Research Anesthesia Skills

A minimum of 80% of the skills must be mastered. Skills must be cross-referenced in your case logs. Some skills may require more than one corresponding case references.
Mastery is defined as to be able to perform a task consistently and competently without being coached or directed no less than 4 times.
Mastery requires having performed the task in a wide variety of patients and situations.

Pharmacology

	Skill	**Case Log Number(s)**	**DVM or VTS Signature**
1.	Administer and assess the effects of an inhalant anesthetic via precision vaporizer, describing any physiological changes after administration in your patient and how it may affect the research being conducted. **Indicate inhalant**: _____		
2.	Administer and assess the necessity of pre-anesthetic anticholinergics, describing any physiological changes after administration in your patient and how it may act as a variable for the research. (e.g. atropine, glycopyrrolate)		
3.	Describe the rational for use in research protocol, administer and assess the pre-anesthetic effects of a pure agonist opioid, describing any physiological changes after administration in your patient and how it may affect the research being conducted. (e.g. hydromorphone, fentanyl, methadone, etc.)		
4.	Describe the rational for use in research protocol, administer and assess the pre-anesthetic effects of an agonist/antagonist, describing any physiological changes after administration in your patient and how it may affect the research being conducted. (e.g. butorphanol, nalbuphine)		
5.	Describe the rational for use in research protocol, administer and assess the pre-anesthetic effects of a partial agonist opioid, describing any physical changes after administration in your patient and how it may affect the research being conducted. (e.g. buprenorphine)		
6.	Describe the rational for use in research protocol, administer and assess the pre-anesthetic effects of an alpha-2 adrenergic agonist, describing any physiological changes after administration in your patient and how it may affect the research being conducted. (e.g. medetomidine, dexmedetomidine)		
7.	Describe the rational for use in research protocol, administer and assess the pre-anesthetic effects of a benzodiazepine, describing any physiological changes after administration in your patient and how it may affect the research being conducted. (e.g. midazolam, diazepam)		
8.	Describe the rational for use in research protocol, administer and assess the effects of a dissociative anesthetic agent used as part of an induction protocol, describing any physiological changes after administration in your patient and how it may affect the research being conducted. (e.g. ketamine/benzo, Telazol)		
9.	Describe the rational for use in research protocol, administer and assess the effects of IV thiopental, diprivan, etomidate, or alfaxalone as an induction agent, describing any physiological changes after administration in your patient and how it may affect the research being conducted. *Must describe at least two induction agents.		

	Indicate drug: _____		
10.	Describe the rational for use in research protocol, administer and assess the effects of a non-depolarizing neuromuscular blocking agent, describing any physiological changes after administration in your patient and dosing differences for at least two species. (e.g. atracurium, pancuronium, etc.) **Paralytic used:_____**		
11.	Describe the rational for use in research protocol, administer and assess the effects of a multimodal analgesic protocol during the maintenance phase of balanced anesthesia, describing the variables it may add to the research protocol.		
12.	Describe the rational for use in research protocol, administer and assess the effects of a non-steroidal anti-inflammatory agent, describing any physiological changes after administration in your patient, describing the variables it may add to the research protocol.(e.g. carprofen, ketoprofen, meloxicam, robenacoxib)		
13.	Describe the rational for use in research protocol, administer and assess the effects of an IV opioid constant rate infusion (e.g., morphine, fentanyl, hydromorphone, remifentanil, etc).		
14.	Describe the rational for use in research protocol, administer and assess the effects of an opioid antagonist (e.g., naloxone, nalmefene).		
15.	Describe the rational for use in research protocol, administer and assess the effects of an alpha-2 antagonist (e.g. atipamezole, tolazoline, yohimbine)		
16.	Administer and assess the effects of an antiarrhythmic drug (e.g., lidocaine, esmolol, procainamide), and indicate the reason for use.		
17.	Administer and assess the effects of a positive inotrope to maintain blood pressure (e.g., dopamine, dobutamine), and indicate the reason for use.		
18.	Administer and assess the effects of vasopressors to maintain blood pressure (e.g., phenylephrine and norepinephrine), and indicate the reason for use, describing the variables it may add to the research protocol.		
19.	Ability to develop a post-operative pain management plan without using an NSAID.		
20.	Ability to develop a post-operative pain management plan for a moderately painful procedure without using an opioid.		

Physiology and Physiologic Response

	Skill	**Case Log Number(s)**	**DVM or VTS Signature**
21.	Evaluate and respond to adverse cardiovascular reactions and/or complications to **pre-anesthetic** drugs. (e.g. bradycardia , hypotension)		
22.	Evaluate and respond to adverse respiratory reactions and/or complications to **pre-anesthetic** drugs. (e.g. respiratory distress, hypoxemia)		
23.	Evaluate and respond to adverse cardiovascular reactions and/or complications to **induction** drugs (e.g., arrhythmias, and hypotension).		
24.	Evaluate and respond to adverse respiratory reactions and/or complications to **induction** drugs (e.g., apnea, hypoxemia).		

25.	Administer and describe use of IV crystalloid fluid therapy during anesthesia (e.g., LRS, Normosol-R).		
26.	Administer and describe use of IV synthetic colloid fluid therapy (e.g., Dextrans, Hetastarch, Vetstarch)		
27.	Understand how to monitor for and treat anesthesia related malignant hyperthermia.		
28.	Ability to recognize and treat a research related adverse reactions to a surgical technique or chemical catalyst.		

Equipment Use and Understanding

	Skill	**Case Log Number(s)**	**DVM or VTS Signature**
29.	Insert esophageal stethoscope to evaluate and monitor heart rate and respiratory rate.		
30.	Set-up and operate a pulse oximeter, indicate function, its limitations and describe how to troubleshoot equipment malfunction.		
31.	Set-up and monitor heart rate and rhythm with continuous ECG monitoring in species with extremely high hear rates, such as rodents.		
32.	Set-up and monitor heart rate and rhythm with continuous ECG monitoring, identify arrhythmias and indicate if/when treatment is necessary; describe how to troubleshoot equipment.		
33.	Set-up and monitor temperature via nasal, esophageal, or rectal probe and evaluate patient status (e.g., hypothermia vs. hyperthermia and their relationship to anesthesia).		
34.	Set-up and operate a capnograph or capnometer (end-tidal CO2 monitor), evaluate ventilation status and describe how to troubleshoot equipment.		
35.	Demonstrate proper use of external warming devices and their limitations.		
36.	Set-up and monitor blood pressure indirectly with an occlusion cuff and Doppler flow probe, evaluate blood pressure status and describe how to troubleshoot equipment.		
37.	Set-up and monitor blood pressure indirectly with an oscillometric blood pressure monitoring device, evaluate blood pressure status and describe how to troubleshoot equipment.		
38.	Set up and monitor blood pressure directly using an indwelling arterial catheter attached to a pressure transducer or aneroid manometer, evaluate blood pressure status and describe how to		

	troubleshoot equipment.		
39.	Set-up, pressure check and operate a rebreathing system, describe how to troubleshoot equipment. (e.g., circle, Universal F).		
40.	Set-up, pressure check and operate a non-rebreathing system, describe how to troubleshoot equipment. (e.g., Bain, Jackson-Rees).		
41.	Set-up an anesthesia machine, indicate proper function and maintenance (e.g., oxygen cylinder, vaporizer, flow meter, CO2 absorbent and canisters, one way valves).		
42.	Set-up and perform intermittent positive pressure ventilation (IPPV) using a mechanical ventilator, evaluate its effectiveness and describe how to troubleshoot equipment.		
43.	Set-up and demonstrate use of a waste gas scavenging system (active or passive).		
44.	Understand how to limit and avoid waste anesthetic gas exposure with using high percentages of anesthetic gas as a form of induction.		
45.	Understand how to calculate tidal volumes when using a mechanical ventilator.		
46.	Demonstrate proper use of a laryngoscope for endotracheal intubation in two species.		
47.	Set up and demonstrate use of an IV fluid pump, describe how to troubleshoot equipment.		
48.	Calculate gtt/sec. for fluid administration with no IV fluid pump.		
49.	Set up and demonstrate use of a syringe pump, describe how to troubleshoot equipment.		
50.	Properly select an endotracheal tube based on diameter and length, indicate rationale for selection.		
51.	Understand and evaluate the risks of complete anesthetic gas induction.		

Laboratory Sample Collection and Analysis

	Skill	Case Log Number(s)	DVM or VTS Signature
52.	Collect blood samples for blood glucose levels, initiate sample analysis and interpret results (e.g., hypoglycemia, hyperglycemia).		
53.	Collect blood samples for PCV and total protein, initiate sample analysis and interpret results (e.g., anemia, dehydration).		
54.	Collect blood samples (arterial or venous) for blood gas analysis, initiate sample analysis and interpret results.		
55.	Ability to assess best euthanasia technique for preservation of tissues for research samples and understand the AVMA recognized methods of humane euthanasia.		

Skills and Techniques

	Skill	Case Log Number(s)	DVM or VTS Signature
56.	Auscultate thorax to assess cardio-respiratory function, indicate any abnormalities heard.		
57.	Perform manual intermittent positive pressure ventilation (IPPV) during the anesthetic procedure, describe technique, and indicate the advantages and disadvantages.		
58.	Perform pre-oxygenation, describe technique and indicate rationale for use.		
59.	Perform endotracheal intubation, indicate confirmation of proper placement in a minimum of two species. **Species: (1)_____(2)_____**		
60.	Describe proper inflation of the endotracheal tube cuff.		
61.	Demonstrate proper use of a stylet or guide tube to assist with intubation, describe rationale for use.		
62.	Indicate appropriate patient extubation time in regards to specific species and human safety concerns.		
63.	Perform SC, IM, IV injection. Indicate drug, location and reason for administration route for each technique.		
64.	Insert and maintain an arterial catheter; indicate location and possible complications.		
65.	Insert a peripheral IV catheter, indicate location and possible complications.		

66.	Assess peripheral pulses, indicate location and describe quality.		
67.	Insert and maintain a jugular or carotid catheter, indicate possible complications.		
68.	Insert and maintain a femoral vein or artery catheter/sheath.		
69.	Perform an epidural injection; indicate the drugs used and rationale for procedure and how it may affect the research being conducted.		
70.	Perform a local or regional anesthetic block and indicate the drugs used (e.g., brachial plexus block, ring block, intercostal nerve block, etc.).		
71.	Administer and assess the effects of an anticholinesterase inhibitor to reverse a non-depolarizing neuromuscular blocking agent, describing any physiological changes after administration in your patient and how it may affect the research being conducted. (e.g. neostigmine, edrophonium)		
72.	Assess pain and assign a pain score using a pain scoring system (e.g., Glascow, CSU or modified version). Describe how elevated pain scores may affect the research being conducted.		
73.	Perform intubation of a patient for one lung ventilation, describe the technique and indicate the rationale for the procedure.		
74.	Administer and evaluate the effects of emergency drugs used during cardiopulmonary arrest. (e.g. atropine, epinephrine, lidocaine and/or vasopressin)		
75.	Set-up and evaluate a Positive End Expiratory Pressure (PEEP) or Continuous Positive Airway Pressure (CPAP) device, indicate rationale for use.		
76.	Identify and initiate treatment for regurgitation under general anesthesia.		
77.	Ability to appropriately assign an ASA status for the pre-operative patient and re-define post-operatively.		
78.	Ability to setup and maintain an animal using the force mask technique and how to treat gastric distention.		
79.	Administer and assess the effects of a total intravenous anesthesia (TIVA) protocol for maintenance of anesthesia, indicate drugs used and describe any physiological changes after administration in your patient.		

80.	Administer and assess the effects of an IV agonist/antagonist as a partial reversal to a mu agonist, describe any physiological changes after administration in your patient and how it may affect the research being conducted.		
81.	Set up and operate a rebreathing circuit using closed flow oxygen flow rates. Indicate oxygen flow rate used and rationale for use.		
82.	Perform nasotracheal OR pharyngeal intubation, describe rationale for use.		
83.	Ability to appropriately choose and place a laryngeal mask airway.		
84.	Set up and perform a tracheostomy		

Surgical Nursing

	Skill	**Case Log Number(s)**	**DVM or VTS Signature**
85.	Mastery of instrument and equipment disinfection techniques.		
86.	Mastery of stereotaxic positioning.		
87.	Sterile draping of patient.		
88.	Demonstrate advanced knowledge and proper use of equipment used to move, protect, pad, and position large animal surgical patients.		
90.	Maintain, set-up, troubleshoot, and understand indications for electrocautery units.		
91.	Maintain, set-up, troubleshoot, and understand indications for portable or central suction units.		
92.	Demonstrate knowledge of shelf life of sterile goods when using low temperature sterilization methods (e.g., ethylene oxide, hydrogen peroxide gas plasma)		
93.	Demonstrate knowledge of shelf life of sterile goods when using steam sterilization methods.		
94.	Mastery of stomach tube placement tube placement with regard to size, length, safe technique in ruminants and/or non-ruminants.		
95.	In association with other medical team members, administer CPR (following VECCS RECOVER guidelines), evaluate effectiveness, and troubleshoot therapy.		
96.	Command of animal welfare guidelines set by the USDA especially in the areas of pain management and humane end points.		

I, the undersigned, declare that I have read the entire ALAVTN application packet. I further attest that the above-named applicant has achieved the ALAVTN definition of mastery for the above skills that are marked with my signature.

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Printed Name and Degree Signature

Please provide the names and credentials of all persons who have signed this form attesting to your mastery of advanced skills in clinical practice.