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INTRODUCTION

This document has been constructed to help orient your activities and self-study program during your residency.

In general you have three responsibilities:

- 1. The clinical anesthetic management of small and large animal patients within the VMTH.
- 2. To design and conduct a prospective research project. It is expected that this will lead to publication in a peer-reviewed scientific journal
- 3. Self-education.

This residency has been designed in order for you to succeed. We will do everything we can to help you achieve your goals, however, this is YOUR residency – make the most of it!

PERSONNEL

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CLINICAL EXPECTATIONS

Our training program has a strong clinical emphasis. Your time in clinics and clinical case management has a very high priority. We have a very busy hospital and the expectation is that it will only get busier as new capabilities are added. The demand on your time in the clinics will be high, as are our expectations.

When on clinics, you will typically be assigned one to two clinical cases per day for which you are responsible for the anesthetic management from preoperative assessment through to postoperative recovery.

Your preoperative assessment will include a complete physical exam, review of any records from referring veterinarians and review of in-house records (patient history, diagnostic tests, consultations, progress notes, etc.). If any additional work-up is indicated, discuss this with the faculty anesthesiologist on duty who will help you obtain the needed information if appropriate. Once you have gathered all the historical, physical and laboratory findings, you will formulate an anesthetic plan appropriate for the patient and procedure, and addresses your learning objectives. You are required to discuss your pertinent preoperative findings and your anesthetic plan with a faculty anesthesiologist. Use this discussion as a learning opportunity. It is imperative that you complete your work-up and discuss your plan with the faculty the day before the procedure (add-on, emergency and same day drop-off cases excepted) even if this requires you to come in to the clinic on a day you are scheduled to be elsewhere.

You will be expected to have prepared for your case prior to starting by doing the appropriate reading to familiarize yourself with all drugs, equipment and techniques you will be using, the procedure the patient is undergoing and special considerations for your patients' species and coexisting diseases and/or conditions. If at any point the faculty anesthesiologist feels you have not adequately prepared for your case you may be removed from the case.

When you are on clinics you will be expected to be in the clinic unless the faculty on duty has excused you. A typical day on clinics finishes around 7 pm (if you are not on call). If you do not have a case assigned to you, you should work with one of our technicians or a more senior resident to get exposure to more difficult cases. You can also assist the faculty on duty with student supervision.

Time off-clinics is available during the first year to attend the UCD Medical Center Anesthesiology rounds in Sacramento once a week (you will be relieved from clinical duties to be able to attend these rounds, unless impossible due to clinical caseload and available staff), and in second and third years to complete a research project and possibly study for the certifying examination. These are the only appropriate activities for the off-clinics time; this time should not be used as additional vacation or for business not related to the residency. Flexibility for adjusting research week allotment between residency years is available at the discretion of the service chief.

Year 1:

At the start of your first year in the training program our primary goal is for you to become familiar and comfortable working with all of the different services and in all areas of the hospital. Regardless of your background you will be assigned relatively healthy patients undergoing uncomplicated procedures. Use this period to familiarize yourself with the different drugs, monitoring equipment and techniques - make the most of these opportunities to utilize equipment and techniques with which you are less familiar.

Your first day on a clinical service you should turn up at 8:00 AM and you will be oriented to the service with the 4th year students starting their rotation.

Once you have worked in all areas of the hospital, demonstrated clinical competency with a variety of drugs and techniques in healthy patients you will be allocated increasingly complex cases. The time frame for advancement will vary between individuals. If you have any special interests we will try to accommodate those whilst ensuring a broad range of clinical experience.

You will be expected to attend student rounds if at all possible. This is an opportunity to learn about anesthesia and about teaching. You will have one afternoon off each week to go to the UCDMC to attend their weekly resident didactic series. However, VMTH clinical responsibility has priority and if the caseload is busy you may not be able to go every week.

Summary of Clinical Expectations – By the end of 1st Year:

1. Formulate and describe in a concise, organized presentation a plan for the anesthetic management of ASA physical status (PS) I-III patients undergoing uncomplicated procedures including special considerations and anticipated problems.

2. Manage ASA PS I-III patients with minimal assistance for uncomplicated procedures including preoperative workup, induction, maintenance, recovery and perioperative analgesia.

3. Efficiently set up a case in a reasonable time. This includes all necessary equipment and supplies.

4. Airway management/endotracheal intubation including patients with difficult airways.

5. Place peripheral venous, central venous and arterial catheters with minimal assistance.

6. Perform common local anesthetic techniques (perineural, epidural, IV regional, etc.) with minimal assistance.

7. Recognize and manage basic intraoperative problems including hypo/hypertension, hypo/hyperthermia, hypercapnia, hypoxemia/lower than expected PaO_2 , hemorrhage, arrhythmias, acid-base and electrolyte disturbances.

8. Keep accurate, complete and legible pre, intra and post-operative records.

9. Operate basic monitors and ventilators and troubleshoot simple malfunctions.

10. Communicate effectively with supervising faculty, primary care clinicians, technicians, and students.

Year 2

During the second year the emphasis will shift to completing your resident research project. You will be allocated 10 weeks out of clinics for this purpose. You will need to schedule these weeks *in advance*. You should have identified a faculty mentor during your first year (see section on resident research), and, if at all possible, identified the actual dates for the experimental work, so you can request them when the Service Chief starts working on the clinical schedule. We understand that factors beyond your control may necessitate adjustments of the weeks scheduled to conduct the research; in this case, you should obtain approval from the Service Chief and the faculty on duty the week(s) you need off. If the request is approved, the rotation you miss will be rescheduled, if possible during the time you were originally scheduled to be on research/study. We will not

reschedule research during non-anesthesia rotations, as arrangements are made in advance to avoid impacting the other service. We will ask you to take full weeks out of clinics rather than a few days a week.

Our expectation of your time and case preparation in the clinic will be unchanged except that you will be managing cases of increasing complexity. We will do our best to assign you cases that interest and challenge you but there will be times that you will need to take cases to help us get through the day's caseload. If the faculty decides you are lacking exposure to certain types of cases we may assign cases to fill those gaps.

We will begin expecting you to take on more clinical teaching responsibilities. You will be expected to provide support and instruction to 4th year students on rotation and to assist the faculty on duty when you are not busy with your own case. Once a week you will be asked to lead student rounds on a topic selected in advance by you and the faculty on duty.

Year 3

In your final year you will have 6 weeks out of clinics to wrap up your resident project and to prepare for the written section of the ACVAA certifying examination. As in the second year, the weeks out must be scheduled in advance as full weeks. You can request specific weeks when the Service Chief starts working on the clinical schedule; we will try to accommodate your requests whenever possible.

In the clinic you will, as much as possible, select your own cases to build on your growing expertise. However, if the faculty on the service decides that you are lacking expertise with a type of case, procedure or technique, you may be assigned to these cases. In addition, you may occasionally be assigned to cases based on the need to cover our caseload. You will also be expected to take on more leadership and teaching responsibilities including but not limited to mentoring and assisting 4th year students, technicians and junior residents. You will assist the faculty on duty with case supervision when you are not involved with a case and there may be times that you will be asked to assume the lead supervisory role while the faculty is fulfilling obligations off the clinic floor (e.g. lectures, meetings)

ROTATION SCHEDULE

Year	SAA	LAA	SAICU	OOC	Other	Vacation
1	18	17	4	4	4	5
2	16	15	2	6	8	5
3	15	15	2	6	9	5

SAA = small animal anesthesia

LAA = large animal anesthesia

SAICU = small animal intensive care unit

OOC = out of clinics time (research & study)

First year residents are expected to attend rounds at the UCD Medical Center once a week and will be relieved of clinical duties to do so whenever possible.

Other rotations typically include:

Year 1: Cardiology (2 weeks), Radiology/Imaging (1 week) VMTH UCD, Primate Center (1 week)

Year 2: Companion Avian and Pet Exotics (2 weeks), Laboratory Animal (2 weeks), zoo/wildlife (1 week at Sacramento or San Diego Zoo and 1 week at Safari Park), Integrative Medicine (2 weeks)

Year 3: Human Anesthesia (2 weeks) & Pain Medicine (2 weeks) at UCD Medical Center (or other hospital facility with Service Chief approval), Radiology/Imaging (1 week), Integrative Medicine (2 weeks), conference and research presentation (1 week), ACVAA written examination (1 week)

VACATION

You will accrue 2 days of vacation/month for the duration of your residency, or a total of 24 days (approximately 5 weeks) per year. The VMTH will require that you provide a list of 24 vacation days at the beginning of each academic year. Requests for vacation should be made at the beginning of the academic year, when the Service Chief establishes the schedule. Requests will be granted as often as possible, taking into account the service's demands. While some exceptions may be granted, we will ask that you take full weeks off for vacation rather than a few days per week. Requests should also be communicated to the person responsible for scheduling after hours duties.

In the event of a need to reschedule vacation time during VMTH rotations, you will need to get approval from both the Service Chief, and the faculty on the service you are scheduled to during the new vacation time. If the request is approved, the rotation you miss will be rescheduled, if possible during the time you were originally scheduled to be on vacation.

CONFERENCE ATTENDANCE

The service will support attendance to at least one conference during your residency. You will be expected to present the results of your resident research project at that conference. Attendance to additional conferences will be encouraged whenever possible. If the Service Chief approves attendance to a conference during time scheduled on a VMTH rotation, you will also need to get approval from the faculty on that rotation. If you wish to attend conferences in addition to those supported or encouraged by the service, you will need to do so during your vacation time.

The resident schedule is established by the Service Chief, who will make all final scheduling decisions. The current version is posted in an online calendar; you will be provided with login and password information at the beginning of your residency.

FINANCIAL SUPPORT

The VMTH provides \$800/year to each resident to support educational activities. In addition, Anesthesia residents currently receive a generous \$1000/year private donation, although this renewal of this funding is not guaranteed. It is your responsibility to manage educational funds well. Funds are typically used to attend conferences, but the VMTH money can also be used to partly support expenses related to the certifying examination. All expenses will need approval by the Service Chief; if you have any doubt that an expense is permissible or that it may not be approved, please consult with the Service Chief **prior to spending the money**, as if the expense does not get approved, you will be responsible for the payment. The Anesthesiology Service will cover expenses related to core and approved elective outside rotations separately from the support provided by the VMTH and the private donor.

AFTER HOURS DUTY

You will be assigned to night and weekend duty for the provision of emergency anesthesia service to the small and large animal clinics. Your oncall schedule will be determined by the Service Chief or will be delegated to an after-hours faculty. The oncall schedule will be published online at https://secure.vetmed.ucdavis.edu/OnCall/, and login will require your UC Davis computing account passowrd. During the beginning of your residency a faculty anesthesiologist will be on call with you to mentor you in coping with the after hours hospital environment and management of emergency cases. The length of this period will be somewhat dependent on the resident's previous experience but is typically 4-6 months. During this time you are expected to contact your faculty backup any time you are called to anesthetize a case. If you need to trade an oncall shift during that time, you will need to arrange for someone to replace you and to ensure that a faculty backup is available for your new shift. As much as possible, the faculty backup should be the same as during the original shift. After the first 4-6 months, there is no longer formal faculty backup, however, you should never hesitate to call a faculty if you have a case or situation with which you feel you need assistance. For the remainder of the residency, it is a service expectation that you will call one of the faculty for consultation or in-person backup if you have questions about case management or are unfamiliar or uncomfortable anesthetizing a particular case. After-hours caseload is variable; you may have no cases or many. Emergency duty does not relieve you of your daytime clinical or academic responsibilities. If you have had a particularly busy emergency shift and the schedule allows, the faculty on the service may decide to let you off for all or part of the day. This should not be taken for granted and will remain at the discretion of the attending faculty. Residents who decide not to come to work without faculty approval will be considered to be absent without authorization.

After hours, you will usually have both a student and a technician working with you. The after hours technicians are on site every night from 6 pm to 5 am, and from 7 am to 6 pm on weekend days. They will assist you at your discretion; you will be ultimately responsible for case management, but may decide to delegate management of a specific case to the technician or student if multiple cases need to be anesthetized simultaneously and you deem it appropriate. However, you are required to be present in the hospital whenever an animal is anesthetized after-hours and you are on duty (at a minimum from induction of anesthesia until extubation).

ACVAA REQUIREMENTS

ACVAA has a series of requirements, some of which are summarized below. You should familiarize yourself with these requirements by going to the ACVAA website (<u>http://www.acvaa.org</u>); in particular, you should read the ACVAA Residency Training Standards and the section for Candidates. You will receive access to this section when you register with ACVAA, which should be done during the first month of your residency.

ACVAA requires that you spend a minimum of 94 weeks in anesthesia rotations under the supervision of an ACVAA or ECVAA diplomate. ACVAA requires residents to be primarily responsible for the anesthesia of a minimum of 250 animals in the core species (dog, cat, horse, cattle, sheep, goats). For the core species, the resident must have anesthetized a minimum of 13 each dogs, cats, horses and ruminants. For the other species (pigs, camelids, birds, exotics, laboratory animals, wildlife) a minimum of 50 animals (total) should be anesthetized by the resident. ACVAA also requires that the case log includes a sufficient number of healthy animals in addition to animals with diseases or conditions affecting the following systems: cardiovascular, respiratory, neurologic, ophthalmologic, gastrointestinal, hepatic, renal, endocrine, orthopedic, obstetric. Pediatric and geriatric patients, as well as patients presenting for emergencies, should also be represented. Finally, ACVAA requires residents to document proficiency in the following techniques, in both large and small animals: endotracheal intubation, tracheotomy, arterial and venous catheterization, monitoring, neuromuscular blockade, local/regional blocks, constant rate infusions, management of ventilation, use and maintenance of equipment for anesthesia and critical animal care. In addition, ACVAA

ACVAA expects you to register early in your residency; please do so in the first month. For details, you can email the ACVAA Executive Secretary at <u>execdir@acva.org</u>, or talk to the Service Chief.

You will have to fill a caselog with every case you anesthetize. The caselog (Excel spreadsheet) can be downloaded from the Candidate section of the ACVAA website. The instructions on how to fill the caselog are available on the website as a separate document, and are copied below. You will have to submit your caselog at the end of each year of your residency by emailing it to the ACVAA Executive Secretary.

ACVAA Case & Activities Log

The log is to be submitted as an annual report of residency training on the anniversary of the start of the training program and on application to take the certifying exam

This Excel log has been formatted to record the anesthesia cases for which you have been <u>primarily</u> responsible. In the Summary Data sheet, formulae have been entered in specific cells to automatically generate totals for the various species work sheets; these formulae are designed to look for and count specific forms of data within specific ranges of cells. If a space or extraneous character is entered in the species data sheet before or after the letter, the formula will not count the data. The Summary Data sheet collects data from ranges of cells numbered 6 through 250. This means that if you have more than 244 cases (ie, cases extend past row # 250) for any given species, then you must enter the number of cases you have done manually on the Summary Data sheet.

On the Summary Data sheet, for Activity, the days should be business/week days (n=260/year), weekends are not included.

On the Weekly Schedule sheet, fill out the activity most associated with that week (or the activity for which you were scheduled), the mentor during that time, and the mentor's Diplomate status, if any, e.g. DACVAA, DECVAA, DACVIM-cardiology etc.

A sample file exists with data that have been entered in the Canine sheet so that you may see how cases should be presented.

Do not forget to enter all non-clinical, scholastic activities on the "Courses & Meetings" worksheet and sketch out the future of your residency as best you can in the "Plans for the Remainder of the 2nd & 3rd year" worksheets.

VSR 491R – RESIDENT CONFERENCE SERIES

This course takes place on Wednesday 7-9am Valley Hall room 2011 Fall, Winter and Spring Quarters, alternating with VSR 493R. Resources and schedules will be posted on the UCD SVM Canvas site for the course that can be found at <u>https://canvas.ucdavis.edu</u>. You will need your Kerberos name and password to log into Canvas. Dr. Pypendop currently schedules the courses and will provide you access to the Canvas site at the beginning of your residency. The current version of the schedule is also posted in an online calendar; you will be provided with login and password information at the beginning of your residency.

This seminar series provides the framework for academic studies during your residency. The series follows a three year cycle: one year covers topics pertaining to physiology, another pharmacology and the third year clinical practice. During your residency you will cover all three major topic areas but the order in which this is done will depend upon when you start your program.

These lectures serve as a guide for what you should be studying in preparation for your American College of Veterinary Anesthesiologist (ACVAA) certification (board) examinations. You should not, however, delay developing knowledge of a subject until it comes around in the three-year cycle. During the course of your residency your knowledge of physiology, pharmacology, as well as anesthetic principles and practice should be continually developing as you prepare for clinical cases.

These lectures are held *for your benefit*, your attendance is considered a **mandatory** part of your training program. You should prepare for the topics each week by general reading within relevant texts (see reading lists). Faculty from outside the anesthesia service, department or veterinary school may present lectures. Being well prepared for these sessions offers an excellent opportunity for interaction with experts with whom you may not otherwise come into contact.

At the end of each semester (fall and spring) there will be an examination based primarily upon the material presented in the conference series for that quarter. The format of the assessment will typically consist of a 20-30 minute oral examination by the faculty (and may include examiners not on faculty who were invited as speakers during the quarter). In addition there will be a written question (2 letter sized page answer) that you will have approximately one hour to complete. These exams are designed to assess your knowledge and communication skills and to prepare you for the ACVAA certification examination.

Current Topic Schedule:

2020-21:	Physiology
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- **2021-22:** Pharmacology
- **2022-23:** Equipment. Anesthetic Considerations for Species & Conditions

VSR 493R - MORBIDITY AND MORTALITY ROUNDS

Systematic review of clinical cases with significant morbidity or mortality will be assigned monthly to residents on a rotating basis (Monday, 8-9 am in 2011 Valley Hall or in the Equine Performance Laboratory conference room, Fall, Winter and Spring Quarters, alternating with VSR 494R). In addition, residents will be expected to discuss in detail (including a review of the relevant literature) one case, selected from the systematic review with faculty input, usually 10 days following the systematic review (Wednesday, 7-8 am or 8-9 am in 2011 Valley Hall or in the Equine Performance Laboratory conference room, alternating with VSR 491R). Typically each resident will present Morbidity & Mortality rounds once per quarter. The goal of these sessions is education and to provide a means for identifying features of our patient management system that could be improved or changed. It is not a forum for attribution of blame.

Suitable cases are those in which outcome was unexpected (good or bad), or one in which there were anesthetic or procedure related complications. The detailed discussion session can focus on one complex case, multiple unrelated cases or a series of related cases. Selected cases should be those from which the resident and others can learn.

The presentation should include the following:

- Case signalment and presenting complaint
- Summary of pertinent history
- Present anesthetic work up/ plan
- Summary of the anesthetic and recovery record
- Highlight the unexpected or adverse event/ outcome(s)
- Identify factors or events which may have led or contributed to the event(s)
- Review the medical and veterinary literature describing such events
- Suggest how we may alter our routine practices or case management in the future. This may raise issues that can be further addressed as a service or identify areas for future research.

The focus of these sessions is critical examination of the morbidity or mortality and not simply to present the anesthetic record. Visual aids (such as computerized presentation) are typically used for the benefit of the attendees, however, time spent preparing such should not replace time spent searching and reviewing literature. The schedule for the systematic review and detailed morbidity & mortality discussions is posted on the UC Davis Canvas site for the course that can be found at https://canvas.ucdavis.edu. You will need your Kerberos name and password to log into Canvas. Dr. Pypendop currently schedules the courses and will provide you access to the Canvas site at the beginning of your residency. The current version of the schedule is also posted in an online calendar; you will be provided with login and password information at the beginning of your residency. The course Canvas site is also a repository for the detailed discussion presentation materials.

VSR 494R - JOURNAL CLUB

Residents and faculty will be assigned to lead journal club on a rotating basis (Monday, 8-9 am in 2011 Valley Hall or in the Equine Performance Laboratory conference room, Fall, Winter and Spring Quarters, alternating with VSR 493R). The purpose of these sessions is critical review of the scientific literature. One or two related articles should be chosen and distributed electronically to the group, via the UC Davis Canvas site for the course. You should then lead a discussion about the paper that may address such issues as: its contribution to current knowledge, appropriateness of

experimental design, methods and data analysis. Original research papers are usually preferred, but review papers or meta-analyses on a particular topic may occasionally be selected. In order to provide time for everyone to read your article(s) they should be selected and posted at least a week ahead of time. The schedule will be posted on the UC Davis Canvas site for the course that can be found at <u>https://canvas.ucdavis.edu</u>. You will need your Kerberos name and password to log into Canvas. Dr. Pypendop currently schedules the courses and will provide you access to the Canvas site at the beginning of your residency. The current version of the schedule is also posted in an online calendar; you will be provided with login and password information at the beginning of your residency.

RESIDENT RESEARCH PROJECT

A first-authored manuscript, that has either been published or formally accepted for publication, must be submitted as part of your ACVAA credentials (application to sit the ACVAA certification examination). See ACVAA certification application process section of the guidelines for further details. In addition, the VMTH requires that you conduct a research project and present it at an Annual House Officer Seminar Day during your residency.

As a guide you should have identified a topic of research and faculty supervisor by the end-December of your first year. January-march of Year 1 can then be spent preparing research and possibly grant proposals with the assistance of your faculty research mentor(s). You will be assigned one week off clinical duty to assist with this (see above). Typically, residents are expected to seek funding through the Center for Companion Animal Health or the Center for Equine Health (intramural funding programs), but exceptions are possible. Out of clinic time in your second year is then to be spent conducting your research project. Once experiments are complete, data analysis and preparation of manuscript should progress promptly as it may take 6 months or longer for a manuscript to go through the review process and be accepted for publication.

You will be expected to present at a national or international conference (usually the annual meeting of the American College of Veterinary Anesthesia and Analgesia, but other conferences can be selected, with the research mentor(s) and Service Chief's approval). If your research project is completed without using all your off clinics time during your second and/or third year, we encourage you to consider being involved in additional research project(s). You can also use that time to study/prepare for the ACVAA certifying examination, or for other rotations, with Service Chief's approval.

ANNUAL RESIDENT EXAMINATION

Once a year (typically in August), residents will take a comprehensive anesthesia examination, mimicking the ACVAA certifying examination.

KNOWLEDGE AND SKILL OBJECTIVES

Knowledge:

- 1. Understanding of normal animal physiology and the effects of anesthetic drugs and techniques on body system functions, with particular emphasis on:
 - a. central nervous system
 - b. cardiovascular system
 - c. respiratory system
 - d. urinary system
 - e. hepatic system
- 2. Understanding of the pathophysiology and preoperative evaluation of patients with organ or system dysfunction, and understand the effects of organ or system dysfunction on perianesthetic case management, with particular emphasis on:
 - a. neurologic disease
 - i. seizure disorders
 - ii. intracranial diseases
 - iii. peripheral neuropathies and myopathies
 - b. cardiovascular diseases
 - i. valvular diseases
 - ii. cardiomyopathies
 - iii. congenital malformations
 - iv. arrhythmias and conduction abnormalities
 - c. respiratory diseases
 - i. parenchymal diseases
 - ii. airway diseases
 - iii. pleural diseases
 - d. urinary diseases
 - i. chronic and acute renal failure
 - ii. glomerulonephropathies
 - iii. urinary tract obstruction or rupture
 - e. hepatic diseases
 - i. hepatic insufficiency and failure
 - ii. biliary obstruction
 - f. hemopathies and coagulation disorders
 - g. systemic inflammation, sepsis, and shock
- 3. Understand physiologic, pharmacologic, and perianesthetic considerations relevant to animal signalment, with particular emphasis on:
 - a. species considerations
 - i. domestic species (dog, cat, horse, ox, sheep, goat, pig, bird)
 - ii. laboratory and exotic species
 - b. age (neonatal, pediatric, and geriatric)
 - c. sex and reproductive status
- 4. Understand the pharmacokinetics and pharmacodynamics for sedative, hypnotic, anesthetic, and analgesic drugs, with particular emphasis on:
 - a. phenothiazines and buterophenones
 - b. α_2 -agonists
 - c. benzodiazepines

- d. guaifenesin
- e. opioids
- f. barbiturates
- g. alkylphenols
- h. cyclohexanones
- i. etomidate
- j. neurosteroids
- k. inhaled anesthetics
 - i. potent volatile agents
 - ii. nitrous oxide and Xe
- 1. neuromuscular blocking drugs
- m. local anesthetics
- n. drugs acting on inflammatory pathways
- 5. Understand the pharmacokinetics and pharmacodynamics of drugs used to support cardiovascular and respiratory function, with special emphasis on:
 - a. α_1 agonists and antagonists
 - b. β_1 agonists and antagonists
 - c. β_2 -agonists
 - d. phosphodiesterase inhibitors
 - e. vasopressin
 - f. anticholinergics
 - g. antiarrhythmic drugs and Vaughan Williams classification system
- 6. Understand the composition, physiologic effects, indications and contraindications for crystalloid, colloid, and oxygen carrier fluid therapies.
- 7. Understand how to use anesthetic circuits and physiologic and clinical drug monitoring equipment.
- 8. Understand the causes, physiologic effects, monitoring and treatment for the following anesthetic problems:
 - a. hypotension
 - b. hypoventilation
 - c. hypothermia
 - d. hypoxemia/lower than expected PaO₂
 - e. bloat
 - f. regurgitation and aspiration
 - g. pneumothorax
 - h. hemorrhage
 - i. airway obstruction
 - j. sinus bradycardia and atrioventricular blocks
 - k. ventricular tachycardia and ventricular fibrillation
 - l. cardiac arrest
- 9. Understand acceptable techniques for euthanasia of domestic and laboratory animal species.

Skills

- 1. Prepare an anesthetic machine, monitoring equipment, and anesthetic plan in a timely and efficient manner.
- 2. Perform a thorough preoperative evaluation, including examination of the written history, communication with receiving or consulting services as needed, physical examination, and interpretation of laboratory and diagnostic imaging data.
- 3. Apply knowledge of pharmacology, physiology, equipment, and comparative medicine (listed above) to induce, maintain, and recover patients from anesthesia.
- 4. Appropriately instrument patients and interpret data from anesthesia monitoring equipment, including: direct arterial pressures, central venous pressures, spirometry, respiratory gas monitoring, pulse oximetry, and electrocardiography.
- 5. Be able to induce and maintain standing chemical restraint in horses or ruminants.
- 6. Be able to induce anesthesia in horses using a hydraulic table, swing gate, recovery stall, or lawn induction technique.
- 7. Be able to assist recovery in horses using head ropes, head and tail ropes, or slings.
- 8. Be able to maintain anesthesia using inhalation or total intravenous anesthetic techniques.
- 9. Perform common local and regional techniques (by palpation, nerve finder, and ultrasoundguided techniques), including:
 - a. peripheral nerve blocks of the head and limbs
 - b. epidural injections and epidural catheter placement
 - c. paravertebral blocks
 - d. intravenous regional anesthesia
- 10. Interpret blood gas and electrolyte data and be able to institute appropriate therapy.
- 11. Be able to use neuromuscular blocking agents and neuromuscular monitoring equipment.
- 12. Develop and successfully execute anesthetic plans for advanced cases, including:
 - a. intracranial surgery
 - b. laser surgery
 - c. thoracic surgery
 - d. cardiac procedures (valvuloplasty, embolization procedures, etc.)
 - e. abdominal surgery in compromised patients (i.e., portosystemic shunts, ASA IV-V colic patients)
 - f. obstetric surgery (extractions and Caesarian sections)
- 13. Be able to perform the following special techniques:
 - a. catheter placement by Seldinger technique
 - b. pharangeal intubation
 - c. tracheostomy
 - d. temporary pacemaker placement
 - e. measurement of cardiac output

- f. operation of pole syringes and darting equipment
- 14. Be able to develop a post-operative recovery monitoring and treatment plan for patients requiring intensive care.
- 15. Be able to recognize pain in domestic animals and utilize local, regional, or systemic analgesic techniques.
- 16. Be able to use the library and online biomedical information resources.
- 17. Be able to evaluate scientific literature and apply evidence based medical practices.
- 18. Be able to communicate effectively with medical staff and students.
- 19. Be able to provide clear and accurate didactic instruction to senior veterinary students.

READING LIST SCHEDULE

- Yr 1 Fall Veterinary Anesthesia and Analgesia, 5th Ed (Grimm, et al.)
 Summer Textbook of Veterinary Anatomy (Dyce & Sack) (relevant chapters) & Large Animal Medicine 5th ed (Bradford P. Smith) (relevant chapters)
- Yr 2 Fall Textbook of Veterinary Internal Medicine (Ettinger) (relevant chapters) Summer Miller's Anesthesia, vol. 1 (Miller)
- Yr 3 Fall Small Animal Regional Anesthesia and Analgesia (Campoy & Read)
 Summer Wall and Melzack's Textbook of Pain (McMahon & Koltzenburg) (Chapters 1-12, 24-33, 40-43, 48-52, 58-70, 72)

Seminar Series: Physiology Year

Fall	Nunn's Applied Respiratory Physiology (Lumb)
Winter	Cardiovascular Physiology (Levy and Pappano)
Spring	Textbook of Veterinary Physiology (Cunningham & Klein)

Seminar Series: Pharmacology Year

Fall	Veterinary Pharmacology & Therapeutics (Riviere & Papich)
Winter	Veterinary Pharmacology & Therapeutics (Riviere & Papich)
Spring	Fluid, Electrolyte and Acid-Base Disorders in Small Animal Practice
	(DiBartola)

Seminar Series: Equipment and Special Case Consideration

Fall	Understanding Anesthesia Equipment (Dorsch and Dorsch) (relevant
	chapters) & Basic Physics and Measurements in Anesthesia (Davis & Kenny)
Winter	Equine Anesthesia: Monitoring and Emergency Therapy (Muir & Hubbell) &
	Laboratory Animal Anesthesia 3 rd Ed. (Flecknell)
Spring	Zoo Animal and Wildlife Immobilization and Anesthesia (West, Heard,
	Caulkett)

RESIDENT EVALUATION

Anesthesia faculty with whom the resident has worked will judge clinical performance of the resident. Input from faculty of other services with which the resident rotates or interacts may be sought. Qualities assessed will include; conduct, standard of patient care, attention to duties, accurate record keeping, demonstrated acquisition of knowledge, attendance and ability to work as part of the anesthesia service.

Residents are expected to conduct themselves in a manner crediting themselves, the anesthesia service, the university and the profession. Patient care should be of the highest standard and residents are expected to uphold this standard in all aspects of their work. Anesthesia is a support specialty. Your interaction with faculty, other residents, staff and students should be professional and collegiate. Remember that anesthesia is performed to facilitate a procedure, and while patient care is the highest priority, providing an excellent service is the next most important aspect of our specialty. Your knowledge will be informally evaluated on a daily basis when you are in the clinics managing cases, developing and discussing anesthetic protocols with faculty and in you interactions with students in the clinic and teaching laboratories. More formal evaluation of your academic knowledge will occur within the VSR491R course oral and written examinations, and through the annual comprehensive evaluation. Performance deemed adequate by the anesthesia faculty for the year of the residency on these exams will be required for progression to the next residency year. Absence is only allowed for illness and vacation. Vacation should be scheduled in advance with the service chief and noted on the anesthesia clinic staff schedule. As a resident you are entitled to 24 days of vacation per year. There should be no more than 2 weeks of sick leave per year of training. According to the ACVAA guidelines any absence in excess of those described will require the trainees program to be lengthened in order to meet the clinical requirements.

At the end of each quarter the resident will meet with faculty to discuss their performance on the preceding VSR491R exam, review their case logs and discuss the residents overall performance.

OVERALL RESIDENCY TIMELINE



Documents and forms for ACVAA candidates can be found on the ACVAA website at http://acvaa.org. You should review these resources early in your residency.

This includes:

- Residency training standards
- Case and activities log template and instructions
- Resident registration form
- Recommended peer reviewed journals
- Examination application

Documents and forms for ECVAA candidates can be found on the ECVAA website at http://www.ecva.eu.com. You should review these resources early in your residency.