quality is called pulse pressure. The pulse pressure is the difference between systolic and diastolic blood pressure. It does not really measure pressure and has been proven to be an unreliable and fairly inaccurate technique.

There are three methods available to veterinary staff that continue to improve and provide reliable blood pressure measurements: oscillometric technology and Doppler instrumentation (indirect methods), and the direct method of blood pressure measurement.

Oscillometric technology involves simply placing a cuff around a leg or tail and connecting the cuff to a computerized monitor. The width of the cuff should be approximately 40% of the circumference of the leg or tail to which it is applied. Oscillometers measure blood pressure by detecting pressure oscillations within the cuff bladder. A pump inflates the cuff and a computer measures the changes in intracuff pressure caused by the changes in pressure associated with each pulse wave as the cuff is slowly deflated. It then calculates a systolic, mean, and diastolic pressure from these cuff pressure changes. Many of the monitors in use are designed to veterinary specifications.

Using Doppler instrumentation (Parks Medical Electronics, Aloha, OR) is a bit more labor intensive but worth the effort. The hair over the dorsal pedal, coccygeal, or metcarpal artery is first clipped, and the piezoelectric crystal is then placed directly over the artery. The probe is then taped in place, and the flow of blood is converted into an audible sound. As with oscillometric measurement, the appropriate-size cuff is placed above the Doppler probe and the cuff tubing with a manometer and bulb are attached. The Doppler is turned on, the cuff is inflated until no sound is heard, and the pressure is slowly released from the cuff. The first sound heard is the systolic blood pressure.

Direct blood pressure measurement requires placing a catheter into an artery by percutaneous or cut-down methods. Although this technique requires a skilled technician or anesthetist, the arterial blood pressure readings obtained with direct measurement are more accurate and continuous compared with indirect methods. The most commonly used arteries for percutaneous catheterization in dogs and cats are the dorsal pedal (metatarsal) artery or the lingual artery. Once the catheter has been placed, it can be attached to a commercial transducer and recording system, which allows for continuous systolic, mean, and diastolic pressure readings.

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*Debbie Coleman joined Vetamac in July 2005 and is a field service technician based in Iowa. Debbie graduated from the Animal Health Technology program in 1980 from Truman State in Kirksville, Missouri. She worked in a two-man mixed animal practice in Paris, Missouri for 8 years. In the fall of 1987, Debbie joined the anesthesia staff at the Iowa State Veterinary Teaching Hospital. Her duties as an anesthesia technician at Iowa State include sharing the emergency duty for small and large animals. She also teaches third year veterinary students anesthesia in surgery lab and fourth year students in the clinic. Debbie has provided lectures to national meetings including WVC, ACVIM, AVMA and SWVC. She has also provided anesthesia lectures to state meetings in Missouri, North Dakota and Iowa.*

## FAQs

Q: Why is it necessary to monitor blood pressure?

A: All anesthetic agents cause low blood pressure during anesthesia.

Q: Which pressure value is most important: systolic, diastolic, or mean?

A: It is most important to know the mean blood pressure value because this is the pressure that "pushes" the blood through the systemic capillary beds.

*If you have a question you would like answered in our FAQs, please email us at [info@vetamac.com](mailto:info@vetamac.com).*