Bringing Your "A" Game: Veterinary Technician Drive Anesthesia and Analgesia

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Anesthesia is a controlled, reversible physiologic state requiring constant monitoring and technician-driven management.

- Includes unconsciousness, analgesia, muscle relaxation, and loss of reflexes
- Requires continuous adjustments to maintain patient stability
- Not simply sedation—true anesthesia affects multiple body systems
- Technicians directly influence outcomes through monitoring and decision-making
- Balanced anesthesia aims to minimize drug side effects while maximizing safety

Safe Anesthesia in Veterinary Medicine

Safe anesthesia enables humane care, advanced procedures, and improved patient outcomes.

- Allows pain-free procedures and proper analgesia
- Maintains cardiovascular and respiratory stability
- Supports advanced diagnostics (MRI, CT) and surgery
- Improves recovery and reduces complications
- Builds client trust and practice value
- Bottom line: anesthesia safety directly impacts morbidity and mortality

Pre-Anesthetic Planning and Communication

Effective communication and planning reduce anesthetic risk and improve team performance.

- Review patient signalment, ASA status, comorbidities
- Develop drug protocol (premed, induction, maintenance)
- Identify anticipated risks (brachycephalic airway, cardiac disease)
- Assign roles (induction, intubation, monitoring, recording)
- Technician should confirm plan and escalation triggers
- Use structured communication and closed-loop communication
- Use 'Status → Concern → Action' framework for clarity

ASA Classification

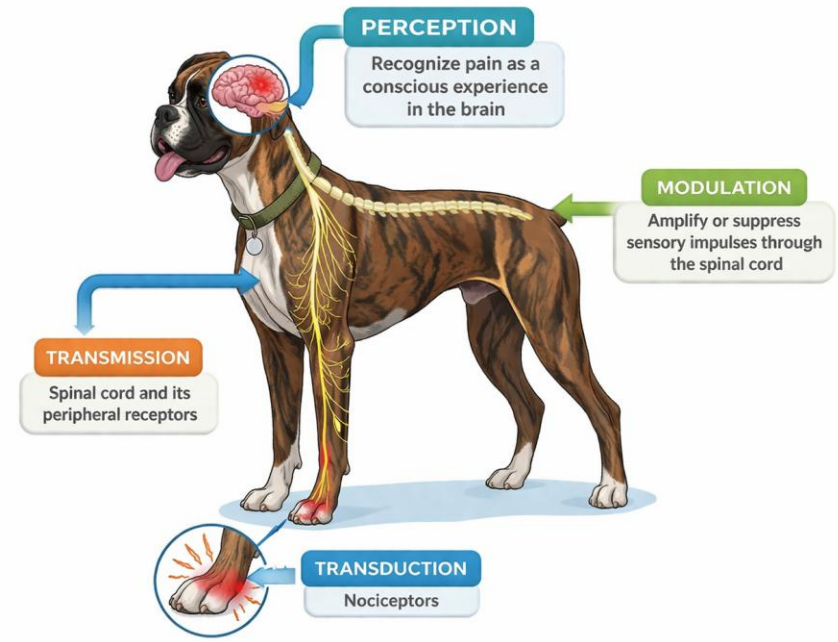
ASA status evaluates anesthetic risk and guides protocol decisions. Higher ASA = increased anesthetic risk and monitoring needs.

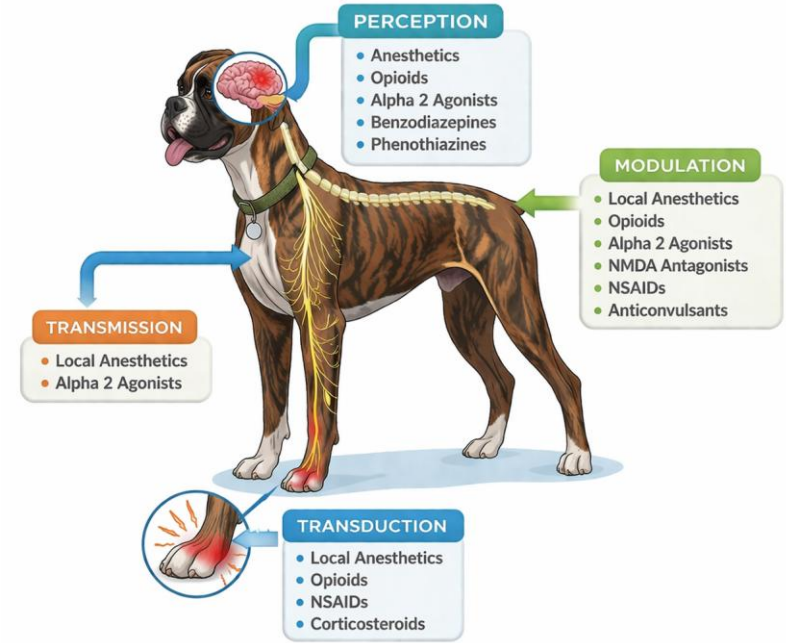
- Class I: healthy patient
- Class II: mild disease
- Class III: moderate systemic disease
- Class IV: severe disease
- Class V: moribund
- 'E' indicates emergency

Multimodal Anesthesia and Pain Pathway

Multimodal anesthesia targets multiple pain pathway stages to improve safety and analgesia.

- Transduction: stimulus converted to signal
- Transmission: signal travels to CNS
- Modulation: signal amplified/dampened
- Perception: brain interprets pain
- Different drugs act at different stages
- Combining drugs reduces individual doses and side effects
- Improves analgesia before, during, and after procedures
- Technician must understand drug interactions





Drug Classes

Understanding drug classes allows safe and effective multimodal anesthesia.

- Opioids: gold standard for pain, reversible, MAC-sparing, risk of dysphoria
- Benzodiazepines: minimal CV effects, muscle relaxation, paradoxical excitement possible
- Phenothiazines: sedation only, hypotension risk, not reversible
- Alpha-2 agonists: strong sedation + analgesia, bradycardia, reversible
- NMDA antagonists (ketamine): prevent wind-up pain, may cause dysphoria
- Local anesthetics: block pain at source
- NSAIDs: inflammatory pain control, renal/GI risks
- Induction agents: propofol, alfaxalone (no analgesia, must pair drugs!)
- Always pair drugs to balance effects and improve safety

Analgesic Opioids

Pre-medication and sedation

Pre-medication, sedation, and induction

Induction Agents

Monitoring and Vital Parameters

Monitoring is continuous and trend-based, not single-value based.

- Monitor HR, RR, BP, temperature, SpO2, ETCO2
- Technician is primary patient advocate
- Trends are more important than individual readings
- Monitoring categories: basic, average, advanced
- Adjust anesthetic depth based on combined data
- Document every 5–10 minutes

Equipment Preparation

Proper equipment preparation is a critical safety step that prevents many anesthetic complications.

- Check anesthesia machine before every patient
- Verify oxygen supply (tank level or pipeline function)
- Confirm inhalant levels (isoflurane/sevoflurane)
- Inspect breathing circuit for leaks, cracks, or disconnections
- Ensure scavenger system is functioning to protect staff
- Perform leak test before each procedure
- Prepare multiple endotracheal (ET) tube sizes for airway management
- Check ET tube cuff integrity to prevent aspiration and leaks
- Have laryngoscope, lubricant, and securing materials ready
- Ensure monitoring equipment is calibrated and functioning
- Select correct cuff sizes and probe placement sites
- Confirm all equipment BEFORE induction to prevent emergencies
- Most anesthesia complications are preventable with proper preparation

Monitoring Principles

Continuous monitoring allows early detection of anesthetic complications.

- Monitor HR, RR, BP, temperature, SpO2, ETCO2
- Evaluate trends, not single values
- Technician is the primary patient advocate
- Document values every 5–10 minutes
- Always verify abnormal readings with patient assessment

Body Temperature

Body temperature is one of the most overlooked but critical parameters during anesthesia, directly affecting cardiovascular function and recovery.

- Often the simplest parameter but frequently neglected
- Anesthetized patients lose heat rapidly due to vasodilation, decreased metabolism, and exposure
- Smaller patients and those under longer procedures are at higher risk

• Hypothermia leads to decreased heart rate and blood pressure
• Drug metabolism slows, prolonging recovery time
• Coagulation and immune function may be impaired
• Patient temperature should NOT fall below 96–97°F
• Temperature directly affects other vitals: especially HR and BP
• Active warming should be used early (blankets, warm air, fluid warmers)
• Cover as much of the patient as possible to reduce heat loss (~30%)
• Rewarming must be gradual (no more than 2–4°F per hour)
• Rapid rewarming can cause rewarming shock and vasodilation
• Monitor temperature continuously, not intermittently
• Preventing hypothermia is easier than correcting it

Cardiac Monitoring – Heart Rate and Rhythm

ECG monitoring provides real-time information about heart rate and rhythm but must be interpreted alongside perfusion and blood pressure.

• ECG evaluates electrical activity of the heart—not mechanical function
• Provides heart rate, rhythm, and identification of arrhythmias
• Does NOT directly reflect cardiac output or tissue perfusion
• Always correlate ECG with pulse quality and blood pressure
• Proper lead placement is essential for accurate readings
• Use alcohol or ultrasound gel to improve electrical contact
• Poor contact leads to artifact and inaccurate tracings
• Common artifacts include electrical interference (60-cycle), movement, and poor grounding
• Electrical interference appears as regular spikes unrelated to cardiac activity
• Ensure equipment is properly grounded to reduce noise
• Check patient leads and cables if waveform looks abnormal
• Arrhythmias must be interpreted in context of patient status
• Bradycardia or tachycardia may be drug-related or physiologic
• Always assess patient, not just the monitor
• ECG is one part of monitoring—combine with BP, ETCO2, SpO2


Common Arrythmia Identification Flowchart

Blood Pressure

Blood pressure is critical for perfusion and patient survival.

• MAP target: 70–120 mmHg
• Systolic: 100–140 mmHg
• Diastolic: 50–100 mmHg
• Doppler for small/critical patients (<5kg)
• Oscillometric for stable patients >5kg
• Cuff size: 30–40% limb circumference
• Incorrect cuff placement causes false readings

Ventilation and ETCO2

ETCO2 reflects ventilation, metabolism, and circulation.

• Normal: dogs 35–45 mmHg, cats 28–32 mmHg
• High ETCO2 = hypoventilation, deep anesthesia, obstruction
• Low ETCO2 = hyperventilation or decreased perfusion
• Sudden drop may indicate disconnection or cardiac arrest
• Capnograph waveform provides diagnostic insight
• ETCO2 inversely related to respiratory rate/depth

Oxygenation (SpO2)

SpO2 estimates oxygen delivery and must remain high during anesthesia.

• Normal: 95–100%
• Below 95% indicates compromised oxygen delivery
• Probe placement critical (tongue/mucous membrane)
• False readings caused by movement, vasoconstriction, poor placement
• Heart rate on monitor must match ECG

Anesthetic Depth

Depth must be continuously evaluated and adjusted.

• Light: increased HR/BP, movement, reflexes present
• Surgical: stable vitals, minimal reflexes
• Deep: decreased HR/BP/RR, dilated pupils
• Adjust gradually, not drastically
• Consider pain vs anesthetic depth before increasing gas
• Balanced anesthesia includes analgesia

Clinical Decision Making

Technicians must respond quickly to physiologic changes.

• Hypotension: reduce anesthetic depth, give fluids, check equipment
• High ETCO2: increase ventilation, check airway, reduce depth
• Low SpO2: check probe, oxygen supply, airway
• Arrhythmias: assess oxygenation, perfusion, drugs
• Always assess trends and patient context

Dysphoria vs Pain

Distinguishing dysphoria from pain is critical for correct treatment.

• Dysphoria: vocalization, agitation, inconsolable behavior
• Pain: responds to analgesia, localized response
• Rule out pain FIRST
• Sedatives alone do NOT fix dysphoria
• Consider reversing drugs if dysphoria suspected
• Monitor continuously after intervention
• Felines may show panting, agitation, nausea

Treating Dysphoria Algorithm

Managing Anesthetic Complications

Early recognition and intervention prevent critical events.

• Hypotension, hypothermia, hypoventilation, and arrhythmias are most common
• Recognize subtle changes early
• Reduce anesthetic depth as first step
• Provide fluids, oxygen, ventilation support
• Use emergency drugs when needed
• Prepare crash cart before anesthesia
• Technician vigilance prevents morbidity/mortality

RECOVER CPR Guidelines

Colorado State University Emergency Drug Calculator

Veterinary Anesthesia & Analgesia Support Group

Merck Veterinary Manual

Recovery Phase

Recovery is one of the highest-risk periods of anesthesia.

- Monitor until fully awake
- Maintain airway and oxygen if needed
- Provide analgesia
- Prevent hypothermia and injury
- Quiet environment improves recovery
- Technician must communicate handoff clearly

Summary

Technician-driven anesthesia significantly improves patient safety, monitoring quality, efficiency, and overall outcomes. The veterinary technician plays an active, not passive, role in managing anesthesia, directly influencing patient survival, recovery, and quality of care. Anesthesia is not passive; it is actively managed.