

SUGGESTIONS FOR MONITORING ANESTHETIZED VETERINARY PATIENTS

The diplomates of the American College of Veterinary Anesthesiologists (ACVA) propose these guidelines for anesthetic monitoring, with the intention of encouraging high quality care of the anesthetized veterinary patient. The ACVA recognizes that some of the methods below may be impractical in certain clinical settings, and that it is possible to monitor and manage the anesthetized patient without specialized equipment. The ACVA does not suggest that using any or all of the methods below can ensure any specific patient outcome or that failure to use any or all methods causes poor outcome. These suggestions are offered only to assist the veterinarian in determining priorities for monitoring during anesthesia, surgery, and recovery. The suggestions may be revised from time to time, as warranted by developing knowledge and technology.

The major categories listed below are aspects of anesthetic management that deserve careful attention. For each category, any one or more of the suggested methods may be used. Suggested methods of monitoring under each category are listed in *approximate* order of simplest/most economical/least invasive, to complex/most expensive/most invasive.

Circulation:

Objective: to ensure that blood flow to tissues is adequate

Methods:

1. Palpation of peripheral pulse
2. Palpation of heart beat through chest wall
3. Auscultation of heart beat (stethoscope, esophageal stethoscope, or other audible heart monitor)
4. Electrocardiogram (continuous display)^{a,b}
5. Noninvasive blood flow or blood pressure monitor (examples: doppler ultrasonic flow detector, oscillometric flow detector)^{a,b}
6. Invasive blood pressure monitor (arterial catheter connected to transducer/oscilloscope or to anaeroid manometer)^b

Oxygenation:

Objective: to ensure adequate oxygen concentration in the patient's arterial blood

Methods:

1. Observation of mucous membrane color
2. Pulse oximetry (noninvasive estimation of hemoglobin saturation)
3. Oxygen analyzer in the inspiratory limb of the breathing circuit
4. Blood gas analysis (PaO₂)
5. Hemoximetry (measurement of hemoglobin saturation in the blood)

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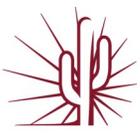
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Ventilation:

Objective: to ensure that the patient's ventilation is adequately maintained

Methods:

1. Observation of chest wall movement
2. Observation of breathing bag movement
3. Auscultation of breath sounds
4. Audible respiratory monitor
5. Spirometry (measurement of tidal volume and/or minute volume)
6. Capnography (measurement of CO₂ in end-expired gas)
7. Blood gas monitoring (PaCO₂)

Anesthetic record:

Objective: to maintain a legal record of significant events and to enhance recognition of trends in monitored parameters

Methods:

1. Record all drugs administered to each patient, noting the dose, time, and route of administration
2. Record monitored parameters (minimum: heart rate, respiratory rate) on a regular basis (minimum: every 10 minutes) during anesthesia

Personnel:

Objective: to ensure that a responsible individual is aware of the patient's status at all times during the anesthesia and recovery and is prepared either to intervene when indicated or to alert the veterinarian in charge about changes in the patient's condition

Methods:

1. If a veterinarian, technician, or other responsible person is unable to remain with the patient continuously, a responsible person should check the patient's status on a regular basis (at least every 5 minutes) during anesthesia and recovery
2. A responsible person may be present in the same room although not necessarily solely occupied with the anesthetized patient (for instance, the surgeon may also be responsible for overseeing anesthesia)
3. In either of the above situations, audible heart and respiratory monitors are suggested
4. A responsible person, solely dedicated to managing and caring for the anesthetized patient during anesthesia, remains with the patient continuously until the end of the anesthetic period. ^{a,b}

^aRecommended for all patients assessed to be ASA status III, IV, or V

^bRecommended for horses anesthetized with inhalation anesthetics and/or horses anesthetized for longer than 45 minutes