Vetamac Vapors

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The next four issues of "Vapors" will discuss the relationship of anesthesia and blood pressure, and the monitoring of blood pressure during anesthesia. If you have a question for our FAQS, please go to our website at www.vetamac.com and email your question. Answers will be returned as soon as possible. You may now access past issues of "Vapors" on our website.

Blood Pressure Part I

Before discussing the measurement of blood pressure, some of the terms associated with blood pressure need to be defined:

Stroke Volume: The volume of blood pumped by one contraction of the heart.

Heart Rate (HR): The number of contractions per minute.

Cardiac Output (CO): Stroke Volume x Heart Rate.

Blood Pressure: The lateral force on the arterial wall.

Mean Arterial Blood Pressure (MABP): The average of systolic and diastolic over one complete cardiac cycle.

Systemic Vascular Resistance (SVR): The resistance to blood flow created by the peripheral arterial system and capillary beds.

$$SVR = \frac{MABP}{CO}$$

The diagram below is a very basic representation of the control of blood flow to the peripheral tissues. Stroke volume and heart rate determine the cardiac output while cardiac output and peripheral resistance determine blood pressure. It should be noted that all of the mechanisms that control cardiac output and SVR are depressed by inhalation anesthesia. Therefore, all patients experience some degree of hypotension (low blood pressure) during anesthesia. In those patients that have a pre-existing condition that decreases blood pressure, the hypotension will be more severe during the anesthetic procedure.

One important point to remember about blood pressure and tissue perfusion is that the mean arterial blood pressure (MABP) is what "pushes" the blood through the peripheral capillary beds (see definition of SVR). The "critical" low point for MABP during anesthesia is generally accepted to be approximately 60 mm Hg.

It must be remembered that no inhalant anesthetic, when present in concentrations high enough to produce anesthesia, will fail to depress cardiovascular function.

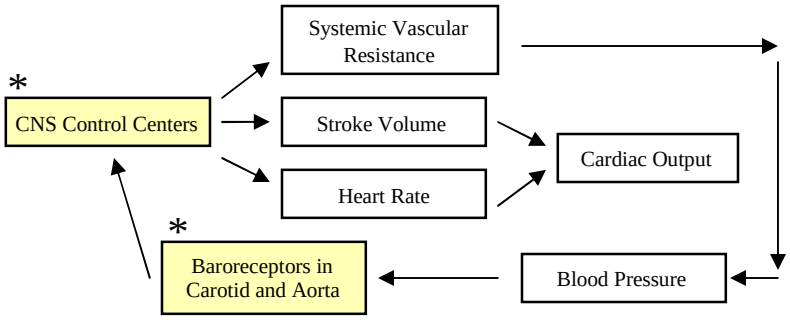
FAQs

Q: Should the bag always be full?

A: If there are no leaks in the machine and the cuff on the endotracheal tube is inflated properly, the bag should stay full. If the bag is not staying full, but there are no leaks in the system, the pop-off valve may not be functioning properly. If the bag is too full, the pressure on the manometer will be registering a pressure greater than 2-3 cm/H2O.

Q: Why do I need an atmospheric interface with an active waste gas evacuation system?

A: The interface allows the system to draw room air through the lines so there is no negative pressure on the breathing circuit. In the absence of an interface, the pop-off valve would have to be partially closed or the O2 flow rate extremely high to maintain sufficient gas in the bag for the patient to breathe.



*Depressed by inhalation anesthesia

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