

# Blood Pressure Measurements on Animals

There are two primary sites for taking blood pressure measurements, the limbs and the tail. Which one you use depends on the animal and the conditions under which the measurements are taken. There is also a matter of personal choice.

Most people use the pressure measurement as a reference point, such as before, during and after surgery. Obtaining an absolute value is trickier because the accuracy of the measurement is dependent on the width of the cuff with respect to the cross-sectional area of the limb or tail. Anatomical hiding of the vessel may make it almost incompressible or compressible with difficulty, making readings too high. Vasoconstriction is of serious concern when measuring pressures on the tail of a rat.

The cuff width should be selected based on the limb size and should never be smaller than the diameter of the limb used, but can be up to twice this diameter without affecting accuracy. The figure diameter from circumference, multiply the circumference by .3183.

Wherever you measure, you should have the inflating part of the cuff over the artery of interest. Place the Doppler probe downstream from the cuff. The Doppler sounds should be clear, before the occlusion, so that when blood does surge under the cuff you can hear it as a distinct change in the background noise. If you move the probe off the vessel simply because you can not hold it steady, you will get either nothing or a reading that is too low. The manometer is read when blood flow is heard to return, as the cuff is gradually deflated. If this end point is not distinct, you may be picking up flow from another vessel as well as the one of interest. It is common to make more than one attempt to get a measurement. Be sure to deflate the cuff completely between measurements. Creating a reactive hyperemia from tissue anoxia can dilate the distal bed and make the end point more clear.

The School of Veterinary Medicine at Davis, California, was the first school to use the Doppler, some 20 years ago. Another active school is at the University of Florida, Gainesville. If you have a particular application you might want to contact them.

There are two types of probes to be used. The most commonly used is the flat probe, which can be affixed to the tail or leg with a Velcro band or non-sticky first aid tape. A pencil-shaped probe is also available. On humans, the pencil probe is preferred for use on the limbs because you can push it in close to the vessel. However, it must be held on target while you inflate the cuff or the beam will be off the artery when you deflate.

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