Oregon State University
Carlson College of
Veterinary Medicine

Student Manual

Year 4 Instructional Program

Class of 2022
June 14, 2021 – June 12, 2022

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Safety Policy for Personnel and Students

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Year 4 Block Instruction Schedule

The final year of the professional educational program is scheduled in 13 blocks of 4 weeks each. All rotations start on Monday and end on Sunday, with the exception of Large Animal Emergency Care. This course starts on Sunday at 8pm and ends Monday morning. All students that have a course scheduled for the end of the year (13, 13b, 13b2 or 13a- 3 week), will stay on this last rotation until Wednesday, June 8, 2022 at noon.

Blocks for the academic year 2021-2022 will be as follows:

Block 1:	June 14, 2021 – July 11, 2021	
1b, 1b2:	**Monday, July 5, 2021 (Observed)**	**Independence Day**
Block 2:	July 12, 2021 – August 8, 2021	
Block 3:	August 9, 2021 – September 5, 2021	
Block 4:	September 6, 2021 – October 3, 2021	
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Block 13:	May 16, 2022 – June 12, 2022 (released Wednesday, June 8)	
13b:	**Monday, May 30, 2022**	**Memorial Day**

Monday holiday rule: Students stay on an extra day to cover Monday holidays. The next block starts on Tuesday instead of the normal Monday. Please note this when making any plans.

Schedule Changes: Changes are not permitted without the approval of the course coordinator. If you need to be absent during a block for any reason you must fill out the standard absence form in advance and have it signed by the Associate Dean for Student and Academic Affairs. If you have an emergency or become ill, you need to notify the appropriate people of your absence as soon as possible. You are responsible for contacting Zach Johnson, to schedule make up days of rotations if needed.

CCVM Student Policies

Absence Policy- Year 4

This policy is also listed on the CCVM website.
http://vetmed.oregonstate.edu/students/current/absences

Students in both elective and required clinical rotations are allowed to have no more than 0.5 days of excused absence per 1-week block, with a maximum of 5 excused days of absence during the senior year. The following are considered EXCUSED absences:

1. Job interviews
2. National or State licensing boards
3. A medical or family emergency
4. Scheduled medical appointments
5. Military or legal obligation such as subpoena or jury duty

Other personal circumstances necessitating absence from the block will be considered UNEXCUSED, unless the course leader and duty clinician to which the student is assigned deem it appropriate to classify as an EXCUSED absence. Except for emergencies, students must complete a Request to be Absent Form (available in the dean's office) for ALL anticipated absences. The form should be completed and returned to the Associate Dean for Student and Academic Affairs. Except in emergencies, if not submitted at least 1 week prior to the absence, the absence will automatically be considered UNEXCUSED.

When a student has greater than 0.5 days of excused absence/1 week of block time or ANY unexcused absence the student will be expected to make up that time along with any after-hours emergency time associated with the block. If, in the opinion of the course leader, absences were such that the student's learning opportunities were sufficiently reduced by the absences, the student may be required to repeat the entire block. Until absenteeism is made up, the student shall receive a grade of INCOMPLETE.

Grading
Students will receive a letter grade for each required block, based on criteria established by the instructor(s). A grade of a "D" is considered "unsatisfactory performance" and will require repeating the block satisfactorily before graduation. A grade of "F" results in dismissal from the DVM program. Reinstatement may be granted by the Student Progress Committee following a submitted petition and details on this process can be found in the Academic Standards Policy. Repeat tardiness or unexcused absence without the instructor's permission may also result in a student needing to retake part or all of a block at the instructor's discretion.

Pet policy
Dogs, cats, and other pets, by University rules, are not allowed in buildings unless they are part of the teaching program, or here as a patient. Animals here for teaching purposes and appointments must be properly housed within the Teaching Laboratory or Veterinary Teaching Hospital. Please leave your pets at home. Pets are not allowed to be kept in vehicles in the

College's parking lots.

Pregnancy, Disabled and Seriously Ill Students

The veterinary curriculum is both mentally and physically rigorous. Veterinary students are potentially exposed to materials and procedures that may result in physical or psychological injury. Traumatic injuries are an inherent risk of your chosen profession whether it be by direct contact with animals or equipment necessary to diagnose and treat disease or as a result of exposure to potentially hazardous chemicals or agents. Physical, academic and emotional stressors are also present that may lead to psychological distress. Injury may be increased when a student is pregnant, trying to become pregnant, disabled and/or seriously ill.

The CCVM realizes that individuals, who are pregnant, may become pregnant, are disabled or seriously ill have the right and responsibility to make decisions for themselves concerning their condition. The CCVM may not discriminate against these individuals based on their condition and the student should expect appropriate consideration from fellow students, staffand faculty.

The CCVM will provide reasonable accommodations to all students regardless of disabilities to the extent possible in classes and clinical rotations consistent with Oregon State University policies, state and federal law unless their presence constitutes a risk to the health and well-being of fellow classmates, staff, house officers or faculty. This risk will be determined by the Associate Dean of Students and Department of Clinical Sciences Chair. The following recommendations are for students who are pregnant, attempting to become pregnant, disabled (temporarily or permanently) or seriously ill:

1. The student should notify his/her healthcare provider of their condition and of the curricular requirements to develop a plan that is appropriate for the student's condition. The healthcare provider may contact the Associate Dean or Department Chair to assist in this assessment.
2. The student should provide the Associate Dean with a signed statement from the healthcare provider that defines the risks that the student is exposed to
3. The student should notify the Associate Dean of his/her pregnancy, disability or illness as early as possible so steps can be taken to decide the best course of action for the student.

The student will work with their healthcare provider and the Associate Dean of students then may elect one of the following:

1. Continuation as a student with no change in schedule or activities and a written acknowledgement of the risks involved
2. Continue as a student with schedule and/or activity changes and a written acknowledgement that program completion may be delayed, and hazards maystill exist
3. Withdraw from the DVM program permanently or request readmission through the Student's Progress Committee

If the student elects to complete the program, they understand they must complete all standard graduation requirements according to the schedule developed with them by the Associate Dean of Students

If a student believes that his or her disability requires an accommodation to meet the standards set forth in this document, he or she should contact the Associate Dean for Student and

Academic Affairs at the time he or she begins the program or, if that is not feasible, at the earliest possible date to ensure that the College and student have ample opportunity to discuss the accommodation request.

Security

The College's security policy requires all students and employees to wear an ID badge while in the buildings. Visitors must check in at the Dean's office reception desk and receive a visitor's pass. Employee and student badges are coded to open the locked external and internal doors in Magruder Hall. Several exterior doors of Magruder Hall (with the exception of the north and south entrances by the bike racks are open to the public from 7:30am - 5pm. Unauthorized people, non-veterinary students and the general public are not allowed to be in the building outside of regular working hours. Even during regular working hours, several areas of the building are restricted from the public. Should you encounter anyone with whom you are unfamiliar, politely ask them if you can be of any assistance and make sure they are not left unattended in the building. Please Contact Dr. de Morais, Dr. Scollan, or Campus Security if there are any problems.

There is a phone at the south entrance by the VDL main entrance for after-hours use. This bell rings in four places: the VTH reception area, the equine and bovine stall areas, and outside the student/house officer sleeping rooms in the hallway. If you hear this phone ring, please respond as quickly as possible.

Any security problems should be investigated and reported as soon as possible to Dr. De Morais (VTH) or Dr. Scollan (student/general).

Keys or codes issued to students must be protected from loss or theft in order to assure security for areas such as the pharmacy, operating rooms, and medical records rooms. If keys or codes are lost or stolen, this should be immediately reported to the supervising individual.

Emergencies

In case of emergency, please call:

Ambulance	**9-911** (dial '9' first when using a university phone)
Campus Dispatch	**7-7000 (**For any facilities-related emergencies)
Campus Security	**9-911**
City Police	**9-911**
Fire Department	**9-911**
Dr. Tornquist	**(541) 908-3152**
Dr. De Morais	**(541) 250-0050 (**For VTH-related emergencies)
Dr. Tornquist	**(541) 908-3152 (**For VDL-related emergencies)
Dr. Scollan	**(541) 740-2308 (**For student or academic-related emergencies)

Policy on Drug and Alcohol Use

Students shall not use non-physician prescribed controlled or prescription drugs, or chemical substances, or be under the influence of alcohol or other drugs of abuse during any time when the student is, or may be, in a work or educational environment. Also, students are advised to avoid drugs that interfere with mental alertness and capacity when in a work or educational environment. Violation of this rule may result in dismissal from the program.

OSU CCVM Professional Code of Conduct for Students

This Code of Conduct is a set of guidelines for professional behavior and conduct for students in the Carlson College of Veterinary Medicine. As members of the veterinary profession, students should reflect the honor and dignity of the profession, maintain an environment conducive to learning for themselves and others, and provide service to the community.

The Code of Conduct is intentionally general in order to provide guidance for professional behavior without specifying every action that might be considered unprofessional. The guidelines are based on the Principles of Veterinary Medical Ethics published by the AVMA https://www.avma.org/kb/policies/pages/principles-of-veterinary-medical-ethics-of-the-avma.aspx

They are not intended to supersede or modify the Oregon State University Student Conduct Regulations http://studentlife.oregonstate.edu/sites/studentlife.oregonstate.edu/files/final_code_of_student_conduct_updated_1_25_18.pdf

A violation of the Code of Conduct will be considered grounds for dismissal. The Student Progress Committee will review all violations and make recommendations to the Dean.

- Students will treat each other, faculty and staff with respect, fairness, and courtesy.
- Students will consider the welfare of the patient first with decisions regarding patient care transcending personal, professional, or academic gain.
- Students will earn the respect of their colleagues and the public through courteous verbal exchange, considerate treatment, professional appearance, professionally acceptable treatments and the utilization of current and valid scientific knowledge.
- Students will maintain an appropriate learning environment at all times and give instructors the respect of their attention.
- Students should respect the rights of other students with regard to access to learning and learning aids.
- Students should strive to continually improve their knowledge and skills as well as the knowledge and skills of those around them.
- Students will be honest in all matters with all people associated with the educational program and their colleagues.
- Students shall observe all laws and uphold the honor and dignity of the veterinary profession.

Examples of unprofessional conduct include, but are not limited to the following:

- Verbal or physical abuse of faculty, staff, patients, clients or students, or knowingly publishing or circulating false information concerning any individual in the College.
- Failure to maintain patient and client confidentiality by sharing or releasing any case information including photographs and recorded images without specific approval from the client.

- Use of non-physician-prescribed controlled or prescription drugs, or chemical substances, or being under the influence of these or alcohol while in a work or educational environment.
- Knowingly producing false evidence against any other person or giving false statements or charges in bad faith against any other person.
- Falsification, fraudulent use or misuse of application materials or forms used by the CCVM for admissions, evaluation of performance or evaluation of conduct.
- Falsification, fraudulent use or misuse of clinical records, vaccination certificates, prescriptions or other forms used in the practice of veterinary medicine.
- Abuse, neglect or improper care of any animal.
- Conviction in a court of competent jurisdiction of a felony or on any charge involving moral turpitude (moral depravity).
- Engaging in any facet of the practice of veterinary medicine or surgery prior to graduation unless under direct supervision of a legally licensed veterinarian. These practices shall be defined according to state practice acts.
- Falsifying medical records or any document relating to the treatment, care, health or disposition of any animal in the College.
- Stealing or misappropriating any item or making unauthorized use of any item, public or private at the Carlson College of Veterinary Medicine, or other departments on campus, for example: drugs, books, instruments, microscopes.

Student Duty Hours

The Carlson College of Veterinary Medicine recognizes the importance of the health, safety, and well-being of veterinary students. It is clear that students need adequate time for rest and personal care in order to optimize learning, student safety, and patient care. The following guidelines have been developed to help define those needs and suggest how to meet them. Limiting required duty hours does not imply that students should cease providing essential patient care services. Priority must always be given to patient care and avoiding transfer of responsibilities to others at inappropriate times (e.g., during an operative procedure, in the midst of a rapidly evolving clinical event). Ultimately, senior clinicians have the authority to determine if a student may be excused or if their presence is required to maintain patient care.

1. It is the responsibility of the students to inform the service faculty when they have been in the hospital after regular business hours. It is the responsibility of the faculty, residents, and staff to allow and encourage students to leave the hospital to rest and attend to personal needs.
2. Continuous on-site duty should not exceed twenty-four consecutive hours. Students may remain on duty longer at their discretion, with service faculty approval, to participate in didactic activities, transfer care of patients, and to maintain continuity of medical and surgical care. Faculty or resident approval must be confirmed before leaving to avoid disruption of patient care.
3. Students should be provided a reasonable amount of time to eat or attend to personal care at least once every six hours. However, sufficient time to leave the hospital to eat may not be available.
4. Weeknight treatment duty or on-call duty should be scheduled no more frequently than every third night, averaged over the length of the rotation, unless student numbers preclude this. Students should not trade shifts that result in consecutive nights on treatment duty or on-call.

5. Adequate time for rest and personal activities should be provided. Optimally, this should be a minimum of 8 consecutive hours within a 24 hour period unaffected by daily duties, after-hours duties or in-house call.
6. Regularly scheduled in-house duty hours, should be limited to eighty hours per week, averaged over the course of the length of the rotation.

Policy on Social Network Use

Posting of material relating to any client, patient, College-owned or research animal in any form to any public or social networking site is forbidden. Visual images such as photographs of surgery, rectal examination and necropsy that veterinary students are accustomed to could be upsetting to many in the general public. In addition, these images could be copied and misused by other groups, resulting in permanent harm to veterinary education programs. Therefore, **no pictures of any animal within the college may be posted to any web site without the prior approval of the Associate Dean for Student and Academic Affairs. No picture of any hospital client may be posted without the written approval of the client involved.** Students are required to maintain and respect client and patient confidentiality and to respect the dignity of all animals and their owners. Failure to comply with this policy will be considered a violation of the Professional Code of Conduct.

The use of personal cell phones and other personal electronic devices should be limited to break periods unless being used specifically for rotation related tasks. Be respectful and professional when using your devices. Limit distractions during your scheduled shifts, rounds, appointments, and meetings.

Honesty in Academic Work

The administration of the classroom rests with the instructor. Immediate action should be taken when evidence of academic dishonesty comes to the instructor's attention. The instructor may impose any grade penalty up to and including an "F" grade after informing the student. The instructor must report the incident and the action taken to the Department Head and then to the Associate Dean for Student and Academic Affairs. Grade penalties imposed as a result of academic dishonesty may be appealed by the student.

Examples of academic dishonesty include, but are not limited to:

- Receiving or giving unauthorized aid on examinations or any other work which is required to be accomplished individually. In general, students may not work together on graded course work without the specific permission of their instructor. If students are unsure of the limits of permissible collaboration, they must seek clarification from the instructor.
- Using unauthorized materials during examinations.
- Removing an examination from the examination room without the instructor's consent.
- Denying others the opportunity to prepare for upcoming exams.
- Plagiarizing, defined as the unacknowledged use of the words or ideas of another.
- Using false excuses to obtain extensions of time deadlines, or providing false information or fabricated documents or data to the University.
- Altering a graded exam and submitting it for re-grading.

The students in the Carlson College of Veterinary Medicine are on an honor system during examinations. They are asked to sign and abide by a Student Honor Code Agreement. The faculty may or may not proctor examinations but are available to answer questions and assist with the evaluation process. If a student knows or suspects another student has committed acts of academic dishonesty, s/he is expected to report the incident to the instructor and the Associate Dean for Student and Academic Affairs.

Lois Bates Acheson Veterinary Teaching Hospital

Dr. Helio de Morais
Director, Lois Bates Acheson Veterinary Teaching Hospital

Hospital Mission
The mission of the Oregon State University, Lois Bates Acheson Veterinary Teaching Hospital (VTH) is to provide superior clinical instruction as part of a professional veterinary curriculum; to provide high quality patient care and customer service; to serve as a referral and consultation center for veterinary practitioners as well as governmental and non-governmental agencies; to conduct original clinical research on emerging animal and human health concerns; and to offer an intellectual and academic atmosphere that supports the practice of innovative veterinary medicine.

Organization
The Veterinary Teaching Hospital is organized into service & support areas:

Clinical Service Areas
Anesthesiology
Diagnostic Imaging
Large Animal Internal Medicine
Large Animal Surgery
Rural Veterinary Practice
Large Animal & Small Animal Theriogenology
Small Animal Internal Medicine
Small Animal Surgery
Cardiology
Oncology
Small Animal Emergency & Critical Care

Hospital Support Areas
Central Sterile
Client Services
- Medical Aide Supervisor
- Medical Aide Receptionists
- Process Improvement Manager
- Client Advocates
- Student Workers

Farm/Ranch Services
- Farm/Ranch Supervisor
- Animal Attendants
- Student Workers

Financial Services
Patient Services
- Patient Service Coordinators
- Certified Veterinary Technicians
- Veterinary Assistants
- Animal Attendants
- Student Workers

Pharmacy

Hospital Hours of Business

Large Animal Hospital Office Hours
Monday - Friday
8am to 5pm
541-737-2858 (Phone)
541-737-8651 (Fax)

Large Animal Emergency Service
541-737-2858 (Phone)
Available 24-hours/day, 7 days/week
Call the number; listen to instructions; leave a message; and a doctor will return call within minutes.

Small Animal Hospital Office Hours
Monday – Friday
8am to 6pm
541-737-4812 (Phone)
541-737-4818 (Fax)

Support Staff

Client Services
The Medical Aide Supervisor oversees the reception areas and the Medical Aide Receptionists. The Reception staff is responsible for client scheduling, patient receiving and discharging, billing, and maintaining medical records.

Farm Services
The Large Animal Farm/Ranch Supervisor is responsible for the entire Large Animal physical plant, including the surrounding CVM-managed property. The Farm/Ranch Supervisor is also responsible for husbandry and care of the CVM-owned animals. The Farm/Ranch Supervisor supervises Large Animal Attendants and Student Worker Attendants.

Financial Services
The Hospital's financial support is provided by the Process Improvement Manager and the VTH Accounting team.

Patient Services
The Patient Services Coordinators supervise the technical and patient care staff as well as coordinate safety and accident reporting.

General Technician, Animal Attendant, & Assistant Duties
Technicians in the Hospital are responsible for the complete organization of their assigned area, including patient care, student supervision, client communication, inventory and equipment maintenance, and assisting faculty with teaching and research. Animal attendants and assistants are responsible for maintaining the hospital's facility, equipment and supplies, in addition to

assisting with patient care (feeding, walking, etc.) and restraint. While working in the clinic, technicians, animal attendants and assistants are required to follow all approved VTH and university policies and procedures, as well as to follow direction provided by the Patient Services Coordinators and/or work leaders and clinicians on their particular service.

The following duties apply to Technicians in all areas of the hospital:

- Provide basic and advanced patient care (blood draws, catheter placement, patient monitoring and critical care, administration of medications, etc.)
- Prepare for and assist clinicians with medical and surgical procedures
- Admit patients, perform physical examinations and take patient histories when necessary
- Oversee and instruct students in general and specialized patient care and techniques
- Provide student orientation for individual service areas
- Provide safety instruction for students and monitor student safety
- Monitor and encourage compliance of all hospital rules and policies
- Coordinate and assist in scheduling daily patient receiving and diagnostic procedures
- Coordinate patient care with core services (Anesthesia and Imaging), reception desk and, at times, the Large Animal Hospital
- Maintain organization and cleanliness of service area
- Maintain specialized service area supply inventory
- Operate and maintain specialty area equipment
- Communicate with clients over the phone, in person or via email, regarding patient care, procedure estimates and medication refills
- Keep accurate patient medical records and drug logs
- Prepare patient estimates for diagnostics, procedures and hospitalization
- Enter charges for all hospitalization, diagnostic testing, and medical, surgical and diagnostic procedures
- Assist in developing and maintaining hospital protocols, forms, logs and teaching materials
- Assist clinicians with research projects, student labs and student grading

General Animal Attendant duties may include the following:

- Maintain and stock general supplies and laundry throughout the hospital, including the ICU and Main Treatment areas
- Maintain and follow daily, weekly and monthly hospital cleaning schedules
- Coordinate maintenance and repairs for hospital equipment
- Coordinate cleaning schedules with outside services
- Maintain and order all hospital bagged and canned food
- Direct animal attendant student workers
- Provide patient care following direction from technicians or clinicians, including walking and feeding
- Assist with restraint for basic procedures, including venipuncture or bandage changes

In addition to the duties listed for Animal Attendants, Animal Assistant duties may also include:

- Provide additional patient care, such as icing incision sites, administering oral medications, etc.
- Assist with and perform selected rehabilitation procedures.

Safety

The OSU VTH realizes the importance of a safe work environment. The training for and practice of veterinary medicine is associated with physical and emotional hazards. Individuals who are pregnant, anticipate a pregnancy, are disabled or seriously ill should review recommendations under the previous CVM Student Policy section. Policies are in place to minimize injury to our students. In the event of a life-threatening injury involving students, staff or clients, emergency services (9- 911) should be called immediately. Someone should stay with the injured person until emergency services arrive. Some specific, relatively common, injuries are discussed below. Any accident or injury occurring at the VTH should be reported as soon as possible to service personnel and/or a supervisor, so that the appropriate paperwork can be completed (OSU Accident Reporting, Benton County Health).

Bites: It is important to remember that all bites should be reported to a service veterinary technician who will aid in completing necessary paperwork (see above) and mark the patient's file with Caution alerts. A policy on animal bites, as well as bite report form, is available in the Appendices. Immediately, all bites should be washed with soap and water for a minimum of 5 minutes and encouraged to bleed. Do not massage the wound. It is recommended that students see their healthcare provider or Student Health Services for further recommendations. The appendix also contains material students should read on rabies.

Sharps: Needle stick and other sharp injuries are common in veterinary practice. Students should read the Sharps Injury policy in the appendix. For life-threatening injuries see above. For non-life-threatening injuries wash it with warm soap and water for five minutes, encouraging bleeding. Do not massage the wound. Wrap and dress as appropriate. Seek medical care as previously directed.

Infectious Disease: As veterinary students, you will be exposed to or potentially exposed to many infectious and zoonotic agents. A comprehensive infectious disease policy for the hospital is in the appendix that covers personal safety as well as individual diseases. Students should read up on cryptosporidiosis, Salmonella ssp. Campylobacter, Giardia, Yersinia, hookworms, roundworms, rabies, tetanus, bartonellosis (cat scratch disease), toxoplasmosis, leptospirosis, brucellosis, Q fever, tuberculosis, anthrax, Lymes Disease, equine encephalitis, West Nile fever, and Herpes B virus (primate contact) as they may come into contact with patients that are or potentially are infected with these zoonotic organisms.

Radiologic Risks: Students may be exposed to several radiologic risks including radiation (radiograph, CT, MRI, fluoroscopy) and radionuclides. Students should adhere to the principles of ALARA. Students who are pregnant or may be pregnant are referred to an earlier section on safety for pregnant persons in the CCVM Student Policies. Additional safety information will be obtained during your diagnostic imaging rotation and orientation. The Appendix contains additional information regarding radiation exposure and ALARA.

Chemicals: Chemicals are used for a variety of tasks around the VTH Students should familiarize themselves with the risks of exposure to chemicals in their environment. MSDS sheets are available in the VTH for all chemicals used and can be found in the hospital laboratory area (Tech Station). If you have questions regarding chemical exposure, please ask a service technician or clinician.

Controlled Substances

Controlled substances are those substances that fall under the jurisdiction of the Drug Enforcement Agency (DEA), which is part of the U.S. Department of Justice, who enforces the Controlled Substance Act, and therefore depict Federal regulations surrounding the use and accountability of. Controlled substances carry diversion and abuse potential, with different scheduling of the substances, which make them high-priority to many regulations in healthcare practices. The primary goal of the DEA is to prevent diversion and abuse of these substances while ensuring adequate supply of controlled substances are met for the country's legitimate medical, scientific, and research needs.

All employees and students within the Veterinary Teaching Hospital, which fall under the DEA registration of the Acheson Teaching Hospital Pharmacy, are subject to Title 21 United States Code (USC) Federal Controlled Substances Act. All definitions, rules, and regulations can be found at the following website: http://www.deadiversion.usdoj.gov/21cfr/21usc/index.html. Therefore, all employees and students must maintain appropriate scope of practice in veterinary medicine when using controlled substances. This means that appropriate protocol and use of controlled substances are warranted in patient therapy, in terms of prescribing, administering, and dispensing for legitimate medical purposes.

Controlled substances will require strict accountability, security, and documentation in all areas of the hospital, therefore a "closed-system" concept is warranted. This means that all records must be accurate and a reflection of secure physical inventory for all audit purposes. Students will, at times, be handling controlled substances and will be granted this authority under their respective VTH clinical practitioner and under their direct supervision. Students, in this regard, will be held responsible in abiding by all measures that fall under the Controlled Substance Act. Students are not allowed to access areas that contain controlled substances within the VTH, veloped positive-will help in maintaining compliance for accountability and accuracy of, for example, serving as witnesses to controlled substance transactions from the Cubex® machines or preparing written prescription orders for controlled substances signed by the VTH practitioner.

If diversion is suspected, severe penalties can follow per Federal regulations, such as civil, criminal, or loss of licensure and in turn, punishments around the veterinary collegiate program as deemed necessary.

Controlled substances are divided into five schedules, determined by current accepted medical use in the U.S. and relative abuse potential and likelihood to cause dependence. Please familiarize yourself with the following examples (definitions are paraphrased):

- C I: high potential for abuse, lack of safety
    - Example: heroin
- C II: high potential for abuse and may lead to severe psychological or physical dependence
    - Examples: hydromorphone, morphine, fentanyl

- C III: have potential for abuse less than C I / C II, may lead to moderate or low physical dependence / high psychological dependence
    - Examples: buprenorphine, ketamine, APAP-codeine
- C IV: have a lower potential for abuse relative to C III
    - Examples: butorphanol, midazolam, diazepam
- C V: have a lower potential for abuse relative to CIV
    - Example: codeine syrup

Large Animal Services
Veterinary Teaching Hospital
Guidelines and Procedures

Introduction

The primary mission of faculty, staff, and students is quality patient care. The provision of excellent service is fundamental to the Veterinary Teaching Hospital (VTH). The VTH is expected to function and provide services in a manner similar to a successful private practice and this requires the attention of everyone to all aspects from patient care, client relations, and general order and cleanliness. The workload and schedule is demanding at times. Your performance under stressful situations will help you develop necessary skills and habits.

Hospital Hours

Regular business hours: Monday through Friday 8:00 am - 5:00 pm

After-hours:
Monday through Thursday 5:00 pm - 8:00 am
Friday 5:00 pm - Monday 8:00 am

Holidays: (Hospital closed for regular receiving):
Martin Luther King, Jr. Day
Memorial Day
Juneteenth
July Fourth
Labor Day
Veteran's Day
Thanksgiving
Christmas Eve
Christmas Day
New Year's Day

General Guidelines and Hospital Procedures

Dress Code: Clean and appropriately worn clothes are required at all times. Nametags are to be worn in the VTH at all times. You are required to carry a stethoscope, thermometer, pen light, a watch (digital or second hand) and bandage scissors in the VTH. It is your responsibility to purchase and launder purchased clothing. We ask that each of you procure **two pair** of Big Dutch bib overalls or coveralls (Pella Products, Inc., 835 Broadway, PO Box 217, Pella, Iowa 50219; telephone 515-628-3092). If, as a **class**, you would cooperate and order the same **style and color** in quantity, there is a discount available from Pella Products, Inc. You do not have to buy from this company, but the color, quality, and style **must** be the same. Shoes should be of a

type that can be dipped into antiseptic solutions and sufficient to reduce injury if stepped on by an animal. Scrubs are required in surgery. Surgery scrub suits will be worn in the operating rooms together with shoe covers at all times. Caps and masks will be worn as required. Surgical scrub suits are not to be worn out of the operating room unless under coveralls or lab coats. For field service you will need coveralls and boots (spare coveralls should be available to replace dirty ones). Upon return from a field service call, students must change their clothes and sanitize or change boots before working in the VTH. This dress code requirement is designed to present students as professionals. No other type of clothing will be allowed for 4th year students in the hospital.

Professionalism and Conduct: Be punctual and dress and behave in a professional manner. Address all Veterinary Teaching Hospital Clinicians as Doctor; and if you have a preference for the way you would like to be addressed (e.g., Mr. Smith, Ms. Jones, etc.,) tell people. Discussions regarding cases in the presence of the owner or client are encouraged only when prompted by the clinician in charge.

Medical Records: Because our program is concerned with detailed case material, extensive records and information are required. Fill out the required forms completely and with the information required. Clearly record all procedures on the daily progress sheet so that the staff may see that relevant charges are made. Any supplies used should be recorded on appropriate forms. Completion of the medical record is the responsibility of the student, veterinary technician and clinician overseeing the case so be sure you are familiar with the portions of the medical record that are your responsibility.

Client Confidentiality: Information regarding clients and their animals is confidential and available only to the owner or his/her designated agent, or referring veterinarian. Patient information is to be released only by a clinician or by written order of the same. Any photographs or video taken must be approved by the owner/agent on the Authorization and Release form.

Patient Care: Students are required to participate in the full regimen of treatments for assigned patients. This includes after-hours care as necessary. All patients should be handled with care, and if aggressive behavior is noted, please call attention to this so that injuries to oneself and others can be prevented. Clinicians should be called to assist you with handling unruly cases. If you ever feel uncomfortable handling a patient or performing a procedure, notify a clinician immediately. Halters are to be left with the patients, but lead ropes, blankets, bandages, etc., should be returned to the owner or carrier when the patient arrives. All animals should be weighed on admission and discharge and details recorded. If owners require "blanketing" of their animals, we will be responsible for returning this equipment to them at discharge. We are in the animal care profession, but do receive requests to accept animal donations for teaching uses. Any person asking to donate animals should be directed to Large Animal Reception.

Procedures: Certain diagnostic or treatment procedures, e.g. rectal examinations, intravenous injections, and the passage of nasogastric tubes, should be performed only in the presence of a clinician. If you have any questions regarding the procedures you are performing as a clinical student, stop and ask a clinician.

Hospital Equipment: All equipment should be cleaned and broken equipment is replaced by a veterinary technician before storing. Return all equipment, supplies, and drugs, to their correct locations when you have finished using them. It is VTH policy that no equipment or supplies be used by students for personal reasons. This policy applies to evenings and weekends. There are no exceptions to this policy.

Facilities: The Hospital reception area, student computer area, and student break rooms are the designated places for students to remain unless busy with patient care. Please respect others by leaving these areas clean.

Safety Procedures

Your safety is our primary concern. There are numerous opportunities for injury in the VTH.

Animal Handling Risks: When dealing with animals, anything can happen, and you should be alert and prepared at all times. If you are unfamiliar with the demeanor of any specific animal, work in pairs or talk to the clinician-in-charge before doing anything. Animals are not to be left unattended while restrained in stocks, chutes, or when tied up. They react differently to restraint. Be alert. Always be aware of an avenue of escape. Keep the stall door closed enough so as not to encourage bolting by your patient. Do not completely close or lock the stall door when working inside stalls with animals. *Never* enter a bull or stallion's stall alone. Veterinary technicians and clinicians (not stall cleaners) are available to help. You should make sure that you have had proper instruction before working with unfamiliar animals. Do not hesitate to ask. If utilizing an assistant, make sure your assistant is aware of the potential hazard and knows how to restrain the animal.

Environment and Equipment: Do not shout or make loud noises in the hospital, as it frightens animals. Avoid running in the hospital. Remove debris from floors to prevent accidents. When spraying water in the VTH be aware of electrocution risks. Do not spray water on electrical outlets, light sockets, or electrical insect/fly killers. Human food and drink are not permitted in the hospital animal areas.

Many of the restraining chutes have hard projections that are at head height; look where you are going and watch what you, the animal, and other people are doing. Equipment used for treatment or restraint of large animals may also break, malfunction, or simply be inadequate at times, and you should never use equipment unless you are fully aware of its proper operation and limitations. Wear ear protection when using noisy equipment. Wear ear protection when using noisy equipment.

Injuries: If a life-threatening injury occurs, dial 9-911 and send someone to meet the emergency vehicle. In addition, if you are injured during the assigned time in the hospital this must be reported immediately to the attending clinician, service area supervisor, Hospital Director and Chair of the Department of Clinical Sciences.

Sharp objects (needles, scalpel blades) should be carefully handled and discarded in designated

disposal containers. Do not to recap needles. For sharps, injuries and animal bites the wounds should be immediately cleaned with warm running water and soap for several minutes followed by an antiseptic solution such as povidone-iodine or chlorhexidine. A bandage should be applied as necessary. Students should contact the Student Health Services at (541) 737-9355. An *Accident and Illness Form* needs to be completed and is located in the small animal hospital outside small animal reception. A technician supervisor (Robyn Panico or Dave Meyer) can assist in completing the paperwork. Specific information on sharps injury and reporting can be found in the appendices *Sharps Safety Plan* and *Sharps Injury Log*. Animal bites follow the procedure above. Animal bites should also be reported to the Benton County Health Department (541) 766-6835. For additional information on animal bite injuries and rabies, please read appendices *Animal Bite Procedure*, *Animal Bite Reporting Form*, *Compendium of Animal Rabies*, and *Human Rabies Prevention Program*. Appropriate paperwork must be completed. You may refer to the appendix on *Accident Reporting Procedures* and *Accident and Illness Form*.

Infectious Disease: See the *Large Animal Infectious Disease Protocol* in the appendices for a full discussion of infectious disease and risks in the large animal hospital. Consider the infectious agent(s) that are a concern and avoid contaminating yourself, the patient or other patients with that agent. Consider things like keeping the stall clean and clear of manure, avoid walking in manure, and avoid tracking manure into feed. Thoroughly clean shoes with a brush and disinfectant when you accidentally get fecal matter on shoes or where required in the facility. Wear appropriate personal protective equipment as indicated by the risk of exposure and transmission of infectious agents. This may include gloves, a gown, mask/goggles and boot covers/plastic booties. Exam gloves should be worn when working with all patients. **Wash Your Hands** between patients. Frequent hand washing has been proven to be the most important component to prevent the spread of infectious diseases. Hands should be scrubbed for at least 15 second, when treating animals with known infectious diseases, remove soiled garments and plastic booties. Do not share equipment between animals unless it has been cleaned and disinfected.

Patient Admission

Patients are admitted only by prior arrangement with the clinician or VTH reception staff. Admission (or discharge) of patients after-hours is <u>not</u> encouraged unless prior arrangements have been made or an emergency situation exists. Do so only when authorized by the clinician-in-charge. All required forms to be filled out and signed are in the reception area. Make sure that these forms are completely filled out. Weigh animals on admission and record the time and date of admission. Take as much history as possible from the owner or agent, or as directed by clinicians. With emergencies, common sense takes precedence over paperwork, which can be postponed until emergency treatment is instituted. Remember to complete the paperwork as soon as time permits. Do not allow a client or agent to leave before signing the required forms, especially the Authorization and Release form. Deposits are required for treatment. Clinicians and reception personnel will provide this function during office hours. Clinicians or technicians perform this duty overnight or during weekends.

Unloading (or loading) patients is the responsibility of the owner/hauler. Responsibility for

animals or people injured during unloading or loading may be placed upon a volunteer helper. If help is requested by the owner/hauler, contact the clinician. Many animals behave badly when being unloaded or loaded from trailers. You may show the client the entrance but they must unload their animal themselves.

Keep the halter on the animal and give owner the lead shank and any other tack not required. Any tack kept should be clearly identified with the owner's name, stall number, and case number. Patient's tack is hung on the stall door

Assign stalls after the clinician has ascertained that no infectious disease is present. In the latter case, the animal will be placed in an isolation stall. If in doubt, confer with the clinician or technician. Each animal should be clearly identified on admission to ensure proper treatment. Food and water should be given according to the clinicians instructions. Place a stall card and necessary instructions on the stall door.

Patient Discharge

No patients will be discharged unless specifically authorized by a clinician. All documents and invoices must be completed and signed before discharging the patient. Clinicians (clinical fellows, residents, faculty) must review discharges prior to their distribution to owners or referring veterinarians. When discharging patients, make sure that the written discharge instructions concerning the patient are clearly understood by the client as well as signed by the clinician and client. The date and time of discharge and patient current weight should be recorded in the medical record. A copy of the signed discharge should accompany the owner. Patients slated for discharge should be ready to go home, i.e., they are to be groomed, and are to look presentable. Make sure the client is given any tack, shoes or equipment that belongs to them. Check the front of the stall, feed room and large animal reception for any belongings. Be sure that any medications to be dispensed are labeled properly and given to the client.

Mark the stall with a card that says 'Clean and Disinfect' or alternatively turn the stall card and write on it.

Additional Information

VTH Policies, Procedures Organizational Charts, and SOPS are available on the Veterinary Teaching Hospital intranet site. http://128.193.215.68:12469/vth-policies/_policies_main.htm.

Large Animal Clinic
After-Hours Responsibilities

After-Hours Student's Role

The after-hours students play a crucial role in maintaining client services and patient care outside of regular hours. The duties of these students are to monitor and treat patients, identify and report patient status changes, and assist in emergency cases. Students are expected to be punctual and available in Magruder Hall during their entire assigned periods. Remember that after hours provides valuable learning experiences in medication administration, patient assessment and monitoring, organization and teamwork. You are a valued member of the team and we appreciate your help.

After-Hours Schedule

There will always be one or more in-hospital clinicians and one field service (RVP) clinician on call. The hospital typically has a House Officer scheduled as primary on-call with a Senior Clinician available as back up. You should be aware of their intended whereabouts and of any required treatments, admissions, discharges, before the clinicians depart each day. The clinician and House Officer on duty may be reached by telephone if needed. A roster of on-duty emergency House Officers is located on the reception area bulletin boards. There are lists of clinician phone numbers in the reception area as well as in strategic locations in the hospital.

Remember the doors are locked outside of business hours so keep your access badge with you.

Duties

Telephone Responsibilities: After-hours students and technicians are responsible for answering the hospital "*back*" telephone line (541-737-6845) when on duty. When the VTH reception area closes, phone calls from clients and referring veterinarians are routed through the primary veterinary clinician (house officer) on duty. If that clinician needs to contact the hospital, he/she will phone on the back line. This hospital number may be answered on the phones in the hospital and communication room telephones by punching *7.

Please answer clearly, "OSU Veterinary Teaching Hospital. This is (your name) speaking. May I help you?" A clinician will notify you about the case, its estimated time of arrival, and will let you know about any special requirements or equipment to have on hand. In addition to preparing yourself to receive this case, please also notify the duty technician as soon as possible so that they may prepare for the patient's arrival.

Non-business and non-emergency calls are not to be made from VTH business telephones. Personal calls may be placed from lines other than 737-6845. When using the telephone, please be as brief as possible. Do not give out individual office numbers or clinician cell phone

numbers to clients or referring veterinarians.

When placing calls remember the following:

For on-campus calls dial: 7 + the 4 digit number.
For local calls dial 9-541+ the 7 digit number.

For 1-800 calls dial 9-1-800+ the 7 digit number.

For long distance calls dial 9-1- + the 7 digit number and then the approved long distance code.

After-hours call boxes are mounted on the wall outside the VDL reception area and at the north gate by the small animal hospital. If **either** box is used, it rings on the hospital "back-line" at 7-6845. You can then look at the live feed of the camera monitoring the north large animal hospital entrance and determine if the North or South gate should be opened. The gates now also have a sign on them labeling them as "North" or "South" so you can ask the client which gate they are at. The North gate button is located within the communications room and the South gate button is located next to the bovine scale. The reception at the call boxes is less than ideal. This means the telephone will often ring and there appears to be no one at the other end, or you may simply hear a vehicle running. The client may also be unable to hear you in some circumstances. Be aware that even if you don't hear a voice, there is likely someone waiting at the gate.
The back line will also ring with clients bringing specimens/animals to the VDL/necropsy after hours. If you are unsure of how to deal with this, please notify the technician who will meet the client by VDL and complete the appropriate paperwork, prior to placing the specimen in the correct location in the VDL.
Once you let a client through the gate, remember that reception is locked, and someone will need to meet them at the reception door to let them in.

Admissions and Discharges: Please refer to the LA VTH Guidelines and Procedures for general information on patient admission and discharge. In most instances, a clinician will be present at the time of client arrival. If the clinician has not arrived, have the owner unload the animal only if the clinician has said to do so. If not, utilize this time to obtain a good history. This is the client's first impression of OSU-VTH so ensure that you are dressed appropriately and act professionally. The usual rules about giving opinions, criticizing treatments, or giving advice also apply here. Many clients will not know if you are student, staff, or faculty. Identify yourself before proceeding with collecting a history or performing a physical examination.

After-hours, a veterinary technician or clinician will generate a case number, complete a financial estimate and collect a deposit for services. The student will aid in filling out the Client Information form as well as the Authorization and Release form. Alert the on-call clinician of any 'walk-in' emergencies.

In the event an animal arrives dead, the on-call clinician is still called for instructions. If he/she feels it is necessary, they will contact the pathologist or instruct you to do so. The details regarding the pathologist on call are posted inside the front VDL door and in hospital Reception.

The number for the emergency cell phone carried by the on-call pathologist is located on the door to the necropsy cooler and on the white board in the hall outside of the Equine Minor Treatment room. The pathologists must be notified of every specimen placed in the cooler; however, the clinician present will typically do this.

Medical Records: SOAPs are required for cases admitted to the emergency service at the end of your shift and until the case is transferred to another service. You are responsible to write records, SOAP's, and treatment sheets. Remember to have a clinician check the treatment sheet prior to administering medications. You are also responsible to turn in any requests or lab work between 7:30 and 8:30 am. In most cases, if a patient goes to surgery, the student who received the case will go to surgery with them and scrub in. In some instances, when it is close to the end of a shift, the emergency student starting at 10pm weekdays/8pm weeknights may scrub in instead. This decision is at the discretion of the clinician on duty; however, it is okay to remind the clinician that it is nearing the end of your shift as sometimes they lose track of time. Every effort will be made to ensure you have adequate time away from the hospital as long as patient care is not compromised. The student who scrubs into the case is responsible to have a surgery report in the record within 24 hours of the completion of the surgery. Final surgery reports are to be submitted electronically. Ensure you also provide the new student a full description of the case, and ensure records are complete for your involvement prior to leaving. Record all medications used and all medications and supplies checked out of pharmacy. Remember that the SOAP is the medical record. Everything from the examination, diagnostic test results, medications etc., must be accurately recorded here. Please ask your house officer or clinician if you are unsure of specific details.

Patient Care: If you admit a case, you are the student responsible for the case during your duty hours or until the case is officially transferred to another service. This will usually occur at transfer rounds the following morning. The primary on-call clinician (resident or clinical fellow) and the emergency clinician or surgeon will challenge you to take an active role in these cases. If you demonstrate you are prepared before case arrival, you will be more likely to be given more responsibility. However, if time is of the essence, and the clinician takes charge of the case, make sure you understand the whys in the case management and ask questions at an appropriate time. If a case requires emergency surgical care, the 5-10 pm or emergency student scrubs in for the surgery and the on-call backup student will provide support. You also should not leave the following morning until you have discussed the case with the house officer/emergency clinician in person, your paperwork is completed, medications for the day have been made, and the flow sheet has been approved by the house officer. If you do not have a patient, please assist other students with their 8 am treatments and do not leave until you have received permission from the house officer/emergency clinician on duty.

Critical care cases are your primary responsibility and the on-duty clinician, resident or clinical fellow is primarily responsible for decisions regarding their care. **Always call the clinician designated if the parameters (written on the stall-side treatment sheet) for clinician contact are met or if there are other patient changes that concern you.** Remember to use your best judgment and call earlier if you have questions or concerns even if the parameters have not been reached. Clinicians would rather that you call too early, than too late. If you are uncertain whether to call a clinician, the duty technician is a valuable resource in making this decision. Never underestimate the value of a physical examination and consider the information a clinician

may need when on the phone with you (i.e. always perform a physical examination prior to calling unless the situation is emergent or dangerous).

The clinician/house officer to call is the person listed on the treatment sheet. If you do not get an answer, leave a voicemail, and call again. Keep calling. If the house officer does not respond, or you need an immediate response in an emergency, call the senior clinician on the case. If neither one can be reached, you may call the emergency clinician on duty.

As with other cases, treatment should not be instigated, altered, or discontinued without consultation with a clinician unless you are dealing with a life-threatening emergency. This is the time in your clinical training to take *initiative*, however, please do so under the guidance of the clinician in charge if at all possible. The location and use of emergency medical kits will be shown to you during orientation. Large animal emergencies can be dramatic, and your safety is always top priority. Take care not to get yourself into a situation where your safety may be at risk, and do not hesitate to call for help (clinician/technician) prior to entering a stall.

Treatment sheets and flow charts are set up by the daytime service and are to be followed exactly unless instructions change. Complete regularly scheduled BID treatments. These are the responsibility of medicine or surgery students assigned to the case, but may be performed by the ER and backup students or technicians as a courtesy. After-hours duty students may relieve block students of this responsibility but only with mutual agreement among concerned parties. A walk through and visual examination should be performed on all hospitalized patients by the ER student at regular hourly intervals. Investigate all concerns by reading the medical record. Weekend treatments are given in the same schedule as weekdays. The time at which you begin morning treatments on weekdays will depend on your caseload. However, you should begin treatments early enough, with SOAPs completed, to be free to participate in rounds by 8:00 am. When you are present in the hospital after hours, you need to be able to hear changes with patients such as fluid pumps beeping. As such, while you may use personal electronics for entertainment during quiet times, headphones are not to be worn, and any sound must be quiet enough that you can hear noises from patient stalls.
Remember that late night/early morning is the most common time for medication errors to be made. Double-check everything before you administer it, and always ask a technician or clinician if you are uncertain. Remember that nothing opaque goes into a vein. If a medication is not prepared and ready for a patient, double check with the technician/other students that they have not given it and forgotten to sign. If not, contact the student on the case to ask if they drew the medication up. Only once these avenues are exhausted, should you prepare the medication/get a medication from pharmacy.

Rounds: Attend clinic rounds and be prepared to discuss any cases under your care. This essentially means all hospitalized cases. To be prepared, read the medical records for all cases and understand the case management decisions that have been made. Use the veterinary literature, colleagues, faculty, and internet in your quest to learn from these cases. Use discretion and judgment when discussing these cases with faculty. Remember, owner information is strictly confidential and not to be shared with other owners and non-VTH veterinarians. Pay attention to presentations during rounds of all hospitalized patients. If the reasons behind the management of the case are not apparent, challenge yourself to discover them by reading the record and the literature, and by having constructive discussions with colleagues and faculty or the emergency clinician.

Be organized and ready for rounds presentations if you are transferring a case. You should have

your SOAP, and all laboratory results available. Present the case in a logical manner- Signalment, history, physical examination findings. After this it is usually logical to present in the order tests were done; i.e. blood gas analysis/CBC/serum chemistry results, then per rectum findings, belly tap results etc. Update on surgical findings even if you were not scrubbed into the procedure. Summarize medications administered (dose in mg/kg, route of administration, frequency) and know WHY you are giving these. Summarize how the patient progressed overnight, and your morning physical examination findings. Be prepared with your plan for the day.

Professionalism: Give the after-hours duty technician your full cooperation. The after-hours duty technician reduces your overnight stays by 50%. Regarding client questions, do not get trapped into trying to answer questions that you do not feel confident about. It is better to refer questions than to speculate. Please take time to locate the duty technician at the start of your shift. They can update you on any special considerations such as patients to discharge, emergencies coming in, or critical cases that need extra attention. They may direct you to divide the cases so that one person deals with isolation cases and one with hospital cases. At the end of your shift, please check in with the technician again. This is the time to update them on any patient concerns that have arisen recently, let them know which treatments you finished/did not finish, and make sure they are aware you are leaving. Your knowledge of the cases is valuable- take a few minutes to update the emergency student taking over from you.

Sleeping Quarters

During large animal rotations, students may spend long shifts in the hospital. This may put them at risk during the commute home. The sleeping quarters are intended to provide a safe alternative for students and house officers who may be too tired to commute home. There is one room provided for living quarters to be shared between after-hours students and house officers. There are four beds located in these quarters. The room is equipped with a bed, bedding, and a washbasin. Showering and bathroom facilities are the student locker rooms across the hall from the living quarters. This is a shared space so please respect others and keep the area clean.

Linens can be placed in the provided bins in the student/faculty locker rooms for washing. All belongings must be removed from the room at the end of occupancy. Dogs, cats, or other pets are not allowed. Flip the sign on the door to “occupied” when you enter so anyone else entering knows to be respectful. The sleeping quarters are to be utilized only at the end of your shift.

While you are on duty in the hospital, you are expected to be awake and present in the hospital at all times, for patient and personnel safety.

Grades

After-hours duties are incorporated into your other grade rotations. Grading is based on attendance and professionalism as well as performance during rounds, quizzes and discussions with faculty and staff. Perfect attendance is mandatory. Absences that are not preauthorized will result in a failing grade. Tardiness can result in a drop of a full letter grade. The after-hours schedule is made by Garland Burdock, Large Animal Technician Supervisor. Students may swap shifts, however they must be changed on the posted after-hours schedule. When switching shifts, it is vital that you consider your schedule in full. The large animal hospital is busy after hours and frequently takes in emergencies, often more than one per night. Expect to be called in when you are on back up. Therefore, do not make alterations that leave you with multiple shifts and back up shifts consecutively. Whenever possible, inform the on-duty house officers and clinicians of changes, difficulties and absences.

VMC 732 & VMC 752
Large Animal Clinical Medicine I and II
Guidelines and Procedures

Course Coordinator: Dr. Erica McKenzie

Course Instructors: Dr. Ana Pacheco, Dr. Erica McKenzie, Dr. Kelly Sears

Objective

To expose students to Large Animal Internal Medicine cases, many of which are received on a referral basis. Phone numbers relevant to operations in the large animal hospital are found in the General Information After-hours Duty sections of this manual.

I. Operation of the Medicine Service

A. The medicine service handles out-patient and in-hospital cases requiring primarily medical management.

B. Cases may be referred or transferred to other services as appropriate.

1. Cases requiring surgical procedures or evaluation for lameness disorders will be addressed by the surgical service.

2. Reproductive cases will be addressed by the theriogenology service, in conjunction with the medicine service, unless surgery is required. If these patients require hospitalization, they will typically be managed by the medicine service with close consultation with the theriogenology service.

3. Some cases may involve one or more services, and the medicine service may also consult with other services on specific cases as appropriate.

C. Students assigned to medicine are permitted to observe theriogenology or surgery cases if there is no conflict with medicine cases and if clinician approval is given.

D. We have support services as listed below. Requisite forms or electronic submissions should be filled out <u>completely</u> at the time of sample submission or request and a copy left in the Hospital record.

1. Pharmacy: For prescriptions, make sure to provide a case number and appropriate details. Forms available in the large animal hospital and Pharmacy should be dated, marked as in- or out-patient, and fully filled out. Stickers outlining patient information are available in the client record and should be applied to all submissions. Please see the pharmacy section of the manual for additional instruction on pharmacy prescriptions and order forms.

2. Radiology and ultrasound: Imaging requests are submitted via the VetHosp program. Requests should be submitted by 4:30 pm. Imaging includes: Radiography, Ultrasonography, Fluoroscopy/Contrast exams, Nuclear Scintigraphy, Computed

Tomography, and rarely, MRI. Imaging scheduling/plan is arranged after an imaging request is submitted. Submission requirements are discussed during orientation to clinical rotations. Where necessary (CT scan), anesthesia requests may also be required. Ultrasonography is typically performed by the medicine service and does not require a request form.

3. Endoscopy: Will be performed by the medicine service, typically with standing sedation. No request form is needed unless general anesthesia is involved.
4. Clinical pathology and Diagnostic Services: Requests are submitted via the VetHosp program. Requests should be submitted by 4:30 pm. Take the appropriately protected sample(s) directly to veterinary diagnostic laboratory receiving. Special and outside laboratory tests may be submitted via the VetHosp program. Some may require additional forms but should be routed through VDL receiving. Ask the clinician or technician for help submitting uncommon "outside lab" samples. Some tests including blood gas analysis, glucose or lactate measurement, ketones, PCV and refractometry total protein measurement can be performed by students in the 'technician lab'. You will be shown how to use this equipment at orientation, but do not hesitate to ask for help if needed.
5. Necropsy service:
    a) Take carcass to cooler or necropsy floor as required by VDL personnel. Identify carcass with tag and client details, and intended purpose i.e. necropsy/teaching necropsy/disposal.
    b) Submit information with **a complete and thorough history** to VDL receiving **after confirming adequate completion of the form with the house officer and faculty member on service.** Incomplete history is a common problem on these forms which is detrimental to the necropsy process, **and every effort should be made to provide as complete a history as possible.** DO NOT click the "import case history" button. Try and attend necropsies on patients that you were involved with-this is an excellent learning opportunity.

E. At present:

1. This service handles all internal medicine cases including:
    a) Gastroenterology (nonsurgical), including colic cases presenting in-hours until diagnosed as requiring surgical intervention. Colic cases presenting after-hours are currently received by the surgical service.
    b) Respiratory diseases (until or unless identified as surgical in nature)
    c) Neurologic diseases
    d) Urinary tract diseases (until or unless identified as surgical in nature)
    e) Dermatological disorders
    f) Endocrine disorders

g) Metabolic/nutritional diseases

h) Toxic diseases

i) Infectious diseases

j) Miscellaneous undiagnosed conditions

k) Almost all neonatal animals under two weeks of age

2. The medicine service provides basic assessment of cardiology cases and requests an in-hospital consult from the cardiology service for echocardiography. The medicine service can perform procedures including resting ECG, exercising or long duration ECG, and conversion of atrial fibrillation.

3. The medicine service commonly provides assessment and management of ophthalmology cases. Where necessary, we can request an in-hospital consult from Dr. Maxwell, a practicing veterinary ophthalmologist currently located in Corvallis.

II. Procedures and Policies of Medicine Service

A. Attendance and duty

1. Students are expected to be present and properly attired on all weekdays from 8:00 a.m. to 5:00 p.m. or until casework is complete. Earlier attendance is frequently required to ensure cases are appropriately assessed before hospital receiving commences. Appropriate footwear is essential and students should wear coveralls. Sleeveless shirts and baseball caps are not appropriate. *Fingernails should be clipped short and jewelry removed. False nails are not acceptable on this rotation. You should be prepared to perform a per rectum examination on any day, and nails that are not clipped will result in you being unable to take part in this exercise.* Clothing and personal appearance are not only important for the impression we have on our clients, but also for safely performing procedures on client and teaching animals as well as avoiding loss of valuable items.

2. Treatments must be completed and charts filled in before 8:00 a.m., unless otherwise instructed. All treatment sheets must be prepared by rounds the night before, and signed by a clinician PRIOR to any treatments being performed.

3. Night care, if necessary for cases requiring close and constant observation such as critically ill foals, may be assigned to students on the service on a rotating basis. This is rare.

4. After hours will consist of one student scheduled from 5pm to 10pm each night. This may be either a Medicine or a Surgery student. The emergency student(s) will relieve the 5-10pm student at 10 pm on weeknights and at 8 pm on weekends. In addition, one primary and one secondary Back-Up student will be scheduled. If needed due to high hospitalized caseloads, or emergency cases presenting to the clinic, the primary back up student will be called in to help. If further help is needed, the second back up will be called in. Back up students are scheduled from 5 pm to 8 am. The large animal hospital is frequently busy after hours, and back up students should be prepared for the fact that they are often called in. If you have been in the clinic overnight, please

notify your clinician the following day. If deemed appropriate and if it will not compromise patient care, you will be sent home for self-care; however, this cannot happen if clinicians are unaware that you were present overnight.

B. Equipment to be carried

1. Vocera
2. Stethoscope
3. Watch with a second hand or digital equivalent
4. Thermometer
5. Penlight or some other light source
6. Scissors (bandage ± suture scissors)
7. A cell phone should be carried after hours for safety reasons

C. Records

All records for each case will be completed by the student assigned. These will be examined by the clinicians and house officers. Discharge reports will be examined by the house officers and the clinician in charge, so please ensure they are completed with sufficient time prior to discharge for them to be looked at by both parties.

D. Relations with clients

1. Students should not discuss diagnosis, treatment, or prognosis with the owner or their representative, unless given permission for this to occur or with a house officer or clinician being present. Please do not give clients your personal cell phone number. If a client contacts you through your personal phone, notify your House Officer or Clinician immediately.
2. Do not argue with a clinician about a diagnosis or treatment in front of a client; please discuss it in a private fashion at an appropriate time.
3. Do not take photos of cases without client consent, and **do NOT post any photos of any client or their animal on social networking sites or blogs**. Consent for photography can be obtained on the Authorization and Release document. The hospital also has signs requesting that clients do not take photos within the hospital to protect staff/student/patient confidentiality. If a client asks to take your photo and you are not comfortable with this, speak up. If a client takes your photo without permission, politely request they delete it, or speak to a clinician who will do this for you.
4. Client visitation: Please meet the client promptly in the waiting room when you are paged and take them back to their patient. Explain that they need to stay with their animal and are not to wander the hospital or look at other animal's records. You do not have to stay with the client for the entire visit, but be available and walk by them frequently. Notify a clinician of their arrival. If you have concerns (i.e. a client visiting patients or looking through treatment sheets of patients that are not their own), please notify a clinician. Do not discuss another patient- if asked, politely

answer that you are unfortunately not allowed to discuss another case due to client and patient confidentiality rules.

E. Emergency situations

'Emergency' refers to a situation which demands immediate action. These situations are usually unforeseen and, unfortunately, often come at inconvenient times. As veterinarians and veterinary students, it is our obligation to treat emergency situations whenever they arise.

With emergency cases, if you are the first person to greet the client, please instruct them to unload their patient and to bring them immediately to the designated area for that patient's triage. Also, alert a technician and/or clinician of their arrival immediately. If the client indicates it might not be safe to unload the patient due to fractures, aberrant behavior, or neurologic disease, please wait for appropriate assistance.

There is always room for controversy as to what constitutes the true emergency situation. Several broad categories can be classified as true emergencies: 1) severe respiratory compromise; 2) cardiac arrest; 3) massive hemorrhage or trauma; 4) rapid-acting poisons; 5) anaphylaxis; 6) penetrating wounds of the thorax or abdomen; 7) acute overwhelming bacteremia or toxemia; 8) massive or compound musculoskeletal injuries; 9) coma and loss of consciousness; 10) severe GI signs (i.e. colic); 11) continuous seizures; 12) multi- animal involvement.

III. Procedures with Each Case

A. New case: Clients must initiate admission of patients at the reception area to complete admission documents/releases, etc.

1. Take a history from the client under the supervision of a house officer and/or clinician; record on case report form. In emergent situations- take a brief, pertinent history and collect the full history at a later time, or assign a second student to complete the history while you assist with immediate patient triage and stabilization.
2. Perform a physical examination under the supervision of a house officer and/or clinician; record on physical examination and physical diagnosis form.
3. Discuss findings; determine a problem list.
4. Discuss each problem in regard to differential diagnosis and pathophysiology.
5. List differential diagnoses. Keep physical diagnosis form in the case record.
6. Discuss diagnostic procedures and rule-outs or confirmation tests for each differential diagnosis.
7. Perform tests or take samples under the supervision of the house officer and/or clinician. Fill out necessary laboratory or procedure request forms.

8. Discuss possible further action or immediate treatment with the clinician and house officers.
9. Administer treatment under supervision; record on daily progress notes.
10. When test values are available, discuss the meaning and implications of each result.
11. Reach primary diagnosis; record.
12. Discuss treatment regimen.
13. Administer treatment.
14. Discuss cost of care and prognosis with clinicians.

B. Hospitalized cases

1. Each morning:
   a) Examine the animal.
   b) Record temperature, pulse and respiratory rate and perform a full physical examination.
      (1) Appetite and water consumption
      (2) Amount and character of manure
      (3) Any changes in the case, especially related to the problem the animal presented for
      (4) Other subjective observations for each system
      (5) Other objective findings for each system
      (6) Assessment of case
      (7) Plan for the day's treatment
   c) Administer medication.

Record any supplies/pharmaceuticals employed on the red sheets, and medications given on the treatment sheet and initial.

2. At other times:
   a) Monitor as predetermined in discussion.
   b) Administer drugs as prescribed by clinician and record.
3. At discharge:
   a) Return any medications or supplies for client credit to pharmacy or supplies.
   b) Be sure the animal is cleaned and groomed; and reweigh the animal.
   c) Prior to arrival, discuss instructions for owner with clinician.

d) Create a document (well in advance of the discharge time) encompassing discharge instructions, or a case summary in the event of euthanasia of a hospitalized patient, for the owner and/or referring veterinarian, which should be reviewed and approved by the clinician. Ensure reception knows the day and approximate time that the animal will be discharged.

e) Give instructions to owner in presence of clinician, or listen to instructions as given by the clinician.

f) Reports and discussion with the referring veterinarian will be made by the senior clinician or house officers but students should be involved in these discussions.

g) Turn the stall card over and write C/D on it to notify animal attendants of departure

h) Take the treatment sheets, place in patient binder and put it on top of the binder carts in the "Discharged Medicine Patients" section – the technicians will review the file for billing completion prior to it being given to reception.

4. Restraint and handling of patients:

a) Most animals admitted to the VTH have good temperaments and can be easily handled. However, good judgment and caution should be used when handling any animal, and proper restraint methods should always be used. This may include the use of appropriate sedation. In animals with questionable temperaments, consult a senior clinician or house officer and never handle such animals alone. Never assume cattle are safe to be in a stall with - consult with a clinician to decide an appropriate handling plan. This also applies to unusual species such as camels. Compassion and empathy for the patient's condition are mandatory! NEVER strike an animal for disciplinary reasons, and be aware of your position relative to theirs in a stall at all times. Label the stall of any patient that has a difficult temperament so everyone is alerted. Ask for assistance before entering these stalls. Do not get between a mother and its offspring regardless of species.

b) Some animals require special equipment for safe restraint. This equipment can cause injury if not properly used, so if not completely familiar with it you should ask a clinician or caretaker for assistance. Such equipment includes: squeeze chute, hydraulic chute, tilt table, head gates, bull leads, transporter chute, equine stocks and cross ties, twitch, hog holder, etc. **Animals should never be left unattended when confined in any chutes or stocks, or when tied.**

c) When handling adult horses, a halter and lead must be used at all times. Do not ever tie a horse and never exit the stall (no matter how briefly) without removing the lead rope, as both situations can result in significant patient injury. Also, please ensure that the stall door is completely shut and latched when exiting the stall (again, no matter how briefly).

d) Never assume a foal is halter trained, even if it is wearing a halter. Please speak with a technician/clinician regarding proper handling tips for foals. Please ensure a 'foal handling sheet' is placed on the front of any stall containing a foal. Footbaths should also be placed in front of all foal stalls and changed at least

twice daily, more often if they become unclean.

IV. Equipment and Drugs

A. All equipment must be cleaned and returned to its proper place after use.

B. The student is responsible for cleaning up the treatment area after use.

1. Clean up manure, blood and discharge.
2. Used instruments should be returned to central services for re-sterilization.
3. Instruments from cold trays should be cleaned up and returned to the tray.

C. Pharmaceuticals and supplies for each case will be checked out of the Pharmacy or from ward stock, depending on the item needed. Ensure that the appropriate paperwork is completed so the owner can be charged appropriately i.e. complete the "red sheet" for ward supplies that do not come from Cubex or the pharmacy

D. At each treatment area there should be:

1. Diagnostic equipment, including sample containers.
2. Diagnostic drugs, including local anesthetics.
3. Sedatives and drugs used for restraint.
4. Emergency treatment drugs are available in the green 'crash cart' in the foal crib room.

E. General care of the equipment:

1. Within our clinical areas, there is a great deal of specialized medical and surgical equipment. Like all equipment, it is expensive, and yearly costs for replacement from breakage and abuse continue to grow. When handling equipment, we suggest that you:

a) Handle it as if it were your own (WITH CARE!).

b) Clean all soiled equipment before replacing it. If equipment needs to be sterilized or ultrasonically cleaned, take it to central services and make sure that it will be returned to correct area. **Ensure that the long metal teat cannulas used for abdominocentesis procedures are not discarded; they must be kept for sterilization.**

c) Replace all equipment following use.

d) Clean and disinfect examination tables, counters, and carts following use.

e) Report defective or broken pieces of equipment to the senior clinician so that it may be taken to Central Services for repair.

f) Please ask a staff member for instructions before attempting to utilize any equipment with which you may not be familiar.

g) Place trash in appropriate receptacles, even if it is not your trash.

h) Clean up the surrounding area when vacated! Place manure in the appropriate

can; hose the floor to ensure that the area is clean and ready for the next client.

i) Avoid spilling lubricant or mineral oil on the floor as it makes the floor slick and dangerous for horses and humans; clean up immediately if a spill occurs.

V. Rounds

A. Combined rounds (transfer rounds) will be held on certain days with students from the surgery and medicine services, usually to address emergency cases that have arrived out of hours and which need to be assigned to another service. Students assigned to each case should be prepared to discuss them briefly and succinctly. Any daily changes in the case should receive particular emphasis.

B. Other mornings, or following combined rounds, the medicine service will hold their own rounds with a more in-depth discussion of their cases.

C. Necropsy rounds are on Wednesdays at 8:30 a.m. for one hour and will include discussions of the previous week's necropsies. Necropsy rounds will be followed by medicine rounds.

D. Senior papers are on Thursdays at 8:00 am for one hour and include in depth topics that are researched and prepared by your peers. Senior papers will be followed by medicine rounds.

E. 'Grand rounds' are held each Friday morning at 8.30 am in which two or more interesting cases are presented by each active service and an in-depth discussion and/or clinic or pathological conference is held. Discussion with clinicians/house officers regarding what might be an appropriate case or topic to present is advised. There must be a minimum of two students presenting each week. DO NOT wait until the final weeks of rotation to sign up as students on two-week rotations will need these times. Please be punctual. Smart phone use during these presentations is discouraged and should be limited to essential clinic communications. A PowerPoint template is available for presentations on the student drive.

VI. Instruction In Addition To Casework

A. Discussions will be held in all blocks at the discretion of the clinicians and based on the students' request and time. Feel free to ask if you have a particular topic you would like to learn about, every effort will be made to accommodate this.

B. Students should work with their clinician to complete any necessary documents related to their training such as RTA's and procedures lists or booklets.

VII. Non-case Related Time will be Spent in a Productive, Educational Manner

A. Complete procedures required for graduation.

B. Special short seminars with clinicians on selected problems.

C. Practice examination skills and common procedures on normal animals.

D. Review cases on other services, i.e., surgery, theriogenology.

E. Observe necropsy of cases or pathology rounds.

F. Auto-tutorial programs in the library or on CANVAS.

G. Library study- notify clinicians of your whereabouts if you intend to go to the library

H. Special assignments may be made if necessary.

VIII. Preparation

Review of common medical conditions in large animals and their treatment prior to this rotation is highly recommended. Knowledge of the principles of fluid therapy and antimicrobial use is critical. Throughout your rotation, you can expect to be constantly questioned regarding large animal medicine and physiology, especially relevant to a case you are managing. Therefore additional or review reading during your rotation is strongly recommended. A student library containing relevant internal medicine texts is located in the computer room to provide you ready access to applicable texts. Texts must not be removed from that room. Large animal medicine notes and lecture slides are available on the student share drive (T drive) in folder named "Clinical Course Handouts".

ADDENDUMS

How to write a SOAP for LA Medicine

S (Subjective): On day 1: You write your SOAP to cover the intake. This is where you write your history on the patient. On subsequent days: TAKE HISTORY OUT! The same information does not need to be revisited multiple days in a row. Now you write your subjective thoughts on the patient (attitude, appetite, behavior, etc.) and how the patient progressed overnight. Also include here how much manure was produced and how much water was consumed (in liters) over the previous 24 hours.

O (Objective): This is where you write all your physical examination data. Please divide it into separate systems categories as follows:
VITAL SIGNS: T _ P_ R_
EENT:
CV:
RESP:
GIT:
UG:
MS:
INTEG:
NEURO:
LN:

Then you write the significant results of any diagnostics that have been performed that morning:
CBC/chemistry:
PCV/TP:
Venous blood gas:

A (Assessment): This is where you can provide a 4-5 (or more if needed) sentence paragraph (NO lists) on your assessment of how the patient is progressing today. You can describe

laboratory results and how they have improved or declined and how they relate to patient progress to demonstrate your understanding of disease processes and what the important concerns are AT THIS POINT IN TIME.

P (Plan): This is where you write the plan for the day. Again, things should be written in lists in a sensible manner. Usually as follows:
MONITORING:

1. PE q X hours
2. Any additional monitoring

MEDICATIONS: (list in ORDER: IV, IM, SQ, PO, Topical)

1. Drug A (concentration): dose (in mg/kg), frequency, route
2. Drug B (concentration): dose (in mg/kg), frequency, route

DIAGNOSTICS:

1. Test A
2. Test B

THERAPIES/TREATMENTS/PROCEDURES:

1. Ultrasound A
2. Flush B, etc.

ADDENDUM:
This is written at the end of the day. This is where you discuss the results of any tests that come back AFTER the 8 am SOAP and any significant occurrences that have happened throughout the current day.

How to write a discharge statement for LA Medicine

Complete the listed sections below as instructed for animals discharged alive.

Chief Complaint: Write the main complaint the animal is presenting for according to the client, e.g. 'Irregular cardiac rhythm' or 'acute colic'

History: Describe the signalment of the animal in question (name, age, species, breed) and the circumstances about why they presented. Prior information from referring veterinarians such as their examination or diagnostic findings, any medications given by the client or vet and other specifics about the current condition should be written here. You can also report the status of other animals on the property and the current diet and management conditions for this patient.

Physical Findings: Describe the initial assessment – attitude, body condition score and weight if available, vital signs, relevant normal findings of examination (heart and lung sounds, GI sounds, digital pulses etc.) and any abnormalities on examination.

Diagnostic Tests: These are usually best listed in order of occurrence. We do not want long lists of terms and numbers that clients will not recognize or understand. For example, indicate that 'a complete blood count was performed, and changes were identified including a high fibrinogen

(an inflammatory protein) and a high neutrophil (white cell) count, consistent with chronic inflammation or infection'. *Write only clinically significant findings of laboratory work and diagnostic procedures* and attribute the meaning to them in a manner that the client can understand.

Diagnosis: List one or more final diagnoses that were achieved during the visit and indicate if the problem was resolved. e.g. 'Acute colic, resolved with medical management'

Case Assessment: Do not reiterate the entire history. Restate why the animal presented and the major findings of the examination and diagnostic procedures that culminated in the specific diagnosis. Then describe how the case was managed including what treatments were given and why (details such as doses are usually excluded). Then summarize how the animal responded to treatments and if the problems resolved or are continuing at this time. A segment educating the owner about specific disease conditions, such as recurrent airway obstruction, pigeon fever, colic or other disorders and methods of preventing them is usually relevant to finish up the case summary.

Treatment Recommendations: individually list ALL medications that the animal is to receive at home, including dose (in tablets or mls), route and frequency of administration, and how long the medications are to be given for. Also, indicate possible side effects that the owner should monitor for in this section.
Dietary and exercise recommendations can also be made in this section, as can recommendations for quarantine.

Follow up: indicate if re-evaluation is needed by OSU or the owner's veterinarian, and what specific tests or procedures are needed and approximately when they should be scheduled. Also, instruct the client to call with any questions or concerns. If results are not expected to be available for some tests or procedures at the time of writing, indicate that they will be transmitted at some point when they are available.

Finish by thanking them for bringing their animal into the hospital,

How to write a case summary for LA Medicine (for animals that are not discharged)

Complete the listed sections below as instructed for animals that do not survive their visit. Ensure that the words 'Discharge Statement' at the top of the template document are replaced with 'Case Summary'

Chief Complaint: Write the main complaint the animal is presenting for according to the client, e.g. 'Irregular cardiac rhythm' or 'acute colic'

History: Describe the signalment of the animal in question (name, age, species, breed) and the circumstances about why they presented. Prior information from referring veterinarians such as their examination or diagnostic findings, any medications given by the client or vet and other specifics about the current condition should be written here. You can also report the status of other animals on the property and the current diet and management conditions for this patient.

Physical Findings: Describe the initial assessment – attitude, body condition score and weight if available, vital signs, relevant normal findings of examination (heart and lung sounds, GI sounds, digital pulses etc.) and any abnormalities on examination.

Diagnostic Tests: These are usually best listed in order of occurrence. We do not want long lists of terms and numbers that clients will not recognize or understand. For example, indicate that 'a complete blood count was performed, and changes were identified including a high fibrinogen (an inflammatory protein) and a high neutrophil (white cell) count, consistent with chronic inflammation or infection'. *Write only clinically significant findings of laboratory work and diagnostic procedures* and attribute the meaning to them in a manner that the client can understand.

Diagnosis: List one or more final diagnoses that were achieved during the visit and indicate if the problem was resolved. e.g. 'Acute colic, resolved with medical management'

Case Assessment: Do not reiterate the entire history. Restate why the animal presented and the major findings of the examination and diagnostic procedures that culminated in the specific diagnosis. Then describe how the case was managed including what treatments were given and why (details such as doses are usually excluded). Then summarize how the animal responded to treatments and if the problems resolved or are continuing at this time. A segment educating the owner about specific disease conditions, such as recurrent airway obstruction, pigeon fever, colic, or other disorders and methods of preventing them is usually relevant to finish-up the case summary.

Delete the treatment and follow up sections.
Finish by thanking them for bringing their animal into the hospital, express sympathy that their animal was euthanized or deceased, and instruct them to call with any questions or concerns.

VMC 734 & VMC 754
Clinical Surgery I and II
Guidelines and Procedures

Course Coordinator: Dr. Troy Holder

Course Instructors: Dr. Jill Parker, Dr. Katja Zellmer, Dr. Michael Huber, Dr. Francisco Rodriguez

Introduction
The clinical surgery block will expose the student to large animal surgical problems and procedures -- both routine and advanced. A variety of clinical cases will be seen in this block. The surgery section also assumes primary responsibility for seeing lameness cases, athletic injuries of all types, some medicine cases, a variety of post-surgical medical problems, diagnostic work-ups, and consultations on the majority of clinical cases admitted to the VTH. The lecture and laboratory instruction that you have received will now be seen in practice. Remember that the practice of surgery is not only "cutting and suturing" -- first a proper diagnosis must be made and suitable treatment must be considered. The actual surgical procedure is often the easiest step in the treatment sequence. Post-operative care often determines the outcome of a case and must be rigorously attended to.

Orientation will commence at 8:00 a.m. the first morning of each block -- meet on the green floor. The following are some guidelines and procedures to help you understand how the surgery section operates. Not all points are covered; remember that when in doubt -- ask!

Objectives
Exposure to clinical cases will be used to develop clinical diagnostic abilities, decision making processes, and technical skills based on the student's didactic and laboratory training in large animal surgery. The student will be expected to review surgical anatomy, surgical procedures and diagnostic methods for the specific clinical cases encountered. Participation in clinical rounds will be used to develop dialogues among clinicians and students regarding clinical decision making, treatment options, prognosis and client costs of treatment, among other topics. Maintenance of complete case records by the student will be emphasized by periodic reviews of surgery reports and case record entries by faculty and other clinical staff. Technical skills such as administration, selection and dosing of medications, bandaging, placement of intravenous catheter diagnostic methods (such as nerve blocks) and other procedures will be supervised by the clinical and technical staff at levels consistent with the student's abilities.

Admitting a Case (During Regular Hours)
Clients should check in at the Reception desk and fill out necessary forms, including the Client Information Form. When the chart is ready, you will be called to see the case. The next step is recording the medical history and performing the physical exam. The appropriate physical examination form should be filled out (i.e., Lameness Examination, Colic Examination, General Physical Examination, etc.). Typically, you will then discuss the history and physical exam findings with the clinician, resident, and/or clinical fellow, followed by your diagnostic plan.

The diagnostic plan will become evident as the examination progresses (e.g., if a lameness -- nerve blocks and/or radiographs will be considered; if an elective surgery case -- hospital admission and pre-operative work-up will be required).

Pre-Operative Work-Up

In most cases, elective procedures will be identified and surgery scheduled for the following day. Filling out the pre-anesthesia checklist form will aid you in preparing the case for surgery.

All elective cases going to surgery must have:

1. A CBC and musculoskeletal profile submitted. Some clinicians prefer the complete large animal profile, or only PVC/TS depending on the case--so ask.
2. A tetanus toxoid booster (if >6months since last booster-ask clinician).
3. Weight recorded.
4. A general physical examination completed.
5. Shoes removed? Ask clinician.
6. The surgical site clipped and some preparation. Ask clinician.
7. Been groomed
8. Held off feed usually beginning midnight the night before. Ask clinician.
9. Scheduled for surgery using a surgery request form turned into Shawn Davis.
10. Anesthesia request turned in (VetHosp).
11. Order pre-operative medications (ask clinician)-may include antibiotics, anti-inflammatories, etc.

Some cases will require a bath, bandaging to reduce edema, special diets, etc. Food animals will be held off for up to 12-24 hours or more while most horses are held off feed for 12 hours prior to surgery. Suckling animals are not held off feed except in special situations.

It is your responsibility to ask the clinician about any questions regarding the pre-operative work-up.

Surgery

The scheduled surgery time is when the patient should be walked into the induction stall. Frequently, this requires that the case be in the final preparatory stages for 30 to 60 minutes. Horses are led outside the induction area, cattle are readied in their pen, the transporter, or the surgery chute.

Prior to surgery a horse must have:

1. Its mouth rinsed.
2. Its tail wrapped.
3. Its feet picked out and scrubbed with a brush to remove all material.
4. A final grooming prior to moving to the induction stall.

Cases being induced in Surgery Room 1 (with the tilt table) will need a tail rope and shipping boots applied. These will be available in the induction stall.

During this final preparation time, it is convenient and expedient to be dressed in your surgical scrub suit. The scrubs are available in the surgery locker rooms; the student color is blue. You must wear coveralls or lab coats over the scrubs when wearing them anywhere other than the surgery suite. If your scrubs are soiled, you will not be allowed to enter the surgery area. Keep the scrubs clean for surgery.

Access to the surgery suite is through induction stalls (with a case only) or past the locker area on the south side of the surgical suite. Whenever entering this area, you must wear proper attire — this means clean shoes and clean scrubs. Entry to an operating room is permitted only with shoe covers, cap, mask, and scrubs. These items are available in the surgery suite ante-room or laid out in the induction stall for the student leading in a patient.

Orientation to operating room procedures and responsibilities will be conducted the first day of the block. Students attending a surgical case must be conversant with the diagnosis, approach to be utilized and associated anatomy, alternative techniques, complications to be expected, patient after-care, and approximate cost for the procedure. You will be expected to utilize your knowledge, textbooks, and current literature to learn as much about each procedure as possible. You will also be expected to use and develop your hands-on surgical skills under the surgeon's supervision.

Recovery from anesthesia is the responsibility of the student anesthetist, anesthesiologist, and surgery team. No animal is ever to be left unattended until it can stand and walk steadily on its own. A patient is returned to the stall only after the surgeon or anesthesiologist determines that it is safe to do so. Food is withheld for 1-2 hours post-recovery to prevent esophageal obstruction.

The student surgeon is responsible for filling out and placing in the surgeon's or resident's mailbox a completed surgery report within 24 hours. The procedure should be described in a concise, yet complete, style. Items to include: position (i.e., lateral recumbencey), type of tourniquet (if used), incision site, approach, findings at the surgical site (including size of mass, condition of tissues, etc.,) description of implants, closure by layers (suture materials and pattern). The resident or surgeon will critique and approve/reject your report.

Post-Operative Care

All instructions for case care are the responsibility of the surgeon. Any changes in treatment will also be approved and recorded in the case record.

Prior to discharge of a patient, the animal must be presentably groomed, and the case record must be completed with explicit discharge instructions, bill, report to the referring veterinarian, and discharge medications.

Records and Forms

The case record is a medical and legal document; and it is an integral part of your learning experience, a follow-up necessity, and a research tool. All entries should be neat, succinct, and signed. Refer to the case record for any changes in therapy or diagnostic plan by the clinician. The case record can become burdensome if you don't keep up with the paperwork on a regular basis. Daily SOAPs of cases should be completed before rounds are scheduled to begin (by 8am).

Charges must be made for all supplies not charged through the Pharmacy and for professional services. The number of forms we use may at first seem overwhelming, but they are necessary for cataloging diagnostic, therapeutic, and progress information on each case. They also serve to organize and record the charges generated. You should be aware of (and discuss with the clinician) all charges — this will be of great assistance to you in practice and will make you aware of the cost of supplies, drugs, and daily care of patients.

Surgery Rounds

Surgery rounds are held as scheduled by the clinician-in-charge; some rounds are in combination with the medicine service. In addition, surgery, medicine and clinical services students will attend pathology rounds one morning (currently Wednesday) each week. Routine treatments must be done and recorded by 8:30 a.m., before rounds. You are expected to be prepared to present and discuss cases assigned to you. The following are to be included in the case presentation: signalment (breed, age, sex), presenting complaint, history, diagnostic procedures and work-up, diagnosis, treatment and/or surgery, progress and outcome, including fees/costs.

More detailed discussions will take place with new cases. Comments on daily case progress should highlight any changes since previous rounds. Grand rounds presentations will be held on Fridays from 8:00-9:00am to expose all students and clinicians to cases of special interest.

The Inevitable List of Do's and Don'ts

1. Clinicians or technicians will supervise intravenous injections, bandage changes, passage of a nasogastric tube, or other non-routine treatments. As your technical skills improve, less direct supervision of these functions will be necessary.

2. Rectal examinations are to be performed only when directed and supervised by a clinician.

3. Be careful around horses — most will stand quietly for routine procedures such as the insertion of a rectal thermometer, but some will object violently. Always work in pairs (or seek the aid of one of the technicians) when giving injections or working on an uncooperative animal.

4. If you have any questions regarding a case, reach the clinician in charge of the case or, if unable, contact the emergency duty clinician.

5. The job is never done until everything is cleaned up and the paperwork is done. Remember if you don't complete your paperwork in a timely manner, it will be redirected to you. We all like to go home at the end of the day. However, due to the nature of our profession, this is not always possible. Students should be prepared to work after-hours on any given day.

6. We are working with the public. It is the animal owner, not the animal, who pays the bills, gives us praise, or voices their disfavor if things don't go right. Reserve controversial comments to private discussion with the clinician and the rest of the section. Owners have a right to privacy regarding the condition their animal is in. What is said on rounds and in communication with the client and referring veterinarian is to be moderated by the attending clinician.

Emergency Duty and Weekend Treatments
Emergency duty is part of the surgery rotation for both Surgery I and II students. After hours duties are scheduled by the LA technician supervisor (Garland Burdock). These duties include treatment shifts, emergency duty and backup duty. Please refer to the Large Animal Clinic After-Hours section of this handbook for more details. Weekend rounds are held at a time set by the clinician on duty (usually 8:30 or 9:00 a.m.). The surgery service generally has a large caseload, hence we request that all students on the service come in and do morning treatments.
With the approval of the clinician in charge, students on the surgery rotation can arrange to care for each other's cases on weekend if necessary.

Additional Training
As time allows, informal laboratory periods for additional training on nerve block techniques and other diagnostic procedures will be provided. "Mini-seminars" will, at times, be conducted to discuss areas of students' interests.

Evaluation and Grades
A Surgery Block Evaluation form (see appendix on-line) with constructive comments will be used to formulate an A through F grade. The following scale will be used for these grades:

A	93-100	A-	90-92
B+	88-89	B	83-87
B-	80-82	C+	78-79
C	73-77	C-	70-72
F	<70		

Students should expect one or more unannounced written or oral examinations covering their clinical block instruction. All active clinicians on the service participate in the final course evaluation.

Our Teaching Hospital requires a continuous flow of suitable cases to achieve its functions. To maintain this, we need the cooperation and confidence of referring veterinarians and animal owners. This involves attention to <u>every</u> detail. Sometimes the most insignificant detail, left undone, will result in the loss of a client or referral. As a service profession, we are required to be concerned with animal owner's problems, and to maintain a professional and polite approach to these problems and their solutions.

VMC 735 and VMC 755
Rural Veterinary Practice I and II

Course Coordinator: Dr. Jorge Vanegas
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Instructors: Dr. Joe Klopfenstein https://vetmed.oregonstate.edu/people/joe-klopfenstein
Dr. Kate Schoenhals http://vetmed.oregonstate.edu/people/kate-schoenhals
Dr. Jorge Vanegas https://vetmed.oregonstate.edu/people/jorge-vanegas

Large Animal Clinical Fellows will be covering the equine section of RVP for a total of 8 weeks. These weeks are not consecutive coverage but rather distributed through the whole year. If a student will be working with a clinical fellow during her/his time in RVP the name and contact information of the clinical fellow will be provided at the beginning of the rotation

Technicians

Betsy Snyder CVT – She provides technical support to RVP and Therio Services
Betsy.Snyder@oregonstate.edu
Kim Veldman – She provides technical support to equine RVP.
Kimberly.Veldman@oregonstate.edu

Course Objectives, purpose: To provide instruction and clinical experience in livestock and general equine practice, herd health management and production of livestock animals, and theriogenology cases in livestock and horses.

Course Objectives:

1. Expose students to ambulatory veterinary medicine and surgery of livestock and horses at a community practice level.
2. Apply preventive veterinary medicine and herd health concepts to livestock and horses
3. Advocate for the welfare of farm animals and horses
4. Participate in verbal and written communication with owners and caretakers of livestock and horses
5. Understand regulatory veterinary medicine and the relationship of agriculture and livestock species to public health.

Specific Course Learning Outcomes:

Students may decide how much time to spend on either the food animal or equine service with the expectation that at least one week will be spent on each during their rotation.

Food Animal: Students will actively participate in the delivery of livestock medicine and herd health programs to dairy, beef and small ruminant herds that are clients of OSU CCVM rural veterinary practice. Outcomes are dependent upon case presentation during the student's rotation.

1. Rectal palpations –gain experience in evaluating ovaries, normal tracts, abnormal tracts and pregnancy status by rectal palpation and reproductive ultrasound.

2. Herd health management, record keeping and evaluation – develop a functional understanding of the basic production stages on a dairy, beef and small ruminant operation. Understand the importance of accurate and complete collection of data, record keeping and records analysis to herd problem solving. Understand vaccination protocols for dairy, beef and small ruminants.

3. Students will develop skills in the examination and treatment of sick and poorly performing animals – ruminant physical exam, development of livestock specific problem lists, understand the treatment of pathological conditions encountered in cattle and small ruminants and the role of herd management, nutrition and environment on disease incidence, control and prevention.

4. Develop skills in performing common farm animal procedures such as disbudding, dehorning and castration including anesthesia, sedation, post-operative care and pain mitigation.

5. Students will develop skills in performing common surgical procedures such as displacement of abomasum and cesarean section.

6. Regulatory veterinary medicine - learn the proper procedures for Brucellosis vaccinations and completing certificates of veterinary inspection.

7. Students will be expected to participate in the RVP emergency service. This will give students the opportunity to develop skills involved in the management of ambulatory or in-house (VTH) livestock clinical emergency situations.

Equine: Students will participate in the delivery of equine medical and surgical services to clients of the OSU CCVM equine rural veterinary practice service. Outcomes are dependent upon case presentation during the student's rotation.

1. Students will practice routine equine health maintenance procedures on CVM and client-owned animals.
   a. Students will be able to perform a general physical examination with detailed

examination of the digestive and locomotor systems.
   b. Students will acquire skills in the development of equine specific problem lists and recommend appropriate diagnostic testing.

2. Students will be expected to be able to develop and administer vaccination and parasite control programs for horses.

3. Dentistry and surgery – students are expected to be able to examine the oral cavity and provide routine dental care including removal of wolf teeth, floating, and occlusal equilibration. Students shall know the various methods of equine castration and be able to demonstrate techniques for field anesthesia and castration.

4. Students should learn and be able to work up common equine emergencies such as equine colic (which is included in the digestive examination), lacerations, acute lameness, including but not limited to laminitis, and ophthalmic conditions.

5. Regulatory medicine: students will understand the specific requirements for animal movement and participate in completing coggins forms and certificates of veterinary inspection.

6. Equine after-hours emergency services. Students will be expected to participate in the RVP emergency service. This will give them the opportunity to develop skills involved in management of ambulatory or in-house (VTH) clinical emergency situations.

Guidelines and Procedures

Attendance:
Since instruction is largely dictated by case material available, attendance is mandatory. Each student will be required to spend an equal amount of time in each of the sections of RVP (equine and food animal) as well as to share equally the participation on the emergency service.
There are legitimate reasons for being absent, and these will be evaluated on an individual case basis in accordance with the STUDENT MANUAL. When possible, a REQUEST TO BE ABSENT form should be submitted to the dean's office 6 weeks prior to a planned absence. An unexcused absence is grounds for receiving a grade of INCOMPLETE for the block.

Appointments:
The Rural Veterinary Service DOES NOT USE VetHosp to set up regular appointments. Visits are scheduled using an RVP email Outlook calendar. Appointments are identified in the Outlook calendar with a different color category for each of the sections of the service (Food Animal: green, Equine: blue). Our daily schedule is available in any of the computers in the RVP office. Clinicians and VTH receptionist will try to update the calendar as regularly as possible with information about the planned farm calls so the

students can prepare ahead of time on the different procedures that may be performed, as well as necessary supplies and equipment.

RVP appointments generally occur during the same hours as the hospital operations, i.e., 8:00 a.m. to 5:00 p.m. Monday through Friday, but patient care, records management, etc. may require additional time before and after regular business hours, including weekends. Promptness for farm calls is important, and failure to be available on time may result in students being left behind and an unfavorable evaluation

Dress Code & Equipment:
Students must supply their own coveralls, boots, stethoscope and thermometer. Coveralls required for hospital assignments are also appropriate for field calls. **Boots are mandatory and must be of a material that is easily cleaned and disinfected after each call** (usually at the client's facility). An extra pair of clean coveralls should be immediately accessible, as they are frequently soiled while working and many days we visit different farms during the sametrip.
We rely on the students having their basic tools with them at all times during the rotation.

Emergency Duty:
RVP provides emergency service at any time of the day; thus, **the schedule posted on the calendar may change on short notice and several times throughout a day**. Therefore, students are encouraged to bring a packaged lunch to eat in between farm calls (in the truck) as we may be unable to return to the VTH until the end of the day. Some days may be filled with lots of calls and others may be slow, we do not have much control about that, although we try to even out the load throughout the week.

RVP has an emergency service that allows clients to be served 24/7. After-hours and weekend calls are rotated among clinicians. Both RVP I and II students will be assigned to be available for emergency duty on a similar rotating basis. Students assigned to emergency duty are required to be readily available while on duty, to carry the student emergency cell phone to be located and able to arrive at the hospital within **20 minutes** of being contacted by the emergency clinician.

A student emergency phone is available in the RVP office. You can forward calls to your personal cellphone when you are schedule to be on call duty. Directions on forwarding the phone are post in the RVP office.
Emergency schedule is as follows:

a. **Weekdays: from 5:00 pm to 8:00 am the next day**
b. **Weekends and holidays: 8 am to 8 am next day**

Clinician will receive the call from the client requesting a visit and clinician will contact student.

Client Communications:
While on the service, certain basic rules of conduct are expected from the students: respect to clinicians, staff, fellow students and clients. This rotation is an excellent opportunity to test your skills with supervision by a faculty member. Own your cases but do not make diagnoses or

recommendations to the client without the clinician's prior approval. Discussion of a case is always encouraged, however arguments or voicing strong disagreement with the clinician in front of the client are unacceptable. There is always time for further discussion later. Avoid making negative comments about anything but especially management procedures, facilities, conformation, etc., in the presence of the client.

Hospitalized Patients:
Although hospitalization of animals is not frequent in the RVP service, when they occur, the students are responsible for the patient records, medications, etc., as with any other hospitalized patient (i.e., LA surgery or LA medicine blocks). Treatments and patient record entries must be accomplished prior to 8:00 a.m. each day.

Student Rounds:
We will meet for RVP student rounds every Friday at 8:00 am (time might change depending on clinical activities. Clinician on the floor will communicate to students). Rounds will include case presentations by the students of cases attended during their rotation. Please present your topic in a Powerpoint format and presentation should not last more than 15 min to allow further discussion

Since much of the farm work is scheduled first thing in the morning, rounds or discussion of daily clinical activities will usually be held in the truck during trips to farms. However, you need to be aware that you are being evaluated constantly on your knowledge, technical skills and deportment. You can be questioned on any procedure and any subject you are supposed to know at any time during your interaction with clinician.

Grading:

Number of term credits:

Path	Weeks	Credits
General	4	6
Small Animal	2	3
Large Animal	4	6
Non-traditional	2	3

Method used to evaluate students**:** Students will be evaluated on their knowledge base (27%), clinical skills (35%), technical skills (15%), professionalism and conduct (13%), communication (5%), animal welfare (5%). The following letter grade system will be used to calculate the final grade:

A	93-100 %
A-	90-92%
B+	87-89%
B	84-86%
B-	80-83%

C+	77-79%
C	74-76%
C-	70-73%

VMC 729
Clinical Theriogenology
Guidelines and Procedures

Course Coordinator: Dr. Charles Estill

Course Instructors: Dr. William Whitler, Dr. Charles Estill, Dr. Olivia Strickland (resident)

Course Objectives

Objectives for this course are to provide guided instruction and hands-on experience in basic and advanced reproductive procedures in domestic species, including the dog, cat, horse, cow, sheep, goat, camelid and pig. Procedures and discussions span the entire gamut of Theriogenology including but not limited to: include reproductive physiology, breeding management, breeding soundness examination, insemination timing and techniques, embryo transfer, in vitro fertilization, semen collection and evaluation, assisted breedings, pregnancy diagnosis, infertility management, diagnosis, treatment and prevention of periparturient disorders, dystocia, and fertility control. Specialized laboratory and imaging techniques include collection and interpretation of vaginal cytology samples, endocrine testing, microscopic and computer-assisted semen evaluation, processing and freezing of semen, ultrasonography of the male and female reproductive tracts, vaginoscopy, and hysteroscopy. The student learning experience will be strongly influenced by the caseload during their scheduled week and students should bear in mind that much of our work is dictated by season of the year.

Description of course

This course will be a one-week core rotation for 4th year professional veterinary students. Students will be assigned to clinical cases under the supervision of staff Theriogenologists and participate in routine veterinary procedures including physical exams, history taking, and some of the reproductive procedures listed above. Students will be required to read supplemental material and present case and topic presentations. Every student will make a formal rounds presentation (~30 min) to other students and faculty at least once during the course.
Emergency coverage will be shared with students on the Rural Veterinary Practice rotation and students should expect some afterhours and weekend emergencies.

Patient records are generally prepared by students and their completeness and accuracy are taken into consideration in the grading

process.

Learning Outcomes

Explain the normal estrous cycle of the major domestic species.
Describe how to collect semen and perform a semen evaluation on stallions, ruminants, and dogs.
Explain how to manage a breeding (canine, equine) with cooled, shipped or frozen semen.
Demonstrate how to diagnose pregnancy and estimate gestational age in domestic species.
Explain how to perform a breeding soundness examination in female animals.
Recognize causes and therapy for female infertility.
Demonstrate how to perform a breeding soundness examination in a male.
Recognize causes of male infertility.
Explain normal and abnormal events of pregnancy and parturition.
Explain how to manage a dystocia.
Articulate causes of neonatal diseases.
Recognize diseases of the mammary gland.

Course specific risk assessment

There are many risks associated with the practice of veterinary medicine. While it is not possible to identify all the risks associated with a particular activity, the following are known potential hazards when participating in this course.

1. Known chemical hazards in this course: tranquilizers, povidone iodine, chlorhexidine, isopropyl alcohol, formalin, sedatives, isoflurane, prostaglandins, progestins, estrogens.
2. Known radiation hazards in this course: radiographs of pregnant dogs, cats, goats, pigs.
3. Known physical hazards in this course: cattle, horses, alpacas, sheep, goats, dogs, cats, OB wire, scalpel blades, suture needles.

VMC 782
Large Animal Emergency Care
Guidelines and Procedures

Course Coordinator: Dr. Francisco Rodriguez

Block Objectives

1. To provide students additional instruction in emergency and critical care of large animal species.
2. To improve patient care and minimize judgmental errors by reducing after hour's commitments for block students and providing alert rested student care providers.
3. To reduce the hours which students in the Large Animal Medicine and Surgery blocks must devote to afterhours live-in duty.

Duty and Instructional Schedule

Students will spend one week in this course. The block starts on Sunday night at 5:00 PM. If there are not concurrent emergencies, you will be met by the house officer (resident or clinical fellow) on duty near that time on Sunday so they can familiarize you with protocol and orient you to hospitalized cases.

After Sunday, weekday shifts begin at 5:00 PM. The final shift on Saturday begins at 5:00 PM. Each shift ends the following morning after case transfer at rounds (usually by 9:30 am) or by permission of the house officer (8:00 AM) if there are no new cases and there have not been any major changes associated with hospitalized cases. To reiterate, the house officer on duty from the night before will determine student dismissal, and thus it is incumbent on the house officer to arrive between 7:45 and 8:00 am. (In the event the house officer is not available, then the senior clinician on medicine or surgery can make the decision.) If you experience difficulties with this system, please contact Dr. Rodriguez.

On weekdays, the emergency student will arrive in time to be changed into clinic attire and to be ready to assist the evening technician with 5:00 PM treatments. During the week (Sunday through Thursday nights, and Friday until Midnight), a night technician is often on duty and if permitted directly by the technician, students may find some time to rest during their shift. However, please do not rely on resting during the rotation. ***The emergency student shall plan to rest sufficiently so that he or she will be awake and alert for the entire duty period.*** If a night technician is not available, a backup student or technician is called to provide support. The backup student will be allowed to rest preferentially since he or she has clinic duty during the day. On occasion when there is no night technician scheduled, the emergency student will be up during the entire rotation.

Orientation

Ideally, all students will have had a previous daytime clinical rotation prior to the emergency care block. Students will be oriented to hospital functions on Sunday at 5:00 pm of each block. The House Officer on duty for Sunday or the Emergency Clinician will meet with you for this purpose.

It is strongly recommended and it is the student's responsibility to attend one block orientation (LA Hospital) prior to the emergency rotation. Students are required to read all sections of this manual for additional orientation. Some instructional materials are to be found in a Hospital Manual located in the Communications Area of the LA Hospital. If the student has not had previous clinical duty at OSU prior to the start of the emergency care block, that student should advise the house officer or Emergency Clinician providing orientation on the first evening (Sunday 5:00 pm). Students should consider arriving one-to-two hours early to work with experienced students and to receive additional orientation from the night technician.

Instructors

Dr. Rodriguez is the instructor in charge. House officers (residents and clinical fellows) will function as the daily instructors to interface with students. Additionally, students will, also, interact with medicine and surgery clinicians, the on-call anesthesiologist, the evening and night veterinary medical technicians, and all faculty attending morning Veterinary Teaching Hospital rounds.

Topics to be Covered

This rotation is case-driven. Consequently, as in practice, students should be prepared for any type of case presentation. All previous veterinary experience, classes, discussions, notes, journals and texts are prerequisites. Remember that logical thinking, knowledge, and experience are the keys to case management of patients with multiple differential diagnoses and long problem lists. Examples include colic diagnosis, treatment of endotoxemia, severe trauma, dehydration, fluid therapy, correction of acid/base imbalances, casting and stabilizing fractures, interpreting laboratory data, performing laboratory tests available to the practitioner, oxygen therapy, and neonatal care.

Students completing the course should be able to evaluate and subsequently develop a treatment plan, calculate fluid therapy needs, insert intravenous catheters, administer oxygen, support fractures, and in other ways care for the critically ill emergency patient.

Library and Reference Materials

The veterinary college library has several texts on critical care medicine, and the more common veterinary journals, which contain articles on emergency care and treatment. A hospital library, made up of pertinent texts donated by previous classes, is available on the shelves of the large animal hospital communications room. Please leave the books in the hospital.

Grades

Attendance is required for each night of this block. Any absences need to be excused. If a student misses more than two shifts, regardless of the reason, a recommendation will be made to retake the block. Letter grades are assigned by the instructor (Dr. Rodriguez), with input from the hospital staff. Letter grade (with +/- scale) for the course will be based on student performance, records, and attendance.

Small Animal Services
Veterinary Teaching Hospital
Guidelines and Procedures

Appointments & Admitting

The Small Animal Hospital is primarily a referral hospital and appointments are made by the Reception staff according to hospital guidelines. The SA Hospital is open Mondays through Friday, from 8:00 a.m. until 6:00 p.m. Appointment schedules vary by service area. Appointment scheduling is accomplished via an electronic scheduling program that can be viewed on line. Printed copies of the receiving schedules are also posted daily outside the door to the client services area. All appointment entries, changes and cancellations must be performed by the Reception staff. Recheck or recurring appointments are sometimes scheduled as drop offs between 7:30 and 9:00 a.m. but new clients cannot be admitted by this mechanism. Clients dropping off a pet must have a scheduled visit through the Reception staff and the client must be greeted by the technician or student assigned to the case. During regular business hours, the student will facilitate the hospitalization process by escorting the client to the SA Reception desk to finalize the admissions process and to leave a deposit based on the content of the written estimate form. Estimates are the responsibility of the service technicians and attending clinician and are derived from the SA fee code schedule which is available on line.

Discharges

Hospital discharges are preferably accomplished in the afternoon from 1:00 to 5:30 p.m. Hospital discharges must be coordinated with the service technicians and Reception staff. It is the responsibility of individual services to make certain that all hospital charges are entered prior to the time of discharge. No patient should be discharged without the knowledge and approval of the attending clinician. Patients should be clean and appropriately groomed prior to discharge. In addition, all dispensed medications should be retrieved, well in advance of the discharge time, from the VTH Pharmacy or hospital. A written discharge form, signed by the attending clinician, is required for all patients discharged from the hospital. A copy of this discharge form should be faxed to the referring veterinarian on the day of discharge along with any other information as indicated by the supervising clinician. Student involvement in these processes is determined by the particular clinical rotation.

After Hours Duties

The student is referred to the Small Animal After Hours Duties section of this manual for an explanation of their duties outside of business hours. The Small Animal Hospital does not provide after-hours emergency services for new clients, but day emergencies are scheduled with the approval of the supervising clinician who is responsible for coordinating the visit through the Reception staff. It is sometimes necessary for existing clients to bring their pet for urgent care outside of normal hours. These visits are appropriately scheduled only with the approval of a supervising clinician. Students assigned to the rotation are responsible to assist in the management of such cases as requested and without hesitation. The Urgent Care service will receive new and existing client emergencies from 9 am to 4 pm Monday through Friday

excluding holidays. This service will transfer all cases to an appropriate service by 5 pm that day. More details regarding the Urgent Care service may be found in the VMC 791 & 792 Small Animal Internal medicine section of this manual.

Student Involvement
Students assigned to a clinical rotation are required to participate in patient admissions, assessment, hospitalization, care and discharge. The exact role of the student may vary depending on service and patient. Students should never operate independently of the supervising clinical faculty member and should never initiate treatment or a procedure except under the direction of a veterinary technician or attending clinician.

Students are required to take an active role in filling out all required hospital forms and maintenance of the medical record. Detailed information regarding these procedures will be provided during the orientation to each service area rotation. All hospitalized patients must have a hospital ID collar with the owner's name and clinic number legible. The kennel assigned in the hospital should also be clearly identified and tagged with regard to feeding and any other special annotations (feeding instructions, special care, etc.) The medical record should be placed in the location that corresponds to the animal's cage or run when not in use by other services so it can be located when necessary. The student, technician, intern, resident and clinical faculty that received the patient are responsible for the animal's care including cage set up, maintenance and cleaning. All animals with intravenous catheters must be housed in the intensive care unit for continuous monitoring.

Clinical Attire and Student Conduct
Professional appearance should be maintained at all times. This includes good hygiene and cleanliness. Jeans, t-shirts, tank tops, shorts or open toed shoes are not permitted in any area of the Veterinary Teaching Hospital where you may interact with the public. Name badges should be worn at all times during work hours, and a white laboratory coat should be worn. It is important to behave professionally to our clients and referring DVMs. Students should be professional in their conduct and mindful of how their remarks might be perceived by the client. It is not appropriate to discuss or criticize case management by a colleague (referring veterinarian) in the presence of the owner. The owner's privacy must also be protected and cases should not be discussed inappropriately with anyone other than the hospital staff and attending clinician(s). Such discussions are best accomplished during clinical rounds. Students are referred to the OSU CVM Professional Code of Conduct under CVM Student Policies for more information.

Food and drink are only allowed in designated areas of the VTH where animals are NOT handled or housed. Water in closed or capped containers is okay.

Attendance: Attendance is mandatory. Please see the Year IV Absence policy in the CVM Student Policies section of the manual. Be punctual. Hours will vary between services so make sure you know what regular and after hours duties you have during your rotation. If you are ill, it is your responsibility to contact the supervising clinician and/or technician. IF you are going to be late for or absent from afterhours duties you must call into the ICU (541) 737-4825 and speak to an ICU technician or small animal rotating intern.

Equipment
For all rotations, you are required to bring a stethoscope, bandage scissors, penlight and thermometer. For surgery, you should also bring suture scissors

Safety Procedures: There are many inherent dangers working with animals particularly in a hospital environment. Please be mindful at all times of your own safety, the safety of others around you and the safety of your patients and clients. If you are ever uncertain, err on the side of caution and ask for assistance. A more extensive explanation of the risks and responsibilities associated with student safety can be found in the CVM Student Policies, Lois Bates Acheson Veterinary Teaching Hospital sections as well as the Small Animal Infection Control Policy in the Appendix.

VTH Policies, Procedures Organizational Charts, and SOPS are available on the Veterinary Teaching Hospital Web Site, http://128.193.215.68:12469/vth-policies/_policies_main.htm. Familiarize yourself with these resources and information and ask your supervising clinician or veterinary technician if you have questions regarding a VTH Policy or Procedure.

Veterinary Teaching Hospital

SMALL ANIMAL INFECTION CONTROL

SCOPE OF DOCUMENT

This document is applicable to ALL personnel that work in within the OSU-SAVTH, including veterinarians, veterinary technicians and students and classified staff. For the purposes of this document, 'veterinary personnel' refers to all personnel that work in a veterinary clinic. This includes non-clinical staff, as in many situations these individuals may still have periodic direct or indirect contact with patients and pathogens within a clinic.

INTRODUCTION

Infection prevention and control strategies are designed to protect patients, owners, veterinary personnel and the community. A significant percentage of hospital-associated infections (HAIs) in veterinary clinics can likely be prevented with proper compliance to basic, practical infection control practices. A systematic approach to infection prevention and control requires all veterinary personnel to play an active role in protecting every person and animal associated with the veterinary clinic, patients or veterinary personnel. Veterinary personnel need to follow infection prevention and control protocols at all times and use critical thinking and problem solving in managing clinical situations.

When an infectious disease that potentially poses a risk to other animals visiting or housed at the VTH is included on the list of potential differential diagnoses the following steps must be taken.

Communication and diligent hand washing are essential for preventing potential transmission within the hospital*

GENERAL COMMUNICATION

- Inform the INFECTIOUS DISEASE CONTROL OFFICER, SENIOR CLINICIAN(s), HOUSE OFFICER(s), and TECHNICIAN SUPERVISOR anytime a known or suspect contagious animal enters or is identified in the hospital.

GENERAL PRECAUTIONS

1. Because of the potential for disease transmission **FOOD IS NOT PERMITTED** in the Veterinary Teaching Hospital where animals are examined, treated, or housed.

2. Food storage is **NOT ALLOWED** in any refrigerator or freezer used for medications, animal samples. Water bottles and coffee cups are **not** allowed in the VTH or the corridor adjacent to the VTH.

3. All multiple use areas where animals are examined or treated should be cleaned and disinfected **immediately** after use by personnel responsible for the patient irrespective of infectious disease status of the individual animal.

4. Exam rooms must never be left dirty with the intent to return later**.** If the emergency nature of the case does not allow this, request help to ensure the room is cleaned.

5. Traffic between the **SMALL** and **LARGE** animal areas of the hospital as well as entry to the main areas of the College through the VTH should be kept to a minimum.

6. Students are expected to have a digital thermometer, stethoscope, and penlight. **USE of THERMOMETER COVERS is MANDATORY**

7. It is the responsibility of the PRIMARY CLINICIAN on each potentially INFECTIOUS DISEASE case to review the BIOSECURITY SOP and to institute containment procedures before admission to the SA VTH.

8. All patients housed in general wards with **MULTIPLE-DRUG RESISTANT BACTERIAL** infections (e.g., MRSA/MRSI) should be moved to a designated isolation area or discharged immediately and treated as an outpatient, following approval by the senior clinician.

HAND HYGIENE

It is recommended to carry out hand hygiene procedures:

1. Immediately before any direct contact with a patient,
2. Before any clean care or any invasive procedure,
3. Between contaminating care and clean care or an invasive procedure with the same patient,
4. Following the last direct contact with, or care given to a patient,
5. After any contact with body fluids,
6. Before putting gloves on for care,
7. Immediately after removing gloves,
8. Before eating food
9. Before and after personal body functions, such as using the toilet

WEARING OF GLOVES

1. Gloves are **ALWAYS** to be worn when there is a risk of contact with blood or any other product of human of animal origin, the mucosa or non-intact skin of a patient, in particular during care with splatter or splashing risks (e.g., blood sampling, insertion and removal of venous or urinary catheters, etc.)

2. Gloves MUST also be worn during the manipulation of biological sampling tubes, and soiled linen and equipment. They are systematically worn during ANY care for which the caregiver's hands have any lesions (cuts, wounds, abrasions or dermatosis).

3. Gloves are to be changed **BETWEEN** any two patients or activities (including those involving the same patient).

4. Gloves should be worn just before the contact, care or treatment.

5. Gloves should be removed as soon as the care has been completed, and be disposed of before the wearer touches the surrounding environment or other animal.

6. Disposable gloves should NOT be washed and reused.

MASKS

1. Surgical splash-resistant mask with safety goggles or a full-face visor MUST be worn with cases involving a known or suspected Zoonotic diseases; particularly when there is a risk of blood or biological fluid splattering and/or exposure to microorganisms that can be communicated by aerosols

2. The mask must always be worn in such a manner as to cover the nose, chin and mouth, and must be hermetically applied to the face. It must not be repositioned or worn around the neck.

PROFESSIONAL AND PROTECTIVE OUTERWEAR

a. When working the clinical environment or whenever there may be contact with an animal, "street" clothes should always be covered by protective outerwear. Neckties (except bow ties) should not be worn.

b. Jewelry, wristbands and watches that interfere with hand washing and disinfection should not be worn (simple wedding bands and watches with metal or rubber straps are acceptable).

c. Examples of protective outwear include: **LAB COATS, SCRUBS,** AND **STERILE** OR **NON-STERILEGOWNS**.

d. Three options for clothing exist for those working in the small animal clinic in direct contact with animals:
    a. A white coat worn over regular"street clothes".

b. A white coat worn over patterned scrubs.
c. Scrubs tops and bottoms

e. **WHITE COATS** must be removed when you leave the VTH and cannot be worn in other areas of CVM outside the VTH.

f. Students must always have a minimum of **2 sets of standard attire** available.
   a. Lab coats should be washed regularly while on rotation, and especially when changing services.

g. Protective outerwear are to be **changed daily** and whenever they are soiled or a case with a potentially infectious condition is handled (e.g. coughing dog, parvo suspect, open wound).

h. They SHOULD NOT be worn **OUTSIDE** the hospital work environment. Ideally, uniforms should be laundered on site or by a professional laundry service.

i. A gown or a disposable plastic apron is used to protect the garments whenever:
   a. There is a risk of splashing or aerosolization of blood or biological fluids
   b. During the direct care of a patient requiring additional contact precautions such as handling animals with suspected or confirmed infectious diseases and/or that are housed in isolation.

j. **DISPOSABLE GOWNS** should only be used ONCE and NOT be reused, and reusable fabric gowns should be laundered after each use.

k. **SCRUBS** should **NOT BE TAKEN HOME** by personnel to be washed, rather they should be washed onsite, with other clinic laundry.
   a. Ideally, scrubs should be washed at the end of each day and whenever they become visibly soiled.
   b. A specific set of scrubs should be designated for use during surgery only
   c. Designated surgery scrubs should be covered with a lab coat outside of the surgical suite.

FOOTWEAR

1. CLOSED TOED FOOTWEAR must be worn at **all times** to reduce the risk of injury from dropped equipment (e.g. scalpels, needles), scratches from being stepped on by dogs, and to protect the feet from contact with potentially infectious substances (e.g. feces, discharges and other body fluids).

2. **DESIGNATED FOOTWEAR** or **DISPOSABLE SHOE COVERS** are required in areas where infectious materials are expected to be present on the floor, in order to prevent their spread to other areas.

a. Designated footwear or disposable shoe covers may be required for patients with infectious diseases that are kept on the floor (e.g. in a large dog run) or that may contaminate the floor around their kennel (e.g. an animal with severe diarrhea).

b. Such footwear must be removed as the person leaves the contaminated area, and should be immediately disposed of in the garbage (if disposable), or left at the entrance of the contaminated area on the "dirty" side.

FOOT BATHS

1. Footbaths or foot mats are used to decrease (but do not eliminate) microbiological contamination of footwear.

2. For the OSU SAVTH foot mats and/or bath will be utilized at minimum:
   a. At the **entrance** of the **ISOLATION WARD (174 D)** when occupied by animals with infectious diseases.

   b. At the **entrance** of the **OVERNIGHT STAT LAB** to be utilized by personnel from the large animal clinic when bringing samples over to evaluate in the STAT lab.

   c. **Inside ICU** as part of **BARRIER-CONTROLLED NURSING PRECAUTIONS** for infectious patients assigned to Semi-Isolation. The foot bath will be placed at the tape used ot cordon off the barrier nursing are, and will be utilized as the Entry Control Point for entering and leaving the area.

VTH OPERATIONS

ADMISSION OF INFECTIOUS DISEASE PATIENTS

GENERAL PRINCIPLES

1. Avoid bringing aggressive or potentially infectious animals in through the main reception area; place these animals directly in an **EXAM RM 7 (172 H)** or **ISOLATION ROOM (174 D)**.

2. Patients with known or suspected infectious diseases should enter through Entry Control Point 1 (**ECP 1**) the gate located between the outside runs and the Linear Accelerator (see attached map)

3. Animals known to be housed in **ISOLATION** should enter through the rear entrance of **ECP 3**.

4. If they must come through the main entrance, carry the animal or place it on a gurney so that it can be taken directly into the designated room.

PROCEDURE

1. Identified at the time of first contact by **phone** or **receptionist**:

   a. Patients with known or suspected contagious diseases **SHOULD NOT** be brought into

the main SA VTH reception area. These patients should be admitted through:

i. The side door / **ECP 1** SEE ATTACHED MAP) and placed directly into **EXAM ROOM 7 (172 H),** or

ii. The ISOLATION ENTRANCE / **ECP 3** (located at the REAR of the VTH) where they can be triaged and held in Isolation Rm 174 D until further notice.

b. Patients with known or suspected infectious diseases should **NOT** be allowed to proceed further into the hospital, especially ICU, unless the patients are in immediate need of stabilization.

c. Parvovirus suspects should be tested **BEFORE ENTERING THE HOSPITAL** if at all possible. All dogs **< 1 YR OF AGE**, especially those with gastrointestinal signs of vomiting or diarrhea, should be considered as parvo suspects.

d. Contact the senior service clinician or Infectious Disease Program Manager to determine if the animal needs to be immediately placed in isolation or if another type of restriction is warranted.

2. Identified in the **EXAMINATION ROOM** by the admitting service:

a. Leave the animal in the examination room and contact the senior clinician and the technician work leader who will assign cleaning staff to disinfect the room.
b. Place a sign on the room to prevent anyone else from entering. Signs are available in each examination room.
c. Do **NOT** allow the patient to proceed further into the hospital, especially ICU, unless the patient requires immediate need of stabilization.

3. Identified **AFTER ADMISSION**:

a. The animal must be transported on a cart, dedicated to that animal.
b. Contact the senior clinician, the Patient-Service Coordinator, and the technician work leader.

4. If the main reception area has been used for triage of a patient with a known or suspected contagious disease, it should be thoroughly cleaned and disinfected immediately.

5. If moving within the hospital at the time it is determined the animal has a zoonotic infection, either place the animal directly in isolation or if you are unsure, return the animal to its current cage and contact the treating technician assigned to the patient, the technician supervisor / work leader and/or the senior clinician.

ADMITTING ANIMALS from SHELTERS, HUMANE SOCIETIES, and SIMILAR FACILITIES

1. Should be considered **HIGH RISK** from an infectious disease standpoint.

2. All animals from such facilities should be examined immediately upon arrival without coming in contact with other animals in the waiting/reception area.

3. Animals from these facilities should be housed separately from other patients.
    a. This may involve utilizing **FULL ISOLATION** in **RM 174 D** or at least **SEMI-ISOLATION** in a separate ward; separate area of a ward or leaving empty cages between those animals and other patients can be used, depending on the degree of separation required for the diseases of primary concern.

4. Animals with clinical signs compatible with an infectious disease including, but not limited to, fever, oculonasal discharge, coughing/sneezing, diarrhea and potentially infectious skin conditions **SHOULD NOT** be admitted for elective procedures.

5. For **ELECTIVE PROCEDURES** (e.g. spay, neuter), all animals should be appropriately vaccinated for their age and treated for relevant intestinal parasites and ectoparasites.

ANY TIME A PATIENT WITH A KNOWN OR SUSPECTED CONTAGIOUS DISEASE IS ADMITTED OR ENTERS THE SAVTH, THE INFECTIOUS DISEASE CONTROL OFFICER MUST BE NOTIFIED.

INITIAL EXAMINATION

1. Wear appropriate protective outerwear, and wash hands before and after examination of individual animals or animal groups (e.g., a litter of puppies).

2. Wear facial protection if a zoonotic respiratory tract disease is suspected. Potentially infectious animals will be examined in a designated examination room (**EXAM RM 7**) and remain there until diagnostic procedures and treatments have been performed.

3. At-risk patients (those whose vaccine status, clinical signs or signalment indicate that they may have a contagious pathogen) should be evaluated in **EXAM RM 7** and enter through **ECP 1**.

4. If another examination room is inadvertently used, it should be thoroughly cleaned and disinfected and allowed to dry for 24 hours before use.

5. A **RECORD LOG** should be maintained to annotate when infectious diseases have been admitted into the examination rooms.

6. The Infectious Disease Control Officer shall also be notified to determine when the examination rooms may be used again for non-infectious animals.

OUTPATIENT TREATMENT

1. If the patient requires **OUTPATIENT therapy only**, this should be performed in the **EXAM RM 7** or the contagious patient may be **admitted through ISOLATION (ECP 3)** and treated in the ISOLATION Ward.

2. The patient should NOT be allowed to progress further into the hospital, particularly the ICU.

TRANSPORT

1. Patients with known or suspected contagious diseases should be moved about the hospital (e.g. to radiology, etc.) on **a GURNEY**. If the patient has a bout of diarrhea or the gurney or on the floor while being transported, someone should immediately clean it up and disinfect that area.

2. When moving contagious / zoonotic patients from ICU or Isolation to the outside, the appropriate designated routes will be used to minimize contamination and spread of disease throughout the hospital (Refer to **INFECTIOUS DISEASE PATIENT FLOW MAP**).

HOUSING

1. OSU SAVTH maintains a dedicated **ISOLATION WARD (RM 174D)** for caring for and housing animals with potentially contagious infectious diseases thereby reducing the risk of direct or indirect infection of other hospitalized animals or clinic personnel.

2. **CAGE RESTRICTION** with **BARRIER NURSING** within a separate ward or a partitioned area of an existing ward may be used in lieu of **FULL ISOLATION** for select animals.

3. Clinicians will refer to the **OSU SAVTH ISOLATION SOP** to determine the appropriate level of Isolation required.

4. Changes to the location of housing or level of isolation restriction for any patient deemed to have a known or suspected infectious disease **MUST** be approved by both the Senior Attending Clinician and the Infectious Disease Control Officer.

IDENTIFYING INFECTIOUS DISEASE PATIENTS

1. Each patient with a suspected or known infectious disease will have the appropriate color-coded kennel card placed on their cage / kennel and the appropriate color identification color attached to them.

    i. **RED KENNEL CARD / ID NECKBAND:** Animals with **KNOWN highly contagious or zoonotic disease**. Red cards should **be used for animals in Small Animal ISOLATION (RM 174 D) or Barrier Nursed**.

    ii. **YELLOW KENNEL CARD / ID NECKBAND:** Animals **SUSPECTED to have contagious disease or animals at increased risk** for acquiring infectious disease, housed in general hospital population.

    iii. **ORANGE KENNEL CARD / ID NECKBAND:** Animals at high risk of developing an infectious disease (Immunocompromised) requiring special precautions such as

barrier nursing (e.g., Patients receiving chemotherapy or other immunosuppressive drugs).

iv. **WHITE KENNEL CARD / ID NECKBAND:** Animals with no historical, laboratory, or physical examination evidence of infectious disease.

2. If **YELLOW** or **RED** kennel cards are used the suspect agent MUST be marked on the back of the card.

3. If an animal should develop an infection of any kind while hospitalized the clinician must complete a **SUSPECTED NOSOCOMIAL INFECTION FORM** (Appendix 8 in the Infectious Disease Control Manual) and submit it to any member of the Infection Control Committee

CLEANING AFTER EXAMINATION

1. Immediately clean and disinfect the examination room, gurney and any hospital surfaces or equipment contacted by potentially contaminated patient or persons (including examination tables and doorknobs).

2. If the examination room cannot be immediately disinfected, then:

   i. Close off exam room

   ii. Place a "**DO NOT USE EXAM ROOM, SPECIAL DISINFECTION REQUIRED**" sign

   iii. Notify SAC TECHNICIAN or PATIENT SERVICE COORDINATOR of the suspected agent and do not use the room until a technician has removed the sign and adequate cleaning/disinfection occurs.

DISCHARGE OF CONTAGIOUS PATIENTS

1. **ISOLATION** - Patients housed in RM 174 D are to be discharged through **ECP 3** located at the rear entrance of the VTH.

2. Other patients hospitalized for contagious diseases should be discharged through either the **ISOLATION (ECP 3)** or through **EXAM ROOM 7** and then ushered out the VTH side access door or **ECP 1** (see **INFECTIOUS DISEASE FLOW MAP** for ECP access routes).

INFECTIOUS DISEASE CONTROL–POLICY AND PROCEDURES
PATIENT FLOW AND HOSPITAL ZONES

IMPORTANCE

Control of the passage of infectious and/or contagious organisms from staff to patients and patient to patient is critical to patient care. Many of the patients at the OSU SA VTH are

critically ill or potentially immune suppressed, all feasible measures should be taken by all staff and students to avoid the possibility of nosocomial infection in hospital patients.

Some animal patients are presented with organisms that represent a significant health risk to students and staff handling the animal. Protocols for the handling and management of animals with potential zoonoses are described in section 3.

HOSPITAL ZONES

The OSU VTH may be viewed as containing **SIX SPECIFIC ZONES**, each of which has requires different approaches to the transmission and management of infectious disease organisms.

The six zones include:

1. **GENERAL HOSPITAL ZONE – LOW RISK**
2. **DIAGNOSTIC IMAGING – INTERMEDIATE RISK**
3. **ONCOLOGY WARD – MEDIUM RISK**
4. **INTENSIVE CARE UNIT – HIGH RISK**
5. **ISOLATION WARD – EXTREME RISK**
6. **STERILE SURGICAL SUITE – NO ACCESS ZONE**

GENERAL HOSPITAL ZONE

1. Inclusive of the Hospital Reception, the consultation rooms, general treatment area, all corridors, endoscopy suite, cardiology suite, fluoroscopy suite, the dog ward, large dog ward and cat ward represent one zone of the hospital.

2. Animals accommodated in this zone are assumed to be at **LOW risk** for contracting or transmitting organisms to or from other patients.

3. Animals with immune compromise or immune suppression should NOT be accommodated in these ward areas if feasible.

4. Patients and staff will often transit this zone to other regions of the hospital. Patients with potentially contagious diseases should be moved through this zone in a manner and at times that minimize contact with other animals and staff.

5. Animals with open or draining wounds should be transported through the general hospital zone area **on a gurney** whenever possible. Following use to transport an animal with an open or draining wound, the gurney should be cleaned with a quaternary ammonium compound disinfectant before use with any other patients.

DIAGNOSTIC IMAGING

1. Diagnostic Imaging is a core service of the OSU VTH, and as such it is inevitable that students, clinicians and staff from the Large and Small Animal services will mingle in this area. Diagnostic Imaging should be considered a transitional area for infectious disease control, and viewed as potentially contaminated that carries an **INTERMEDIATE RISK.**

2. Animals hospitalized in the General Hospital zone may enter the Diagnostic Imaging zone without need for additional precautions.

3. Animals hospitalized in the ICU or Oncology zones requiring diagnostic imaging should, where possible, be taken to the Diagnostic Imaging zone at the **end of the day**, when staff and patient movement is at the lowest.

4. The staff of the Diagnostic Imaging zone should receive prior notice regarding patients that are at risk for infectious complications or contracting nosocomial disease, to allow suitable disinfection/cleaning of the imaging room to be used.

5. Movement of animals from the Isolation Ward zone to Diagnostic Imaging should be carried out at the end of the day, unless urgently required for patient care.

6. The staff of the Diagnostic Imaging zone should receive prior notice regarding patients that are housed in the Isolation Ward zone to allow suitable disinfection/cleaning of the imaging room used before other patient procedures are carried out.

ONCOLOGY WARD

1. Animals housed within the oncology ward should be considered at **MEDIUM risk** for immune suppression and contracting nosocomial infections.

2. Staff, clinicians and students should minimize entry into the oncology ward. The oncology ward should only be entered for direct manipulation of patients and the **administration of chemotherapeutic drugs**. For occupational safety as well as infectious control purposes, gloves and disposable gowns should be worn while handling animals in the oncology ward, these items should be disposed of in the biohazard bins in the oncology ward.

3. Disposable gowns should be disposed of if contaminated with urine, feces, blood or chemotherapeutic agent as per the **ONCOLOGY SERVICE SOP'S**. Disposable gowns from the oncology ward should not be worn into the General Hospital Zone, to minimize potential introduction of infectious organisms into the oncology ward.

4. Oncology cases will typically be day-stay visits, thus owner visitation is unlikely. Critically ill oncology cases will be moved to the ICU, where owner visitation may occur as described.

INTENSIVE CARE UNIT (ICU)

1. Animals housed in the Intensive Care Unit (ICU) are considered to be at **HIGH risk** of contracting nosocomial infections, due to greater potential for immune suppression in these patients.

2. Students and staff should avoid transiting the ICU area unless it is directly essential to patient management within the ICU. ICU technicians should remain within the ICU area and not assist with patients in the general hospital zone or diagnostic imaging unless this is critical to patient care. Students and staff should avoid congregating in the ICU area.

ISOLATION WARD ZONE

1. The Isolation Ward is a single purpose isolation facility for the hospital care of canine and feline patients with presumed contagious diseases and carries an **EXTREME RISK.**

2. Animals housed in the Isolation Ward should be considered a significant potential source of infectious organisms that may affect other patients within the hospital. Great care should be taken to avoid contact between animals in the isolation ward and animals in the remainder of the hospital.

3. All examinations and, where feasible, all treatments for animals hospitalized in the isolation ward should be carried out within this area. An adequate supply of bandaging, intravenous fluid, catheterization and diagnostic sampling materials will be maintained within this ward.

4. Medications for use on individual patients in the isolation ward should be dispensed prior to entry into the isolation ward environment. Bulk bottles of medications should not be transferred to the isolation ward from the general hospital environment or from the isolation ward back into the general hospital zone.

5. Patients admitted to the isolation zone should enter the building **via the rear door entrance** to avoid contamination of the general hospital environment.

6. Disposable gowns, gloves and shoe covers are provided in the isolation zone; these protective items must be used when treating animals within the Isolation Zone, and must be disposed of in the bins within the isolation ward.

7. Disposable gowns should be disposed of if contaminated with urine, feces, or blood. Disposable gowns from the isolation ward should remain within the isolation zone and must not be worn into the General Hospital Zone, to minimize potential introduction of infectious organisms into the General Hospital Zone area.

8. Owners may visit patients hospitalized in the Isolation Zone at the **end of the day**. Owners will be provided with and must use suitable protective items such as gowns, gloves and shoe

covers. Owners of animals in the Isolation Zone must enter and exit the hospital via the rear entrance, and should not be allowed access to the remainder of the hospital at the end of their visit. Students and/or clinical staff responsible for patients in the Isolation Zone should accompany owners during the visit to ensure compliance.

STERILE SURGICAL CORE

1. The sterile corridor area of Surgery is specifically and highly isolated from the remainder of the hospital traffic. Specific protocols for entry to the sterile surgical core are provided in the **SURGICAL SERVICE SOP** manual.

2. ***No individual shall enter the sterile corridor under any circumstances without donning appropriate protective clothing.***

PASSAGE OF STAFF, STUDENTS AND PATIENTS BETWEEN ZONES

1. Students responsible for the care of patients in the Isolation Zone shall not also be responsible for care of patients within the ICU or Oncology zones, but may be responsible for care of patients in the General Hospital zone.

2. Students on surgical rotations may be responsible for the care of surgical patients in the ICU, General Hospital or Oncology zones, but shall not be responsible for patients hospitalized in the Isolation zone.

3. Wherever possible, students and staff shall minimize movement into and between the ICU zone and the General Hospital zone. **Movement of staff and students between the isolation zone and the ICU should be avoided**.

4. Staff and students exiting the Isolation zone must ensure that they have removed and disposed of all outer garments, shoe covers, leashes etc., from the Isolation zone before entering the general hospital zone treatment areas. Hands should be washed before leaving the Isolation zone. Stethoscopes, thermometers, reflex hammers and all other items used in diagnostic assessment of patients in the Isolation zone should be thoroughly cleaned and swabbed with 70% alcohol before use on patients in the other hospital zones.

5. The Isolation zone is visible via windows at the end of the large dog ward and from the adjoining corridor. Quick checks of patient's mental state can be made through these windows without requiring entry into the isolation ward.

6. Students and staff from Large Animal Medical or Surgical services shall not enter the Small Animal ICU or Oncology zones while wearing overalls or protective overboots that have been worn in the Large Animal hospital wards.

7. **Passage of students and staff between the Large and Small Animal Hospitals should be minimized.**

8. Students and staff from the Small Animal hospital delivering prescriptions to the hospital pharmacy or diagnostic samples to the Veterinary Diagnostic Laboratory should travel via

the front of the hospital, avoiding passage through the Large Animal hospital general corridors

CLIENT VISITATION FOR PATIENTS WITH INFECTIOUS DISEASE

1. **ISOLATION WARD**: As a policy, clients should not be allowed to directly handle or enter the ISOLATION WARD when visiting hospitalized patients in **RM 174 D.** Exception may be made for end-of-life situations.

2. **ICU:** (Refer to "ICU VISITATION POLICY" located under ICU POLICY section for general guidelines)

    a. Clients visiting patients in the ICU will exit through the rear entrance of the VTH at (**ECP 2**) in order to minimize the spread of contamination.

3. **SEMI-ISOLATION / BARRIER NURSING: Restriction cages are "off limits" to visitors.** Only personnel immediately concerned with the restricted patient shall be allowed entry. Some visitations may occur with proper senior clinician and area supervisor approval.

4. All visitations are to be scheduled at **END OF THE DAY** and will be no longer than **15 minutes** in duration.

5. The attending clinician or house officer MUST be present during the visit.

6. Clients will abide by all policies and procedures regarding handling of infectious disease patients to include use of appropriate hand hygiene, personal protective wear, and barrier precautions.

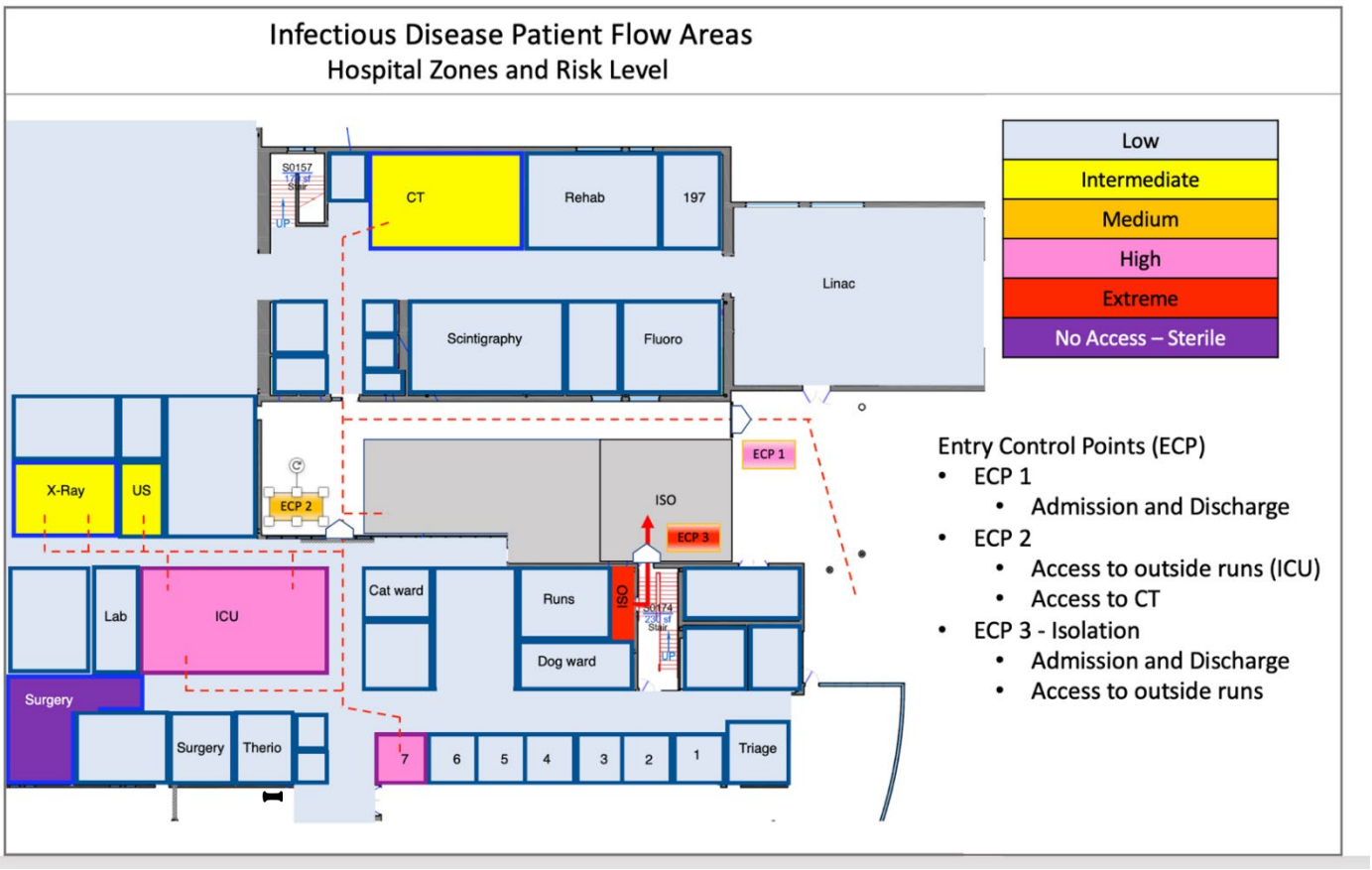
ISOLATION PROCEDURES FOR INFECTIOUS DISEASES–SMALL ANIMAL

TYPES OF SEGREGATION:	LOCATION
FULL ISOLATION	RM 174 D
CONTACT / SEMI-ISOLATION	Barrier Nursing / Cage Restriction
LIMITED MOVEMENT	Minimize movement between kennels & runs; Minimize relocation

Clinicians and students will refer to the **OSU-VTH INFECTIOUS DISEASE CONTROL MANUAL** for isolation precautions to be taken as per **DISEASE-SPECIFIC ISOLATION PROTOCOL TABLES**

A daily **ISOLATION HOSPITALIZATION FEE** will be incurred.

Patients housed in ISOLATION or under SEMI-ISOLATION are "OFF LIMITS" to visitors. Only personnel immediately concerned with the restricted patient shall be allowed entry. Visitation of these patients may occur with proper senior clinician and area supervisor approval.


Infectious Disease Patient Flow Areas
Hospital Zones and Risk Level
Low
Intermediate
Medium
High
Extreme
No Access – Sterile
CT
Rehab
197
Linac
Scintigraphy
Fluoro
X-Ray
US
ECP 2
ECP 1
ISO
ECP 3
Lab
ICU
Cat ward
Runs
ISO
Dog ward
Surgery
Surgery
Therio
7
6
5
4
3
2
1
Triage
Entry Control Points (ECP)
ECP 1
Admission and Discharge
ECP 2
Access to outside runs (ICU)
Access to CT
ECP 3 - Isolation
Admission and Discharge
Access to outside runs

Oregon State University
Small Animal Teaching Hospital
Intensive Care Unit Policy and Procedures

ICU PHONE NUMBER: (541) 737-4825
Do not give number to client or make client calls from this phone!

CRITICAL CARE SERVICE HEAD:

THANDEKA NGWENYAMA DVM DACVECC

ICU TECHNICIANS:
Julie Posch VTS-ECC PATIENT CARE COORDINATOR
Julie Brown CVT
Trevor Fitcha CVT
Janice Hutcheson CVT
Meghan Hiatt CVT, VTS (ECC)
Tracey Jastad CVT
Jamie Edgmand CVT
Kimberly Warren CVT

Float Technicians:
Allison Lake CVT
Emily Moncrief CVT
Makenzie Rybalko CVT

SCOPE AND PURPOSE

The CRITICAL CARE SERVICE (CCS) is responsible for providing 24-hour care to patients housed in the INTENSIVE CARE UNIT (ICU).

IMPORTANT: ICU is for housing and providing care for patients that are deemed critical, immunocompromised, or that need post-operative recovery monitoring. It is NOT a General Treatment area. Care for patients housed outside the ICU are not to be brought into ICU for treatments (e.g., bathing, bandage changes, etc.) or diagnostics, unless approved by ICU Technician.

DAILY ICU HOSPITALIZATION CHARGES START AT 10 AM. ALL PATIENTS MUST BE DISCHARGED BEFORE 10 AM TO AVOID INCURRING A DAILY ICU HOSPITALIZATION FEE.

ADMITTING PATIENTS TO THE ICU

1. Clinicians and students from the **PRIMARY ADMITTING SERVICE** will maintain primary case management for their patients admitted to the ICU.

2. Whenever possible, the staff in the ICU should be advised **at least ONE HOUR prior** to admission of a patient into the ICU.

    a. A student, house officer, or faculty member must round with the ICU technician regarding the case on admission. This includes any animal admitted following sedation or anesthesia.

3. Upon Admission to the ICU, students from the admitting service MUST complete the **ICU STUDENT SET-UP CHECKLIST (BLUE SHEET)**. Once complete, the checklist must be signed off by an ICU technician

4. The service admitting the patient is responsible for all patient set-up (e.g., cage, medications/therapeutics, records, equipment). Set-up includes all patients having:

    a. All collars and harnesses (not necessary for patient monitoring and treatment) removed
    b. An **I.D. NECKBAND** with the Patient / Client Sticker
    c. An appropriately sized, adequately furnished (pads, mats, towels, absorbent pads) kennel. Dogs should not be left outside of cages or in 'pens'
    d. A fully **COMPLETED CAGE CARD**
        - Patient's name
        - Case #
        - Assigned student name,
        - Attending clinician name
        - Primary Service (e.g., IM, Sx, Cardio, etc.)
        - Primary complaint or diagnosis
    e. **Colors** of the **ID neck band** and **cage card** should match the infectious disease risk of the patient
        - **RED** – Isolation (Rm 174D)
        - **YELLOW** – Infectious / Zoonotic Risk with Barrier Nursing
        - **ORANGE** – Chemotherapy
        - **BLUE (OR WHITE)** – No infectious risk / General Populace
    f. Special **INSTRUCTION TAGS** (e.g., "Will Bite", "NPO", "Seizure Watch", "Chemo", etc.) shall be attached on the cage door.
    g. A **PATIENT SUPPLY CONTAINER / BOX** will be labeled for any personal items, food, leash/collar, etc. and will be neatly housed in the ICU
5. The following must be initiated / completed upon admission to the ICU:

    a. An **ICU FLOW SHEET** with detailed orders and the clinician's signature.
        - Interns must have a resident or faculty signature as well. If the orders do not have the appropriate clinician's signature(s), treatments will not be given to the patient and the faculty will be contacted.
    b. An **ICU CHARGE SHEET** (Orange sheet)
    c. **EMERGENCY DRUG SHEET** (YELLOW SHEET) (placed on the clipboard behind ICU Flow

Sheet)

d. **RESUSCITATION ORDERS** (e.g., DNR) – displayed clearly on patient's cage door and annotated on the ICU Flow Sheet.

6. **ALL** patients hospitalized in the ICU with **EXTERNAL (CPR)** orders or under **SEIZURE WATCH** should have an intravenous catheter placed.
    a. This is to ease the administration of appropriate pharmaceuticals should an arrest or seizure occur.
    b. Exceptions to this are animals in which catheter placement is contraindicated due to underlying disease.
        i. Exceptions must be approved by the **SUPERVISING FACULTY** on the service and noted on the ICU orders in the remarks.
    c. Animals that are DNR do not have to have an intravenous catheter placed.

ANESTHETIC RECOVERIES in the **ICU**

1. **ANESTHESIA PERSONNEL** are responsible for monitoring patients **UNTIL EXTUBATION**

2. **SURGICAL STUDENTS** are responsible for monitoring patients until a **rectal** temperature of **99° F** or **axillary** temperature of **100° F** is achieved.
    a. ICU technical staff are committed to ALL patients housed in the VTH, depending upon the number of ICU patients currently present, may not be available to assist with monitoring patients during the immediate recovery period.

3. Recommended Post-Operative BASELINE MONITORING:

    a. **TPR** with temperature acquired **EVERY HOUR** until maintained at ≥ 99 F without a heat source for **TWO** consecutive hours
    b. Mucous Membranes / Capillary Refill Time
    c. Thoracic auscultation
    d. **Pulse quality** (strength, regularity, synchronicity with heart rate)
    e. Mentation
    f. **Doppler blood pressure** (until value **> 90mmHg** is achieved on 2 consecutive readings obtained no less than 15 minutes apart)

ADMITTING PATIENTS WITH KNOWN OR SUSPECTED *INFECTIOUS DISEASES* OR *CHEMOTHERAPY*

1. Follow appropriate guidelines as outlined in the **VTH INFECTIOUS DISEASE MANUAL**

2. At minimum, any contagious patient admitted to the ICU will undergo barrier nursing protocols. Proper hand wash hygiene and wear of PPE will be practiced.

3. Personnel allowed to handle contagious patients will be limited to only those necessary to provide patient care. This should ideally include only the primary student and one designated ICU technician.

4. Care and handling of contagious patients should be conducted at the end of the shift or after attending to all other patients in the ICU.

5. Each contagious patient admitted to the ICU will receive the appropriate color-coded **neckband** and **cage card**, be assigned their own ***INFECTIOUS DISEASE KIT***, and have their cage clearly marked with appropriate ***Signage*** indicating the infectious disease and precaution needed.

6. All Chemotherapy patients will have their cages CLEARLY identified and must be handled in accordance with the VTH SOP for **"*SAFE HANDLING OF CYTOTOXIC DRUGS*"**

ISOLATION PATIENTS *(174D)*

1. ICU staff (technicians, students) are ***NOT PERMITTED*** to handle animals in isolation during their shifts.

2. **EXCEPTION** to this rule may occur during a critical emergency such as cardiopulmonary arrest.

3. If the **PRIMARY SERVICE** has hospitalized a patient in isolation, **THE PRIMARY SERVICE** is responsible for ***ALL*** of the patient's care.

4. **THE PRIMARY SERVICE** may utilize ICU students, "after-hours" students, and ICU technicians for after hours, but it has to be in a manner in which they will not be returning to patients in the ICU. For example,

    a. If an individual is completing their ICU shift, then they would be free to treat an isolation patient, or
    b. If there are 2 students or one student and two CVT's on overnights, then one student may be committed to the isolation patient.

5. It is the ***PRIMARY SERVICE'S RESPONSIBILITY*** to organize and communicate care for their patient's housed in Isolation.

CARE of PATIENTS HOUSED in the WARDS

1. The ICU staff's primary responsibility is dedicated towards providing the appropriate **LEVEL OF CARE** to the more critically ill patients housed in the ICU.

2. The student (or attending clinician) for a patient hospitalized in wards is responsible for rounding their patients care to the ICU intern at 6 PM (Monday – Friday). Weekend and holiday patient rounds will be at 8AM.

3. Patients housed in the Wards after-hours should be limited to only those patients that:
    a. Have a **STABLE CONDITION** and
    b. **DO NOT REQUIRE HANDS-ON INTERVENTION** or continual observation (e.g., hourly seizure watch) by the ICU Staff throughout the night

4. In an effort to ensure better quality of care is provided to all patients, the following actions should be practiced and observed by all Services:

    a. You must round your patient to the ICU staff if they are spending the night in wards.
    b. Each patient in wards is required to have a completely filled out ward's treatment sheet, including doctor signature.
    c. Students are responsible for the **7 AM and 7 PM** treatments of their Wards patients **7 days a week**
    d. Students are responsible for their **DAYTIME TREATMENTS** of wards patients during regular business hours. This includes end of day treatments (7PM) such as feeding patient and walking them.
    e. Students are responsible for **MORNING** treatments of wards patients regardless of whether it is scheduled at 6 am, 7 am or 8am as well as being responsible for completing **END OF DAY** treatments that are scheduled from the hours of **5- 7 pm**.

5. Wards treatments between **11 PM to 7AM** (or first morning treatment conducted by the student) should be **LIMITED.**

    a. Ward patients that require more frequent **(< Q 4 HRS),** hands-on treatments between **10 PM** and **7 AM** are advised to be hospitalized in the SA ICU overnight to ensure treatments will be completed. Prior coordination with the ICU technical staff is required before moving Ward patients into the ICU.

        i. Not all patients in the Wards will always need to be transferred into the ICU every night. Transfer of patients into the ICU is not necessary for patients that just require a walk-by observation (except seizure or respiratory watches)

        ii. Transfer into the ICU is advised primarily for patients that require:
            1. Frequent treatments **(e.g., < Q 4 HRS)**
            2. Hourly seizure or respiratory watches

        iii. Students from the Primary Care Service are responsible for transferring patients into and out of the ICU to include cage set-up and cleaning.

b. **EXCEPTIONS** may be made for situations where moving patients into the ICU would cause more harm than good to either the Ward patient or ICU patients (e.g., highly anxious, continuous barking, etc.) or when the number of Wards patients requiring treatments does not preclude completion of their treatments in a timely manner (e.g., only 1or 2 Ward patients). Prior coordination with the ICU staff should be consulted to determine this exception.

i. When patients that require treatments are kept in the Wards overnight, then treatments should be limited to **NO MORE** frequent than **≥ Q 4HR**.

ii. In addition, it is advised to coordinate treatments by scheduling them to occur during the prescribed 1-hr blocked times of:

(11PM-12AM) and **(3-4 AM).**

iii. Coordinating treatments during these blocked periods will allow the ICU student to anticipate and prepare for the treatments as well as reduce the number of trips to the Wards required through the night. Overall, this coordinated scheduling will help facilitate the ease of accomplishing treatments.

iv. If treatments are scheduled outside the prescribed treatment blocks (noted above), then it cannot be guaranteed that the treatments will be completed.

****PATIENTS TRANSFERRED INTO THE ICU OVERNIGHT CAN HAVE THE TREATMENTS SCHEDULED AT ANY TIME, NOT NECESSARILY DURING THE BLOCKED HOURS NOTED ABOVE***

CHARGING FOR WARD PATIENTS Transferred to ICU for Overnight observation and care:

1. Ward patients housed overnight in the ICU may be charged the same level of hospitalization as if they remained in the Wards.

DAILY ICU RESPONSIBILITIES

CASE RESPONSIBILITIES:

ALL Services that have a patient in the ICU are required to perform the following:

1. **Every morning** (including weekends and holidays) by **8:30 AM** students MUST:

a. Change patient bedding and thoroughly clean the kennel/patient
b. Start a new **ICU FLOW SHEET**
c. Complete **PRESCRIPTIONS** as needed (24-hour supply of medications in patient belonging box by 10AM)
d. Complete **7:00 AM TREATMENTS**
e. Attend Zoom rounds at 7:30 AM
f. Complete **SOAPs**
g. Perform **IV CATHETER / BANDAGE CARE**: evaluate cleanliness and patency, re-tape if needed.

2. Students are responsible to communicate (round) their ICU patient to the ICU technicians at the end of their day. ICU patient treatment sheets should be updated, and **all** medications should be available for administration.
3. The ICU staff *may* ask the primary student to stay and help with their patient 7PM treatments. The student will be notified at the end of day rounds if they are needed to provide care for their ICU patient.

ZOOM PATIENT ROUNDS

1. Morning rounds at 7:30 AM will be coordinated by the ICU intern who is caring for the ICU patient. Overnight ICU students are responsible for presenting patient rounds.
2. Evening rounds at 6:00PM will be presented by the primary service student.
3. There is an ICU CVT that is designated as the 'Rounds CVT'. If you will be admitting a patient into the ICU notify so that we can facilitate the set up for your patient.

4. A clear and concise case summary should provide the following information: signalment, history, master problem list, current and proposed interventions, therapeutics, and plan of action.

    a. Interventions discussed should, at minimum, include plans for: *fluid therapy, medications, diagnostics, monitoring, CPR code, nutrition, nursing care, procedures (e.g., surgery, feeding tube, urinary catheter, etc.), and expected term of hospital stay.*

ICU FLOW SHEET

1. Technicians and students are allowed to create a flow sheet, but the **SUPERVISING CLINICIAN must sign** the flow sheet in order for any treatments to be administered to the patient.

2. The **ICU flow sheet** and **charge sheet** need to be completed upon the patient's arrival to the ICU and **by 8:30 A.M. OF EACH DAY** of the ICU stay.

3. All portions of the ICU flow sheet must be completely filled out **DAILY**. This includes:

    a. *Date, time, patient I. D. information, cage #, reason for admission, potential complications, clinician/student contact phone numbers, resuscitation orders, weight, diet, fluids (if indicated), specific orders and IV catheter placement/date.*

4. ICU Flow sheets MUST include the following:

    a. Phone numbers of clinicians (first call is first clinician listed) and primary student (Vocera can only be used for Faculty and Residents)
    b. Medication Dosages written in **MG/KG AND MG**
    c. Route of administration and frequency clearly noted.
    d. Dosages of IV pumps/CRIs clear and checked by the clinician or technician and

initialed on the hospital orders.

e. Call parameters – clearly noted on treatment sheet.

5. It is recommended to schedule all TPRs and the majority of treatments / interventions on the following rotating schedule:

   a. BID (Q12 HRS): 7 AM / 7 PM
   b. TID (Q8 HRS): 7 AM / 3PM / 11 PM
   c. QID (Q6 HRS): 7 AM / 11AM / 3PM / 11 PM
   d. OVERNIGHT: (11PM-12 AM) / (3 -4 AM)

**NOTE: Coordinating the majority of treatments during these times will allow ICU technicians to coordinate care more efficiently, while at the same time preclude critically ill patients from being disturbed frequently and therefore disrupting their much-needed rest.*

6. Changes to a patient treatment sheet must be documented on the patient green sheet. Notify the ICU staff of the green sheet and an ICU CVT will update the patient chart. **Once a treatment sheet is signed – no changes are made without documenting on the green sheet.**

7. If there are any areas of omission, the ICU staff will contact the clinician and changes need to be made immediately. **THE CLINICIAN MUST READ AND VERIFY ALL ORDERS AND DRUG DOSAGES COMPLETELY.** The ICU staff will notify clinicians if orders are not completed.

8. It is important to maintain a detailed and meticulous observations on each case; note all *urination, defecation, vomiting, coughing, abnormal behavior, etc.; all procedures, catheter changes, lab results etc*.

ICU CHARGE SHEET

1. The charge sheet is used to keep track of expenses of ICU patients; therefore, it is extremely important that **ALL students, clinicians and ICU technicians** make every effort to ensure charge sheets are current and accurate.

2. Daily accounting for each **24-hour period** will be tallied and documented on this sheet.

3. Each patient needs **a new charge sheet every 24 hours** beginning **8 am**.

4. Charge sheets include supplies, lab work, medications, etc.

5. The most current sheet should be placed behind the most current ICU flow sheet.

6. Clinicians, technicians and students are all responsible for marking on the sheet and/or communicating to the ICU staff regarding supplies, procedures and medications.

PATIENT RECORDS / CHARTS

1. All patients' records (soft and hardback) are to remain in the ICU in the chart rack.

2. The soft back should accompany the hardback.

3. Records should only leave the ICU when patients are in other service areas for procedures (e.g., surgery, oncology).
    a. When patient records/charts are removed from ICU the person removing said chart will notify the ICU staff.

4. Maintain detailed and meticulous observations on each case. Note any and all:
    a. *Urination, defecation, vomiting, coughing, abnormal behavior*, etc.
    b. Procedures performed, catheter changes, pertinent lab results, etc.
    c. Changes in fluid regimen, nutrition, medications, treatments, etc.

5. When administering medications **ALWAYS** record on the **ICU FLOW SHEET**:
    a. Drug **NAME**, **AMOUNT** (mg / kg and mg), **DATE/TIME** of administration, and delivery **ROUTE** and **SITE** (e.g., central line, cephalic vein, etc.)

ADDITIONAL ICU RESPONSIBILITIES

1. A representative of the **PRIMARY SERVICE** hospitalizing a patient in the ICU (student, intern, resident, faculty) must round with ICU technicians upon

    a. Admission,
    b. After completion of daily ICU orders in the morning,
    c. Evening Zoom rounds (6 PM), and
    d. Any changes to the ICU orders (e.g., treatment, monitoring, diagnostics, etc.) will be written on the change of order sheet (Green sheet)

2. **Students** are responsible for the **7 AM morning treatments (7 days/week)** scheduled prior to any service rounds

3. If the student is present at or around the time the treatment is requested, then it is expected the student will perform the treatment.

    a. It is important to remember that if the ICU is busy caring for patients; students may need to volunteer or be asked to help with treatments.
    b. You should anticipate and assist with time-consuming treatments or those requiring additional assistance.
    c. Other students and/or technicians from the patients' primary service may also be asked to help with treatments if the ICU staff is busy.

EQUIPMENT/SUPPLIES

1. Students and clinicians are responsible for knowing how to work all equipment.
2. The ICU technicians will give instructions/demonstrations in orientation as well as when students are on the ICU rotation.
3. ICU equipment should **NOT** be removed from ICU.

    a. Exceptions to this rule must be approved by the ICU technician on staff.
    b. All equipment MUST be returned promptly after use.

ICU CLEANLINESS - GENERAL

6. All students, faculty and staff utilizing the ICU are expected to participate in keeping the unit clean and organized at all times.

7. When students and after-hours clinicians are not busy caring for patients, every effort should be made to keep the ICU clean and stocked.

8. Students are responsible for cleaning cages any time they become soiled, and cages should be thoroughly cleaned by the ADMITTING SERVICE **EVERY 24 hours**.

9. Exam tables should be cleaned immediately after use. Refer to the cleaning protocols for proper cleaning techniques.

DISCHARGING PATIENTS FROM THE ICU

Students and clinicians from the service admitting the patient are also responsible for removal of personal belongings and clean-up of housing facilities. The following are some general reminders.

1. Enter date and time of discharge, and exit code (see below) on the flow sheet in the remarks

A= ALIVE **D= DIED IN ICU** **E= EUTHANIZED**

2. Ensure the patient is clean and presentable to the owner for discharge.

3. Check the patient's treatment box and controlled drug safe for any personal belongings or medications, respectively.
    a. **ALL MEDICATIONS** must be removed upon discharge of the animal from the ICU by the appropriate service.
    b. Unused controlled drugs that are not going home with the patient should be disposed of by the ICU technician.

4. Leave ICU **CHARGE SHEET(S)** and **FLOW SHEET(S)** with the ICU technical staff for completion of ICU charges. Charge sheets and flow sheets will be returned to medical

records once charges are completed. Upon discharge from ICU the medical record can be removed.

5. Clean and disinfect cage (see cage maintenance).

6. Any discharge from the ICU on a **WEEKEND** must be recorded in the ICU patient ICU Census log. All charges will be finalized by the ICU technician.

MEDICATIONS

GENERAL

1. All medications for each patient are to be brought to the ICU.

2. The ICU technician is **NOT** responsible for dropping off prescriptions or picking up medications from Pharmacy.

3. Medications/therapeutics must be filled daily to last through the following day.

4. Controlled drugs that have been filled for ICU patients must be placed in the ***SMALL ANIMAL CONTROLLED DRUG SAFE*** located in the tech station.

    a. This safe will house controlled substances for in-hospital use as well as medications designated to go home with the patient.
    b. The controlled drug safe is accessible via key entry to **ICU TECHNICIANS ONLY**.

5. Students are NOT permitted to formulate (compound) ICU medication (e.g., heparinize saline or dilute acepromazine) without the supervision of a technician or veterinarian.

USE OF MEDICATIONS RECEIVED FROM OUTSIDE OSU-SAVTH

1. The use of outside Controlled substances for hospitalized patients is **NOT** allowed and **will not be stored in the ICU.** Please refer to the VTH Policy on "*Use of Client- owned Medications on Patients in the Veterinary Teaching Hospital.*"

SMALL ANIMAL EMERGENCY CONTROLLED DRUG BOX

1. An emergency-controlled drug box that contains diazepam, midazolam, euthanasia solution and butorphanol, is accessible to ICU technicians and interns.

2. These drugs are only to be accessed **UNDER DIRE EMERGENCIES** when access to the Cubex or Pharmacy Rx is not conducive to the welfare of the patient. Refer to the: *"CONTROLLED SUBSTANCE EMERGENCY KITS FOR LARGE AND SMALL ANIMAL HOSPITALS"*

EMERGENCY CRASH CART/BOX

1. The emergency crash box located in ICU is for use to conduct cardiopulmonary resuscitation of patients either housed in ICU or that are brought to ICU for CPR. The cart is **NOT** to be removed from ICU at any time.

2. If the emergency drugs (e.g., epinephrine, atropine, vasopressin, etc.) are used during the resuscitative procedures then, at minimum, the following information will be recorded into the patient's record:

    a. **DRUG / CONCENTRATION** administered (e.g., epinephrine 1:1000)
    b. Amount used in **ML** and **MG**
    c. **INITIALS of** person administering the drug

3. Pharmacy is to be notified if drugs in the ER crash box are used so that the drugs are restocked.

4. Please refer to the *EMERGENCY KIT SOP* for further guidance.

IMPORTANT REMINDERS

1. There is absolutely **NO EATING** OR **DRINKING** in the ICU or tech station.

2. All personal items such as purses and backpacks should be kept outside of ICU and tech station.

3. Hands should be washed prior to obtaining gloves, after removing gloves and between patients.
4. **NEW GLOVES** are to be worn with each patient.

5. New **TEMPERATURE PROBE COVERS** must be used on **ALL** patients

6. Emergency # for power outages or security are located above telephone (yellow highlighted) in ICU.

7. In case of the Fire alarms sounding~ exit east side door of building. If the Fire dept. asks you to exit building, please do.

8. When unsure about orders or treatments contact the ICU technician.

9. All medication dosages must be checked by a CVT or DVM prior to administration.

10. A technician or clinician must be present for any procedures ~ blood draws/catheter placements/cystocentesis/etc.

ICU VISITATION POLICY

1. **ALL ICU visits must be approved by ICU staff**. In hospital visits are pending current COVID guidelines. Any ambulatory or stable patient can visit with their owner outside of the ICU or hospital.
    a. Visitation within the ICU is limited to patients whose movement would be detrimental. (Currently not allowed due to COVID-19 guidelines).

b. If a patient has a known or suspected infectious disease, they will not be removed from their cage. Appropriate infectious disease biosecurity protocols MUST be followed (see below for "visits in ICU").
c. Clients will abide by all policies and procedures regarding handling of infectious disease patients to include use of appropriate hand hygiene, personal protective wear, and barrier precautions.

2. All visitations will be no longer than **15 MINUTES** in duration, and are limited to **ONCE** daily.

3. When scheduling ICU visits it is important to avoid the main treatment times; therefore, visits should **NOT** occur in the:

MORNINGS BETWEEN **7:00 AM AND 10:00 AM**, OR
EVENINGS BETWEEN 5**:00 PM AND 7:00 PM**.

4. The student or clinician on the service responsible for the patient must be present at **ALL** times.

<u>VISITS CONDUCTED IN ICU:</u>

1. Check current COVID-19 guidelines before scheduling visit

2. All phone calls must go through the client services telephone answering Service

    a. **DO NOT** give out the ICU phone number under any circumstance

3. Advanced arrangements must be made with the ICU technician on duty to be sure that the visit will not be disruptive to other patients, treatments, or procedures.
    a. If it is determined by the ICU technician that a visit is not appropriate (e.g., extremely hectic, deteriorating patient, patient arrest) then the visit must be delayed until deemed appropriate

4. All visits to the ICU must to be arranged in advance with the primary clinician on the case.
        a. Clients will **NOT** be allowed to drop in for **UNSCHEDULED** visits.
        b. Clinicians or students familiar with the case are responsible for escorting clients back to the ICU to visit with their pets.

c. The student or clinician on the case **MUST** be present in ICU during the entire visit.

5. For patients housed under **SEMI-ISOLATION: RESTRICTION CAGES ARE "OFF LIMITS" TO VISITORS.** Only personnel immediately involved with the restricted patient's care shall be allowed to handle the patient. Some visitations may occur with proper senior clinician and area supervisor approval.

6. The client MUST apply hand sanitizer and wear gloves while handling patients in the ICU.

7. No more than **3 PERSONS per pet** should visit at any one time.

8. Children **UNDER THE AGE OF 16** must be accompanied by an adult at all times. Children under the **AGE OF TWO**, strollers and other family pets are not permitted in the hospital area.

9. **IMMUNOCOMPROMISED** individuals should not be allowed to visit in the ICU, but concessions can be made with respect to this policy on a case by case basis.

10. Visitation and discussion should be limited to the client and their pet. No other patients should be discussed.

11. The ICU staff reserves the right to ask any client to leave ICU if a problem arises.

LEVELS OF ICU CARE

1. **LEVELS OF CARE** will be based off both:

a) **Duration** of ICU stay
b) **Frequency** of required interventions

LEVEL 0
(1) ICU hospitalization only
(2) No handling by ICU staff
(3) No IV catheter placed

LEVEL 1:
(1) **≤ BID** (or **no more than TWO** scheduled treatment times)
(2) **< 12 HR** hospitalization
(3) Any patient with an IV catheter is considered at least Level **1 Care**

LEVEL 2:
(1) **≤ BID** (or **no more than TWO** scheduled treatment times)

(2) **> 12 HR** ICU hospitalization

LEVEL 3:
(1) **TID** (at least but no more than 3 scheduled treatment times)
(2) **< 12 HR** ICU hospitalization

LEVEL 4:
(1) **TID** (at least but no more than 3 scheduled treatment times)
(2) **> 12 HR** ICU hospitalization

LEVEL 5:
(1) **QID** (at least but **no more than** 4 scheduled treatment times)
(2) **< 12 HR** ICU hospitalization

LEVEL 6:
(1) **QID** (at least but **no more than** 4 scheduled treatment times)
(2) **> 12 HR** ICU hospitalization

LEVEL 7:
(1) **> QID** (more than **FOUR** scheduled treatment times)
(2) **< 12 HR** ICU hospitalization

LEVEL 8
(1) **QID** (more than **FOUR** scheduled treatment times)
(2) **> 12 HR** ICU hospitalization
(3) ISOLATION

Small Animal After-Hours Duties

Students on any small animal hospital rotation (Cardiology, Oncology, Internal Medicine or Surgery) and diagnostic imaging will be required to work evening and/or weekend shifts in the small animal hospital. In addition, students on small animal hospital rotations will also be scheduled for on-call shifts in which they may not be in the building but must be available in case their services are needed. The students on the Small Animal Hospital Intensive Care Unit and Hospital Services Rotation (VMC 797) will be assigned the overnight shifts Monday through Saturday. The monthly schedule will be posted on the bulletin board outside the ICU in the hallway across from diagnostic imaging. Any changes to the posted schedule must be initialed and approved in advance by an ICU technician.

The following rules apply to any shift that a student may be assigned in the ICU:

1. The student must report to the ICU on time for their designated shift and must stay until the shift is completed unless released by the ICU technician and/or Intern. An ICU shift is completed when the next shift's students and/or technicians have completed rounds on each of the hospital patients.

2. Attendance is mandatory. All missed and incomplete shifts (excused and unexcused) will be made up prior to receiving a diploma. An incomplete grade will be assigned until all shifts are made up. In the event of an emergency or illness, the student is required to contact the ICU technician or intern on-duty. This should be done by calling directly into the ICU (541-737-4825). Fellow students cannot approve absences. Any missed shifts will be reported to the scheduling ICU technician who will review the upcoming schedule and assign make-up shifts. These shifts may be assigned during the same block or any subsequent block in addition to normally scheduled shifts and duties.

3. Students should report for their shifts with clean scrubs and a stethoscope.

4. Any on-call student must be immediately available by phone for the entire shift. Students are responsible for updating their phone numbers in the ICU as needed. Students must be within 20 minutes travel time to the ICU when on duty or call.

5. During after hours, unauthorized people (including friends and family) are not allowed in the small animal hospital. On occasion it may be necessary to have food or supplies dropped off to students working after hours but extended stays are not permitted.

6. The primary duty of after hour care will be exemplary patient care followed by hospital maintenance. It is expected that the students on duty will work with each other and the technician to complete all necessary tasks. If all work has been completed, additional

time may be spent studying, practicing emergency medicine and critical care techniques or going over use of equipment.

7. Absolutely no unprofessional behavior will be tolerated. This includes sleeping, watching movies and using the internet for non-veterinary related purposes. No food or drinks are allowed in the ICU or Tech Station. All personal items should be left in one of the rounds or communications rooms.

8. There is a zero-tolerance policy for drugs and alcohol. If a student arrives for a shift and appears to be under the influence of drugs or alcohol, it is the immediate responsibility of the other students and technicians on-duty to contact the intern on-duty.

9. If any patient is housed in the small animal hospital, regardless of resuscitation status or level of care, two people must be present at all times.

VMC 791 and VMC 792
Small Animal Internal Medicine I & II

Course Coordinator: Dr. Jana Gordon

Course Instructors: Dr. Helio de Morais, Dr. Jana Gordon, Dr. Stacie Summers

Course Objective: To give students hands on practical experience in managing small animal internal medicine cases. Specifically, students will:

Take clinical histories
Perform physical examinations
Create problem lists
Compile lists of differential diagnoses
Formulate diagnostic/therapeutic plans
Obtain samples for diagnostic tests (e.g. blood, urine etc.)
Perform diagnostic procedures
Interpret laboratory results
Discuss treatment options and plans
Generate medical records
Discharge patients
Follow up on cases
Participate in daily case and topic rounds
Participate in after-hours care of patients

Dress Code:
Students should maintain a professional appearance with business casual or scrubs as acceptable options. A good barometer of appropriate clothing is what the residents on the IM service are wearing during receiving and client interactions. Clothing should be in good repair and a white lab coat should be worn with in person client interactions. Shoes should be closed toe. A nametag or badge should be worn at all times. Each student should also have their own stethoscope.

Professional Conduct:
As representatives of the veterinary profession, it is important to maintain not only a professional appearance but demeanor as well. The student must consistently demonstrate appropriate behavior in all settings when in the veterinary teaching hospital and interacting with faculty, staff, fellow students, clients, referring veterinarians and the general public. This includes the assurance of maintaining client and patient confidentiality inside and outside of the veterinary teaching hospital. If the student fails to do so their grade may be affected, they may be dismissed from their duties, may have to repeat a portion or all of the rotation, and may fail the course. Inappropriate behavior observed within the IM service should be reported to a service technician, house officer or faculty member as deemed appropriate by persons involved.

Rotation Schedule:
The rotation begins at 8:00 a.m. on the first day of the block, or elective week, and ends at 8:00 a.m. (after treatments are complete) on the first day of the following block, or week. Students should expect to be present until their work is completed each evening. Students with after-

hours obligations to the ICU will be dismissed at 5:00 pm. The rotation includes after hours, weekend and holiday responsibilities. This includes regularly scheduled obligations and call duty. There will be a general small animal medicine orientation with clinicians and technicians the first morning of the block at 9:30 am that is required for all students. You must have reviewed the orientation video posted on canvas prior to orientation. On day 1 you need to have completed (and passed) the preventive health quiz on Canvas so we can make sure you are prepared to see wellness cases as soon as day 2.

Students will be assigned cases with an intern, resident or faculty as primary clinician. Once assigned to a case and clinician, the student retains his/her responsibilities to the case for the duration of the rotation. Each student is responsible for assigned cases until the animal is released or reassigned to other students.

Rounds:
In general, morning rounds will be held at 8:30 am (Monday-Friday). These will be discussions regarding hospitalized patients or topic rounds on small animal medicine topics. When presenting a case please use the standard protocol of name, signalment, history (including a brief diagnostic and therapeutic history), problem list, differential list, assessment and plan. Students may request topics for discussion; otherwise, topics will be assigned. On Wednesdays, students will have the option of attending the IM clinician journal club in place of rounds. When scheduled, students are expected to attend senior papers in lieu of morning rounds on Thursdays and IM rounds will be to follow. Afternoon rounds will be held at the discretion of the supervising clinician but will generally be at 4:30 pm for case discussions.

Student Assessment:

The student assessments may change for the 2021-2022 academic but currently students in the core rotation will receive an A, B, C, D or F and students in the elective rotation will receive a pass or fail based on the following criteria:

Attendance
Knowledge base
Clinical performance
Communication
Professionalism Rounds
Participation
Other

Assessment

Student participation is vital to the success of any program. Students are encouraged to actively investigate the cases they are caring for. These cases provide the opportunity to learn about a variety of disease processes as well as their diagnosis and treatment. Current College policy states that students are not able to miss more than 0.5 days/week of their rotation (e.g. 2 days for a four-week VMC 791 rotation). If they do then they may be asked to make up any additional time. All absences must be excused. Please see the attendance policy to review excused absences.

Unexcused absences will need to be made up. Any unexcused absence may result in a lower grade or an incomplete. If students are going to be late for or miss the rotation then they should

contact the Dean's office and the course coordinator.

Students are also required to complete their after-hours duties. Any after-hours duties missed, excused or unexcused, must be made up prior to receiving their diploma. Missed shifts may be made up during the same rotation or subsequent rotations at the discretion of the scheduling technician. If a student is going to be late or miss an after-hours shift, they must contact the ICU (737-4825) and speak either to a technician on ICU duty or the intern on duty. If a student arrives for their shift intoxicated, or is deemed by the technician or intern on duty to be incapable of completing their shift for whatever reason, they will be sent home and the shift will be repeated at a future date.

General Operation of the Small Animal Internal Medicine (SAIM) Service

Personnel and Organization:
The small animal internal medicine service provides referring veterinarians and the community access to advanced diagnostics and therapeutics in small animal internal medicine. The internal medicine service consists of small animal internal medicine faculty, internal medicine residents, small animal rotating interns, and veterinary technicians.

Regular working hours:
8:00 am to 6:00 pm Monday through Friday. Students are expected to be present and in proper attire, weekdays from 8:00 am to 5:30pm **or until casework is completed**. It may be necessary to come in earlier in the morning to complete patient evaluations and records on time. Students are expected to meet with the clinician on weekends to assess hospitalized patients, contact owners, and write records.

Appointments/Receiving:
We receive regularly scheduled internal medicine appointments on Monday through Friday from 9:30 am to 3:00 pm. Additional appointments are scheduled at the discretion of the supervising clinician. Students are also responsible for receiving appointments for the Preventive Health Clinic, which runs Monday through Friday at 3:00 pm. These appointments are for vaccinations, parasite prevention, micro-chipping and other wellness services offered to students, staff, and faculty of the CVM. They should not involve diagnosis and treatment of complex medical or surgical problems. If more complicated problems are found an appointment may be scheduled through the appropriate service. We will provide limited wellness exams for dogs and cats that may include evaluation for, and monitoring of, chronic diseases as well as age-related diseases and conditions. Appointments are overseen by a house officer on internal medicine.

Admitting cases:

Students should contact owners for a case history the evening before their visit when possible. Whether or not the student is in direct contact with the client or admitting patients into an examination room will depend on where the CVM is with COVID policy. A history sheet has been provided to assure a complete history is taken. If the animal is presenting for a recheck, please review the previous record prior to examining the patient. The student will perform a physical examination. This may include a fundic, otic and rectal examination as deemed appropriate. The weight, BCS and a pain score should be entered in the medical record. A limited physical examination may be performed in the cases of aggressive animals or if multiple exams will negatively impact patient comfort. The student should also generate a problem list, a

list of differential diagnoses and a tentative initial plan (space is provided in the medical record) and then discuss it with the clinician. The clinician will then assess the animal and discuss the case with the client.

Procedures:
Certain procedures will be performed by the student but must be under the immediate supervision of a clinician or licensed veterinary technician. Some procedures may be performed by the intern, resident or faculty supervisor of the case as deemed appropriate for the procedure and case.

Patient Care:
All patients admitted to the ICU and in the wards should be placed in a clean, appropriately sized cage. Animals should be placed on grates or absorbent bedding as indicated. All patients should have an id neck band with the case number, name of patient (first and last) and date. A cage card should be completed and placed on the cage with a patient sticker, the name of the clinician, the student's name and the presenting complaint or diagnosis. There are laminated tags available to hang on the cages in ICU for special instructions. The animal's belongings and medications are placed in a designated, labeled box. Please remove all collars as they can be a choking hazard. All medications and supplies necessary for after-hours treatment must be either in the ICU or wards or accessible to the after-hours staff prior to the treatment time. If there are any specialized diagnostics or therapeutics (chest tube, abdominal lavage catheter, jugular catheter) the patient might have, make sure the after-hours staff is comfortable performing these diagnostics or therapeutics. The patient information should be placed on the appropriate hospitalization board in the general treatment area and/or ICU.

One student will have primary responsibility for the medical record and daily care of each patient; however, all students are expected to be generally familiar with all cases on the service. Students retain case responsibility for each patient for the duration of the hospital stay, including weekends. Students may not delegate their case responsibilities to other students without prior approval by the clinician. Cases should not be transferred among students except for reasons constituting excused absences. If case responsibilities are inappropriately transferred, or shared for any other reasons, the primary student's grade may be affected. Students with patients in ICU or wards must have their cage cleaned, orders written, medications ready, and other supplies available by 8:30 am. Students are responsible for the 7-8:00am treatments of ICU patients and 7-8:00am and 7-8:00pm treatments of ward patients. Students also take care of their ward's patients during regular business hours. Please keep the animals clean and comfortable at all times - bedding, water, feedings, etc. If the student feeding the animal does not want the routine feedings by the kennel staff, this must be noted this on the cage card. Animals must be walked on a leash in the designated fenced area outside. You are expected to clean up any urine, feces, or other materials deposited by your patient.

Records:
Students are responsible for filling out the history, physical examination and patient flow sheets (with clinician). SOAPs are also completed by students in VetHosp. SOAPs will be completed by the student in charge of the case and should be in the format of the problem oriented veterinary medical record (POVMR). The medical record is a legal document and may be provided to owners or referring veterinarians at their request. For inpatients there should be two SOAPs per day or a single SOAP and an addendum. The morning one is generally the more detailed one, outlining a plan for the day and should be completed prior to morning rounds. The afternoon one can be a

brief update, or addendum, but should also include analysis of new test results and how they alter the plan. A single SOAP should be done on the day of admission of inpatients. The technician assigned to the case will fill out and submit anesthesia, imaging and laboratory requests. Medical records should remain in the ICU for ICU patients. For hospitalized patients in ICU or wards, new orders should be written and reviewed by the clinician before 8:30 each morning.

Communications:
Students will be in charge of client communications based on clinical discretion. The client communications should be recorded in the computer under case communications. Students may also be responsible for communicating with referring veterinarians and these communications should also be recorded in case communications. For any hospitalized patient, the student should communicate with the owners at least daily. Referring veterinarian communications are at clinician discretion. Any changes in medications or new prescriptions called in to a pharmacy should also be documented in case communications.

Pharmacy Prescriptions:

Fill out prescription forms completely with patient sticker, weight, date, clinician's name, and signature. All prescriptions must include the drug name, strength or concentration, total amount prescribed, and directions for use including amount in mg and either number of tablets/capsules, or volume of liquid, route of administration, and frequency. Alternatively, E script can be utilized and must contain all of the same information. Prescriptions should be submitted prior to 5:30 PM on the day they are needed.

Controlled substance (CS) prescriptions must include the patient's physical address (P.O. boxes are not acceptable). A maximum of 24 hours of CII injectable medication may be ordered for in hospital use. A maximum of 3 days of oral CII or oral and injectable CIII-CV CS may be ordered for in hospital use. A maximum of 30 days of any controlled substance may be sent home. CII CS prescriptions being sent home must be hand written and signed. CII CS cannot be on the same prescription as non-controlled or CIII-CV medications.

Medications can only be returned to the pharmacy for patient refund within 7 days of dispensing. The medication must not have left the hospital. Liquids, refrigerated items, and injections that have been drawn up are not eligible for credit. Vials must be sealed.

Clients may not bring their own medication into the hospital unless the pharmacy is unable to acquire the medication through normal distribution channels within an acceptable time frame, the medication is a compounded medication that cannot be made by the pharmacy, or the medication is very expensive and would prevent the owner from affording required care. Client-owned medication approved for use must be verified by the senior clinician or brought to the pharmacy for identification by a pharmacist.

Radiology and Ultrasound:
Forms are submitted electronically and must be submitted by 4:00 pm on the day of the procedure. Appointments should not be made for diagnostic imaging until the patient is admitted to avoid late and no-show appointments with diagnostic imaging. Make sure you consider time to acquire, admit and obtain sedation. Special procedures such as nuclear scintigraphy, fluoroscopy, computed tomography and magnetic resonance imaging should also be discussed with diagnostic imaging. Imaging should be documented on the patient flow sheet.

Endoscopy:
Discuss any endoscopic procedures with the clinician and veterinary technician. These procedures are typically not performed the same day the patient is admitted. Appropriate anesthesia request forms must be submitted ahead of time or at least the day prior to the procedure. These procedures require preparation. A gastroduodenoscopy only requires a 24 hour fast (water can be given) but a colonoscopy might require a 24 to 48 hour fast followed by 24 hours of enemas and saline cathartics. It is important to communicate with the clinician and client effectively to make sure animals are adequately and safely prepared for these procedures. Procedures are documented on the patient flow sheet.

Anesthesia:
Requests are submitted electronically and must be submitted by 3:00 pm the day prior to the procedure. After hours and same day requests are also submitted electronically and follow all notifications. A member of the anesthesia technician or faculty should be consulted regarding same day and after hour's availability.

Case Transfers:
Occasionally it is necessary to obtain a consult or transfer from another service area on a case seen through the internal medicine service. Sometimes consults are necessary on hospitalized patients and at other times the consult may be completed after the patient has been discharged. Records must be completed by the internal medicine service prior to complete of transfer and the clinician as well as technician on the service contacted. There are consultation forms that should be completed and posted in the consulting service box, with the medical record (unless an ICU patient) and any referral information.

Veterinary Diagnostic Laboratory (VDL):
All laboratory tests should be documented on the pink patient flow sheet. Take all submissions, with appropriate paperwork filled out, to the VDL office. They will accept submissions M-F 8:00- 4:30. Any tests that are shipped out to referral labs must be submitted by 11:30 am and should be evaluated by the internal medicine technician for accuracy prior to submission.

Necropsy & Care of Remains:
Refer to policy notebook located in the small animal treatment room. All submissions to VDL for necropsy and cremation should be under the guidance of a veterinary technician.

We hope the block will be an enjoyable learning experience. Students should not hesitate to ask for assistance or clarification of policies and procedures.

Textbooks: provided on service

OSU Student, Faculty and Staff Preventive Health Program

The students, faculty and staff at Oregon State University are able to participate in a preventive health program for dogs and cats offered through the internal medicine service at the small animal teaching hospital. The following companies have graciously donated their products to our program:

Pfizer®/Wyeth®/Fort Dodge®

Bayer®
Merial/Boehringer-Ingelheim®
Novartis®
Merck Animal Health®

Services Offered:
Physical examination
Vaccinations Heartworm
testing FeLV/FIV testing
Parasite prevention
Microchip placement
Basic wellness

Enrollment: Veterinary students, faculty and staff may enroll up to 4 dogs and/or cats in this program. Preventative health privileges are limited to animals that are personally owned and that live at the person's residence. A patient/doctor relationship must be established in all cases and pet ownership must be attested to when the names and case numbers are registered with the veterinary teaching hospital. Once designated, the animals eligible for the program will not be changed, except if ownership is transferred or the animal dies. No substitutions will be allowed. Upon the animal's death or transfer of ownership, the animal's spot on the discount list may be replaced with another animal. Once an animal is deleted from the discount list, it cannot be put back on the list. Those violating this policy may have discount privileges permanently removed.

Services are limited to those described above. Animals evaluated through the preventive health clinic are only approved for testing and treatment offered through the preventive health clinic. Evaluation for other stable disease conditions may be performed through the preventive health service at the discretion of the attending veterinarian as long as that condition has been previously documented in the medical record. Complex cases or patients that have experienced a change in status will require a regularly scheduled appointment through the appropriate service area. For example, if your pet is on thyroid supplementation for hypothyroidism, refills and monitoring can be obtained through the preventive health clinic. But if your previously stable hypothyroid dog now has an inguinal mass to be evaluated an appointment through the small animal internal medicine service is required. Care guidelines regarding wellness and life stages follow AAHA and AAFP guidelines and should be reviewed by small animal medicine students prior to participating in the preventive health clinic.

Medical Records: A medical record must be completed for every animal enrolled in the preventive health program. Medical records should be completed prior to the day of evaluation. All pertinent records, including previous laboratory tests, must be available to dispense medications (e.g. heartworm test performed prior to filling a prescription for heartworm medications).

Physical Examinations: A physical examination will be performed or supervised by a veterinarian at least annually to participate in the program. A heartworm test is required prior to dispensing heartworm medications. A physical examination is required just prior to administration of any vaccine. A physical examination is not required prior to dispensing flea and/or tick preventative as long as a preventive health exam has been done in the last 12 months.

Vaccinations: Oregon State University (OSU) realizes that each animal has a different level of immunity and exposure to infection and that a single vaccination protocol may not be adequate for all cases. The College of Veterinary Medicine (CVM) also realizes that administration of biologics is associated with risk to the animal. The CVM has adopted the recommendations of the AAHA and AAFP regarding the use of core and non-core vaccinations. It is with these recommendations that the following protocols were developed.

Core vaccinations for the dog. Puppy vaccinations will begin at 6 to 8 weeks of age and consist of a modified live virus (MLV) distemper, parvo and adenovirus-2 (DAP) vaccine given every 2 – 4 weeks to age 16 weeks. Puppies living in a high risk environment may benefit from receiving a final dose at 18 to 20 weeks of age.
Puppies should then receive a booster vaccine at one year and then every 3 to 5 years. Adult dogs (> 16 weeks of age) that present for initial vaccination, will receive one or two doses of MLV DAP and subsequent booster at one year then every 3 years. Dogs between the ages of 16 to 20 weeks living in a high risk environment may benefit from administration of 2 doses of a MLV DAP vaccine 2 to 4 weeks apart. A killed rabies vaccine will be offered to dogs. Dogs can be vaccinated as early as 12 weeks of age. A booster should be given to dogs at 1 year and subsequently at 1 to 3 year intervals depending on county of residence. Benton County requires vaccination for dogs for rabies and a 3 year vaccine is appropriate.

Non-core vaccinations for the dog. A MLV avirulent bacteria combination CAV-2, parainfluenza virus and *Bordetella bronchiseptica* intranasal vaccine will be offered as another non-core vaccine for puppies and dogs at high risk (e.g. boarding). It is recommended this vaccination be given 72 hours prior to boarding. This vaccination can be given to puppies as a single dose as early as 3 weeks of age and then yearly. Adult dogs (> 14 weeks) require a single dose to be protective and subsequent vaccinations are given annually. Vaccination for leptospirosis will also be offered as a non-core vaccine but is strongly recommended because of increased cases of canine leptospirosis in the state of Oregon. Dogs that engage in outdoor activities such as hiking, camping, swimming in streams or are exposed to rivers and lakes are at more of a risk. This vaccine is a subunit vaccine that contains four serovars of *Leptospira spp*. including *L. pomona, L. canicola, L. grippotyphosa* and *L. icterohemorrhagiae.* There have been very few reactions to this vaccine to date and this is believed to be due to the fact that it is a subunit vs. whole bacterin vaccine. This vaccine can be given to dogs 8 weeks of age and older using an initial vaccination followed by a booster 2 to 4 weeks later and annual boosters. Dogs > 16 weeks of age receive a single injection followed by a booster 2 to 4 weeks later and annual revaccination. There have been a few reports of canine influenza in the state of Oregon. We do not carry the killed canine influenza vaccine at this time. Vaccination recommendations are similar to those for parainfluenza, CAV-2 and *B. bronchiseptica*. The vaccine may be given to puppies 6 weeks of age or older.
Regardless of age an initial vaccine followed by a booster at 2 to 4 weeks is required. When vaccination is recommended, initial vaccination series should be initiated 4 weeks prior to risk for exposure to allow 2 weeks between the initial vaccines and 2 weeks for the humoral immune response to develop.

Core vaccinations for the cat. Kittens can be vaccinated with a MLV panleukopenia, herpes and calici virus vaccine as early as 4 weeks of age (if healthy and at high risk) but most kittens will begin vaccinations at 6-8 weeks of age followed by additional vaccinations every 3 to 4 weeks until 16-20 weeks of age. These kittens should then receive subsequent vaccination at 1 year and then every 3 years. Adult cats (>16 weeks of age) that present for initial vaccination will receive two doses of

MLV vaccine 3 to 4 weeks apart and subsequent vaccination at 1 year and then every 3 years. A killed rabies vaccine will be offered to cats. The rabies vaccine is not considered core for cats by the AAFP, but because Benton County requires vaccination of cats we have included it in this section. Cats can be vaccinated as early as 12 weeks of age for rabies. The feline rabies vaccine is a non-adjuvant canarypox vector vaccine and must be repeated annually.

Non-core vaccinations for the cat. The feline leukemia virus (FeLV) vaccine is not considered core but recommendations are to test and vaccinate all kittens and new cats to the household with an annual booster. Boosters may be every 1 to 2 years based on risk of exposure. All kittens and cats should be tested prior to initial administration. Kittens will be vaccinated for FeLV using either a non-adjuvant canarypox vector vaccine given subcutaneously or an alternative depending on availability of vaccine. The initial vaccination will be given to kittens 8 weeks of age or older followed by another vaccination 2 to 3 weeks later then booster one year later and every 1 to 2 years after. Adult cats can be given the initial vaccination followed by another vaccination 3 to 4 weeks later and then booster vaccination every 1 to 2 years.

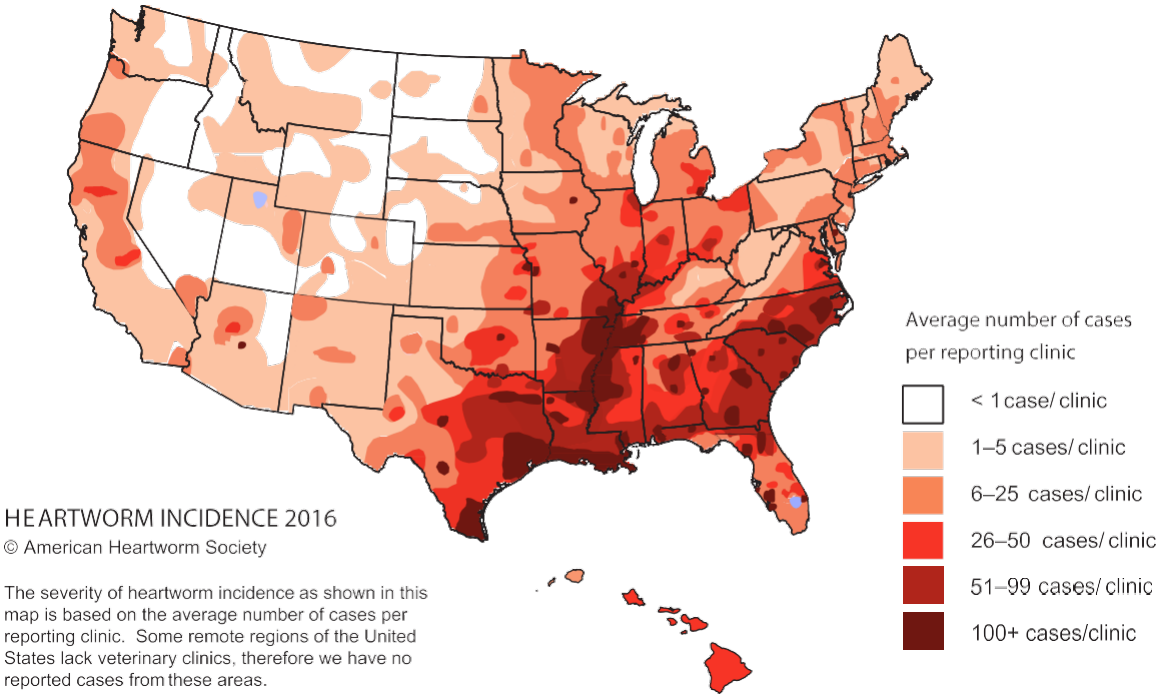
Vaccines will be administered on the distal extremities subcutaneously as

follows: DAP – left hind limb
Leptospirosis – left forelimb
Rabies (dog) – right hind limb

FPHC – tail (1st vaccine)
FeLV–tail (3rd vaccine) **OR** left hind limb distal to stifle
Rabies (cat) – tail (2nd vaccine) **OR** right hind limb, distal to stifle

in cats Heartworm Disease

Prevalence:
Heartworm infection (*Dirofilaria immitis*) in dogs has been diagnosed around the globe, including all 50 states of the United States. In the United States, its territories and protectorates, heartworm is considered at least regionally endemic in each of the contiguous 48 states, Hawaii, Puerto Rico, U.S. Virgin Islands, and Guam. Heartworm transmission has not been documented in Alaska; however, there are regions in central Alaska that have mosquito vectors and climate conditions to support the transmission of heartworm for brief periods. The greatest numbers of cases are seen in the southeastern U.S. and the Mississippi River Valley. There is an apparent high level of prevalence documented in northern California.



Heartworm life cycle:

Mosquitoes are the intermediate hosts and more than 70 species are capable of transmitting the disease. Transmission can occur anytime infected mosquitoes are active and feeding. The dog is the definitive and primary host for heartworm, however, other species such as coyotes, wolves, foxes, ferrets, bears, cats, wild felidae (mountain lions bobcats, tigers, etc.), marine mammals (seals, sea lions, etc.) can also get infected (although less commonly). Rare instances of transmission of microfilaria from infected bitches to fetuses via the placenta and from dog to dog via blood transfusion can occur. However, these microfilariae will not develop into adult worms. Presence of these microfilariae can confound a diagnosis and may serve as a potential source of microfilaria that could be transmitted by feeding mosquitoes.

Microfilariae reside in the blood of most, but not all, infected canids. Microfilariae (307-322 µm x 6.8-7.0 µm) are ingested by feeding female mosquitoes. After two molts (approximately 2 weeks), infective third-stage larvae (L3s) are present in mosquito mouthparts. Development may be slower at cooler temperatures and ceases at temperatures below 57°F but the presence of microenvironments in urban areas suggests that the risk of heartworm transmission never reaches zero. Development progresses in the mosquito relative to ambient temperature; if ambient temperature increases, development will resume. L3s (1,000 µm x 40 µm) are deposited on the skin of the dog during subsequent feeding and migrate through the bite wound into the host. Most L3s molt to fourth-stage larvae (L4s) in subcutaneous tissues within 1-3 days after infection. L4s migrate through tissues for several weeks. A final molt to the sexually immature adult stage occurs approximately 2 months (50 to 70 days) after infection. The young adults (2-3

cm in length) enter the vascular system and are carried to the heart and pulmonary arteries, arriving as early as 70 days after infection. Rarely, ectopic infections of the eye, central nervous system, peritoneal cavity, systemic circulation, or skin have been reported. Final maturation and mating

occurs in the pulmonary vessels. By 4 months after infection, the worms in the pulmonary arteries are around 10-15 cm in length. Fully mature adults at 6.5 months after infection reach lengths of 15-18 cm for males and 25-30 cm for females. Canine hosts typically demonstrate microfilaremia 6 to 7 months after infection (pre-patent period). Heartworms live approximately 5 to 7 years in the dog.

HEARTWORM IN DOGS:

Diagnosis:

Most dogs diagnosed with heartworms are asymptomatic however; cough, weight loss, exercise intolerance, dyspnea, collapse (due to arrhythmias-hypoxia), ascites, and hemoptysis can be seen as the disease advances. On physical exam a split second heart sound (due to pulmonary hypertension) and a right-sided heart murmur (tricuspid regurgitation) might be ausculted. Bronchovesicular sounds might be ausculted with pneumonitis. Jugular venous distension/pulsations (due to high right heart pressures) can also be noted (easier to see in a shaved neck). Eosinophilic, mixed and granulomatous pneumonia can occur, particularly in dogs. Pleural effusion is a rare finding in dogs with just heartworm infection. Some dogs develop renal glomerulonephritis, proteinuria (secondary to antigen-antibody complex deposition), hemolytic anemia and amyloidosis. Thromboembolism may also occur.

The onset and severity of disease in the dog is mainly a reflection of the number of adult heartworms present, the age of the infection and the level of activity of the dog. Dogs with higher numbers of worms are generally found to have more severe heart and lung disease changes. Until the number of mature heartworms exceeds 50 in a 25kg dog, nearly all of the heartworms reside in the lower caudal pulmonary arteries. Large burdens of heartworms result in their presence in the right chambers of the heart. In such infections, the most common early pathological changes caused by heartworms are due to inflammatory processes that occur in and around

the arteries of the lower portion of the lungs in response to the presence of heartworms (vascular endothelial cell damage, smooth muscle hypertrophy and fibrous tissue proliferation); all these changes in the lungs may lead to pulmonary hypertension and secondary tricuspid regurgitation/insufficiency. Later, the heart may become enlarged/hypertrophic due to pressure overload and right-sided heart failure may occur. A very active dog (e.g., working dog) is more likely to develop severe disease with a relatively small number of heartworms than an inactive one (e.g., a lap dog).

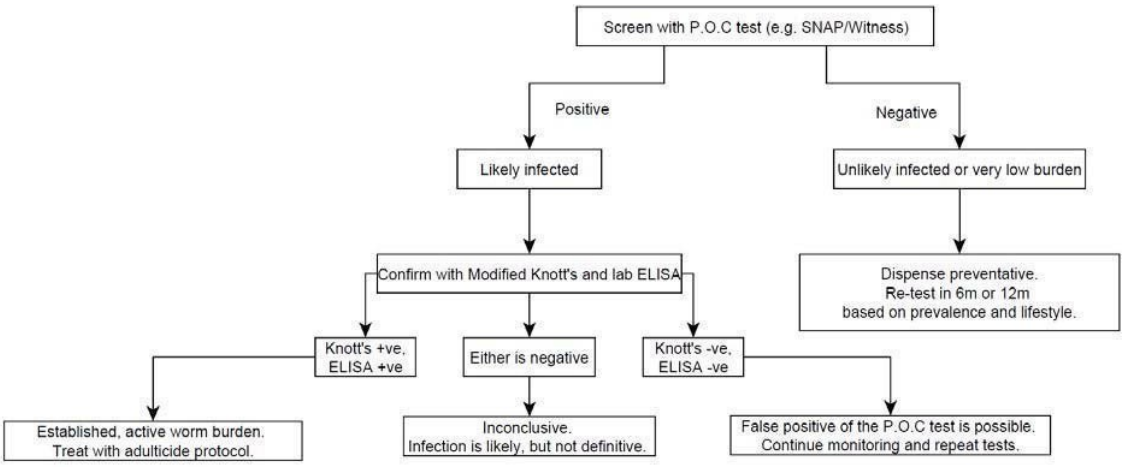
Caval syndrome occurs in a small number of cases, typically associated with large numbers of adults in the pulmonary arteries, right heart and caudal vena cava. Worms found in the right heart (right ventricle and right atrium) may interfere with the tricuspid valve function. This results also in right-sided heart failure. Other associated findings include: pallor, weak pulses, tachycardia, and sudden collapse, hemoglobinemia and hemoglobinuria, and DIC. Dogs with caval syndrome are typically very sick and it is considered an emergency.

Rarely, ectopic infections of the eye, central nervous system, peritoneal cavity, systemic circulation, or skin have been reported.

Dogs on heartworm prevention should be checked annually for the presence of circulating heartworm antigen to verify that they are being protected, and in areas where resistance may be a possibility it

may be prudent to test outdoor dogs twice each year (see *Prevention* below). Recent work has shown that there are isolates of heartworms that are capable of developing to adults in dogs receiving routine prophylaxis with any of the available macrocyclic lactones. Antigen tests detect a glycoprotein found predominantly in the reproductive tract of the female worm (gravid uterus). Only mature infections (older than 6 months typically) with at least one female worm are usually detected. Low worm burdens (fewer than two adult females) and infections with only male worms may not be detected. Microfilaria tests in combination with the antigen tests allow for greater sensitivity. The earliest that heartworm antigen and microfilariae can be detected is about 5 and 6 months, respectively. Antigenemia usually precedes but sometimes lags the appearance of microfilariae by a few weeks. There is no need or justification for testing a dog for antigen and microfilariae prior to 7 months of age. Whether screening a population of asymptomatic dogs or seeking verification of a suspected heartworm infection, antigen testing is the most sensitive diagnostic method. It is now recommended, however, that microfilaria testing be done in tandem with antigen testing. This is especially important if there is a high degree of suspicion or if the heartworm prevention history is unknown (e.g., dogs adopted from shelters). It has come to light that in some dogs infected with heartworms, antigen blocking, presumably from antigen– antibody complexes, may lead to false-negative antigen test results. These dogs will be antigen negative and possibly microfilariae positive; a study conducted on shelter dogs in the southeastern United States reported this occurred at a rate of 7.1% (Velasquez et al, 2014). It is important that these dogs are identified and treated to decrease the potential for selection of resistant subpopulations of heartworms. There will be instances where an infected dog is both antigen and microfilaria negative.

The high incidence of amicrofilaremic infections (no circulating L1-L2) has led to increased use of tests targeting adult worms. ELISA and immunochromatographic tests are available for detecting circulating heartworm antigen. Each testing format has proven to be clinically useful. The current generation of heartworm antigen tests identify most “occult” (adult worms present but not circulating microfilariae) infections consisting of at least one mature female worm and are nearly 100% specific. Currently there are no verified tests capable of detecting infections consisting of only adult male worms. False-negative and false- positive results can occur and unexpected test results should be repeated. If the results are still ambiguous, confirmation by a reference laboratory is recommended to confirm the result. It is recommended to confirm all positive antigen tests in asymptomatic dogs prior to any adulticide therapy. Concentration tests for microfilariae, thoracic radiography to detect signs of heartworm disease, or ultrasonographic visualization of worms may also validate weakly positive antigen test results (see below). The color intensity of a positive antigen test result (e.g IDEXX SNAP® test, Witness® HW) cannot reliably be used to determine the level of worm burden. As said



above, false-negative test results occur most commonly when infections are light, female worms are still immature, only male worms are present, antigen blocking by antigen – antibody complexes, and/or the test kit instructions have not been followed. Heat treatment of serum samples prior to heartworm antigen tests to release blocked antigen is currently available through reference laboratories, but routine heating of blood samples is not presently recommended for heartworm screening. Positive antigen tests regardless of its high sensitivity should be interpreted carefully, taking other relevant clinical information into consideration. In general, however, it is better to trust rather than reject positive antigen results.

Microfilaria testing should be done in tandem with antigen testing to determine whether this life-cycle stage is also present in dogs. The modified Knott test remains the preferred method for observing morphology and measuring body dimensions to differentiate *D. immitis* form non-pathogenic filarial species such as *Dipetalonema reconditum* (slide is examined under 100X for detection of microfilariae and under 400X to observe characteristics of the microfilariae). All dogs should also be tested for microfilariae as microfilaremia validates serologic results, is diagnostic should a dog have antigen-antibody complexes (no antigen detected on antigen tests), identifies the patient as a reservoir of infection, and alerts the veterinarian to a high microfilarial burden, which may precipitate a severe reaction following administration of a microfilaricide (e.g milbemycin). Microfilaria tests are insensitive methods by themselves. Reduced microfilaria test sensitivity may occur due to variations in microfilaria concentrations based on time of day and season, variation of circulating numbers of microfilaria (highest in summer and afternoon/evening). A dog may have a negative microfilaria test when: single sex adult infections, elimination of microfilariae by administration of monthly preventives, host immune responses, occurrence of circulating antigen prior to microfilariae production (in rare cases, the appearance of microfilariae may precede antigenemia.), and true occult infections. Other methods less preferred for detection of microfilaria are: direct examination of fresh blood or blood treated with an anticoagulant, examination buffy coat in a microhematocrit tube, and concentration using a stained or unstained Millipore filter. If the microfilaria test is negative, a positive result can be verified using a second antigen test from a different manufacturer.

In instances of noncompliance or changing the brand or type of heartworm preventive, it is important to determine the heartworm status of the dog. The dog should be antigen and microfilaria-tested prior to starting or changing products. A positive test indicates pre-existing infection. When noncompliance/change of product has occurred, preventive therapy should be restarted and the dog should be retested 6 months later; a positive test at this time would most likely be due to an infection acquired before starting preventive therapy. Antigen and microfilaria testing should be performed 1 year after the initial test and annually thereafter.

As said above, it is important to confirm positive antigen tests with other diagnostic aids (in the symptomatic or asymptomatic dog). A CBC may suggest signs of heartworm infection: non-regenerative anemia (chronic disease), eosinophilia, basophilia, neutrophilia, and thrombocytopenia. Biochemical changes may include elevated liver enzymes, azotemia, hyperbilirubinemia, and hyperglobulinemia. Urinalysis may indicate proteinuria and albuminuria. Radiography provides the most objective method of assessing the severity of heartworm cardiopulmonary disease secondary to heartworm infection. Typical (nearly pathognomonic) signs of heartworm vascular disease are enlarged tortuous, and often truncated peripheral intralobar and interlobar branches of the pulmonary arteries, particularly in the caudal lobes. These findings are accompanied by variable degrees of pulmonary parenchymal disease. The earliest and most subtle

If the lapse is...	Then...
Never been on preventative	Always test before dispensing
<5 months, previously on preventative	Testing is ideal Dispense heartworm treatment and test 6 months later
>5 months, previously on preventative	Always test before dispensing

pulmonary arterial changes are most commonly found in the dorsal caudal wedge of the diaphragmatic lung lobes. As the severity of infection and chronicity of disease progress, the pulmonary arterial signs are seen in larger branches. In the worst cases, eventually the right heart enlarges (evidenced by a reverse "D" shape to the heart) and right-sided heart failure may occur (see above). Additional radiographic findings may include lymphadenopathy and pleural effusion (uncommon in dogs). Heartworm associated lung disease is described as a cause of chronic respiratory signs in dogs and cats some of which fail to have the classic cardiovascular changes on imaging. On electrocardiography evidence of right ventricular enlargement can be found. Echocardiography can provide definite evidence of heartworm infection, as well as allow for assessment of cardiac anatomic and functional consequences of the disease. Echocardiography is not an efficient method of making a diagnosis in lightly infected dogs (worms are often limited to the peripheral branches of the pulmonary arteries). When heartworms are numerous, they are more likely to be present in the main pulmonary artery, right and proximal left interlobar branches, or within the right side of the heart. When significant infection is present, right heart enlargement/hypertrophy, pulmonary artery enlargement and tricuspid regurgitation may be seen.

Prevention:

Heartworm infection is prevented by the routine administration of a number of macrocyclic lactone preventives. Uninfected dogs should be maintained on macrocyclic lactone preventives all year-round. Preventives will not only protect dogs against infection but will also diminish the risk of infection in other dogs and secondary spreading of the disease in the population. It is extremely important, however, to do annual antigen testing on dogs receiving preventives to verify that they are not becoming infected despite precautions. Annual testing will ensure that infected dogs are detected and treated as soon as possible. For dogs living in highly endemic areas, twice-a-year testing is advised. These preventives (+/- additives) vary in their claims against other internal (hookworms, roundworms, whipworms) and external parasites (ticks and fleas) and are available in different formulations (tablets, topicals and injectable preparations). Macrocyclic lactone preventives currently available include: ivermectin (oral), milbemycin oxime (oral), selamectin (topical), and moxidectin (topical or injectable).

Fortunately, the dose of ivermectin, selamectin, milbemycin and moxidectin in the commercial heartworm preparations are low enough to be used safely even in dogs with the MDR1 mutation (Australian Shepherd, Collie and other herding breeds and their crosses). It is only when the drugs are used at high doses, such as those used to treat mange (50 times higher dose than the heartworm prevention dose), that dogs with the mutation will develop neurological toxicity (http://www.vetmed.wsu.edu/depts-VCPL/drugs.aspx). Genetic testing for the mutation may be offered to the client if there is significant cause for concern.

Treatment:

Medical management consists of killing adults with an adulticide followed by a microfilaricide. Dogs with severe pulmonary hypertension and caval syndrome may have worms surgically

extracted. Dogs with heart failure are stabilized prior to treatment. Stabilize dogs presenting with clinical heartworm disease. Any or all of the following may be medically indicated: corticosteroid therapy, fluid therapy, diuretics, vasodilators, and positive inotropic agents.

Dogs receiving a macrocyclic lactone should be maintained on preventive if it is already being administered. If a dog is not receiving a macrocyclic lactone preventive, administration of preventive should be instituted as soon as any severe medical condition has been stabilized. The purpose of preventive use is to prevent infection with new larvae if the dog is bitten by more infected mosquitoes because the treatment with melarsomine for removal of adult worms will not kill newly introduced larvae. Also administering a macrocyclic lactone preventive 2-3 months prior to administering melarsomine will make young worms (2 and 4months) more susceptible to die.

CAPC (Companion Animal Parasite Council) recommends treating infected dogs with adulticide promptly, as soon as medically practical. Delaying treatment while maintaining dogs on preventives may contribute to selection for resistance and allows pathology to progress. Infected dogs are staged into 1 of 3 classes based on clinical signs: asymptomatic or mild disease (stage 1), moderate disease (stage 2), or severe disease (stage 3). Previously a two-dose protocol has been described for stage 1 and stage 2 disease where melarsomine dihydrochloride (2.5 mg/kg) is administered intramuscularly twice over a 24-hour period, killing greater than 90% of the worms present. However, due to decreased complication rates and increased safety, the American Heartworm Society recommends the three-dose protocol regardless of severity of disease (with the exception of caval syndrome). The three-dose method describes administering melarsomine dihydrochloride (2.5 mg/kg) intramuscularly once, followed in 1 month (or longer if the dog's condition dictates) by two intramuscular injections (2.5 mg/kg each) 24 hours apart. Any excitement or exercise beyond slow walking should be restricted for at least 6 to 8 weeks following each set of injections (this is ESSENTIAL for minimizing cardiopulmonary complications such us PTE). Avoiding overheating is also recommended. This treatment regimen will kill up to 98% of the worms present. Other, off-label regimens for administration of melarsomine dihydrochloride are not recommended. Melarsomine is not proven effective against heartworms younger than 4 months of age. Because dogs may have been bitten over a period of months by infected mosquitoes, the worms in a dog may be of different ages within a given season, and thus, melarsomine treatment may not be completely effective in all situations. This may necessitate additional therapy or alternate therapeutic strategies. All dogs that are treated with melarsomine should be tested for the presence of microfilaria 1 month after completing therapy. If the dog tests positive for microfilaria, treat with a microfilaricide and retest in 4 weeks, then continue with a year-round heartworm prevention program. Dogs should be antigen tested and screened for microfilaria 9 months after completing therapy to determine if infection has been cleared. If still antigen positive, re-treat with doxycycline followed by two doses of melarsomine 24 hours apart. See attached treatment protocol.

In cases where melarsomine therapy is not possible or contraindicated, the use of a monthly heartworm preventive along with doxycycline at 10mg/kg BID for a 4-week period might be considered. This protocol is not recommended as a standard first-line treatment but instead as a salvage procedure. An antigen test should be performed every 6 months and the dog not considered cleared until 2 consecutive negative antigen tests have been obtained 6 months apart. If the dog still antigen positive after one year, repeat the doxycycline therapy. Exercise should be rigidly restricted for the duration of the treatment process.

Adulticidal therapy using long-term macrocyclic lactone administration (the "slow kill" method) IS NOT RECOMMENDED especially in light of resistance. It has been demonstrated that repeated

macrocyclic lactone administration over a period of time to infected dogs increases the proportion of circulating microfilariae that possess resistance markers (i.e., application of long- term drug pressure will select for survival of drug-resistant microfilariae). If the "slow kill" method is the only medically acceptable option, microfilariae should be eliminated prior to exposure to preventive doses of macrocyclic lactones. Topical moxidectin/imidacloprid is label approved in dogs (FDA) for removal of microfilariae when used monthly. Pretreatment with antihistamines and glucocorticoids is advisable in the face of high microfilariae burdens to minimize potential reactions.

Depending on the macrocyclic lactone used, as many as 20% of dogs infected with heartworms will continue to have circulating microfilariae for at least a year or longer when receiving monthly preventative (even after adulticide therapy has been successfully completed). Current protocols utilizing doxycycline in combination with regular preventive doses of macrocyclic lactones have essentially eliminated the need for post-adulticidal elimination of microfilariae (see treatment protocol attached). Most filarial nematodes, including *D. immitis*, harbor obligate, intracellular, gram-negative bacteria belonging to the genus *Wolbachia* (Rickettsiales).
Although more research is needed, data suggest that the treatment of dogs with doxycycline prior to adulticide therapy may reduce the gross pulmonary pathology that occurs as a result of thromboembolic shower of dead worm fragments, aid in the suppression of microfilarial numbers after adulticide therapy, and interfere with the ability of the microfilariae to infect other dogs after they have passed through a mosquito host.

Public Health:

Dirofilaria immitis is of public health concern even though the number of reported cases is small (more than 100 human cases of pulmonary dirofilariasis have been reported in the U.S in the last 50 years). Prevention is best accomplished through mosquito abatement programs (including screening outdoor kennels), and by using mosquito repellents, wearing protective clothing, and remaining indoors during mosquito feeding periods.
Reducing the prevalence of heartworm infection in the definitive canine host will also reduce transmission risk for humans.

HEARTWORM IN CATS:

Heartworm infection is less common in cats and they have lower worm burdens (usually 1 or 2 worms), fewer larva developing into adults a longer pre-patent period (7-8 months) and shorter survival times of adult worms (2-3 years). Pathologic findings are similar to dogs. The clinical importance of heartworms is amplified in cats because even a small number of heartworms are potentially life-threatening. Although live adult worms in the pulmonary arteries cause a local arteritis, some cats never manifest clinical signs. When clinical signs are evident, they usually develop during 2 stages of the disease: 1) arrival of heartworms in the pulmonary vasculature (immature adult worms 3-4 months post infection), and 2) death of adult heartworms. The initial phase is often misdiagnosed as asthma or allergic bronchitis, however it is part of a syndrome known as heartworm associated respiratory disease (HARD). When the adult worms begin to die (second stage) pulmonary inflammation and thromboembolism may occur (which usually leads to fatal acute lung injury).

Clinical signs associated with heartworm disease in cats can be vague or can consist of predominantly respiratory, gastrointestinal (e.g, emesis), and occasionally neurological. Most

commonly cats have clinical signs of chronic respiratory disease (tachypnea, intermittent coughing, and increased respiratory effort).
Chronic cor pulmonale and right-sided heart failure may also occur. Radiographic findings are variable and include peribronchial infiltrates, interstitial disease, consolidation and pleural effusion. Caudal pulmonary arterial blunting and enlargement can be seen. Chylothorax and hydrothorax are sometimes found.

Fewer microfilaria circulate for shorter periods making tests for microfilaria insensitive (if you are looking for microfilariae do Knott s or Millipore test). Antigen tests underestimate prevalence because of early infection, resolved infection, low worm burdens, immature females, and all male infections. The current generation of available antigen tests can identify infections with a single mature female worm and are nearly 100% specific; however male infections and immature females infections can occur in cats as said above decreasing the utility of the antigen test for detecting infection. There are also documented cases of antigen-antibody complexes interfering with antigen testing resulting in false-negative tests. Heating the sample test-tube in a warm water bath to 104 degrees Celsius for 10 minutes will break these complexes down, releasing any antigen, resulting in more accurate test results. Antibody test have the advantage of being able to detect infection by both male and female worms. The sensitivity of the antibody test is variable and depends on larval stage, age of the worms, etc. (see American Heartworm Society guidelines). Limited evidence from several studies suggests that the antibody level in cats decreases with time as the parasite matures and that heartworm-infected cats with clinical signs are more likely to be antibody positive than infected asymptomatic cats. Antibody tests overestimate prevalence because of persistence antibodies despite clearance of infection. Since both juvenile and adult worms are capable of causing clinical disease in the cat, both antibody and antigen tests are useful tools and when used together increase the probability of making appropriate diagnostic decisions. Adult worms can often be identified on echocardiogram. The diagnosis is most commonly made when a cat from an endemic area manifests the appropriate clinical signs, has radiographic findings consistent with infection and a positive antibody/antigen test.

No specific treatment is recommended for asymptomatic cats. Infected cats with symptomatic feline dirofilariasis should be treated with corticosteroids in decreasing dosages to minimize dyspnea, coughing, and wheezing caused by death of either juvenile (HARD) or adult worms. Antileukotrienes also may be beneficial in reducing the risks associated with adult worm death. Bronchodilators may be useful if there is radiographic evidence of air-trapping. Specific therapies should be used if vomiting and neurological signs are present.
There is insufficient experience with melarsomine at this time and its use is NOT recommended (preliminary data suggests that melarsomine is toxic to cats at doses as low as 3.5mg/kg). Surgical extraction can be considered in heavily infected cats or cats in critical condition. Preventatives are similar to dogs (milbemycin oxime, ivermectin, selamectin) and monthly prophylaxis should be considered in endemic areas (should be started in kittens at 8 weeks of age).

Table 1. American Heartworm Society recommended management protocol for dogs diagnosed with heartworm disease.

The American Heartworm Society has established guidelines for the diagnosis, prevention and management of heartworm disease in the dog and cat (http://www.heartwormsociety.org). The CVM agrees with these recommendations and it is with these recommendations that these notes were developed.

Day	Treatment
Day 0	In a dog diagnosed and verified as heartworm positive: • Positive antigen (Ag) test verified with microfilaria (MF) test • If no MF are detected, confirm with second Ag test from a different manufacturer • Apply an EPA-registered canine topical product labeled to repel and kill mosquitoes • Begin exercise restriction-the more pronounced the signs, the stricter the exercise restriction If the dog is symptomatic: • Stabilize with appropriate therapy and nursing care • Prednisone prescribed at 0 .5 mg/kg BID first week, 0.5 mg/kg SID second week, 0.5 mg/kg every other day (EOD) for the third and fourth weeks
Day 1	• Administer appropriate heartworm preventive o If MF are detected, pre-treat with antihistamine and glucocorticosteroids, if not already on prednisone, to reduce risk of anaphylaxis o Observe for at least 8 hours for signs of reaction
Days 1-28	• Administer doxycycline 10 mg/kg BID for 4 weeks o Reduces pathology associated with dead heartworms o Disrupts heartworm transmission
Day 30	• Administer appropriate heartworm preventive • Apply an EPA-registered canine topical product to repel and kill mosquitoes
Days 31-60	A one-month wait period following doxycycline before administering melarsomine is currently recommended as it is hypothesized to allow time for the *Wolbachia* surface proteins and other metabolites to dissipate before killing the adult worms. It also allows more time for the worms to wither as they become unthrifty after the *Wolbachia* endosymbionts are eliminated.
Day 61	• Administer appropriate heartworm preventive • Administer first melarsomine injection, 2.5 mg/kg intramuscularly (IM) • Prescribe prednisone 0.5 mg/kg BID first week, 0.5 mg/kg SID second week, 0.5 mg/kg EOD for the third and fourth weeks • Decrease activity level even further : cage restriction; on leash when using yard
Day 90	• Administer appropriate heartworm preventive • Administer second melarsomine injection, 2.5 mg/kg IM • Prescribe prednisone, 0.5 mg/kg BID first week, 0.5 mg/kg SID second week, 0.5 mg/kg EOD for the third and fourth weeks
Day 91	• Administer third melarsomine injection, 2.5 mg/kg IM • Continue exercise restriction for 6 to 8 weeks following last melarsomine injections
Day 120	• Test for presence of MF o If positive treat with a microfilaricide and retest in 4 weeks • Continue a year-round heartworm prevention program based on risk assessment described in prevention section
Day 365	• Antigen test 9 months after last melarsomine injection; screen for MF • If still Ag positive, re-treat with doxycycline followed by two doses of melarsomine 24 hours apart

Microchips
Microchips will be placed under the skin between the shoulders as recommended by Intervet/Schering Plough®. All pets will be scanned prior to and after implantation. Veterinary students, veterinary technicians and veterinarians will be able to pre-register their pets with HomeAgain® at no cost. All other individuals will be required to pay the pharmacy cost plus 28% for the microchip (as determined by the OSU discount policy).

Viral Disease Affecting Cats

Feline Upper Respiratory Disease
Several infectious organisms have been recognized as causing the sights of feline upper respiratory disease. The two major viral causes are feline calicivirus (FCV) and feline herpesvirus-1 (FHV-1), which is the cause of feline viral rhinotracheitis (FVR). The most common bacterial organisms associated with feline upper respiratory disease are *Bordetella bronchiseptica* and *Chlamydia felis;* whose prevalence varies by region and, while they can cause clinical signs on their own, are often seen in co-infections with FCV or FHV-1. Other viruses (cat pox, FeLV and FIV) can manifest with clinical signs of respiratory disease however they are also usually the result of co-infection with FCV or FHV-1 (or both).

Feline Calicivirus
Feline calicivirus is a non-enveloped, single-stranded RNA virus from the *Caliciviridae* Family. This virus can infect all felids but is most commonly seen in young kittens as they lose their maternal antibodies or in group situations. There are caliciviruses that infect dogs that are genetically distinct (canine calicivirus) and indistinct from FCV raising the possibility of transmission between dogs and cats. Since FCV is a single-stranded RNA virus it is capable of genetic heterogeneity, which can affect its antigenicity and may be responsible for the variable presentation seen with this virus. Infection is typically direct from actively infected or carrier cats via oral, nasal or conjunctival secretions. The virus typically replicates in 2 to 5 days in the oral and respiratory tissues. The virus can also replicate in the synovium, viscera and urinary bladder.

Clinical signs of FCV infection include depression, fever, ulcers of the tongue, lips or nose, hyper salivation, nasal discharge and occasionally lameness. The oral ulceration begins as a vesicle and heals over 2 to 3 weeks. Lesions in the lungs are less common but may include a focal alveolitis that can develop into an interstitial pneumonia. Sneezing, conjunctivitis and nasal discharge also occur as bacterial colonize the upper respiratory tract membranes. Lameness, which is less common, is the result of synovitis. In most cases, with supportive care, signs typically resolve in 7 to 10 days. Morbidity can be high, up to 100%, however mortality is generally low with kittens under 6 months at a higher risk. Less commonly, outbreaks of more pathogenic forms of FCV with high mortality rate, coined virulent systemic feline calicivirus (VS-FCV), have been observed where clinical signs include respiratory tract infection, dyspnea, oral and footpad ulceration, facial edema, enteritis, pneumonia, coagulopathies, high fever, and icterus.

In practice, definitive diagnosis is not often necessary in the presence of the appropriate history, signs and signalment but in some instances (cattery outbreak, monitoring patient progress) diagnosis may be desirable. Viral isolation using PCR is now readily available through Commercial laboratories with results in 2-7 days (laboratory dependent). Samples collected for PCR are deep pharyngeal and conjunctival swabs. The Idexx lab, for example, offers a feline Upper Respiratory Disease RealPCR panel which includes *Bordetella bronchiseptica*, *Chlamydia*

felis, FCV, FHV-1 (with quantification), H7N2 influenza virus, influenza A virus (includes H3N2, H1N1, H3N8) and *Mycoplasma felis* RealPCR™ tests. Fluorescent antibodies on conjunctival scrapings and tonsillar biopsies can also be performed however samples are more difficult to obtain.

Treatment consists primarily of supportive care. Broad-spectrum antibiotics are indicated for secondary infections. Cleaning of secretions, nutritional support (strong smelling foods, appetite stimulants, enteral feeding devices), and nebulization (nebulizer, steam room) may also be indicated. Systemic antiviral agents have thus far proven ineffective against FCV and/or (in the case of ribavirin, which is effective against FCV) quite toxic to cats and should not be used.
Immune modulation with human interferon and recombinant feline-origin interferon have been investigated however results thus far have shown questionable efficacy. L-lysine supplementation has been recommended as it inhibits arginine, which is required for viral replication, however it's efficacy in FCV infected cats has not been proven. In 2018 Tulio M. Fumian et al., using the in vitro assays, identified other antiviral compounds, quercetagetin and PPNDS as potent RdRp (a viral nonstructural protein) inhibitors, and they also demonstrated a moderate inhibition of protease activity by GC376. Finally, they reported the identification of two compounds (nitazoxanide and 2CMC) with antiviral activity against FCV in cell culture at low micro molar concentrations with a potential combinational therapeutic utility to treat FCV-infected cats. Anyway, those treatment are still under study and are not yet feasible.

Acutely infected cats generally shed virus for up to 2–3 weeks. Most of them will eliminate the infection and do well if given appropriate supportive care. However approximately 80% or more of cats that survive acute FCV infection will become chronic carrier cats. These cats actively shed virus continuously from their oropharynx, for months to years, and can be clinically asymptomatic. It is estimated that 25% of clinically healthy breeding cats and approximately 10% of healthy household cats are FCV carriers. Repeated outbreaks in a multi-cat household or population of cats suggests a carrier cat is present. Chronic carrier cats may experience recrudescence of clinical signs, including sneezing episodes, nasal discharge, and chronic gingivitis which may respond completely too antibiotic therapy only to return 3-5 after discontinuation of antibiotics. Due to genetic heterogeneity, cats are susceptible to re-infection.

Vaccination against FHV-1/FCV induces what is called "nonsterile" immunity. This means that vaccination (intranasal or SQ) will prevent or lessen clinical signs, but will not prevent infection nor the establishment of a chronic carrier state. Vaccination also does not prevent virus shedding. By contrast, cats vaccinated and immunized against panleukopenia are completely protected in the event of subsequent exposure, this is called "sterile" immunity. The FCV vaccine has to take into account the genetic heterogeneity and since the result is multiple strains it may be difficult to guarantee protection with a single serovar. Instead they have selected a few of the more common isolates to formulate the vaccines. Modified live vaccines are capable of inducing mild disease (mild upper respiratory signs, transient lameness), particularly in kittens, and approximately a third of cats vaccinated with intranasal vaccine develop post-vaccine sneezing. As with any inactivated vaccine, the adjuvants may cause fever, lethargy, injection site reactions and, rarely, sarcoma formation. Intranasal may provide a more rapid onset of action (72 hours after a single dose vs. 6-7 days with SQ) and have rarely been associated with oral lesions. This virus is inactivated by many commonly used disinfectants.

The current AAFP recommendations for vaccination against FCV/FHV-1/FPV are as follows: 6 weeks of age, and be repeated every 3-4 weeks (or 2-3 weeks in shelters) until 16-20 weeks of age and 1 year booster (12 months following last dose of initial series), booster every 3 years. The

duration of immunity in adult, vaccinated cats has been shown to be at least 5 years. If intranasal vaccines are used a parenteral FPL vaccine is still recommended. If a cat is going to be placed in a known high-risk situation, an additional booster vaccination may be warranted 7–10 days prior to entry, particularly if it has not been vaccinated in the preceding year. However single dose of intranasal vaccine offers more rapid (2–6 days) onset of protection, and can be useful for animals entering a high-risk situation.

Feline Herpesvirus-1

FHV-1 is a double-stranded DNA virus from the alpha herpesvirus subfamily. Since it is a DNA virus it does not have the genetic heterogeneity of FCV so its isolates are similar and vaccine composed of a single serovar. This virus is also found in all felids but primarily the domestic cat. As with FCV, young cats or cats in group settings are most susceptible. Route of infection is the same as FCV as it primarily replicates in the upper respiratory tract and very rarely causes a viremia with more generalized disease. Generally speaking, FHV-1 causes more severe upper respiratory signs (more pronounced nasal discharge, conjunctivitis), and the cats feel more ill than FCV. Ulcerative keratitis (linear dendritic ulcers) and uveitis can occur and may be quite severe. Oral ulcers, skin ulcerations, neurologic disease and pulmonary infection occur rarely. FHV-1 has also been implicated in fading kitten syndrome. Acute infection typically begins as intermittent sneezing which progresses over 2-5 days and lasts 1 – 3 weeks but may result in permanent damage to the nasal turbinate and chronic nasal discharge.

Definitive diagnosis is not frequently clinically important, as discussed above. PCR panels are available and can be performed on deep pharyngeal and conjunctival swabs if warranted. Because FCV and FHV-1 can be find in apparently healthy cats, it may be difficult to know the significance of a positive test result in a single cat with of signs of respiratory disease.

Treatment is focused primarily on supportive care; including broad spectrum antibiotics (Examples: Amoxicillin-clavulanate, doxycycline [must be compounded for use in cats], azithromycin), nutritional support and hydration support as indicated. Cleaning secretions and humidification can also be of benefit. In cats who develop ocular lesions antiviral topical ophthalmic can also be used. Antiviral medication (see table below), specifically famciclovir, has recently been recommended by ophthalmologists for cats with severe ocular lesions and may shorten the course of the disease although this has not yet been widely studied. Famciclovir is well tolerated by cats however the optimum duration of treatment is yet unknown. In a retrospective study by S. M. Thomasy et al. (2016) comparing outcomes when famciclovir was administered thrice daily to cats with presumed herpetic disease at approximately 40 (n = 33 cats) or 90 mg/kg (n = 26 cats). Median duration of therapy required for clinical improvement was significantly longer in cats administered 40 versus 90 mg/kg. Furthermore, the reduction in treatment duration with the higher famciclovir dose was estimated to decrease overall client costs due to a reduction in total famciclovir administered. L-lysine supplementation has been recommended, as discussed above, however there is conflict amongst studies regarding its benefit and the cost can vary significantly. Immune modulating interferon (human or recombinant feline) treatment has not shown any benefit.

After primary infection, reinfection is rare but FHV-1 however, all kittens that recover from acute FHV-1 infection are expected to become chronic carrier cats. Healthy appearing carriers maintained in the population serve as reservoirs and can spread virulent virus to susceptible kittens, as well as adult cats, through direct cat-to-cat contact or fomite contamination. Chronic carrier cats have a latent infection and shed the virus sporadically (versus the continuous shedding of FCV). Stress has been shown to induce shedding and recrudescence of clinical signs in carrier cats. FHV-1 is less stable in

the environment than FCV and susceptible to most disinfectants.

Vaccination against FHV-1 is discussed above as FHV-1 vaccines are most often combined with FCV vaccination.

Antiviral Drug	Mechanism of Action	Human Applications	Small Animal Applications
Acyclovir/ valacyclovir	Guanosine analogue; interferes with viral DNA polymerase and DNA synthesis. Activity requires viral TK.	Herpesviruses, especially HSV and varicella-zoster virus	Poorly effective against FHV-1
Penciclovir/ famciclovir	See acyclovir	Herpesviruses, especially HSV and varicella-zoster virus	FHV-1 infections
Cidofovir	Deoxycytidine monophosphate analogue. Activity independent of viral TK.	Systemically to treat cytomegalovirus retinitis; topically to treat papillomavirus infections	Topical treatment of FHV-1 ocular infections
Idoxuridine	Iodinated thymidine analogue. Interferes with viral DNA synthesis.	Topical treatment of HSV keratoconjunctivitis	Topical treatment of FHV-1 keratitis
Trifluridine	Fluorinated thymidine analogue. Interferes with viral DNA synthesis.	See idoxuridine	See idoxuridine
Vidarabine	Adenosine analogue. Interferes with viral DNA synthesis.	See idoxuridine	See idoxuridine

Feline Infectious Peritonitis

FIP is caused by feline coronaviruses, which are large enveloped positive-stranded RNA viruses and is an important cause of death in young cats, particularly in catteries and shelters. Seroprevalence of feline coronavirus is 25% in single cat households and 75 to 100% in multi-cat households. FIP can occur in cats of any age but is more prominent in those less than 3 years old, especially between 4-16 months of age. However, FIP can occur at any age and there is a secondary peak of incidence in geriatrics cats (> 10 years), possibly as a result of suboptimal immune function. Male and sexually intact cats have been predisposed in some studies and disease peak may exist in the fall and winter. There are two biotypes of feline coronavirus; the highly pathogenic FIPV and the feline enteric coronaviruses (FECV). FECV is ubiquitous in cats and typically causes a mild gastroenteritis. FIPV is a mutation from FECV which occurs within the intestinal tract of the infected cat during the initial infection when replication of FECV is very high. The mutation which causes affinity for replication in macrophages, allowing for systemic spread of the virus, has been identified however mutation still does not guarantee development of FIP. Chronic stress appears to increase the rate of FECV replication, leading to a greater chance of mutation.

These viruses are highly infective and the transmission route is fecal-oral. More than half, and as many as 100% of cats in environment with more than six cats, become infected with FCoV. However, even though the prevalence of infection in multi-cat household is high, fewer than 10% of cats from larger, multicast households ultimately develop FIP. Most infected cats shed the virus intermittently but some shed chronically and remain reservoirs for infection; this is particularly important in group settings. Some strains remain infective for several weeks in the environment however they are susceptible to most disinfectants. Clinical FIP is determined by virus levels, virulence factors and host factors. Host factors which may play a role, especially if present at the time of infection, include immunosuppression, overcrowding, stress and genetic factors. Purebred cats are at a higher risk.

FECV replicates in enterocytes (and especially colonic epithelial cell) and destroys the villus tips. Clinical signs may include mild fever, small bowel diarrhea, and vomiting. When FECV mutates to virulent FIPV it can multiply in macrophages and infected macrophages are deposited in the endothelial lining of small venules. This is a key point relating to the pathogenesis of disease. Because of the viruses associate with macrophages, systemic disease (FIP) is more likely to occur if the infected cat develops a strong humoral response to pathogenic FCOV and an ineffective cell-mediated immune response. The mutation may occur shortly after initial infection, or years later, which may explain why some indoors cats from single-cat household develop FIP several years after they are acquired. Clinical FIP is an immune-complex disease. With strong cell mediated immunity (CMI) the virus is eliminated or a latent infection occurs. If there is no CMI, pyogranulomatous vasculitis results. Tissue damage occurs due to an inflammatory response in perivascular locations initiated by antigen-antibody-complement complexes. Subsequently, pleural and peritoneal effusions may develop (wet form). If there is partial CMI, viral replication slows and granulomas form (dry form). The dry form can develop into the wet form.

General clinical signs of FIP include an antibiotic non-responsive fever, weight loss, anorexia and lethargy. Transient upper respiratory signs have been reported in some cats on initial infection with FCoV. Effusive FIP (wet form), dyspnea (due to pleural effusion), progressive, non-painful abdominal distention (due to ascites) and pericardial effusion are seen. No effusive FIP (dry form) any organ may be affected. Icterus, splenomegaly, renal failure, renomegaly, abdominal masses, coughing and/or dyspnea may be seen. Ocular involvement is commonly noted in the dry form and may cause anterior uveitis, retinal detachments and hemorrhage. Neurologic signs may include multifocal progressive signs such as ataxia, seizures, nystagmus, tremors, hyperesthesia, decreased proprioception and behavioral changes. FIP is one of the most common causes of neurologic disease in cats. Solitary intestinal masses can develop which may cause intestinal obstruction.

Clinicopathologic findings include a mild to moderate regenerative anemia, lymphopenia, and hyperproteinemia due to hyper-gammaglobulinemia (usually polyclonal gammopathy). Serum albumin to globulin ratio (A:G ratio) has good diagnostic value, and at values above 0.8, FIP is extremely unlikely. Azotemia, proteinuria, elevated liver enzymes and coagulopathy may also be observed and are the result of secondary organ damage. CSF analysis in cats with neuro signs may show hyperproteinemia, increased neutrophils and increased lymphocytes (however this is not consistent). Immuno-mediated glomerulonephritis has also been reported, and FIP always be considered in cats with protein-losing nephropathy, which is otherwise rare in cats.

FIP effusions have a higher diagnostic value than blood tests. The effusions typically have a very high protein content (>35 g/l) but a low cellularity (<5000 nucleated cells/ml), consisting primarily of macrophages and neutrophils, and are clear to yellow and may contain fibrin clots.
When sufficient cells are present, the presence of viral antigen in macrophages confirms the diagnosis with a very high positive predictive value (PPV). The A:G ratio can also be measured in effusions; this test has a high PPV if the ratio is <0.4 and a high negative predictive value (NPV) if the ratio is >0.8. The demonstration of feline coronavirus-specific is only meaningful when the titer is high (1:1600), whereas the absence of antibodies has a good NPV.

Serology (immunofluorescence, ELISA, rapid immunomigration), is commonly employed in the diagnosis of FIP however positive results only indicate exposure to feline coronavirus. Most tests can be run on blood as well as effusion. Negative antibody titer helps to rule out FIP as less than 4% of cats with FIP will have a negative antibody titer. There is still no test available to differentiate between strains and recent FIP vaccination can also result in a positive titer. Very high titers (1:1600)

in combination with other tests which suggest FIP indicate an increased likelihood of FIP, unless obtained from cats in an endemic environment. Positive CSF serology (>1:25) in cats with neuro signs may help to support diagnosis of FIP. Serology results should not be compared between laboratories due to different methodologies used. Real-time RT-PCR is a sensitive method to detect virus RNA in a variety of samples (feces, blood, effusions, and tissues) of feline coronavirus-infected cats and those with FIP; however, these still cannot differentiate between the biotypes.

The gold standard for ante-mortem diagnosis is histopathologic exam of biopsy specimens. Characteristic lesions are pyogranulomatous vasculitis. The most commonly affected organs are kidneys, brain and eyes; with liver and lungs affected less frequently. Immunohistochemistry can be used to demonstrate virus in these specimens. Immunocytochemistry on cells in CSF or effusion may help. A presumptive ante-mortem diagnosis can be made based on signalment, housing history, elimination of other differentials and a combination of clinic pathologic abnormalities.

FIP mortality rate is very high, >95%, once clinical signs develop. Survival time typically is 5-7 weeks post-diagnosis, although it varies from days to months. Supportive care includes SC/IV fluids, periodic thoracentesis, +/- antibiotics, anti-inflammatory and immunosuppressive medications (to help to suppress vasculitis). Parenteral and oral interferon (human and feline recombinant), as well antivirals, have also been used without proven benefit.

In multi-cat households that are seropositive, the goal is to control fecal contamination, stress, fomite transmission and other disease. Cats are grouped at lower numbers (<10) with one litter box for 2 cats. It is recommended to keep cats in stable groups of 3-4. Isolating kittens with the queen for 4-6 weeks then separating them from all adult cats can prevent infection with coronavirus. Testing and removal is not possible due to the inability to differentiate between FECV and FIPV. The prevalence of high frequency shedders in a cattery is the most significant risk factor for FIP incidence, so eliminating these cats could help control disease. These cats are detected by serial RT-PCR evaluation of fecal samples. Cats must be positive for > 8 consecutive months. Seropositive cats usually become seronegative within 6 months-1year unless exposed to other infected cats.

Pfizer has developed the only FIP vaccination, which is called Primucell FIP®. Vaccination is controversial as humoral immune response has been implicated in the pathogenesis of the disease. The vaccine is a temperature sensitive mutant given intranasal that replicates locally and, because of its temperature sensitivity, cannot spread beyond the upper respiratory tract. In seronegative cats, this may decrease the incidence of FIP to some degree, but one field study showed no significant reduction in the incidence. Vaccination has led to ADDE experimentally, but not in the field. Currently its use is only recommended in select situations and it is only given to seronegative cats. Two doses 3-4 weeks apart are given to cats older than 16 weeks, then yearly boosters. Unfortunately, in a cattery situation, 50% of kittens will have already been infected by 16 weeks of age. The ideal candidate for vaccination would be an uninfected cat going to a cattery, shelter, or multi-cat household where litter box sharing is likely.

Feline Leukemia Virus (FeLV)

FeLV is an enveloped RNA retrovirus. The virus is fragile, surviving a maximum of 24-48 hours at room temperature, and is rapidly inactivated by disinfectants, soaps and heating. There are 4 primary strains of FeLV ("A," "B," "C," and "T"). FeLV-A is the most abundant subtype and is responsible for transmission of the virus between cats. Vaccination against subgroup A virus induces immunity to infection with all subgroups. FeLV is transmitted through salivary contact, including mutual

grooming, shared food and water bowls, sexual contact, and potentially vertical transmission (it has been referred to as the “lover’s disease” versus FIV which is the “fighter’s disease”). Transmission is orinasal, the virus then replicates in oral lymphoid tissue, infects circulating mononuclear cells, enters systemic lymphoid centers, epithelial tissues and bone marrow. The virus is shed in saliva, tears, urine and feces and cats can shed virus for months to years. Transmission may also occur through reuse of instruments, blood transfusions and possibly fleas.

FeLV susceptibility varies with age and immune status. Maternal antibodies help protect kittens up to 12 weeks of age from infection. After infection, around 70+% of neonates, 30-50% of kittens aged 8-12 weeks and <10-20% of immunocompetent adults cats become persistently viremia. The prevalence is currently around 3.5% nationwide but may be higher in certain populations (catteries). Cats with access to the outdoor; those that have contact with other cats; cats that are male, aggressive, or intact; and cats that are co-infected with FIV are at increased risk of infection. Adults cat are more likely to be infected with FeLV than cats younger than 6 months, the median age of cats infected with FeLV is 3 years.

The outcome of infection depends on: 1) the infectious dose 2) immune status 3) age of the cat and 4) virus strain. Clinical signs include malaise, lymphadenopathy and cytopenias. The virus may be eliminated at or before this stage. Cats with an inadequate immune response may appear healthy but develop persistent viremia and shedding (regressive form). FeLV related diseases may occur months to years later.

Most persistently infected cats (progressive form) die within 4 years and typically die within months of developing clinical signs. In some cats, viremia is followed by latent bone marrow infection. Viral DNA inserts into the host genome and replication is suppressed by antibody. ELISA, IFA and virus isolation on the blood and marrow are negative. These cats are not infectious. Most latently-infected cats eventually eliminate the virus. Less commonly cats develop hematopoietic malignancy months to years later. Cats that have recovered from FeLV are 60-fold more likely to develop cancer than cats never infected. And FeLV-negative cats that live with cats that test positive for FeLV antigen are more than 40-fold increase risk of lymphoma compared to tat expected without exposure to FeLV. Redevelopment of persistent viremia can occur with immunosuppression. Mediastinal lymphoma is the most common type in FeLV-infected cats (80% are FeLV+). Multicentric, renal, spinal and alimentary lymphoma can also occur. FeLV induced leukemia is usually acute and may be granulocytic, erythroid, lymphoid or megakaryocytic. Despite the name of the disease, leukemia is less common than lymphoma or anemia. Pancytopenia may occur due to marrow infiltration, myelodysplasia and myelofibrosis. Anemia (90% of FeLV-associated anemia are nonregenerative) may result from lymphoma, leukemia, chronic disease and immune-mediated destruction. Because these animals are immunosuppressed they are predisposed to bacterial, viral, protozoal and fungal infections. Other, less common, clinical manifestations include infertility, gastrointestinal signs, neurologic signs and peripheral lymphadenopathy.

Diagnosis is made by antigen detection using ELISA and IFA. FeLV diagnosis relies on antigen testing (p27 core antigen) by ELISA and/or IFA. ELISA is the screening test of choice and is sensitive, cheap and rapid. In-house kits are often used. Sensitivity and specificity are about 98%. ELISA+ cats should be retested 3 months later as there are 2 potential outcomes. They may eliminate the virus or become persistently infected. As an alternative, an IFA can be performed to verify the result. Cats that are IFA+ are persistently infected. IFA checks for viral antigen within cells and can be done on blood or marrow. ELISA+/ IFA- cats may be in the process of eliminating the infection.

They should be retested in a few months. Saliva and tear ELISA's are less sensitive and specific. The newly arrived cat FeLV-negative with unknown origin, should be retested 3 weeks later to difference cat that is truly FeLV negative among others that have a primary stage of infection in which the virus is not yet in the blood but is in the lymph nodes.

Treatment is non-specific and supportive including blood transfusions, antibiotics, glucocorticoids (may further suppress immune system) and chemotherapy for LSA (survival is usually several months to rarely up to a couple of years). Cats with acute leukemia rarely respond to chemotherapy. A variety of antivirals and immunomodulators have been used with questionable efficacy.

Management of the healthy, viremic cat includes warning owners about the potential for spread to other cats in the household. Before removing a FeLV+ cat, all cats in the household should be tested. All cats in the household should be kept indoors to minimize risk of infection to other cats and introduction of other diseases. In catteries, test and removal programs have been successful. A sample protocol would be to test all cats and separate the positive from negative cats. Then, close the cattery and perform routine disinfection. Retest after 3 months and remove positive cats. Retest all cats every 3-6 months. Test, isolate for 3 months and retest all new introductions.

There are several commercially-available vaccines including whole killed vaccines, disrupted virus vaccines and gp70 subunit vaccines. Vaccines are not completely protective as vaccinated cats have developed FeLV. Vaccination is only recommended for FeLV negative cats. AAFP recommends administering FeLV vaccines to all kittens but considers the vaccine to be non-core for cats after their 1 year booster unless they are at risk of exposure. 19–22 Risk of exposure to FeLV is defined as access to outdoors, living with known FeLV-infected cats, or living in a multiple-cat environment where the status of all cats is not known. Vaccination of all kittens is recommended because a kitten's status (indoor versus outdoor, low risk versus high risk) may change, and susceptibility to persistent infection is believed to be highest in kittens. A single booster vaccination should be administered 1 year later for previously vaccinated cats. The AAFP Advisory Panel recommends that for cats at high risk of infection (eg, spending most of the day outdoors, in contact with infected cats, multiple-cat homes where the status of all cats is not known, etc), a booster vaccination may be administered yearly. Cats at low risk of infection (eg, households with small numbers of cats, cats with limited outdoor access), a booster vaccination may be administered every 2 years. Vaccinating older cats is controversial because of age related resistance. Vaccination does not interfere with testing for FeLV. As with any adjuvant vaccination, there has been association with vaccine-associated sarcomas.

Feline Immunodeficiency Virus

FIV is a lentivirus (enveloped RNA virus), in the same family as HIV, which causes a chronic infection culminating in immunodeficiency. Unlike feline leukemia virus (FeLV), kittens do not appear to be more susceptible to infection than adults. The virus is present in the saliva of infected cats, and FIV infection is most likely to occur in male cats and free-roaming cats, reflecting efficient transmission by bite wounds. Transmission via sustained contact among infected and uninfected cats, as with FeLV, may also occur. In addition, in utero and lactogenic transmission to kittens from queens may occur, especially if the queen is experiencing high levels of viremia. Experimentally, queens can be infected via semen, but it is unknown how important this mode of transmission is in nature.

Prevalence of FIV varies across North America according to gender and age, but is highest in middle-

aged intact males. There does not appear to be significant breed predilections. The average prevalence in North America is ~4.6%, though there is significant regional variation.
The mean age at diagnosis is 6-8 years (80% of cats are over 2 years of age). Retrovirus survive only few minutes outside of the host and are very susceptible to disinfectant.

FIV infects CD4+ cells, CD8+ cells, B cells and macrophages. Some strains can infect cell types such as astrocytes. Clinical signs are related to gradual immune system dysfunction as well as FIV-induced neoplastic disease. There are several stages to the course of disease, which begins with replication in lymphoid and salivary tissues causing a peak viremia in several weeks; during which cats may experience mild "flu-like" symptoms (fever, lethargy, anorexia, and diarrhea) which often go unrecognized. This is followed by an asymptomatic phase that may last months to years during which cats have a slow decline in the number of CD4+ cells and the CD4+/CD8+ ratio. They may experience mild systemic inflammation, lymph node dysfunction, and mild to moderate immunosuppression which manifests as intermittent diarrhea and fever, mild hematologic changes, and being more prone to secondary infections (such as URIs and fungal disease) and certain cancers (lymphoma). They may also have delayed wound healing, lymphadenopathy, and in extreme cases stomatitis or encephalitis. When CD4+ cell numbers decrease below a critical level (<200 cells/ul in humans), the immune system begins to fail and viremia becomes more pronounced. This is the terminal phase and is associated with fAIDS. This phase may last months to years and some cats never develop terminal disease.

FIV diagnosis uses **antibody** testing. The most common form of testing is an ELISA. It is important to note that this test will record positive in animals exposed to FIV, as well as those vaccinated. Cats may take 1-2 months to test positive after exposure so a negative cat may need to be retested 60 days later to confirm negative status. Kittens under 6 months of age should not be tested, as there may be interference from maternal antibodies leading to false positives. Because of the low prevalence of FIV and the high sensitivity of the test, a negative. ELISA result should be considered truly negative. False negatives are very rare (except in the case of animals tested too soon after exposure). Despite the very high specificity of the ELISA test, FIV is a rare enough disease that false positives are common. Any positive result should be confirmed with further testing (PCR or Western Blot). Conflicting results should be confirmed by the third testing type. Vaccinated cats may still test Western Blot positive, while they are unlikely to be PCR positive.

Treatment of FIV is primary supportive through management of secondary infections and keeping cats indoors to prevent exposure to other diseases. Antibiotics and antivirals can be used to control most infections. Immunomodulatory therapy (corticosteroids or interferon) has been used for stomatitis and dermatitis. Antiretroviral medications have been used with varying efficacy to treat some conditions, usually stomatitis and encephalitis. Cats in fAIDS crises may be treated with an antiretroviral, however, prognosis remains poor. AZT (zidovudine) has been the most successful. Cats with bone marrow suppression should not be treated with zidovudine. Most FIV-infected cats treated with zidovudine for as long as two years tolerated the drug well. The hematocrit can decline within three weeks of initiating treatment to approximately 50% of baseline but increases afterwards in most cases, even without discontinuation of treatment.

There are medications that are contraindicated in retroviral infection. The most commonly used medication being Cyclosporine (Atopica) which should be avoided (all cats who are candidates for cyclosporine therapy should have retroviral screening) as it may lower T-cell counts too far and cause severe immunosuppression. Corticosteroids are often indicated in FIV+ cats; however,

immunosuppression may occur at lower-than-normal doses. Vaccination for other conditions should be performed only as necessary as there are reports of FIV+ cats developing vaccine associated disease with the use of modified-live vaccines (especially calicivirus).

An inactivated vaccine for FIV is available (Fort Dodge); however, it is not fully protective. The vaccine is made from FIV strains A and D, may have up to 80% efficacy against these strains.

Efficacy against other strains (which vary by region) ranges from 0-50%. The introduction of this vaccine generate controversy, because (1) exciting serologic assays cannot differentiate between natural infection or vaccine, (2) vaccination provide only partial protection from infection, (3) PCR assay results cannot be relied upon in vaccinated cats. However, vaccination against FIV could be recommended for cats at high risk of exposure, such as outdoor cats or cats living with FIV infected cats. When FIV vaccination is appropriate, a three-dose primary series is administered, with the first dose given as early as 8 weeks of age. Annual revaccination is recommended subsequent to the initial series if the risk of infection continues. Vaccinated animals will test ELISA+ indefinitely after vaccination. Transmission of FIV is reduced when cats are housed indoors. When one positive cat is identified in a household, all other cats should be tested and no new cats should be introduce, as this time lead to conflict and increase fighting behavior.

Viral Disease Affecting Dogs

Canine Infectious Respiratory Disease (CIRD)

Formerly referred to as infectious tracheobronchitis, CIRD is an acute, highly contagious disease of dogs that is caused by one or a number of viruses and bacteria. Most of the pathogens are insufficient in themselves to cause serious disease without the additional stress and high contact rates and multiple viral and bacterial pathogens work sequentially and synergistically to cause CIRD. The following agents have been implicated with the most commonly ones identified in **bold:**

Viral:
Canine parainfluenza virus (CPiV)
Canine respiratory coronavirus (CRCoV)
Canine adenovirus-2 (CAV-2)
Canine herpes virus -1
Canine influenza virus (CIV)
Canine distemper Virus (CDV)
Pneumovirus (CPnV)

Bacterial:
Bordetella bronchiseptica,
Mycoplasma cynos
Streptococcus equi subsp. *zooepidemicus*

The most common mode of transmission is dog-to-dog contact and outbreaks are most common in high-stress, high-density environments, such as pet stores, boarding and grooming facilities, sporting events, shelters and veterinary hospitals. Aerosolized respiratory secretions and fomite spread may also be important, depending on the pathogen. Clinical signs usually develop one to three days post-exposure (can be up to ten days), although this is pathogen-specific. Pathogen shedding varies with

infectious agent; viral agents typically shed for three to thirteen days post-infection, H3N8 CIV viral shedding ceases after approximately seven days, canine distemper virus (CDV), canine adenovirus 1 (CAV-1), *B. bronchiseptica* and *Mycoplasma* can be shed by recovered dogs for weeks to months.

Clinical signs develop because viruses and/or bacteria colonize the upper respiratory tract, trachea, bronchi, bronchioles and pulmonary interstitium. The milder clinical signs are typically seen with single virus infections. Co-infection of other viruses and bacteria tend to create the more severe clinical signs. Signs may be mild with a self-limiting cough or more severe (especially in puppies) with fever, lethargy, anorexia, gagging, retching, pneumonia, mucopurulent to purulent nasal and ocular discharge. Death is uncommon but can occur.

Diagnostic testing is indicated if affected dogs are not responding to supportive care or if dogs are showing systemic signs of disease. Diagnostic testing is also indicated in the face of an outbreak. A definitive diagnosis helps guide effective treatment plans and control measures; however, it is important to note that many of the pathogens can be found with some frequency in normal dogs (especially in high-density environments) so isolating the same pathogen from multiple dogs is used to raise the index of suspicion. Ideally, acutely affected dogs should be sampled prior to treatment. Collection of specimens from multiple dogs (at least 5–10) may increase the chance of positive test results and identification of the true causative agent. Several diagnostic tests are available, but sensitivity and specificity will vary depending on the pathogens involved, the location of sample collected, and the timing of collection. Diagnostic options include culture and sensitivity, serology, virus isolation, polymerase chain reaction (PCR), and histopathology. Culture and sensitivity is primarily useful for bacterial pathogens that demonstrate antimicrobial resistance (example, *Strep. zoo* can carry doxycycline resistance genes). Serology's use is limited due to standard vaccination; however, it is useful for CIV diagnosis in naïve populations. Virus isolation is uncommonly used and is primarily useful in identifying CIV. PCR testing is the most practical option for viral detection and respiratory PCR panels are available from most commercial laboratories. False positives can result from recent vaccination with a modified live virus and some laboratories now offer quantitative real-time PCR results that can help differentiate vaccination from field strain infection.

Treatment is primarily supportive. Antibiotics are given to address secondary bacterial infections in dogs with mucopurulent to purulent nasal or ocular discharge or evidence of pneumonia. Doxycycline is a good first choice in the absence of antimicrobial susceptibility results because of its efficacy against *B. bronchiseptica* and its good penetration of lung tissue. Remember, doxycycline is bacteriostatic, and in cases of more severe infections and pneumonia, bactericidal antibiotics are indicated. Glucocorticoids have been used at anti-inflammatory doses short term (up to 5 days) to help control cough in dogs that do not have evidence of pneumonia however they do not shorten the course of disease. Concurrent use of glucocorticoids with bacteriostatic antibiotics is not recommended. Antitussives are not recommended due to retention of pathogens that should be expectorated. Methylxanthines (aminophylline, theophylline) have limited use as bronchospasm is not a typical feature of CIRD. Nebulization of mucolytic agents or glucocorticoids does not appear to be beneficial, but aminoglycosides are effective against *B. bronchiseptica* when nebulized. Stimulation for barking should be minimized as should tracheal stimulation for collars. Hydration and nutritional support should be initiated as necessary. Oxygen supplementation may be required in severe cases.

Maternal antibodies to Canine adenovirus-2 (CAV-2) and Canine parainfluenza virus (CPiV) are absent by 16 weeks of age. Maternal antibodies to CAV-2 may interfere in puppies up to 16 weeks of

age whereas maternal antibodies to CPiV may interfere up to 6 weeks of age. Maternal immunity for *B. bronchiseptica* is unknown. Dogs that have been infected by the viruses may be immune from reinfection for 1 year. Dogs may be immune from reinfection of *B. bronchiseptica* for 6 months. There are numerous vaccines available for the dog that protect against the major components of CIRD. According to the *2018 AAHA Canine Vaccination Guidelines*, CDV and CAV-2 vaccines (along with canine parvovirus) are core vaccines. Non-core vaccinations include CPiV (usually in combination w/ core vaccines), *Bordetella bronchiseptica* (parenteral (inactivated) or intranasal/oral (live avirulent)), CIV, *Bb* + CPiV ± CAV-2 (combination intranasal vaccine). Intranasal vaccines have the advantage of being able to be administered to puppies 8 weeks or less (as early as 2 weeks vs. 6 weeks for parenteral) because maternal antibody does not interfere. Vaccination 3 to 5 days prior to exposure is required for intranasal vaccines to be effective. Duration of immunity following vaccination to CAV-2 and CPiV are at least 3 years but duration of immunity to *B. bronchiseptica* is 3 to 10 months which explains recommendations to booster every 12 months. Parental vaccines may result in local irritation or granuloma formation and require a booster 3 to 4 weeks following the first vaccination. Intranasal vaccines that contain live, attenuated *B. bronchiseptica* can cause sneezing, coughing and nasal discharge.

The prognosis is good with most dogs developing mild self-limiting signs. Complicated pneumonias carry a more guarded prognosis, especially in young dogs. Infected dogs should be isolated and the premises disinfected. Bear in mind that high pressure washing can aerosolize pathogen particles and further spread the disease therefore low pressure washing with standard disinfectants is indicated. As with any highly contagious disease, these dogs pose a risk to other hospitalized dogs so their hospitalization should be limited and appropriate precautions taken to prevent spread.

Canine Influenza

Canine influenza is caused by an RNA virus, a type A Orthomyxovirus which originated as a mutated form of equine influenza virus and is now widespread in pet dogs across the continental USA. Peak viral shedding precedes clinical signs, making the prevention of transmission difficult. Additionally, H3N8 CIV has a shorter incubation period than other causes of CIRD. Historically, there has been regular CIV activity in the NE USA, as well as CO, TX, Las Vegas, and CA. CIV is highly infectious and morbidity rates can be as high as 60–80%. In 80–90% cases, dogs present with mild upper respiratory signs, but in 10–20% cases, severe lower respiratory tract signs are observed and co-infections can be identified. Mortality rates are very low for single-agent infections with CIV but can occur, especially with co-infections. A new strain of CIV (H3N2) was isolated from Chicago in early 2015. The strain is closely related to H3N2 Asian influenza strains and can infect both dogs and cats. There have been no documented feline cases in the USA.

Transmission is via aerosolization and fomites (including people). The virus incubates in 2 to 5 days and about 80% of infected dogs develop clinical signs but all infected dogs shed the virus for 7 to 10 days after the incubation period. Signs are similar to CIRD and may be mild or severe. The majority of dogs develop a cough that may last 3 weeks and is unresponsive to antibiotics and cough suppressants. The cough may be dry or moist. Purulent nasal discharge is common and is secondary to bacterial infection by opportunistic bacteria. Fever is also common. Occasionally dogs will develop tachypnea and dyspnea. In addition, consolidation of lung lobes may be seen.

Ante mortem diagnosis is most often made via serologic tests. Diagnosis of CIV can be made by PCR or virus isolation only in the early stages of infection before viral shedding ceases; antibody testing is required after viral shedding stops. Antibody titers will begin to rise 10 days after infection.

Commercially available PCR panels can detect a wide range of CIRD pathogens from nasal or oropharyngeal swabs, including CIV. False negative PCR results can occur when the specimen is taken after viral shedding has ceased which is common because shedding ceases by seven days after infection. The Cornell Animal Health Diagnostic Center offers virus isolation testing for both H3N8 and H3N2 CIV. CIV infection can also be diagnosed through Hemagglutination Inhibition (HI) testing for anti-CIV antibodies. Antibodies appear as early as 7 days after development of clinical signs. This test relies on submission of paired serum specimens to demonstrate a rising convalescent titer two to three weeks after the initial titer. It is still important to view titer results in light of the animal's history and clinical signs.

As with other viral respiratory diseases, treatment is supportive to include antibiotics for secondary bacterial infections as well as maintaining hydration and nutritional status. Antiviral agents do not appear effective with this disease. Even though infection has a high morbidity rate, the mortality rate is less than 8%. Zoetis currently manufactures separate killed vaccines against CIV H3N2 and H3N8. They are labeled for vaccination of healthy dogs as an aid in the control of disease associated with canine influenza virus infection. Vaccine selection should be based on the CIV endemic in the region and/or emergent outbreak strain. For initial vaccination, two doses are given 2 to 4 weeks apart. This vaccine can be administered to puppies as young as 6 weeks of age. Annual boosters are required. Vaccination for this infection is considered non-core and recommended for individuals at risk of exposure. The virus is susceptible to quarternary ammoniums and bleach. Suspects should be isolated and handled accordingly.

Canine Distemper Virus

CDV is a morbillivirus in the Paramyxoviridae family of viruses. It is a single-stranded RNA virus, enveloped in a lipid outer membrane that is easily disrupted by any disinfectant with detergent activity. Transmission is via inhalation of aerosolized secretions from an infected animal or contact with infected fomites. CDV replicates in lymphoid, nervous, and epithelial tissues and is shed in respiratory and conjunctival exudates, feces, saliva, vomitus, and urine of infected animals for 7 to 10 days, although some dogs shed virus for up to 60 to 90 days post infection. The virus is engulfed by macrophages and carried in the lymphatic system to lymph nodes in the pharynx and lungs, as well as to the tonsils. The incubation period can last between 1 and 3 weeks after exposure. Signs are reflective of CDV's epithelial tropism and secondary bacterial infections of these tissues occur as a result. Severity also appears to be related to the host immune response. Young and unvaccinated dogs are at the highest risk although outbreaks have been reported in vaccinated animals.

CDV infected dogs typically present with fever, lethargy, anorexia, and dehydration. Respiratory signs may include ocular and nasal discharge (mucopurulent to purulent), dyspnea and cough. GI signs may include anorexia, vomiting and diarrhea. Neurologic signs may include blindness, months to years after the initial infection. CDV infection is one of the most common causes of seizures in patients under six months of age. Hyperkeratosis of the foot pads, 'Hard pad', and nasal planum are more chronic signs. Enamel hypoplasia may also occur in young patients.

CDV may cause a lymphopenia and thrombocytopenia. Radiographs may initially show a diffuse interstitial pattern that develops into a bronchial or alveolar as secondary bacterial or extensive necrosis occurs. Eosinophilic inclusion bodies can be found in infected cells (WBC, RBC, epithelial cells). The gold standard for diagnosing CDV infection is reverse-transcriptase polymerase chain reaction (RT-PCR) testing, which can be performed on any tissue sample. Urine is a good sample for RT-PCR, as the virus may persist longer in urine than in other tissues. Immunofluorescent assay

techniques (IFA) can be performed on respiratory and genitourinary tissue; lymphoid tissue (tonsils); CSF; or conjunctival scrapings. Titers may also be performed and should consist of paired samples taken while the animal is sick and again during recovery.
Treatment is supportive and focused mainly on preventing secondary bacterial infection. Intravenous fluids, antiemetics, prokinetics and nutritional support may be necessary for GI signs. Systemic antibiotic therapy is indicated if bacterial pneumonia develops. Anticonvulsants may be necessary for neurologic signs. Isolation of infected individuals is important to prevent spread to other patients in the hospital via aerosolized secretions.

CDV vaccination is considered a core vaccine. Vaccination is protective and in puppies begins at 6 to 8 weeks of age then every 3 to 4 weeks until 14 to 16 weeks of age followed by revaccination at one year then every 3 to 5 years. In adults, a single dose of MLV is given with a booster at 1 year then every 3 to 5 years.

The prognosis is guarded for acute CDV infection. Acute encephalitis carries a poorer prognosis.

Infectious Canine Hepatitis
Infectious canine hepatitis results from adenovirus-1 infection (related to adenovirus-2 a cause of kennel cough). The virus can be inactivated by heat and iodine-based disinfectants. Exposure is via the oronasal route. The virus moves to tonsils, regional LN, via hematogenous spread then to numerous tissues. During acute infection, the virus is present in all body secretions and continues to be shed in the urine for up to 9 months.

The virus has a predilection for the liver, attacking the Kupffer cells, as well as endothelial cells. Hepatic necrosis, endothelial damage and DIC are sequelae. Glomerulonephritis and anterior uveitis with corneal edema (blue eye) have also been reported. Most infections are subclinical however severe cases can result in death. Clinical signs vary but may include fever, anorexia, hepatomegaly, DIC, jaundice, and abdominal pain with or without effusion.

There are several tests specific for infectious canine hepatitis (IgM, IgG, and ELISA). On a serum chemistry profile, the liver enzymes usually are elevated (ALT, AST, ALP, and GGT). Hypoglycemia, hypoalbuminemia, and bilirubinuria may also be observed secondary to liver failure.

Vaccination is typically part of a multivalent modified live vaccination for dogs along with distemper and parvovirus and follows the same protocol.

Viral Disease Affecting both Dogs and Cats

Canine Parvovirus and Feline Panleukopenia Virus
Canine parvovirus (CPV) infection is a common, highly contagious disease that may be fatal. Feline panleukopenia is less common than canine parvovirus infection. These are tiny, resistant non-enveloped DNA viruses that survive months, and sometimes over a year, on inanimate objects. They are resistant to most disinfectants apart from bleach (1:30 dilution) and glutaraldehyde (requires 10 min contact time). CPV has a high capacity to mutate and CPV-2c differs by a point mutation (Glu-426) in the DNA chain. Most susceptible dogs and cats are exposed to and infected by these viruses in their first year of life. Newer strains of CPV-2 may now be causing many cases of feline viral enteritis, which are being increasingly recognized. FPV does not infect dogs. Transmission is fecal-

oral via exposure to feces, vomit or virus persistence on fomites. CPV-2 and FPV are shed a couple of days before clinical signs and shedding continues for a maximum of 6 weeks after recovery (usually 2-3 weeks). CPV-2 enteritis is of highest incidence in the summer.

Most infections with CPV-2 and FPV are subclinical. With CPV-2, puppies 6 weeks to 6 months of age are most susceptible due to declining maternal antibody, parvovirus preference for rapidly dividing cells and concurrent presence of intestinal parasites. Rottweilers, Dobermans, Pit Bull terriers and German Shepherds are at increased risk. With FPV, the highest morbidity and mortality is in unvaccinated kittens aged 3 to 5 months. Fading kitten syndrome may also occur. Once ingested the virus incubates for 4 to 14 days for CPV-2 and 2 to 10 days for FPV. The virus then replicates in oropharyngeal lymphoid tissues. Viremia develops and then the virus spreads throughout the body selectively damaging rapidly dividing cells in particular, the GI epithelium (crypt cells), thymus, lymph nodes and bone marrow (neutropenia, lymphopena). Translocation of intestinal bacteria can result in septicemia, endotoxemia and DIC. Puppies who are infected in-utero or up to 8 weeks of age and may develop viral myocarditis. Infection of queens early in gestation may result in infertility, resorption or abortion. Kittens infected late in gestation or early in the neonatal period may have damage to the developing neural tissues (especially the cerebellum), optic nerve and retina. The most common lesion in these cats is cerebellar hypoplasia.

Clinical signs may include lethargy, decreased appetite, vomiting, diarrhea and abdominal discomfort. Rapid dehydration may occur. Pyrexia and leukopenia may be evident. Some animals develop secondary intestinal intussusceptions. Sudden death may occur within 1 to 2 days of illness usually due to gram negative sepsis, shock and DIC. Chronic diarrhea may persist occasionally in dogs and cats due to extensive bowel damage and secondary fibrosis. Canine myocarditis may be associated with sudden death or congestive heart failure. Some kittens in a litter may show cerebellar signs once they reach 2 to 3 weeks of age (ataxia, intention tremors, in coordination, broad-based stance). These kittens can be acceptable pets. Forebrain damage may result in seizures and behavioral changes. Neurologic signs in dogs with parvovirus enteritis may result from hypoxia due to myocarditis, intracranial hemorrhage (DIC) or hypoglycemia.

Signalment, vaccination history, clinical signs and leukopenia are suggestive. Leukopenia does not occur in all cases. Severe GI signs and leukopenia can also occur with other GI infections, especially salmonellosis. The most common test used is an in-house fecal ELISA assay for CPV-2 antigen (also detects some FPV). It is very sensitive and specific. False positive results could occur 5 to 12 days after vaccination (with modified live vaccine). Negative results do not rule out infection. CPV-2 is often not present in the stool up to 5 to 7 days after onset of illness. Virus isolation can be performed on feces or tissues. Jejunum, ileum, mesenteric LN and other lymphoid tissues are best. Parvoviruses cause hemagglutination, therefore inhibition of hemagglutination by serial dilutions of antibody can be used to measure the antibody titer to CPV-2. Virus neutralization and ELISA assays are also available to detect antibodies. In-house antibody tests have been developed to CPV-2 and their primary use is to decide whether to vaccinate animals in which vaccination may not be desirable.

Treatment for CPV typically consists of hospitalization, hydration and nutritional support. Electrolytes, glucose and total protein are monitored. A recent study showed early enteral nutrition via naso-esophageal tube 12 hours after admission resulted in earlier clinical improvement and significant weight gain compared with using NPO until vomiting had ceased for 12 hours. Antimicrobials should be given to treat possible sepsis. Ampicillin or cephalosporin may be sufficient for uncomplicated cases. Gram negative coverage can be increased in severe cases with

enrofloxacin or gentamicin. Deworming and treatment for Giardia may be indicated once GI signs improve.

CPV vaccination is considered a core vaccination in dogs. Maternal antibody interference is the primary cause of vaccination failure. Modified live vaccinations produce higher titers more likely to overcome maternal antibody interference at an earlier time point. With current canine parvovirus vaccines, there is now only a short period (few days to 2 weeks) where maternal antibody can interfere with vaccination (i.e. window of vulnerability). In order to be fully protective, the final booster must be given when the animal is at least 14–16 weeks age. MLV vaccines replicate in the GI tract and are shed in feces but are safe. Killed CPV-2 vaccines produce a weaker response. They should not be used in contaminated environments because the window of vulnerability is too great. Confining puppies until 1 week after the last vaccination helps to minimize exposure during the window of vulnerability. Immunity generated by MLV vaccines is of long duration so after the initial vaccination series, boosters should be repeated every 3 years.

In susceptible cats, MLV vaccine is given at 6 to 8 weeks then every 3 to 4 weeks with final booster between 14–16 weeks of age. Initial vaccine series is boostered every 3 years. Initial vaccination in adult cats consists of the MLV vaccine is given twice 3 to 4 weeks apart then every 3 years. Inactivated products are indicated for pregnant queens, colostrum-deprived kittens <4 weeks of age, and immunosuppressed cats.

Rabies

This is an enveloped RNA virus that can infect any mammal and is quickly inactivated by heat, sunlight and disinfectants. Different strains affect raccoons, bats and skunks and when these strains infect mammals other than their common hosts, death occurs. Typically, infection is via a bite but aerosolization is possible. Occasionally in humans the source is unknown and has even occurred as a result of organ transplantation. In Oregon, Washington, and Idaho, bats are the only reservoir species, and other animals (notably bat predators such as foxes or cats) are only rarely infected as "spillover" from rabid bat populations. In other parts of the U.S., skunks, raccoons and foxes are important reservoirs in addition to bats. In many other parts of the world, dogs and other carnivores are the primary reservoirs and dogs account for the most human exposures worldwide. Wildlife rabies has been increasing and dog and farm animal rabies decreasing in the US, thanks to mandatory vaccination and reporting protocols. Raccoons account for most feline exposures and there have been more cases of rabies in cats than dogs in the last 20 years.

The virus incubates for weeks to up to 2 months in dogs and cats and time it takes to show clinical signs can vary depending on location of the bite wound. Replication begins locally at the site of the bite and then the virus travels to the neuromuscular junction, the peripheral nerves and finally to the forebrain. The virus then causes death or moves to other peripheral nerves and tissues (including salivary glands). Studies have established that, in dogs, shedding begins at most 3 days before signs occur; in cats, it is 1 day before. Shedding may persist until the animal dies, which is typically within a few days. Little or nothing is known about the shedding period in other species. The rationale for a 10-day confinement period for dogs, cats and ferrets rests on this observed interval between viral shedding and onset, padded by a healthy margin of safety.

Animals may exhibit one or all three of the phases: prodromal, furious/excitative and paralytic/dumb. During the prodromal phase mild fever, behavioral and voice changes may be noted. During the "furious" phase excitability, photophobia, hyperesthesia, aggression, pica, drooling, muscle tremors

and incoordination may occur. Seizure, coma and death can also occur during the furious phase. The so-called “dumb” phase is characterized by reclusive behavior, salivation, anorexia, a startle response to sudden noise or light exposure and irritation around the site of the bite, resulting in frequent licking and biting of the area. In the paralytic phase cranial nerve paralysis can occur and death within 2 to 4 days from respiratory muscle paralysis. Rabies should be a differential for any acute behavioral change or flaccid paralysis. Suspects should be handled VERY cautiously with appropriate personal protective equipment and public health authorities should be contacted.

MLV vaccines were associated with post-vaccinal rabies in some cats, so dog and cat rabies vaccines in the US are now inactivated. These have been associated with a higher incidence of allergic reactions and vaccine-associated sarcomas (1:5000 cats), which can occur months to years after vaccination. Purevax® (Merial) is a non-adjuvanted, recombinant rabies/Canarypox vaccine that expresses immunogenic rabies proteins in the host and is thought to be less likely to contribute to vaccine-associated sarcoma formation. In dogs and cats the first vaccination is given at no less than 3 months of age, followed by a booster one year later, then every 1-3 years depending on the vaccine and the local regulations. Except for Purevax® (above), 1-year vaccinations are not recommended. Rabies vaccines should be given parenterally in the right rear limb. One injection does not give adequate protection. Booster vaccinations should be given when vaccination history is uncertain. Vaccinated animals should be boostered after suspected exposure to rabies.

If a domestic animal is bitten by a wild animal that cannot be tested, that wild animal is considered to be rabid. Bite wounds should be washed under pressure with large amounts of warm soapy water, a QUAT compound, and/or ethanol solution and the following situations considered. Immediate copious lavage is the best way to reduce viral load at the site of the bite and prevent local viral replication.

Dogs and cats bitten by rabies suspects are handled differently depending on vaccination status and local public health policy. If an unvaccinated dog, cat or ferret has known contact with a known rabid animal, the bitten animal should be humanely euthanized under direction of the local public health authority (always consult with them before euthanizing an animal for rabies). If the owner will not permit this, the animal must undergo a supervised quarantine for 6 months, with the vaccine administered either as soon a quarantine starts or 1 month prior to release. A dog, cat or ferret with a current rabies vaccination that has had a known contact with a rabid animal should be revaccinated and confined at home for 45 days (indoors, in a fenced yard, or on a leash at all times).

All animal bites inflicted on people should be reported to local public health officials. Quarantine protocol differs among counties, even within the same state, so it is prudent to stay in contact with public health offices and stay abreast of local policies so you can relay accurate information to owners. Typically, if a healthy, vaccinated dog or cat has inflicted a bite the pet is confined and observed for 10 days, especially if the bite was unprovoked. Again, these bites still require reporting and the quarantine will be followed by a public health official. If the pet is unvaccinated local policy may require the animal to be euthanized and tested or quarantined for 10 days in an approved quarantine facility; this will be at the discretion and guidance of local public health authorities. If the animal is a stray it is typically euthanized and tested, regardless of presence or absence of neurologic signs. Any illness or neurologic signs in quarantined animals should immediately be reported to public health officials.

Rabies should be a differential for any acute behavioral change or flaccid paralysis. Suspects should

be handled VERY cautiously and public health authorities should be contacted. When rabies suspects are euthanized the head should be submitted refrigerated (not frozen) for histologic diagnosis in which Negri bodies (eosinophilic viral inclusions) are seen within neurons. Fluorescent antibody testing is more sensitive and is also done on the brain.

Bacterial Disease Affecting Dogs

Ehrlichiosis
Anaplasmosis
Lyme Borreliosis

Ehrlichiosis
Caused by a bacterium, ehrlichia, that affects dogs, cats, goats and humans. Ehrlichiosis is found worldwide. The two most common are *E.canis* and *E.* ewingii. The incidence of *E. canis* is highest in tropical and subtropical regions. The vector is *Rhipicephalus sanguineus,* commonly called the brown dog tick or kennel tick. The organism is transmitted only from larva to nymph to adult within the tick. Jackals, foxes, and sometimes coyotes then act as a reservoir host. Transmission requires 24-36 hours of tick attachment. German shepherds tend to be more susceptible and the prognosis may be poorer. Common clinical signs appreciated include fever, lethargy, inappetence, weight loss, mucosal hemorrhages, uveitis, pallor, edema and occasionally neurological signs. Indirect immunofluorescent assays (IFA) is considered the gold standard for diagnosis and antibodies can be detected within 7 - 28 days after the initial infection however, if dogs have a false negative result, PCR assays may be used with retesting in 2-3 weeks to evaluate seroconversion.

E. ewingii is primarily found in south-central and southeastern United States. The vector is *Amblyomma americanum,* commonly called the lone star tick. Common clinical signs appreciated include fever, lethargy, inappetence and signs of polyarthritis. When performing diagnostic tests, serological testing is performed via ELISA assay and common laboratory finding are non-regenerative anemia and thrombocytopenia. Doxycycline is the first choice in treatment. Improvement is usually noted within the first 24-48 hours. Treat for 4 weeks. Prevention consists of routine inspection for ticks, topical ectoparasiticides and/or amitraz collars.

Anaplasmosis
Caused by a bacterium, *Anaplasma phagocytophilum* (granulocytic anapasmosis) and *Anaplasma platys* (thombocytotropic anaplasmosis). *A. phagocytophilum* is distributed within the United Stated and Europe. The strain within the United States affects dogs, cats, horses, camelids and humans whereas the European strain affects ruminants. Within the United States, *A. phagocytophilum* is most widespread in the upper Midwest, northeast and western states. The mode of transmission is through tick vectors, mostly the *Ixodes ricinuspersulcatus* complex tick. Dogs and cats can become infected only after being exposed to infected nymphs or adult ticks which have been attached for 36-48hours. Common clinical signs include fever, lethargy, inappetence, lameness and GI upset. Diagnosis relies on history, clinical signs, laboratory findings, serology and often PCR. The treatment of choice is doxycycline for 2 weeks with clinical improvement seen within 24-48 hours. Prevention consists of inspection for ticks, topical ectoparasiticides and/or amitraz collars. Routine prophylactic use of antimicrobials to prevent disease is NOT recommended.

Lyme Borreliosis
Caused by a spirochete, *Borrelia burgdorferi,* that affects dogs, cats, horses, cattle and humans. The incidence is highest in New England, the upper Midwest and mid-Atlantic States. There is a smaller endemic focus on the west coast. The vector is *Ixodes scapularis* (Midwest) and *I. pacificus* (West coast). Uninfected tick larvae feed on small rodents. The nymphs feed on mice or larger mammals

such as dogs, humans and deer. Adults feed on large mammals. Ticks acquire infection at any stage and are most likely to acquire infection from the white-footed mouse *Peromyscus leucopus*. Transmission requires 48 hours of tick attachment. The spirochete replicates and migrates away from the tick bite site through connective tissues. Persistent infection is then established.

Most cases of Lyme disease are subclinical. In endemic areas seropositivity may be as high as 85% but only 5-10% of infected dogs show signs. Some seropositivity may result fromnonpathogenic spirochetes. Signs result mainly from the host's inflammatory reaction. In dogs, erythema migrans (cutaneous rash seen in man) does not occur. Signs of arthritis, fever, lymphadenopathy and anorexia occur several months after tick exposure. A small percentage of dogs may be susceptible to a severe, treatment-resistant arthritis. Dogs may also develop a severe protein-losing nephropathy with anorexia, vomiting, lethargy and profound weight loss. Golden Retrievers and Labs seem predisposed. Co-infection with *Anaplasma phagocytophilum* may occur (i.e. canine granulocytic ehrlichiosis).

Diagnosis can be difficult as clinical signs and laboratory abnormalities are nonspecific. Joint taps reveal a neutrophilic arthritis. Culture from symptomatic animals is diagnostic, but expensive, can take 6 weeks and is insensitive. Skin biopsies can be useful from around the tick bite site. PCR has variable sensitivity. Antibody titers can be run but seropositivity does not mean a dog's signs are due to the spirochete. Paired titers are needed for definitive diagnosis. Vaccination results in false positives using ELISA and IFA. Western Blotting can be used to discriminate between natural infection, vaccination and "dual status". The IDEXX SNAP 3Dx test uses an ELISA that detects antibody against the C6 antigen. This antigen is only expressed during active infection and so will only be positive with natural infection.

Doxycycline is the first choice in treatment. Improvement is noted within the first 24-48 hours. Treat for 4 weeks. Relapse can occur but most cases respond to a second course of antibiotics. The infection is probably not ever completely cleared. NSAID's may also be used. Immunosuppressive doses of glucocorticoids should be avoided.

Prevention consists of inspection for ticks, topical ectoparasiticides and/or amitraz collars. Routine prophylactic use of antimicrobials to prevent disease is NOT recommended. The risk of humans acquiring infection after a deer tick bite in an endemic area is <2%. Vaccinations do not provide absolute protection. There are 2 vaccines available for dogs: a bacterin and a recombinant OSPA (outer surface protein A) subunit vaccine. Allergic reaction can occur with the bacterin vaccine but the risk is low. Concern exists that vaccination may induce autoantibody formation leading to arthritis or glomerulonephritis. Limit vaccination to outdoor, hunting or field trial dogs in endemic areas. Vaccinate before the tick season and never use the vaccine as a substitute for tick control.

Salmon poisoning

Caused by *Neorickettsia helminthoeca*, which belongs to the Anaplasmataceae family and is a gram-negative, obligate, intracellular bacterium. Salmon poisoning affects dogs, foxes, coyotes, raccoons, and occasionally captive bears. The incidence of infection is restricted to coastal regions. In the United States this includes Washington, Oregon, and northern California but can also be seen in southern British Columbia, Canada. The vector is a trematode (fluke). Transmission usually occurs when the encysted trematode metacercariae from uncooked freshwater fish is ingested by dogs. Once ingested the trematode matures and attaches to the mucosa of the GI tract where it injects the organism so it can be shed through the feces for 60-250 days. After a few months, miracidia develop

and penetrate snails which release cercariae intermittently. These cercariae swim around and then are ingested by fish. Once ingested they encyst as metacercariae and the process begins again.

Common clinical signs can range in severity and include lethargy and GI upset such as inappetence, vomiting, diarrhea or weight loss. The incubation period can be anywhere from 2-33 days but most commonly these signs are appreciated within the first 2 weeks post ingestion. On physical exam more than 70% of dogs will have a fever and peripheral lymphadenopathy. Diagnosis can be difficult as clinical signs and laboratory abnormalities are nonspecific. However, a compilation of history, PE findings, and diagnostic results should guide you. PCR and fecal floatation are used to confirm the diagnosis of salmon poisoning. A fecal floatation to look for eggs has >90% sensitivity and 100% specificity. Eggs typically appear within 5-8 days post ingestion. Eggs are light brown, ovoid, and operculated.

Treatment of choice is doxycycline, tetracycline, or oxytetracycline for a minimum of 1 week. Clinical improvement typically occurs within 24 hours with clinical signs resolving in 1-4 days. If dogs are severely affected close monitoring and hospitalization will be required. In general, the earlier treatment is started, the better the prognosis. Without appropriate treatment, death can result within 5-10 days. Animals that recover from one strain of salmon poisoning are immune to reinfection of that same strain but can be infected with another strain.

At this time there is no vaccine available. Prevention involves appropriate handling and cooking of infected fish. Discouragement of ingested raw fish in endemic areas is recommended. Careful monitoring of dogs swimming in areas with freshwater fish, especially salmon, is critical due to the variability and severity of clinical signs.

Endoparasites

Roundworms – Ascarids
Toxocara canis and *Toxocaris leonina* are the roundworms found in the dog. *Toxocara cati* and *Toxascaris leonina* are found in cats. *Baylisascaris procyonis* is an ascarid of raccoons that is occasionally found in dogs. *Baylisascaris procyonis* occurs in raccoons across the U.S. and Canada, with the highest prevalence in the midwestern and northeastern U.S. and along the west coast. *T. canis* can undergo transplacental transmission. *T. canis* and *T. cati* are also transmitted in the milk. Infection can also occur by ingestion of ova or other hosts. Almost all puppies are born infected with *T. canis* and produce eggs by 3 weeks of age. Signs are typically seen in young animals and include vomiting, diarrhea, weight loss, dull coat and failure to thrive. Occasionally intussusception and intestinal obstruction can occur. Diagnosis is made on routine fecal flotation. Pyrantel, fenbendazole, pyrantel/febantel, milbemycin oxime, moxidectin and praziquantel are all effective. Puppies and kittens should be dewormed with pyrantel pamoate at 2, 4, 6, 8, 12 and 16 weeks of age then at 6 month intervals. The lactating bitch or queen should also be treated. Zoonosis is a concern with visceral larval migrans in children.

Hookworms
Ancylostoma caninum is the most common hookworm in the dog and *A. tubeforme* in the cat. *A. braziliiense* occurs in dogs in the southern US and *Uncinaria stenocephala* in the Northern US and Canada. Infection occurs transplacentally, transmammary, via ingestion of the third-stage larvae or ingestion ofother vertebrate hosts with infective larvae in their tissues. Infective larvae are often in the dirt and grass of contaminated areas. Clinical findings include vomiting, dark and tarry diarrhea

(melena), weakness, pale mucous membranes, dehydration, anemia and poor growth. Cutaneous larval migrans also occurs in dogs and cats (hookworm dermatitis).
Diagnosis is made by identification of ova in feces. Treatment is as described for roundworms although some animals need supportive therapy to keep them alive until the drugs can kill the worms. Pyrantel pamoate is the treatment of choice for infected puppies. All dogs in an infected environment should be treated and feces should be removed from the premises promptly. Prophylactic treatment in puppies and kittens can begin at 2 to 3 weeks of age. Hookworms can cause visceral and cutaneous larval migrans in man.

Tapeworms
Dipylidium caninum is the most common tapeworm of the dog and cat. The flea or, more rarely, lice is the intermediate host. *Echinococcus granulosus* uses dogs as a definitive host (no signs) and humans as definitive hosts (important zoonosis). Very rarely heavy infestations of *D. caninum* have been associated with diarrhea, weight loss and failure to thrive in dogs and cats. *D. caninum* can cause anal pruritis. Proglottids may be noted on the perineum or egg capsules demonstrated in the feces. Treatment is with flea control, fenbendazole, pyrantel/febantel +/- praziquantel, praziquantel alone and epsiprantel. Praziquantel is the treatment of choice.

Strongyloides
Strongyloides stercoralis can affect young puppies. Infection is via ingestion, transmammary and skin penetration. Hemorrhagic enteritis can occur and may result in death. Baermann funnel technique or fresh smears are performed for larvae. Treatment is with thiabendazole, fenbendazole or ivermectin. Dogs with diarrhea should be promptly isolated from dogs that appear healthy. It is a potential zoonosis particularly if the person is immunosuppressed.

Whipworms
Trichuris vulpis is reported in the dog. *T. serrata* and *T. campanala* occur in the cat (rare in domestic cats in North America). Infection is oral fecal. Infected ova are ingested, hatch in the small intestine and larvae migrate to the cecum and colon where they attach to the wall. Clinical signs reflect host response. Dogs may be asymptomatic or develop large bowel diarrhea often streaked with mucus and fresh blood. Anemia and hypoproteinemia may also develop. Dogs may also develop pseudo-hypoadrenocorticism in which hyperkalemia, hyponatremia and hypochloremia can occur. Diagnosis is made by identification of ova on fecal flotation. Ova may be shed intermittently and missed on fecal examination. The organism is susceptible to fenbendazole, febantel/praziquantel, milbemycin, ivermectin/pyrantel pamoate, milbemycin oxime and moxidectin. Repeat treatment at 3 weeks and 3 months.

Ectoparasites

Fleas and ticks do occur in the Willamette Valley. Our current protocol for flea and tick control consists of administration of Revolution® given monthly beginning in May through October and Frontline Plus® from October through April. Revolution® will combat heartworm as well as external parasites in the heartworm susceptible months. Alternating with Frontline Plus® will help avoid/delay the development of resistance in fleas and ticks. We will also be offering additional types of flea and tick preventative including Capstar®, Program®, Advantix® and Advantage®.

Ticks

There are hard (ixodid) and soft (argasid) ticks. Soft ticks are found in the southern US and often colonize the external ear canal where larva and nymphs feed off the lymph in the ear canal. Hard ticks are more likely to be parasitic and spread disease. *Rhipicephalus sanguineus*, the brown dog tick, can transmit babesiosis, anaplasmosis*, E. canis, F. tularensis* and cause tick paralysis. *Dermacentor variabilis*, the American dog tick, can transmit RMSF, tularemia, anaplasmosis and cause tick paralysis. Ticks may cause anemia as all stages feed on blood and lymph. Treatment options are manual removal and topical insecticides. Exercise care when manually removing to ensure the whole tick is removed. Fipronil (Frontline®) kills all parasitic stages of ticks within 48 hours of application and has residual activity for one month. Fipronil kills ticks before they attach and has residual activity for 1 month. Amitraz collars (Preventic® collar) are also helpful in causing ticks to detach as well as prevent attachment. There are various dips and sprays that can also be used. Caution should be exercised in cats with these products as some cause serious side effects. The premises can also be treated with malathion, diazinon or chlorpyrifos.

Fleas

Ctenocephalides felis is the most common flea of the dog and cat. *Ctenocephalides canis, Echidnophaga gallinacean* and *Pulex irritans* may also infest the dog. The flea is an obligate parasite of the dog and cat and infestation is by contact with an infested environment (not directly from another animal). Fleas thrive in moist, warm environments. They can survive on a host for up to 100 days but will die within 2 to 4 days off the host. Fleas serve as an intermediate host for tapeworms so ingestion of an infected flea can lead to infection with tapeworms. Annoyance and pruritus are common complaints. Heavy infestations can lead to iron deficiency anemia and death, particularly in young animals. *Ctenocephalides felis* can transmit *Rickettsia typhi, Rickettsia felis, Bartonella henselae, Dipylidium caninum* and *Acanthocheilonema (Dipetalonema) reconditum*. Flea allergy dermatitis is caused by hypersensitivity to antigenic material from the salivary glands of fleas.

Treatment of fleas consists of treating the pet (adult stage composes 5% of total population) and environment (eggs, larvae and pupa consist of 95% of total population). Lufeneron (Program®) is an insect development inhibitor given monthly that inhibits chitin synthesis. Chitin is essential for egg and larval development thus this product prevents eggs from hatching and flea larvae from maturing. Lufeneron does not kill adult fleas so it is best used in conjunction with an adulticide (Frontline®, Advantage®). It will take 1 to 3 months to benefit from full effects.

Lufeneron is available with milbemycin oxime (Sentinel®) to control fleas and heartworm. This product can be used in puppies and kittens form 6 weeks of age.

Fipronil (Frontline®) is an adulticide applied monthly for fleas in cats and every 3 months for dogs. Fipronil is a GABA inhibitor. GABA is an essential neurotransmitter in the CNS of fleas. It kills all fleas within 24 hours. Fipronil has no effect against eggs or larvae. The spray can be used in puppies form 2 days of age and kittens 7 weeks of age. The topical can be used in puppies 10 weeks and older and kittens 12 weeks and older.

Imidacloprid (Advantage®) is also an adulticide applied monthly that binds nicotinic receptors and disrupts nerve transmission. This product kills all fleas within 24 hours but has no effects on eggs or larvae. It can be used in puppies 6 weeks and older and kittens 8 weeks and older.

Nitenpyram (Capstar®) is an oral tablet that kills adult fleas within several hours. It can be administered as frequently as once daily and to puppies and kittens as young as 4 weeks of age. Best used with longer-acting products.

Selamectin (Revolution®) is a monthly avermectin that affects chloride channels in fleas. This product kills adults and prevents eggs from hatching. It is also used to prevent heartworm infection, control ticks (*Dermacentor variabilis*), ear mites and *Sarcoptes scabei*. In cats it may also treat hookworm and roundworm infections. This product can be administered in puppies and kittens 6 weeks and older.

Flea collars with insect growth inhibitors are also available (methoprene, nylar-permethrin). Some are adulticides but others only affect eggs and larvae.

It is also important to treat the environment. Insect growth inhibitors can be used to render eggs and larvae non-viable (e.g methoprene, fenoxycarb). Environmental adulticides include permethrin, carbamyl, chlorpyrifos, diazinon and malathion. There are also newer treatments including borate used on carpet and Interrupt® (a nematode that kills flea larvae/pupae in grass and soil). The premises should be treated every month until there is no evidence of fleas then every 3 to 4 months. Steam cleaning and routine vacuuming can also assist in the decrease of the environmental burden.

C. Felis can transmit many zoonotic agents including cat scratch disease (*B. henselae*), murine thyphus (*R. typhi*), flea-borne typhus (*R.felis*) and tapeworms (*D.caninum*). Ingestion of infected fleas by children can result in development of adult *D. caninum* (tapeworm).

Summary of parasiticides

Primarily Endoparasiticide

Drug Name	Ingredient(s)	Activity	Species	Other
Strongid-T	Pyrantel pamoate	A, H	D, C	5-10mg/kg
Panacur	Fenbendazole	A, H, W, T, G	D, C	50 mg/kg x 3 d
Droncit	Praziquantel	T, D	D, C	Not in < 4 wks
Drontal	Praziquantel Pyrantel pamoate	A, H, D, T	C	Not in < 4 wks or < 1.5 lb
Drontal Plus	Praziquantel, pyrantel Febantel	A, H, W, D, T	D	Not in < 3 wks or < 2 lb
Heartgard Plus	Ivermectin Pyrantel pamoate	A, H, HWM	D	HWM
Feline Heartgard	Ivermectin	H, HWM	C	HWM, not < 6 weeks

Sentinel	Milbemycin oxime Lufeneron	A, H, W	D	Fleas, HWM, not in < 4 weeks, not in < 2 lb
Ivomec	Ivermectin	S	D, C	200µg/kg, repeat in 2 weeks, not in collies
Tribrissen	TMZ	coccidia	D, C	15 mg/kg PO BID x 7 d

Primarily Ectoparasiticide

Revolution	Selamectin	A, H (cat)	D, C -dogs:>6 weeks -cats:>8 weeks	Fleas, HWM, Dermacentor, Otodectes (cat), Sarcoptes
Advantage II	Imidacloprid Pyriproxifen		D **No cats**	Fleas
Advantage Multi	Imidacloprid Moxidectin	A, H, W (dog)	D, C	Fleas, HWM, Otodectes (cat)
Advantix	Imidacloprid Permethrin Pyriproxifen		D> 7 weeks **No cats**	Fleas, ticks, biting lice, mosquitos
Capstar	Nitenpyram		D, C -dogs: >4 weeks and >2lb -cats: >4 weeks and >2lb	Fleas, Works in 30 mins, can be used daily
Frontline	Fipronil		D, C > 8 weeks	Flea, tick, chewing lice
Frontline Plus	Fipronil S-methoprene		D, C > 6 weeks	Fleas, ticks, chewing lice
Program	Lufeneron		D, C > 8 weeks	6 mo injectable for cats
Easy Spot	Fipronil		C> 8 weeks	Flea, tick, chewing lice
Parastar	Fipronil		D	Flea, tick, chewing lice
Promeris dog	Metaflumizone, amitraz		D	Flea, ticks, scabies

Milbemite	Milbemycin oxime		C	Ear mites
Trifexis	Spinosad/milbemycin	HWT, H, R, W	D **No cats**	Flea
Promeris	Metaflumizone		C	fleas
Vectra 3D	Dinotefuran, permethrin, pyriproxifen		D **No cats**	Flea, tick, moquitoes
Simparica	Sarolaner		D	Flea, ticks
Nexgard	Afoxolaner		D	Flea, ticks
Bravecto	Fluralaner		D	Flea, ticks
Activyl	Indoxacarb, permethrin (TickPlus)		D, C (no tick)	Fleas, ticks (TickPlus)

A = ascarids, H = hookworms, W = whipworms, T = Taenia, D = Dipylidium caninum, G = giardia, S = strongyloides, HWT = heartworm

Small Animal Critical Care Rotation (VMC 797)

Course Coordinator: Dr. Thandeka Ngwenyama, DVM, DACVECC

Course Goal: The overarching goals of this rotation are for fourth-year veterinary students to develop the knowledge, skills and attitudes necessary to care for critically ill patients and become active members of the care team in the ICU setting. This rotation is a mixture of hands-on patient care experience, topic rounds and participation in a series of simulation exercises to enhance clinical learning.

Core Competencies:

1.) Patient care: Students must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.
2.) Medical knowledge: Students must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social–behavioral sciences, as well as the application of this knowledge to patient care.
3.) Practice-based learning and improvement: Students must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning.
4.) Interpersonal and communication skills: Students must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with clients, their families, and health professionals.
5.) Professionalism: Students must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.
6.) Systems-based learning: Students must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.

Learning Objectives:

• The ability to perform routine technical procedures, including, at a minimum, venipuncture, inserting an intravenous (IV) catheter, placing a nasogastric tube, inserting a foley catheter, closing a wound, applying a bandage, and interpreting cardiac monitoring and electrocardiography.
• The ability to interpret the results of commonly used diagnostic procedures.
• The ability to recognize patients with immediately life-threatening cardiac, pulmonary, or neurological conditions, regardless of etiology, and the ability to institute appropriate initial therapy.
• The ability to recognize and outline an initial course of management for patients with serious conditions requiring critical care.
• The ability to communicate effectively, both orally and in writing, with owner, peers, nurses, house officers, faculty, and other members of the healthcare team with whom students must exchange information while carrying out their responsibilities.

Dress Code:

Students should wear clean scrubs, a white lab coat (in case of client interaction) and a name tag. The lab coat is protective clothing, and you can expect it to get soiled. Please have an extra clean lab coat and pair of scrubs available. Your shoes should be comfortable. Athletic shoes are acceptable if they are clean and in good condition. You may not wear jeans, open- toed shoes, or sports/beach attire at any time.

Personnel And Organization:
The hospital service rotation provides after hours care for the small animal services. These services include cardiology, internal medicine, oncology and surgery. These services, their students, interns, residents and faculty have primary case responsibility.

Professional Conduct:
As representatives of the veterinary profession, it is important to maintain not only a professional appearance but demeanor as well. The student must consistently demonstrate appropriate behavior in all settings when in the veterinary teaching hospital and interacting with faculty, staff, fellow students, clients and the general public. Inappropriate behavior should be reported to a technician house officer or faculty member immediately and may result in lowering of grade (including failure) and assignment of additional duties/shifts.

Rotation Schedule:
The rotation will begin Monday evening at 11:59PM and end the following Sunday morning at 9 AM. after rounds. Shifts will generally run from 12 AM to 9 AM. Please read through the rotation handbook and complete the self-guided orientation module and quiz on the Canvas site before your shift. The first shift will start at 12 AM Tuesday morning (or midnight on Monday) and the last shift will start at 12 AM Sunday morning (or midnight on Saturday).

ICU Rounds:
Goals: (1) to communicate the patient's present status to the entire team (patient-centered) (2) to establish patient-specific treatment goals and anticipate patient outcomes based upon anticipated response to treatment and (3) to provide educational value to the veterinary team by eliciting team members' perspectives to share clinical pearls and pitfalls

Assessment:
Oral presentation is accurate, organized and concise. Areas of continued deliberate practice: organization of presentations, being more concise in presentations, focusing on the key patient specific elements of a presentation, including more pertinent positives and negatives, better highlighting the key active issues, communicating areas of uncertainty, and modifying presentation based on audience, amount of time, purpose, and specialty.

The oral case presentation serves as a surrogate assessment of your ability to perform an accurate history, physical examination, to analyze and synthesize relevant clinical data, and to formulate a well-thought-out treatment plan. From an educational standpoint, your case presentations allow the instructor to gauge your understanding of the case. The ability to present a case in a clear, concise, and organized fashion is a skill which requires deliberate practice. Regarding your presentation, your instructor generally has two fundamental goals. The first will be to focus on patient-related issues to better understand what is wrong with the patient. The second will be to ascertain your understanding of the case to focus his or her teaching points better. Your instructor will be asking you questions that are patient care centered and diagnosis driven. Educators will ask questions to further clarify specific aspects of the case such as onset, location, duration, quality, aggravating or alleviating factors, and the like. Your instructor may also ask you direct questions to better access your knowledge base. "What antibiotics should we use to treat this patient?" "What is the differential diagnosis for fever or sinus tachycardia?" Alternatively, your teacher may inquire about your overall assessment of the case by asking you, "What do you think is wrong with the patient?" or "What diagnostic studies should we order?" Questions such as these are higher order questions and explore your clinical reasoning and problem-solving abilities. It is common for assessment-oriented case presentations to

be used in the ICU setting and during transitions of care. These presentations have a different focus than standard or traditional case presentations. When using an assessment-oriented presentation style, the directed opening statement should include the patient signalment, diagnosis or diagnostic impression, trajectory of disease, followed by a treatment plan.

How: (Approach for AM rounds)

a. Determine order of patients (unstable patients first, patients ready for discharge, new admissions, watcher patients, stable patients)
b. *Overnight student to start*:
    i. Who is the patient? (signalment, diagnosis/main problem list, # days in hospital, progress- improving, plateau, deteriorating)
    ii. Lab data (don't just read off numbers, interpretation and using semantic qualifiers- opposing, often paired descriptors that can be used to compare and contrast diagnostic considerations), culture data
    iii. Imaging (look at radiographs yourself and make your own interpretation, echocardiogram, CT-scan, MRI, point of care ultrasound- POCUS)
    iv. Events overnight (patient care)

    Assessment:
    Communication is system-based. To ensure that each patient undergoes a comprehensive evaluation each day, ECC think—and communicate—in terms of systems. Using a modified version of Kirby's Rule of 20- these typically include neurological (including pain and sedation management); pulmonary; cardiovascular; renal, fluid, and electrolytes; gastrointestinal (GI), nutrition, and metabolic; hematologic and infection issues; and immunosuppression. Another mnemonic we can use to remember is: Systems A to M: airway, breathing, circulation, disability, exposure (including skin, secondary survey if trauma, temperature), fluid/ renal, GI, Haematology, Infection; lines, labs (and other investigations), medications, micro-organisms

    i. Systems based approach:
        1. Respiratory: (airway patency, RR and character; oxygenation- SpO2, PaO2, oxygen supplementation, FiO2; ventilation-PaCO2; arterial blood gas data)
        2. Cardiovascular: (hemodynamic status- BP, HR, rhythm (ECG), peripheral pulses, evidence of ischemia; interventions to adjust preload, contractility and afterload; antiarrhythmic therapy)
        3. Neurological: (pain and anxiolytic management- type/route of medications, pain scale score, Modified Glasgow Coma Score (MGCS), intracranial pressure, seizure control)
        4. Renal/Fluid/Electrolytes: (fluid balance- net input and output balance, weight, volume status, electrolytes, BUN/Creatinine, UA)
        5. Gastrointestinal/Metabolic/Nutrition: (metabolic- glycemic control; RER, nutrition-route/rate/composition of nutritional support; GI integrity-use of prokinetic or anti-emetic agents, prophylaxis against GI bleeding)
        6. Hematologic: (Bleeding risk- Red cell count/coagulation parameters, transfusion requirements- cross match/type, thrombotic risk and prophylaxis)
        7. Infectious/immunosuppression: (temperature, findings suggestive of infection on P.E., C&S results, infectious disease control, procedures to diagnose and/or control infection, antimicrobial regimen- escalation, de-escalation)
c. Primary service (intern/resident, student): Plan (short and long-term, exit strategy)
d. Recommendations (Criticalist, ICU nurses)

Patient Management Goals:

- Provide excellent patient-centered care and be attentive to the needs of patients.
- Readily accept responsibility for patients and provide timely attention to all aspects of the patient's needs: medical condition, hygiene, treatments, comfort and mental well-being.
- Understands the principles of triage and assessing and monitoring critical patients. In the management of critical patients, is able to respond in emergency/crisis situations as part of a team to assess the patient, make diagnostic and treatment recommendations, and provide immediate care.
- Compassionate patient care is your first priority. Be proactive and available to help the ICU staff at all times and with any task. All patients admitted to the ICU and in the wards should be placed in a clean, appropriately sized cage. Animals should be placed on grates or absorbent bedding as indicated. All patients should have an id neck band with the case number, name of patient (first and last) and date. A cage card should be completed and placed on the cage with a patient sticker, the name of the clinician, the student's name and the presenting complaint or diagnosis. There are laminated tags available to hang on the cages for special instructions. The animal's belongings and medications are placed in a designated, labeled box. All medications and supplies necessary for treatment must be in the ICU or wards and accessible to the student prior to the treatment time.

PROFESSIONAL DEVELOPMENT:

Professionalism

Goal: Demonstrates all aspects of professionalism in interactions with others. Areas of deliberate practice: compassion and respect for patients and clients, balancing personal and patient care needs, interactions with other members of the health care team, dependability in fulfilling responsibilities, timeliness, utilizing feedback to improve performance and recognizing one's own personal limits and when to seek assistance

Interprofessional interactions

Goal: Interacts appropriately with different health professionals based on their role in the care of an individual patient. Areas of continued deliberate practice: contributing within one's role to optimize care and team functioning, understanding of the roles of health professionals, respecting and appreciating team members, ask more clarifying questions when uncertain and listen more carefully.

This is a clinical rotation, so you should take every opportunity to learn from the cases that are in ICU. While working in the intensive care unit it is expected that students will devote their time to the care of animals in the small animal teaching hospital. Any additional time should be utilized to maintain the intensive care unit or for educational purposes related to veterinary medicine.
There is no food or drink permitted in the ICU or laboratory area at any time.

Take the opportunity to hone your clinical skills by conducting your own physical exam of each patient. It is recommended that at the beginning of each shift you make an assessment of all patients in the wards and ICU. Your initial assessment (hands-on or utilizing the patient record) might include an evaluation of mentation, mucous membranes, pulse quality, heart and lung sounds as well as activity level.

Review the patient's history, presenting complaint/problem, and diagnostic findings, then use this information to develop your own problem list, diagnostic plan, and therapeutic strategy. Familiarize yourself with the patient's condition so you understand what to monitor and why.

Look at the monitoring equipment and make sure you are familiar with its operation. If there are any specialized diagnostics or therapeutics (chest tube, abdominal lavage catheter, jugular catheter) the patient might have, make sure you are comfortable performing these diagnostics or therapeutics. Assessments in compromised or aggressive animals may be minimal and if there is any concern please contact the supervising house officer or faculty.

If there is few or no cases in the ICU, use this time to review or learn about Emergency or Critical Care Topics that you are interested in. Regardless the type of practice you pursue, you inherently will deal with some type of emergency at some point in your career.

An essential part of your professional development is learning to be an active participant in the learning process. Be proactive and do not hesitate to bring up topics of interest for discussion. Also, do not always settle for "the way it has always been done", but rather pursue the evidence behind why we do things the way we do. Feel free to ask any question; however, be prepared that in response to your question that a question may be asked of you. This approach is designed to explore the scope of your knowledge and to help you, if possible, to find the answer within your own knowledge base. Whatever, gaps in knowledge remain, we will do our best to fill in or at least provide you with the references needed to fill those gaps in. Don't hesitate to let us know if you have different information on the subject. We try to provide you with the references for our statements, whenever we can, so that you can check it out for yourselves. Students sometimes think that a teacher will be offended if the student has more or better information than the teacher. This is not the case on this service, as none of us thinks we know everything.
Instead, we appreciate that medicine is continually revolving and, therefore, we welcome novel and better information and experience. However, be prepared for us to ask you for references for your information just as we are ready to provide them for you.

HOSPITAL RECORDS:
All medical records of ICU patients are to remain in the ICU. Records for animals in the wards are in the wards. The ICU patients will have signed (by clinician), completed orders (including an emergency drug sheet and resuscitation orders) upon admission to the ICU and daily by 8 am. Animals in the wards will have ward sheets that are also signed and completed. If they are incomplete then you can contact the student, intern, resident or faculty member responsible for the case. Please review all orders prior to your shift to make sure you understand them and obtain clarification if necessary. ICU students will be responsible for recording treatments and observations on orders sheets as well as procedures and supplies on the ICU charge sheet. Any additional paperwork (lab work, radiology reports, etc.) may be maintained in the appropriate section of the medical record. The ICU student is not responsible for maintaining SOAP's in the patient's medical record.

FACILITY:
A clean, quiet, well-organized hospital is crucial to adequately care for our patients. Every effort should be made to maintain a clean organized hospital. Noise and traffic should be kept to a minimum. Only individuals with a case in the ICU (students, faculty, and staff) or students and staff working in the ICU should be present in the ICU. Food or drink should remain in designated areas. Basically, no food or drink should be placed and/or consumed where animals or laboratory specimens are housed. This includes ICU and the laboratory area.

It is important to remember that animals carry diseases contagious to man, man may harbor disease that can put animals at risk and animals may have diseases that pose a risk to other animals. The easiest way to think of how you should maintain hygiene is to think of the animal and his cage as a single environment not to be contaminated by or contaminate the area outside the cage. What goes in should be clean and what comes out should not contaminate the environment. You will wash your hands after EVERY patient contact. You will wear clean gloves with every patient upon entering a cage and remove the gloves upon exiting before closing the cage door so as to not contaminate the environment. When a patient is out in the ICU and contaminates the environment (e.g. use tabletop for treatment, urinates/defecates in the ICU) the environment should be disinfected adequately to maintain cleanliness and minimize contamination. If you are accessing communal areas (medication drawers, bandage material, scrub containers, etc) make sure you are not carrying contaminants with you (dirty gloves, unwashed hands, dirty scissors, etc).

COMMUNICATION WITH CLIENTS AND VETERINARIANS:

During the rotation you will likely need to contact the student, intern, resident or faculty member on a case. The ICU orders will have contact numbers in the list of order they should be contacted. The individuals listed should respond promptly (within 10 minutes). If they fail to respond please contact the next individual listed. There are certain questions that can be answered by students (clarification of orders, location of equipment or supplies needed for treatments, etc) but others should be addressed by interns, residents or faculty. If there is any change in status of a patient then the intern, resident or faculty should be contacted.

Client and referring veterinarian communications will be handled by the service in charge of the case. Students on the emergency medicine rotation should not advise owners of specific changes in patients or comment on the treatment of animals to the owner. Instead, students should contact the supervising clinician. A faculty member, resident or intern may occasionally ask you to contact an owner or veterinarian and the emergency medicine student may do so if comfortable.

Any questions the ICU student may not be able to answer, or should not discuss with the owner, should instead be answered by the supervising clinician. Students should contact the faculty member, resident or intern before communicating with the owner or referring veterinarian.

When calling a clinician call the number left on the orders first. Leave messages if there is no answer. There is a list of phone numbers posted in the ICU with alternate means of contact (cell phone, pager, etc). If a clinician has not returned your call in 10 minutes and you need assistance please, call the intern on duty. The schedule for interns is posted outside ICU in the corridor between ICU and radiology.

If you are contacting an owner please identify yourself as follows, “Hello, this is (name) from Oregon State University’s College of Veterinary Medicine, I am calling regarding…..” Please record all communications with owners and veterinarians in the electronic medical record.

Patient Visitation:
Owners may wish to visit with their animals during their hospitalization. Visits should be scheduled by faculty, residents or interns and a member of that service must be present. Visits are not the responsibility of ICU personnel. Visits should take place out of the ICU if possible. Visitation within ICU should take place only with animals in which movement from the ICU would be detrimental to their condition. If the visit is in ICU it must be approved by ICU personnel and should be limited to 15 minutes. Visitation hours are M – F from 10 am to 6 pm and Saturday and Sunday from 10 am to 8 pm. Please remember that patient and client information is confidential so other cases should not be discussed with clients.

Student Assessment:
Students will receive an A, B, C or F based on the following criteria:

Attendance
Knowledge Base
Clinical Performance
Communication
Professionalism
Rounds Participation
Quiz Soap assignment
Other.

Because this is a one-week rotation midterm evaluations are not possible. Students should not expect a midterm evaluation and if they are performing poorly, they may fail (D or F) the rotation and not be notified until after the rotation is completed. It is very important that you are mindful of the rotation requirements and assessment methods. Historically, students that have failed the rotation (D or F) have done so because of poor attitude, poor work ethic and concerns over patient care/decision-making.

Attendance:
Student participation is vital to the success of any program. Students are encouraged to actively investigate the cases they are caring for. These cases provide the opportunity to learn about a variety of disease processes as well as their diagnosis and treatment. **Attendance is vital**.
Current College policy states that students are **not able to miss more than 20% of their rotation** (**1 day for VMC 797**). If they do then they will be asked to make up any additional time or repeat the rotation. All absences must be excused. Please see the attendance policy to review excused absences. Any unexcused absence may result in a lower grade, an incomplete or both. Students are not able to sell or switch shifts. If a student is more than 15 minutes late for a shift, they may have to repeat a shift. If a student is going to be late or miss a shift, they must contact the ICU (737-4825).

Students are also required to complete their after-hours duties. Any after-hours duties missed, excused or unexcused, must be made up prior to receiving their diploma. Missed shifts may be made up during the same rotation or subsequent rotations at the discretion of the scheduling technician. If a student is going to be late or miss an after-hours shift, they must contact the ICU (737-4825) and speak either to a technician on ICU duty or the intern on duty. If a student arrives for their shift intoxicated or is deemed by the technician or intern on duty to be

incapable of completing their shift for whatever reason, they will be sent home and the shift will be repeated at a future date.

Small Animal Critical Care Assignment

Goals: This assignment is designed to help students develop an understanding of Emergency and Critical Care (ECC) Medicine as it applies to companion animals. Students should be able to identify clinical manifestations of a certain disease, diagnose that particular disease, provide suggestions for management of that disease, understand complications that arise from the disease or treatment of the disease, and provide prognostic information regarding the disease process.

Format: Choose any ECC topic to compose a 2-3-page **Clinical Summary Handout**. The handout will serve as a "*quick-look*" resource for other veterinary students and staff. It should be designed similar to the format found in the "5-Minute Consult" text and consist of concise, bulleted, paragraph statements. The handout is to be typed in a word document using Arial 12-pt font. All topics must be approved by the faculty clinician on staff prior to starting the assignment.

The length will be variable depending upon the case and / or topic but should include the following in order and clearly differentiated:

1. Disease Description/Overview
2. Pathophysiology Of This Disease Process
3. Differences In Disease/Disorder Between Species (Cats And Dogs)
4. Physical Exam Findings
5. Differential Diagnoses
6. Diagnosticwork-Up/ Findings
7. Management Of Disease/Disorder
    a. Medical
    b. Surgical
8. Complications Of This Disease And Treatment
9. Monitoring Parameters Association Of This Disease
10. Prognosis
11. Preventive Measures /Special Considerations
12. List 3 Good References You Found For This Disease
    a. Books
    b. Articles

Suspense: An electronic copy needs to be sent to the course coordinator, prior to 8 AM after completing the rotation.

Grading: This document will be graded by the course coordinator and house officers based on timely completion inclusion and detail of those things stated above.

Recommended References:

Silverstein and Hopper. Small animal critical Care Medicine. 1st ed. Saunders Elsevier. 2009

DiBartola. Fluid, Electrolyte, And Acid-Basedisorders In Small Animal Practice. 4th ed. Elsevier-Saunders. 2012

Creedonand Davis. Advanced Monitoring And Procedures For Small Animal Emergency And Critical Care. 1st ed. Wiley & Sons, Inc., Publication. 2012

Hackett, Mazzaferro. Veterinary Emergency And Critical Care Procedures, 2nd ed. Wiley and Sons, 2012

Mathews. Veterinary Emergency And Criticalcare Manual, 2nd ed., Lifelearn, 2006

Plunkett. Emergency Procedures For The Small Animal Veterinarian, 3rd ed. Elsevier

Health, 2012

Fordand Mazzaferro. Kirk & Bistner's handbook Veterinary Procedures & Emergency Treatment, 9th ed. Elsevier Health, 2012

Macintire, Drobatz, Haskins. Saxon Manual of Small animal emergency And Critical Care Medicine, 2nd ed., Wiley and Sons, 2012

CONSENSUS GUIDELINES:

Fletcher, D. J., Boller, M., Brainard, et al. (2012), Recover Evidence And Knowledge Gap Analysis On Veterinary Cpr. Part7: Clinicalguidelines. Journalof Veterinary Emergency and Critical Care, 22: S102–S131. http://onlinelibrary.wiley.com/doi/10.1111/j.1476-4431.2012.00757.x/pdf

Surviving Sepsis Campaign: International Guidelines For Management Of Severe Sepsis And Septic Shock: 2012 http://www.survivingsepsis.org/Guidelines/Pages/default.aspx

Davis H. et al. 2013 AAHA/AAFP FLUID THERAPY GUIDELINES FOR DOGS AND CATS. *J Am Anim Hosp Assoc 2013; 49:149–159.* https://www.aahanet.org/PublicDocuments/Fluid_Therapy_Guidelines.pdf

Weese JS. et al. Antimicrobial Use Guidelines For Treatment Of Urinary Tract Disease In Dogs And Cats: Antimicrobial Guidelines Working Group Of The International Society For COMPANION ANIMAL INFECTIOUS DISEASES. *Veterinary Medicine International. Volume 2011, Article ID 263768.*

VMC 793 – Small Animal Surgery

Faculty	Office #
Dr. Katy Townsend*	737-6841
Dr. Jennifer Warnock	737-6859

* = *course coordinator*

I. INTRODUCTION

The course is a 4- or 2-week rotation in small animal surgery in the Veterinary Teaching Hospital. Emphasis will be placed on history taking, physical examination, diagnostic techniques, and therapeutics utilized in the management of small animals presented for surgical diseases. One of the faculty surgeons listed above will be in charge for each week of the rotation. The surgeon in charge may change during the course of the rotation. Surgery house officers, technicians and interns are assigned to the service and can also serve as an asset when you have questions with day-to-day procedures. This is intended to be a guideline but please be aware that individual faculty surgeons may request some variation to this guide.

II. GENERAL INFORMATION

Students are expected to be familiar with and adhere to policies described in the "Student Manual: Year 4 Instructional Program" available from the Dean's office. The following sections from the above referenced manual are particularly applicable:

- CVM Student Policies
- Lois Bates Acheson Veterinary Teaching Hospital Overview
- Small Animal Services Guidelines and Procedures
- Small Animal Infection Control
- Intensive Care Unit
- Small Animal After-Hours Duty

III. EXPECTED LEARNING OUTCOMES

1. Students will be able to explain the general approach to surgery cases, including history taking, physical examination, diagnostic tests and their interpretations, the different therapeutic approaches including non-surgical options, the different surgical options and the prognosis.
2. Students will combine their knowledge of other medical disciplines with that of surgery.
3. Students will demonstrate appropriate clinical reasoning in diagnostic workups and a working knowledge of essential surgical principles.
4. Client communication is a crucial aspect of clinical veterinary practice and students are expected to take charge in that respect. Most problems arise from a lack of communications or miscommunication with the clients. Most client problems are avoidable by adequate communication. You cannot "over-communicate".

Note: many surgical procedures that are performed on the small animal surgery rotation in the Veterinary Teaching Hospital are beyond the training level of the senior veterinary student. The faculty surgeons do not expect the students to be able to perform the surgical procedures and at the same time the senior veterinary students should not expect to be performing the procedures. The decision as to what can be performed by a student remains at the discretion of the faculty surgeon in charge of the rotation. Instead of concentrating on the technical details of a particular surgery, the students are expected to learn the indications for the particular surgery, the postoperative care, and the prognosis. As well students are expected to learn general concepts in tissue handling, hemostasis, and anatomy for the surgical procedure.

IV. GRADING

Grading will be consistent with the description in the "CVM Student Policies" section of the "Student Manual: Year 4 Instructional Program" available from the Dean's office. Students will be evaluated by their proficiency in handling surgical cases, by their performance at clinic rounds and by their participation in case discussions. Reading assignments, presentations, and quizzes may also form the basis for part of the grade.

VI. APPENDIX

SUGGESTIONS ON WRITING SOAPs

Subjective

- TPR
- Eating, drinking, eliminations, changes to treatments
- Current medications (include doses and frequency)

Objective

- Pertinent Physical examination findings (don't just copy and paste!! Make sure to note the changes, incision status)
- Diagnostics since last SOAP (bloodwork, ultrasound, cytology, etc)

Assessment

- Each problem for the patient should have its own number

- The first problem should be the surgery
- Co-morbidities should always be listed as problems
- New problems since last SOAP should be listed as well

Plan

- Each problem should have its own plan
    - List the medications for each problem (i.e. a pre-existing cardiac condition with medications should have those medications listed under the plan for the heart condition)
- Plans should include as much as you know, including the discharge plan

Example:
S:

No interest in food, drinking some water No
V/D/R, normal urination, no defecation No
arrhtyhmias noted on
Current medications: LRS at 140ml/hr (2x maintenance), fentanyl CRI at 3mcg/kg/hr, famotidine 0.5mg/kg IV q12, monitoring for V/D/R, ECG for

O:
Gen: wt: 28.7kg QAR, T 101.4F, P 135bpm, R 30bpm, MM pink, CRT <2sec
EENT: clear OU, mild ceruminousdischarge AU, no nasal discharge, moderate dental tartar
Integ: ventral abdominal incision is clean dry and intact, hair coat is clean with mild amount ofscale on caudaldorsum, multiple small (<2cm) soft mobile subcutaneousmasses along ventral and right lateral chest
PLN:no peripherallymphdenopathy
CV: no murmurs or arrhythmias, adequate synchronous, pulses, soft and quiet bronchovesicular soundsin all fields
Abd: slightly tense but non-painful on palpation, no obvious organomegaly or masses palpable,rectalexaminationunremarkable
GU: unable to palpate kidneys, bladder is small, male castrated
MS: ambulatory x4, mildly stiff gait in pelvic limbs
NS: alert and appropriate, full neurologic examination not performed

PCV/TP: 32%, 4.6g/dl
Chemistrypanel: hyperlactatemia 4.5mg/dl, mildly elevated ALP 168U/L, BUN 27mg/dl, Creat1.1mg/dl
BP: Doppler 180mmHg

A:
A1: 1d PO splenectomy for splenic mass – r/o malignant vs. benign neoplasia
A2: azotemia – resolved
A3: hyperlactatemia – r/o hypoperfusion
A4: mild hypertension – r/o pain vs. other
A5: inappetance – r/o ileus vs. nausea

P:
P1: continue IVF, fentanyl CRI at 3mcg/kg/hr (see below), famotidine 0.5mg/kg IV q12 and monitoring of ECG/V/D/R. Continue hospitalization for another 24 hours and consider discharge. If continuing to do well, possible discharge tomorrow morning/afternoon
P3: continue IVF at 2x maintenance and re-evaluate lactate tomorrow
P4: administer fentanyl bolus (2mcg/kg) and recheck BP. If still elevated, continue to monitor BP q8. If continuing to be hypertensive, consider urinalysis for proteinuria and other diagnostics for cause of hypertension
P5: administer maropitant for possible nausea, may want to consider transitioning to oral pain medications if hypertension not pain related, consider other GI protectants (omeprazole),offer more tempting foods

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SUGGESTIONS ON CASE PRESENTATIONS

New patient:

New patients get the traditional history, physical, and diagnostics with assessment and plan. Give the chief complaint and a brief and pertinent history of present illness (i.e. onset, duration, progression, response to treatment). Next give important past medical and surgical history as well as travel, medications, and allergy information. The physical exam is reviewed. Only give pertinent positives and negatives. The assessment and plan should include what you think is wrong and, briefly, why. Then, state what you plan to do for the patient, including labs. Be sure to know why things are being done: you will be asked.

Follow-up or hospitalized patient:

The follow-up presentation differs from the presentation of a new patient. It is an abridged presentation, perhaps referencing major patient issues that have been previously presented, but focusing on new information about these issues and/or what has changed. Give the patient's name, age, date of admission, briefly review the present illness, physical examination and admitting diagnosis. Then report any new finding, laboratory tests, diagnostic procedures and changes in medications.

General format of a case presentation:

- Signalment: species, age, sex, breed
- Problem or Chief Complaint
- History (onset, duration, progression) One sentence. Items that are unrelated to the present problem should only be briefly mentioned. For ongoing care, present other historical items only if there are new complaints.
- Physical examination findings
    - Co-morbidities: Highlight the pertinent positives and negatives that are germane to the diagnosis and/or plan being suggested. For ongoing care, mention only further positive findings and relevant negative findings
- Diagnostics
    - Bloodwork, imaging, consults, etc.
- Surgery

    - Surgical findings, samples collected
- Assessment and Plan:
    - Describe the main problem list from most important to least. Provide assessment/diagnosis for all of the problems or assess and give differentials for each individual problem if they can't all be accounted.
    - Provide a specific plan for the patient including additional diagnostics and therapeutics. Be prepared to justify your plan based on current evidence.
    - Post-operative plan
        - Fluids (rate/hr)
        - Medications (with doses and frequency): group by analgesics, antibiotics, other medication categories
        - Treatments: monitoring, food/water/TPR/walks
    - Discharge plan
        - Medications (with doses and frequency) grouped by category
        - Activity restriction
        - Monitoring: incision care, specific CS
        - Follow up

A Few Practical Tips:

1. Try to be thorough without being long-winded or too detail oriented. Knowing what constitutes the "right amount" of relevant information will obviously take some practice and experience.
2. Include only the most essential facts; but be ready to answer any questions about all aspects of your patient.
3. Beware of jumping back and forth between descriptions of separate problems.
4. Use the presentation to build your case.
5. Your reasoning process should help the listener consider a differential diagnosis.
6. Ask for feedback from your listeners. This will allow you to correct errors and improve subsequent presentations.

Further Reading: http://meded.ucsd.edu/clinicalmed/oral.htm

TECHNICIAN ORIENTATION HANDOUT

The orientation handout will be provided and reviewed with you during the first day of the rotation with the service technicians. It provides valuable information about the logistical aspects and "nuts and bolts" of daily responsibilities for the rotation.

VMC 719
Clinical Cardiology
Guidelines and Procedures

Course coordinator: Dr. Kate Scollan

Course instructors: Dr. Kate Scollan

Welcome to the cardiology service:
During the next 2 weeks, please focus your attention on acquiring the skills needed to evaluate the cardiovascular system in domestic animals, particularly in those animals that are suspect for cardiovascular disease, as well as focusing on the treatment of common cardiovascular disorders.

The tools required for this rotation include a sound knowledge base, a functioning stethoscope, your cardiology notes, as well as ready access to the literature. You will get the most from this rotation if you review your class notes or a reference textbook prior to your first day on the rotation.

Top ten goals of the cardiology rotation:
By the end of this clinical rotation you should:

1. Be proficient at conducting a thorough cardiovascular physical examination with improved confidence about auscultation ability.
2. Be able to interpret ECGs in dogs and cats.
3. Be able to recognize common arrhythmias including AV block, sinus arrest, premature atrial and ventricular depolarizations, escape beats, atrial fibrillation, and ventricular tachycardia.
4. Be able to treat the most common arrhythmias in companion animals.
5. Be able to interpret non-invasive blood pressure measurements in dogs and cats, and treat systemic hypertension in dogs and cats.
6. Be able to recognize normal anatomic structures on thoracic radiographs, as well as recognize left and right heart enlargement patterns on thoracic radiographs.
7. Be able to recognize the radiographic hallmarks of cardiogenic pulmonary edema on thoracic radiographs.
8. Be familiar with the common echocardiographic modalities - two-dimensional and color flow imaging.
9. Be able to recognize the most common congenital heart defects in companion animals and know how they are treated.
10. Be able to recognize the most common acquired heart diseases of companion animals and know how they are treated.

Service personnel and organization:
The cardiology service operates as a team comprised of 2-4 senior veterinary students, the cardiology residents (Dr. Eric Owens; 3rd year and Dr. Erin McCarragher; 2nd year), the cardiology technicians (Robyn Panico, Amy Berry, and Allison Marvin), and a board-certified cardiologist (Dr. Kate Scollan) and possible visiting cardiologists. Questions about routine procedures are best directed to the cardiology technicians. Questions about a particular case should be directed to the clinician with primary case responsibility, i.e. the resident or faculty clinician. Questions about the rotation, grading, problems, schedule changes, and special requests should be directed to Dr. Scollan.

Rotation schedule and hospital receiving:
The cardiology service receives cases every Monday, Tuesday, and Wednesday. Thursdays are reserved for interventional procedures and afternoon student rounds. Fridays are reserved for urgent/emergent cases, research cases, student rounds, and occasionally additional procedures. There will be an orientation (9:00 – 9:45 AM) on the first Monday of the rotation, followed by in-coming case rounds from 10:00-10:15. Receiving on that day will begin at 10:15.

Morning in-coming case rounds: Case rounds to discuss in-coming cases will occur on all receiving days at 9:00am (except the orientation Monday). In these rounds you will present the cases you will be receiving that day to the group with a complete history and review of any records and images sent by the referring veterinarian. Be prepared to discuss the potential differentials based off the signalment and history and have a tentative diagnostic plan for your patient.

Quizzes:
You will have a quiz on the physical examination and physiology concepts within the first few days of the rotation. You will have a quiz on ECG interpretation in later potion of week 2 after completion of the ECG practice packet.

Case logs:
Please keep a running list of the cases you have primary case responsibility for on the rotation. The final Friday of your rotation, please come prepared to present a 10 minute summary on a case that had good learning points to share with your classmates.

On-call schedule:
A student is scheduled to be on call for cardio for each day of the 14-day rotation. This schedule will be made on your first day in conjunction with your rotation-mates and will need approval from the faculty clinician if changes are made. The schedule will be posted on the outside of ICU and will need phone numbers posted. When on call you will have to be reachable and within ~20 minutes drive of the VTH. Failure to respond to a call during on call responsibility can result on failing the rotation.

Medical history taking:
Prior to receiving a case, we expect you will have prepared yourself for the case by

reviewing the details for existing patients in VetHosp (as well as the communication log) and for new patients, by reviewing incoming referral information which is often located in VetHosp or the cardiology email (login details are provided to students). We expect you to read about all cases the service is seeing, not just your primary case. Please be proactive and ensure referring records are received prior to the appointment for new patients if possible.

For the medical history, please indicate the primary complaint as described by the owner to the best of your ability, as well as secondary problems mentioned by the owner and duration of problems.

List all medications the owner has administered to the pet, the dose of these medications, the duration of treatment (starting date and ending date), and the response to treatment – beneficial or otherwise. Please ask the owner if they gave any medications on the day of presentation and at what time. Please also ask if they need a refill of their medications to avoid end-of-day refill requests. Lastly please try to define what the objective(s) of the owner is (are) – expectation of a cure, confirmation of a prior diagnosis, concern for other pets in the household, etc.

Physical examination:
You should conduct a careful and thorough cardiovascular examination on each patient. This should include examination of the jugular veins, palpation and characterization of the femoral artery pulses (dogs and cats), and auscultation of the heart and lungs.

Consider what cardiac conditions cause systemic (jugular) venous distension (elevated central venous pressure)? What cardiovascular conditions result in bounding arterial pulses, weak pulses, pulse deficits, and pulses paradoxus? What cardiac events are best heard in each traditional cardiac auscultation location? What transient heart sounds are normal for the dog, cat, and horse? What physiologic events cause S_1 and S_2? What physiologic events cause S_3 and S_4 heart sounds? What are the common causes of a systolic murmur heard on the right side of the thorax? What are the possible causes of a systolic murmur heard best on the left side of the chest? What are the distinguishing features of an innocent murmur? What type of murmur is found in a dog with a left to right shunting patent ductus arteriosus? In what species are you most likely to hear a diastolic heart murmur?

Consultation with the clinician:
After you have obtained a history and performed a physical examination, compose a succinct problem list from the history and your physical examination with relevant differential diagnoses and your initial clinical plan. Be prepared to summarize the history and your physical examination findings to your clinician. The history, physical examination, and summary portion of the appointment should take less than 20 minutes ideally.

Once you and the clinician have solidified a treatment plan, the cardiology technicians

will print an estimate and provide detailed consent forms. You and the primary clinician will return to the exam room or call the owner on the phone, the plan will be discussed with the owners and relevant signatures or verbal cosent obtained. Please do not administer treatment or perform additional testing until you have reviewed and received approval for any procedures or treatments from the clinician in charge of the case.

All admitted patients must also be weighed and the weight must be recorded in the record, along with the scale that was used. All admitted patients must have a hospital ID collar in place and completed cage card. Please place patients in an appropriately sized kennel with bedding and water unless specified otherwise.

Out-patients:
Our goal is to be thorough and efficient while maintaining a positive learning environment. In an effort to stay organized, we place all of our patients on the dry erase board. After admission to the hospital, the procedures that have been outlined should be placed under the patient's name and the agreed upon discharge time should be noted. As the procedures are performed a check mark can readily identify what tests have been completed.

We generally perform ECGs, blood pressures, and echocardiograms within the cardiology suite. All procedures (blood draws, catheter placement, medication administration) must be supervised by a clinician or technician. Some diagnostics may be performed by the clinicians and technicians in your absence, but will be subsequently reviewed with you. It is our primary goal to create doctor- level competency regarding interpretation of diagnostic testing, not necessarily gain proficiency in technical procedures. We often provide you the opportunity to perform these technical skills and generally allow 2 attempts before a technician or clinician steps in ("2 strikes rule"). This may not be the case for unstable or fractious patients.

In-patients:
We frequently have in-patients on the cardiology service so you should plan to be available throughout the entire rotation, <u>including weekends</u>, unless the faculty member has approved prior arrangements. In addition to the responsibilities listed for out-patients it is your responsibility to:

1) Have your SOAP and treatment sheets completed by 8:00 a.m.
    1) If an animal is to have surgery performed, please ensure that:
        a. The anesthesia request is completed. All requests must be turned in by 4:00 p.m. for the procedure to be done the following day. If a procedure needs to be done the same day the patient is admitted, please contact an anesthesia technician or clinician.
        b. NPO treatment orders are in place for the evening prior.
        c. The ICU nurses have been rounded comprehensively and understand monitoring parameters, especially for arrhythmias.
        d. Please personally hand the intra-operative antibiotics to

anesthetist the morning of the procedure. The first dose needs to be drawn up in syringe and labeled.

e. Clients have been contacted a minimum of twice daily with updates. Please record a summary of all conversations in VetHosp.
    i. To use the phone, often a long-distance code is required. First dial 9, then 1, then area code and number you are trying to call. You will then hear a series of beeps, and then dial 3895000.
f. After discharge, please ensure the cage/kennel is left clean.

2) To facilitate treatment of in-patients, treatment times should be uniform when possible, according to the following schedule:
   Twice daily: 7 am, 7 pm
   Three times daily: 7 am, 3pm, 11pm
   Four times daily: 7 am, 1 pm, 7pm, 1 am

Medical paperwork:
The problem list (blue form) is completed by the primary clinician on the case. The pink (Hospitalization Orders) form is currently not used in cardiology. Please complete and sign the blue physical examination form, as well as the purple cardiology-specific history form. Discharge instructions should be completed by the admitting student and ready for review by the attending clinician 30 minutes prior to the scheduled discharge time. Templates for common disease processes, drugs, and the physical examination can be found on the desktop of each student computer in the cardiology suite. Please ensure that all necessary medications have been retrieved from the pharmacy by the scheduled discharge time. For the discharge appointment, the client should be taken into a room without the animal unless directed otherwise to allow for better focus and information transfer. We often have students conduct the discharge appointment although in some instances the primary clinician may conduct the discharge. <u>In all cases, the clients must speak to the primary clinician prior to leaving the hospital.</u>

Communication with the client and referring veterinarian:
Please ensure you know how to contact the owner prior to the owner leaving the hospital. The primary clinician on the case will perform the majority of the written and verbal communication with the referring veterinarian.

Grading for the rotation and student expectations:
Our goal is to be transparent about the grading process for our rotation. A mid-rotation evaluation and self-assessment will take place the first Friday of your rotation. Your grade for the cardiology rotation is weighted based on the following components:

1. Knowledge base (20%)
2. Clinical skills (30%)
3. Proficiency in procedures (15%)
4. Professionalism and conduct (15%)
5. Communication (15%)

6. Animal welfare (5%)

Knowledge base includes understanding disease pathophysiology, treatment options, individual effort seeking out information and awareness of recent developments in the field. Clinical skills include data prioritization, diagnostic planning, and interpretation of lab data/radiographs/ECG. Proficiency in procedures includes phlebotomy skills and other technical tasks. Professionalism and conduct include work ethic, reliability during business hours and after hours, reaction to feedback. Communication includes collegiality and interactions with classmates, staff, and faculty. We do not grade based on your performance the first day of the rotation, rather we evaluate performance throughout the 2-week rotation. Both quantity and quality of effort are both factored into grading.

Please show initiative by being actively involved in all cases the cardiology team sees. This involves performing a cardiovascular exam on all patients (exception: fractious animals) to practice your physical examination skills. Please write histories or import discharge templates in advance whenever possible to optimize your time for experiential learning during business hours. Generally, students on the cardiology service have a decent amount of free time before and after receiving, so we expect you to use this time towards learning.

Students who meet basic expectations as outlined above receive feedback such as this:
You have a solid working foundational knowledge base. Please keep reading to solidify your knowledge base and spend time on rotations seeking out information relevant to your cases. You did a good job prioritizing case information and improved over the 2 weeks in your interpretation of diagnostics. You displayed strong verbal and written communications with clients. You were reliable during business hours and after-hours, and accepted feedback well.
Students who exceed our expectations receive feedback such as this:

You displayed an above average knowledge base in cardiology, and willingness to research new information without being prompted. You did an excellent job prioritizing case information and improved over the rotation in your interpretation of diagnostics. Your written discharges were excellent, requiring minimal corrections/edits on our behalf. You showed great teamwork with your classmates and strong verbal communication skills with owners.

Students who fall below our expectations receive feedback such as this:
You displayed a weak knowledge base in cardiology including disease pathophysiology, recent developments, and therapeutic medications. It was also found to be difficult for you to identify physical exam abnormalities and prioritize data to formulate an appropriate treatment plan effectively. Also newly learned concepts could not reliably be applied to clinical cases. Your medical records were not always complete or accurate. You struggled with appropriate interpretation of diagnostic tests.

Here is an example of a typical schedule for the 2-week rotation:

	Week 1	Week 2
Monday	9-9:45 Orientation 10-10:15 Case rounds 10:15-5:00 Receiving, case work up, discharges Evening- Watch ECG review video on Canvas	9-9:30 In-coming Case Rounds 9:30-5:00 Receiving, case work up, discharges
Tuesday	8:15-8:45 physical exam Quiz 9-9:30 In-coming Case Rounds 9:30-5:00 Receiving, case work up, discharges Evening- Work on ECGs #2-5	9-9:30 In-coming Case Rounds 9:30-5:00 Receiving, case work up, discharges
Wednesday	9-9:30 In-coming Case Rounds 9:30-5:00 Receiving, case work up, discharges Evening- Work on ECGs #2-5	9-9:30 In-coming Case Rounds 9:30-5:00 Receiving, case work up, discharges
Thursday	7:30 Possible procedure in-take 8-9 Senior Papers/Resident Rounds 9:30-12:00 Procedure 2-4pm Student Rounds (ECG packet #2-5)	7:30 Possible procedure in-take 8-9 Senior Papers/Resident Rounds 9:30-12:00 Procedure 2-4pm Student Rounds (ECGs or worksheets)
Friday	Possible procedure or Receiving	Possible procedure or Receiving ECG Quiz
Saturday	On call shift /Possible discharge	On call shift /Possible discharge
Sunday	On Call shift Complete ECG packet for week 2	On Call shift

VMC 753
Clinical Oncology

Course Coordinator: Dr. Haley Leeper

Course Instructors: Drs. Haley Leeper and Katie Curran

The Clinical Oncology Service is devoted exclusively to the diagnosis and treatment of pets with cancer. The goal of the Clinical Oncology Service is to teach students a realistic approach to the diagnosis and treatment of pets with cancer. We are a very busy service, which allows students the opportunity to be involved with a wide variety of cases. Our most important goal, however, is for you to experience the practical diagnosis and treatment of a cancer patient.

Faculty
Dr. Katie Curran
Dr. Haley Leeper

Technicians
Chelsey Lisiewski, CVT
Shannon Litchfield, CVT

Residents
Dr. Mark Jeon (3rd year)
Dr. Margaret Duckett (2nd year)
Dr. Kelly Hicks (1st year)

Learning Objectives

1. To diagnose, differentiate, and review the biological behavior of spontaneous neoplasms in dogs and cats
2. To develop skills in clinical medicine, palpation (especially liver, spleen, and lymph nodes), interpretation of laboratory data, and the management of geriatric patients
3. To become acquainted with chemotherapy, immunotherapy, radiotherapy, and surgical aspects of cancer management
4. To become familiar with chemotherapeutic agents, immunotherapies, and tyrosine kinase inhibitors and their side-effects
5. To learn how to diagnose, workup, and stage a small animal oncology patient
6. To become acquainted with cytology
7. To develop skills in fine needle aspirations
8. To become skilled in the use of the problem oriented medical record
9. To become familiar with the workings of clinical trials of new anticancer therapies

Evaluation of Student Performance
The general criteria for student performance assessment includes:

- Preparedness and initiative
- Critical thinking
- Patient care and client communication
- Daily case presentation
- Knowledge of veterinary medicine (diseases, diagnostics, treatments, etc.)
- Teamwork and collegiality

Attendance
Students are to be in the SA clinic by 7:30 a.m. Any absences need to be approved by the senior clinician on clinics. If you have an ICU afterhours shift or other commitment, please inform the oncology staff the morning of, so we can make sure you arrive to your shift on time. It is also recommended that you write your name and shift on the white board in the rounds room.

Rounds Room/Treatment Room
Oncology has three dedicated spaces for this rotation. The oncology treatment and rounds room are connected, and the chemotherapy administration room is next door. Based on new pharmacy regulations, students are not able to hold patients or be present for chemotherapy treatments. However, you are welcome to watch the oncology technicians deliver chemotherapy through the window (between rounds room and chemotherapy admin room). As a reminder no animals are allowed in the oncology rounds room and no food or drink are allowed in the oncology treatment room.

Receiving Appointments
We receive new cases and recheck patients Monday-Friday. Review the next day's appointment schedule each afternoon, sign up for a case in VetHosp, and familiarize yourself with the incoming patient complaints. You are expected to review the patient's record before the animal arrives for its appointment.

To help transition to the role of doctor, we expect you to adequately plan for cases.

- Prepare for your case by reading up on the patient's history, understand the patient's comorbidities, and general disease process through review of textbooks or primary literature (class notes at a minimum). Please be sure to look through the communication notes, laboratory, diagnostic imaging tabs, medical records-referring etc. as these can provide additional sources of patient information. Sometimes, rDVM records, bloodwork, and radiographs are added the night or day of the appointment. If you don't see any records when reviewing the cases, don't assume that nothing has been performed. You may call "Oncology Medical Aide" on Vocera to request additional medical records.
- For new cases, be prepared to discuss the diagnostics you would like to perform and your reasons behind why you want to do those tests.
- Ask owners about their pet's medications EVERY SINGLE TIME. It is not appropriate to assume that owners are following the instructions written on the last discharge summary. For every medication, please confirm the following:
    - Drug, dose (mg/kg), route, frequency, when they started/stopped a medication

For ALL appointments (COVID restrictions):

- All animals will be received by the oncology technical staff until further specified.
- Please see orientation packet (provided pre-rotation) for full details regarding patient receiving with COVID restrictions.

For new appointments (once COVID restrictions are lifted):

- Place cage card outside exam room (oncology has two assigned consult rooms)
- Perform a complete history and physical exam
    - Please be concise when taking histories from owners. We expect that you will be in and out of the room in ~20 minutes and ready to talk to your doctor.

- Develop a diagnostic/treatment plan to review with the clinician
- Consult with technician to formulate an estimate
- Review estimate and consent forms with owner, make sure they sign the forms, and confirm their contact information

For recheck appointments (once COVD restrictions are lifted):

- These cases may or may not need an exam room
  - Check with technician and/or clinicians ahead of time to determine the best use of the exam rooms
- Formulate a plan for the appointment based on the previous discharge summary
  - Check the communication log as changes to the plan may be noted there
  - The referring veterinarian may have done blood work for the current appointment. Ask the owner if this was performed. Also check the communication log and ask the technicians if any blood work has arrived for your patient.
- All patients need a signed authorization form and estimate for each appointment
- All recheck appointments will have a patient flow sheet (green sheet) that needs to be filled out according to the plan for that visit
- Perform a complete history and physical exam
- Develop a diagnostic/treatment plan to review with the clinician
- Consult with technician to formulate an estimate (these are generally made the day prior, however updates based on a changing plan may be needed)

Tips for learning about on-going cases:

- Read the most recent discharge report
- Look over the initial VTH history & physical exam and discharge from that visit
- Review pertinent radiographs, CT scans, etc.
- Check the Master Problem List

Chemotherapy Appointments

Chemotherapy appointments are considered drop-off appointments. The drop-off times are generally between 7:30am-9:30am, however some exceptions apply. For these visits it is recommended you review the chemotherapy/recheck drop off sheet (goldenrod sheet) with the client in the lobby prior to bringing the dog back to the treatment room. **All chemotherapy patients will have a patient flow sheet (green sheet) that needs to be filled out according to the plan for that visit. In addition, all patients will need to have a complete physical exam (including TPR, weight in kg) and a CBC +/- chemistry submitted as soon as possible**.

You should attempt to calculate the chemotherapy doses on scratch paper. These calculations are not part of the medical record. Please review how and why chemotherapy agents are dosed on body surface areas (i.e., m^2), based on lean body weight. Compare your dose to that calculated by the oncology clinicians. A CBC must be deemed acceptable for chemotherapy by the clinician prior to drawing up and administering the drug.

*Charts for every patient (seen by oncology that day) are to be kept in the oncology treatment room until the patient has received all treatment, at which time in can be relocated to the rounds room.

Client Discharge Summaries
Client discharge letters are generated and modified through a different way than any other small animal rotation. A step-by-step guide has will be provided during orientation.

Oncology Procedures

- Aspirates and/or biopsies
- Venipuncture: only draw blood from the jugular vein unless the clinician instructs you otherwise. The peripheral veins are used for chemotherapy catheter placement.
- Urine collection: In most cases, urine can be collected by free catch methods.
- Radiation therapy: Certain tumors will be treated by radiation, either as a single treatment modality or as adjuvant therapy in conjunction with surgery and/or chemotherapy. Radiation therapy, both palliative intent and curative intent, are not currently available at Oregon State University. The closest facilities are VCA NW in Clackamas OR, UC Davis Veterinary Teaching Hospital, Washington State University Veterinary Teaching Hospital, and Colorado State University Veterinary Teaching Hospital.

Client Communications
At times, students will be responsible for client communications. You will generally be asked to communicate with your clients daily. This includes follow up on blood tests so please remember to track down results, interpret, and discuss with the clinician prior to calling your client with the information. All communications must be documented under "visit case communication." If at any time medications, dosages, or dietary plan are changed by your clinician or house officer you must document all information. If you do not feel comfortable communicating with a client, please let your attending clinician know. Students are allowed to obtain authorization over the phone for certain diagnostic tests and procedures. Clinicians (faculty, residents and interns) should obtain authorization to do anything requiring sedation, anesthesia, anything posing a significant risk to the patient, and euthanasia.

Before Leaving Hospital
Before you leave the hospital for the day, please review the following check list:

- Check on any patient you may have hospitalized either in wards or ICU
- Make sure all flow/treatment sheets are completely filled out and signed by a clinician
- Round with the ICU technician
- Check with your fellow students and offer any help with other patients
- Clean up after yourself and your patients (including kennels)

Rounds
Patient rounds will occur daily at 4:00pm. Topic rounds occur 3-4 times per rotation, and the topics and timing of rounds will be provided in detail at orientation. You are obligated to attend senior papers on Thursdays from 8:00am-9:00am.

Oncology housekeeping rounds occur daily at 9am in the oncology treatment room. This is for the clinicians and technicians only. If you are present in the treatment room when these rounds start you may be asked to step outside as treatment/diagnostic plans are discussed.

Self-Evaluation
On the first Friday of your rotation, you will have the opportunity to meet with the faculty member(s) on oncology for a self-evaluation and discussion about your learning goals for the following week.

Oncology Clinical Rotation Self-Guided Study Assignments
Throughout your rotation, you will be asked to complete 5 guided studying assignments on various topics. These assignments can be accessed through Qualtrics and are required to be completed by the following schedule. These are meant to be open-book and/or open-note as the questions are at the knowledge level of a first-year oncology resident. Therefore, the exercise is more in where you will find the information and how you evaluate the credibility of that source. Links for the assignments will be sent to you in an email. If you have any questions regarding these, please contact the house officer or senior clinician on clinics during your rotation.

The textbook, Small Animal Clinical Oncology, is a great resource to utilize.

- Chemotherapy: to familiarize yourself with common chemotherapy agents and their uses in veterinary medicine
  - Due the first Wednesday of your rotation
- Cancer Biology and Paraneoplastic Syndromes: review cell cycle, cell replication, hallmarks of cancer and paraneoplastic syndromes that can occur with cancer.
  - Due the first Friday of your rotation
- Advanced Diagnostics in Veterinary Oncology: to become acquainted with several diagnostics used in the veterinary oncology field
  - Due by the second Monday of your rotation
- Oncology Case Based Medicine: Four individual cases to test your clinical knowledge and thought process
  - Due by the second Wednesday of your rotation
- Disease and Treatment: diagnostics, median survival times and treatment options for many oncological diseases
  - Due by the second Friday of your rotation

Oncology Journal Club
On the second Monday of the rotation, you will be asked to participate in a discussion around an assigned journal article.

Suggested References

- Course notes from 3rd year oncology lectures and 2nd year oncology pharmacology
- Pathology notes on neoplasia
- Textbooks (available in oncology rounds room; please do NOT remove from this area)
  - Clinical Veterinary Oncology: S.J. Withrow and E.G. MacEwen (Vail) (5th and 6th editions)
  - Textbook of Veterinary Internal Medicine: S.J. Ettinger
  - Kirk's Current Veterinary Therapy: J. Bonagura
  - Nelson and Couto's Internal Medicine Textbook
  - Managing the Clinical Veterinary Patient. A Practice Manual. G. Ogilvie and A. Moore
- Journals (many to choose from), check out Pubmed!

Oregon State University
Acheson Teaching Hospital Pharmacy or "VTH Pharmacy"

General Information:

Location: 147 Magruder Hall, Corvallis, OR 97331

Phone contact:
Main phone: (541) 737-6863

Fax: (541) 737-9487

Business Hours:
Monday – Friday: 8am – 6pm
Saturday: 9am – 12pm
Sunday: Closed
[*Supply Room: Monday – Friday 8am-5pm (12pm-1pm closed)]*
After Hour Contact (Emergencies only):
(541) 207-5721

Services Offered:
The Acheson Teaching Hospital Pharmacy at OSU CCVM offers a variety of services for our patients and referring veterinarians. Our pharmacy department is licensed as a dual retail and institutional pharmacy which allows prescription orders to be used as an inpatient and outpatient basis, making pharmaceutical drug products accessible to meet the needs of our patient's therapeutic needs. In addition, pharmaceutical product selection is maintained to meet patients' needs from commercial products and limited drug compounding.
The VTH Pharmacy staff consists of two licensed pharmacists, two full-time veterinary pharmacy certified technicians, one full-time supply room technician, pharmacy technician student-workers, and pharmacy interns. The VTH Pharmacy is a managed entity of the College of Pharmacy with a working relationship to the College of Veterinary Medicine.
The Pharmacy fulfills the pharmaceutical needs of the VTH, specifically, for the Small Animal Hospital, Large Animal Hospital, and the core services.
The VTH Pharmacy also abides and coordinates its operations around regulatory compliance towards the Oregon Board of Pharmacy (OBOP), Drug Enforcement Agency, Veterinary Medical Examining Board, and all other applicable State and Federal laws.

Staff:
Brian T. Bowers, PharmD, Director of Pharmacy
Lauralei Schuster, PharmD, Staff Pharmacist
Julie Haynes, PharmD, Staff Pharmacist
Alyssa Tucker, Supply Room Technician
Jeffrey Holland, Certified Pharmacy Technician
Audrey Sturner, Certified Pharmacy Technician

VTH Pharmacy Prescription Writing

Applicable To: Pharmacy and prescribers within VTH

Purpose / Principle:
To formalize protocol and procedure for in-house prescription writing

Policy / Procedures:

1. Only prescribers (veterinary clinicians) in the Department of Clinical Sciences that have prescription authority, given by the VTH Director, can prescribe pharmaceuticals for VTH patient cases

2. Appropriate scope of practice is required for prescription writing with valid Veterinarian Patient Client Relationship (VCPR)

3. Pharmaceuticals and supply inventory items will be written on separate blanks for filling and dispensing
    a. White blanks = "Rx only"
    b. Light blue blanks = "Supply only"

4. Prescriptions for medications will require the following items and/or information:
    a. Patient and client information including:
        i. First and last name of owner (full name required)
        ii. Name of animal
        iii. Species of animal
        iv. Case number assigned by hospital
        v. In the instance of dispensing control substances, the DEA registrant number and address, for Federal law requirements
        vi. It is preferred to use patient stickers, however, can manually write <u>all</u> information as well
    b. Drug information including:
        i. Name of the drug
        ii. Strength or concentration of the drug
        iii. Drug formulation
        iv. Complete instructions for drug use (sig), including route of administration and dosing
            1. Example: 1 tab po bid
        v. Quantity prescribed
        vi. Refills authorized (when necessary)
        vii. When applicable, prohibition of substitution of a brand name drug
            1. "No substitution" 2. "N.S."
            3. "Brand medically necessary"
            4. "Brand necessary"
            5. "D.A.W. (Dispense As Written)"

6. Words of similar meaning

viii. For food animals: withdrawal times

c. Authorized prescriber signature
d. Name of student/technician writing the order
e. Weight of the animal
f. Date prescription is written
g. CII orders must be written on separate blanks, as required by Federal and State Law
h. CIII-CV orders can be written separately or in conjunction with non-control prescriptions

***All prescription orders require this information for dispensing**

5. Supply orders will require, at minimum, case number, animal name, and owner last name
   a. Veterinary technician signature is minimally required for dispensing to ensure case charges and invoicing appropriateness

Oversight / Follow Through:
The Director of Pharmacy shall be responsible for the implementation and oversight of this policy.

Pharmacy Order Writing and Submissions Policy

Applicable To: All VTH Personnel with Order Writing Authority.

Purpose / Principle:

To provide structure and familiarity to the pharmaceutical and medical supply ordering process and to potentially reduce unnecessary order errors and dispensing time in a continuing effort to maximize patient care.

General:

When submitting an order, the VTH Clinical Science faculty/staff or student must first be respectable to the time allotted for filling orders. If there are no questions/confirmations, place the order request in the slotted file organizer on the counter (by the pharmacy window) with respect to the time of submission (submit or clearly note which order you may need first). Please get the attention of one of the Pharmacy staff for assistance when there are questions. It is the expectation of the VTH clinical science member/personnel and/or student to accurately write the prescriptions.

On average, it takes approximately 10-15 minutes for the Pharmacy staff to complete an order. This time estimate varies and is highly dependent on the quantity of drugs being ordered at one time and the level of busy times from all departments within the hospital. However, **this is not a guaranteed time** and should only be used as an estimate only. If, however, you have an emergency situation (e.g. animal crashing or need immediate euthanasia) be sure to direct

attention at getting the medications from the Cubex® machines or crash kit(s) first before coming to the pharmacy, as secondary pharmaceutical storage areas hold emergent drug supply as a primary objective. Let one of the staff members know about your situation if this is not a possibility. These emergency situations will take priority over all others. The next level of priority is given to inpatients and then to outpatient prescriptions. If an owner is waiting, this is not a valid reason for the Pharmacy staff to supplement lost time to the owners, but will be noted and completed in a reasonable and timely manner.

Helpful Notes:

1) Please realize that Pharmacy staff is currently working on orders throughout the day.
2) Please be respectful and minimize all unnecessary disturbances when submitting orders.
3) The VTH works on a closed formulary system and listed in VetHosp as a guideline for all order submissions.
4) All orders that are for procedures scheduled for the following day are advised to be submitted by 5:00PM (i.e. surgery orders). All discharge orders are to be submitted no later than 5:00PM. This will leave the last hour of the day for last minute urgent orders and gives the Pharmacy staff an opportunity to prepare for the next day's service.
5) If there are any questions, the Pharmacy staff is happy to help and is preferred when questions are present and/or clarifications are needed.

Policy / Procedure:

1) Hospital pharmaceutical and medical supply orders that are submitted to the Pharmacy, either during normal operating hours or via after-hours will be submitted on an approved white VTH Rx order form or blue VTH Supply order form, respectively.

2) Please refer to "SOP Prescription Writing" for all requirements

3) Indicate if the patient is "inpatient" or "outpatient" to notify Pharmacy personnel destination of drugs to be dispensed. Outpatient medications will be dispensed in child-resistant packaging, when possible, to be in compliance with the Poison Prevention Act. If child-resistant packaging is not possible the dispensing container must be labeled – Not child proof – Keep out of Children's Reach.

4) Print all names submitting and signing orders, legibly

5) Use inventory names and strengths as written in Pharmacy inventory formulary (VetHosp formulary) as a guide to appropriate writing.

6) Liquids should be submitted with "mLs" and solids with "tabs," "caps," "grams," etc…to respective quantity dispensed.

7) If the product is an injectable, the preferred method is to have the

mgs/ml converted by the prescriber to the amount of "mls" required. For example, "acepromazine 10mg/ml, dispense 6.5mgs" would be converted to "acepromazine 10mg/ml, dispense 0.65mls."
*If the requested amount of the injectable is less than 1.0ml, the dose should be rounded to the nearest hundredths (e.g., 0._ _) to improve measurement accuracy. **NOTE:** Please consider that only the 1 cc syringes have the ability to correctly measure to the hundredths place. All other syringes vary on measured accuracy and this must be considered when calculating doing amounts (please see information under the
—general comments section)
*If the requested product is an injectable then the number of independent doses should be clearly indicated (e.g., four syringes/doses of 0.3ml).

8) If the order is written for a Controlled Substance (CS) the following will apply:
   A. All inpatient orders for CS, unless intended for immediate use, must include complete directions for use. All Small Animal (SA) inpatient CII CS orders are limited to a 24-hour supply for injectable medication (no more than 72 hours will be dispensed for oral medication) which is based upon the stated frequency of dosing interval in the directions for use. All Small Animal (SA) inpatient CIII-V orders are limited to a 72 hour supply (i.e. tramadol tablets)*. If the CS request is for a CRI, the rate of infusion is required and it is the clinician's responsibility not to request a medication quantity (within reason) in excess of that required to cover a 24 hour period. All Large Animal (LA) orders intended for multiple dosing require complete directions for use and should be limited to a 24-hour supply whenever possible.
      *Note: An orange "VTH Pharmacy" seal will be utilized for outpatient ("to-go-home") medications dispensed at the time of patient discharges or prior to the weekend schedule (with anticipation of discharging patients during nonbusiness hours). All inpatient orders will be written **separately** from outpatient orders.
   B. All outpatient orders for CS must be written as a separate order for better dispensing workflow.
   C. The 24-hour rule is not in effect for outpatient CS orders. Upon discharge, the responsible clinician is encouraged to limit the order to cover a reasonable period of need. A month supply for any outpatient CS order is required in one dispensing event. These orders will be double counted and confirmed with the quantity circled on the prescription label.
   D. All controlled substances in schedule-II must be written on a separate hospital order.

   E. Controlled substances in schedule III through V can be combined with routine pharmaceuticals on a single hospital order.

9) Directions for use.
A. All orders intended for inpatient and outpatient dispensing must include complete directions for use.
   B. It is recommended that only recognized direction abbreviations be used. Full written descriptions are always preferred over abbreviations.

   Examples of the resulting format of steps above:

   A. For oral forms:

ranitidine 150mg tablets
dispense #2 tablets
Give 1/2 tablet (=75mg)by
mouth every12 hours for
(condition).

or

ranitidine 150mg tablets
total 4 doses
Give 1/2 tablet (=75mg) by mouth
every 12hours for (condition).

B. For injectable products:

acepromazine 10mg/ml injection
dispense 4 syringes of 0.10 ml Inject
0.10ml (1 syringe) IV
every 4 to 6 hours if needed for sedation.

10) If any corrections or changes are required to the order hardcopy, please follow this procedure:

A. Mark out the item to be changed with an —X or —\

B. Make the necessary change in close proximity.

C. All corrections or changes must be initialed by the person making the change.

D. Certain changes will require the authorization of the practitioner.

E. Changes are always at the discretion and approval of the pharmacist on duty for appropriateness.

NOTE: If a clinician or veterinary technicians fills the order themselves (e.g., during afterhours) the space provided on the form that says "filled by" must also be initialed.

11) When leaving an order at the Pharmacy the following procedures are required:

A. Make sure that the billing account for the case, internal client or research account, is **open or active** and billable before leaving the order at the Pharmacy. **This is a required item for order processing.**

B. Waiting for an Rx or order dispense is permitted, however, only in respectable manners. It is a preference to come back when necessary.

C. The general sequence of order

priority is:

1) Emergency hospital orders.

Orders that are of a true emergent situation (e.g., butorphanol to sedate an animal that is causing a danger to itself or persons) will be moved to first priority over all other orders. The person submitting an order of this nature is to alert the pharmacy staff to the necessity. These situations requiring orders in this fashion should first be retrieved from Cubex® and/or crash kits as first level priority.

2) Routine inpatient hospital orders.

3) Routine hospital orders (i.e., outpatient orders).

4) Routine stocking orders.

5) Research and teaching orders with large volume of inventory.

D. Orders must be submitted to the Pharmacy as they are completed for each patient and preferably, not submitted in groups of more than one patient.

E. Except for an urgent situation as previously described, **the latest time for order submission to the Pharmacy is 5:45pm**. Any order submitted to the Pharmacy after 5:45 must be filled the next day.

F. All large orders for research or student teaching must be submitted to the pharmacy **two weeks in advance of start date.** Small fill-in orders for research or student teaching may be submitted for same day retrieval. These small orders will be filled in the sequence of priority provided above.

G. Orders for medications intended for non-controlled substance ward-stock that are contained within a preprinted ward-stock order form do require a clinician or technician approval. If the requested medication is not a controlled substance, then a technician may review and approve the order. If the medication being requested is a controlled substance, then the order must be reviewed and signed by a VTH clinician. In no instance may a student submit a request for ward-stock unless for fluids/supply items.

Retrieving an Order from the Pharmacy:

When retrieving an order(s) from the Pharmacy the following procedures are required after pharmacist quality assurance has been performed:

1. Upon retrieving an order from the Pharmacy, the student, technician, or clinician will check for completeness of the order and dispensed item(s).

2. When the order is picked up by the student, technician, or clinician, they will sign (legibly) in the —verify section to note pick-up and ensuring it is the right order being requested.

3. The white copy (or "hardcopy" or "original copy") is to be retained and kept

by the pharmacy. The yellow or carbon copy may be taken to its respective patient chart when requested.

4. Items that require mailing to clients will be retrieved, as per items 1 and 2 above, and then taken by the recipient to Shipping & Receiving for further processing (see "Mailing Prescriptions SOP") and left to the discretion of the VTH personnel for appropriateness.

5. All hospital orders that are intended to be used during afterhours must be retrieved before closing time (6pm).

6. Items for research and teaching should only be retrieved during normal operating hours.

Other Comments:

1. It is preferred that all prescription orders submitted to the VTH pharmacy are submitted during M-F when full pharmacy staff is available. Saturday morning pharmacy hours are intended to dispense prescription supply that may be further required to help hospital activity meet patient care objectives and is not fully staffed as a core service during weekend hours.

2. All diluents required for reconstitution (unless provided by the product manufacturer) retrieved from the Pharmacy require a written order.

3. To improve accuracy in filling abbreviating drug names is discouraged.

4. Only commonly recognized —sig abbreviations should be used.

5. Please consider dosing syringe calibration and potential for measurement accuracy when ordering injectables and round up or down as appropriate. Please do not request dispensing of injectables that cannot be accurately measured within the following specified parameters:

   1 cc syringe - measures to the 100^{th} of a ml mark (e.g., 0.xx).
   3 cc syringe - measures to the 10^{th} of a ml mark (e.g., 0.x).
   6 cc syringe - measures to the $2/10^{ths}$ of a ml mark (e.g., 0.2, 0.4, 0.6, etc.)
   12 cc syringe - measures to the $2/10^{ths}$ of a ml mark (e.g., 0.2, 0.4, 0.6, etc).
   20 cc syringe - measures to the 1.0 ml mark.
   35 cc syringe - measures to the 1.0 ml mark.
   60 cc syringe - measures to the 1.0 ml mark.

6. For those prescriptions written and intended to be filled at outside pharmacies it should be considered that "s.i.d." is not recognized in human pharmacies and can potentially interpreted incorrectly.

Oversight / Follow Through:

The Director of Pharmacy, in cooperation with VTH Hospital Director, shall be responsible for the implementation and oversight of this policy.

VTH and Pharmacy Use of Cubex® Machines

Applicable To: VTH Clinical Science Clinicians and Staff; VTH Pharmacy Staff

Purpose / Principle: To provide procedure and protocol for Cubex use within the Veterinary Teaching Hospital (VTH)

Policy/Procedure:

1) Communication Chain:
    a. If problems arise for any staff member, this should be discussed with their Work Leader or Service Chief first
    b. The Work Leader or Service Chief will communicate issues to the VTH Pharmacist
        *The Work Leaders and Service Chiefs will be informed regularly (as well as hospital administrators) of known issues with Cubex® use as they arise by the VTH Pharmacist

2) The Cubex® machines are for **inpatient hospital use (i.e., unit-dose use only)**
    a. Outpatient use (i.e., dispensing regimen drug supply to clients) is not permitted per Oregon Board of Pharmacy (OBOP) and Drug Enforcement Administration (DEA)
        1. Cubex® machines cannot hold outpatient inventory quantities
        2. Clinicians should plan for prescribing and dispensing needs over weekends and holidays (i.e., on Friday or Saturday business hours with VTH Pharmacy)
    b. Outpatient use (i.e., dispensing regimen drug supply to clients) will be done by VTH Pharmacy during normal business hours only per OBOP and DEA requirements
        1. After-hour outpatient prescriptions will be left for pharmacy to fill/dispense the next business morning
        2. Similar guidelines for weekends/holidays, which will be filled on Monday (or first business workday)
            1. In the rare event a patient is discharged after pharmacy business hours and medication is needed, the patient may have a sufficient quantity of **non-controlled substances only** to last until the pharmacy is open (i.e., 1-day supply of trilostane or pergolide)
                a. No extra doses permitted
                i. Supply will be depleted in Cubex® for inpatients and may affect other patients' quality-of-care

b. The pharmacy will supply the remaining outpatient regimen upon normal business hours
c. At a client's request, a prescription may be mailed by the VTH and account for an additional small supply to accommodate mail delivery time; otherwise, they may return to the pharmacy during normal business hours

d. Professional judgment should be utilized by the VTH clinician for reasonable quantities of medication use so depletion of supply doesn't occur from Cubex®
e. The VTH clinician should always phone-in outpatient prescriptions to public retail pharmacies for patients being discharged as a *primary outpatient medication supply when VTH Pharmacy is closed*
f. <u>Controlled substances must be dispensed from the VTH pharmacy for all outpatient-use</u>
g. All Cubex® activity will be reviewed by VTH pharmacy for accountability and appropriate use of drug supply

3) Cubex® Hours of Operation
   a. Cubex machines are primarily intended for **after-hour and weekend use**
   b. Guidelines for Permitted Use During Normal Pharmacy Operating Hours
      1. Specific products will be available for use during normal hours, hence 24 hours, 7 days a week; see "Urgent Access Drugs," "Emergency Access Drugs," and "Oncology Treatment Drugs" on inventory lists
         1. Product List:
            a. SA: Hydromorphone, Dexmedetomidine, Atipamezole, Butorphanol, Buprenorphine, etc…
            b. LA: Butorphanol, detomidine, sedivet, etc…
            c. SA Oncology: Cytotoxic (liquid/injectables only) drugs
               i. Reduces unnecessary handling/exposure to harmful agents
               ii. Facilitate patient care
         2. All controlled substances will be preferably dispensed primarily from Cubex®, but optional, with VTH Pharmacy
         3. SA/LA Crash carts (not part of Cubex): Emergency CPR drugs
      2. The Anesthesia department will continue to have access to their products using current procedures of department ward stock (applicability of a separate Cubex® machine for the anesthesia department is being reviewed) [*Pending; current operations continue until further notice]

4) Individuals with Access
   a. All practicing clinicians within the VTH will have access to Cubex inventory
   b. All VTH Licensed Veterinary Technicians/Animal Health Technicians will have access to Cubex inventory

c. Students will have no access to inventory
d. Access will be done by bio-ID (fingerprint) and/or manual ID login and pin password and trained by the Director of Pharmacy

5) Record-Keeping
    a. All users that access controlled substances will be required to manually write a prescription and have it signed by prescribing clinician (required by Federal law)
        1. Signed prescriptions will be left for Pharmacy record-keeping in a designated location adjacent to the Cubex®
    b. For non-controlled drugs, Cubex® will have a generated report of all users taking inventory from machines
        1. This report will be printed by pharmacy staff and will suffice as record- keeping requirements for pharmacy

6) Waste/Disposals
        1. Controlled substances must be returned to the VTH Pharmacy or through Cactus Sink® units, where proper disposal will take place
            1. There is no crediting to client for discarding
            2. It is not applicable to be used for another patient
                a. Example: 0.15mL of buprenorphine is needed for a cat; a 1 mL ampule is cracked, and the remainder must be either planned for use on that specific patient or discarded
                    i. Use of controls will be monitored closely by pharmacy personnel to match accurate dispensation/use and discard records to verify matching quantities
                        1. Discrepancies will be reviewed by hospital directors
        2. See Return/Waste SOP for all pharmaceutical items

7) Pharmacy procedures for Restocking and Monitoring Use
    a. A report of pharmaceutical inventory that was taken from Cubex® the previous night/weekends will be printed each morning on business days
        1. Pharmacy personnel will restock and check/monitor use (especially controlled substances) each business day
        2. Signed scripts will be returned/brought to the Pharmacy each business day
        3. The VTH Pharmacist will evaluate and monitor use of inventory items and adjust accordingly
            1. VTH Pharmacy Committee will be actively involved in adjusting Cubex® inventory requests.
        4. Pharmacy personnel will maintain logbook of expiration dating of inventory
            1. Anything within one month of short-dating will be brought back to pharmacy to allow for dispensing and replaced with longer-dating inventory back into Cubex
    b. Discrepancy reports will also be generated to pharmacy when a blind count

of controls do not match physical count
    1. Email to VTH Pharmacist/pharmacy personnel as soon as discrepancy occurs
        1. If discrepancy cannot be located and fixed immediately, an email will be sent to hospital administrators and potential responsible parties
            a. Close attention will be on trends of discrepancies
            b. Penalties may ensue if cannot correct (see Penalties for Misuse)

8) Penalties for Misuse of Cubex
    a. After an initial setup period, accurate use of the Cubex® system will be expected
    b. Misuse will be reported to the Hospital Director(s)
    c. Penalties will be determined by the Hospital Directors, and may include loss of access and other consequences as deemed appropriate from training certificate documentation
        1. Director of Pharmacy reserves right to implementation of fees

9) Admission/Turn-around time for Emergency inpatient in relation to drug access
    a. The pharmacy/drug room cannot dispense pharmaceuticals without proper scripting/patient record
        1. As soon as admissions have recorded a case in VetHosp, pharmaceuticals will be available through Cubex®
            1. Emergency meds may be obtained either through Cubex® (see pharmaceutical options mentioned above), crash carts, or emergency kits
                a. If time or no case number is assigned to a patient, an "Emergency Patient" is available through Cubex® and notifies the item, quantity of item, and person accessing the item to the VTH Pharmacy for follow-up measures
            2. After normal operating hours, a case number may be generated within VetHOSP, which will allow access to Cubex®
            3. If necessary, rush orders can still be obtained from pharmacy with proper scripting/billing/record keeping
                a. This will allow for complete pharmacy prescription filling and compliance with OBOP

10) Inventory Lists of SA, LA, SA Oncology, and Anesthesia departments
    a. See VetHosp formulary

Oversight / Follow Through:

The Director of Pharmacy services, in cooperation with VTH Hospital Director, shall be responsible for the implementation and oversight of this policy.

Electronic Rx Submission/Refill Program

- Definition/Purpose: The VetHosp 2.0 Electronic Prescription Submission/Refill program is intended for Rx orders submitted to the VTH pharmacy. Prescriptions for VTH patients are submitted (electronically signed/ reviewed and approved) by VTH clinical faculty and house officers (prescribers). These prescriptions can be prepared by VTH clinical staff and students for prescriber review.

- FAQs:

  General use:

  - **Who can approve (electronically sign) a prescription item for a patient?** A: Only VTH prescribers (clinical house officers and faculty) with valid VCPR can approve/sign Rx items for a patient; 4th year students and clinical staff (CVTs) of the VTH can prepare electronic orders, which are submitted to the VTH prescribers for approval.
  - **Am I required to use the electronic Rx order submission instead of the current written Rx paper submission system to the VTH pharmacy?** A: No, participation in the electronic Rx order program is *optional*, especially during the initial launch. The intention is to transition the majority of prescriptions to the new electronic Rx program due to increased efficiency for both the pharmacy and the hospital. However, you may continue to submit paper prescriptions if you prefer.
  - **Can electronic Rx ward stock be approved in VetHosp as well?** A: Yes, the program already exists. (NOTE: controlled substance ward stock orders for anesthesia/RVP must continue to follow manual Rx white copy submission)
  - **Are any policies or requirements different with the new electronic Rx submission?** A: All Oregon Board of Pharmacy (OBOP), Drug Enforcement Administration (DEA), and current policies apply (see attached policy for prescription requirements, order submission and examples). There are slight differences in the new application with respect to refills and outpatient Schedule II orders. Schedule II orders like hydrocodone-homatropine tablets/syrup and codeine tablets MUST continue to be handwritten on a paper prescription due to DEA regulations.
  - **What does the question 'Is this an eScript or for an outside pharmacy?' mean?** A: The Oregon Veterinary Medical Examining Board (OVMEB) requests that we have in place an option for Rx hardcopy prints to be provided to a public pharmacy of client's choice. Therefore, the "Outside pharmacy" button will allow you to create a prescription to give to the client if they wish to fill medications with a public pharmacy rather than the VTH pharmacy. The 'eScript' button allows you to submit an Rx order to the VTH pharmacy for filling.
  - **What are the step-by-step functions to help me navigate throughout the electronic Rx program? (later attached)**
  - **Can I check the status of an Rx I submit to the VTH pharmacy?** A: Yes, the electronic Rx program offers the ability to see at step of the process a specific Rx is at. This includes if an order has been created, submitted, is in the process of filling, is in the process of being checked by the pharmacist, is ready-for-pickup,

or has been picked up (specific person and date/time will now be identified).

- **What are important reminders about prescription items?** A: Prescriptions are finalized and approved drug orders with valid VCPR and are official documents. Review all prescription orders before signing to alleviate problems of returns, errors, and missing required information for accuracy and efficiency measures.
- **Can I submit Rx returns in the electronic system?** A: No, if you must return Rx items, they must be returned accompanied by a white Rx hardcopy with a signature. The Rx product must be returned within 7 days per policy and must be in reusable condition.
- **Can I view the Rx item cost before I submit an Rx electronic order to the VTH pharmacy?** A: Yes, you have multiple areas to view the cost for a patient; the new electronic Rx order submission automatically provides the cost of the drug after you input a drug quantity.
- **Does a patient case need to be active before I can start using the new electronic Rx order submission program?** A: Yes. The case needs to be activated and once you start preparing Rx orders under a particular case, it will remain open while in the eScript queue.
- **Do the Rx 'wait-times' change if I use the new electronic Rx order submission program?** A: No, the VTH pharmacy will continue to provide prescription dispensing in 10 - 15 minutes on average as the standard (highly dependent upon level of hospital Rx order requests/prioritization and efficiency of Rx prescribing).
- **What are personal identification requirements in VetHosp, with respect to my position in the VTH?** A: There are requirements that must identify any hospital student or personnel member beyond normal user and password to VetHosp authentication. This is both required legally and for custody of drug purposes, where we will require a fingerprint read (just like Cubex®) and an electronic signature stamp with user right limitations appropriate to your position.

<u>Outpatient Refills:</u>

- **Can clients directly contact the VTH pharmacy for prescription refills?** A: No. The VTH support staff (i.e. reception) and veterinary technicians must be contacted by the client to initiate a refill request to the VTH pharmacy. This will allow for appropriate case activations, billing, and Rx pick-up by the VTH service. This system also aligns with compliance with the Oregon Board of Pharmacy and consultation(s). Additionally, clients are not permitted to pick-up their own Rx orders at the VTH pharmacy due to the location of the pharmacy in a secure area.
- **Can clients call to request an Rx transfer to a public pharmacy?** A: No. The VetHosp system is not designed to accommodate transfers. Additionally, there are certain challenges regarding product availability, VTH pharmacy access, product costs, facilities (i.e., phone-lines) and pharmacy resources. An appropriate mechanism is to have the VTH prescriber approve an 'Outside pharmacy' Rx hardcopy to a client and/or telephone the Rx order to a pharmacy of their choice.
- **How many refills can I prescribe for non-controlled substances?** In Oregon, you can prescribe up to 12 refills or up to one year. Examples: 30-day supply of a total of 12 fills, 60-day supply of a total of 6 refills, 90-day supply of a total of 4 refills, etc.

- **How many refills can I prescribe for controlled substances (CIII –V)?** In Oregon and per Federal requirements, you can prescribe up to 5 refills or up to 6 months, whichever is earlier: 30-day supply per fill
- **How many refills can I prescribe for controlled substances that are schedule II?** In Oregon and per Federal requirements, you cannot prescribe refills (they must be in the form of a new, written prescription); 30-day supply per fill
- **Can a client request to combine controlled substance or psychotherapeutic (i.e., trazodone, fluoxetine, etc.) refills for a lump refill beyond what was normal prescribed (i.e., 30-day RX with 2 refills dispensed as a 90-day supply)?** A: No, in Oregon a client cannot request two refills combined on these items (other Rx items may be permissible, but it is not preferred).
- **Can a client request less than what was original prescribed for a refill?** A: Yes, however, it is preferred to dispense the original amount prescribed to help alleviate discrepancies and communication errors
- **Can a refill request be changed once it has been approved from the original Rx order (i.e., the 2nd refill request requires a dosechange)?** A: No.
  Refills only apply to the original Rx order submitted. Another Rx order would have to be submitted/approved for such changes.
- **Do I need a license to prescribe prescription items to the VTH pharmacy? To an outside pharmacy?** A: You do not need a State or DEA license to prescribe prescriptions to your patients at the VTH pharmacy, however, you may be required to have a personal license State and/or DEA license for public pharmacy Rx orders.

PRESCRIPTION WRITING
for patient cases

Consider these elements for writing an accurate and complete prescription.
Consider these elements to supplement your prescription writing knowledge.
Review these elements before and after prescription writing.

Rx CHECKLIST:

1. ALWAYS review for accuracy & completeness.
2. Confirm your patient's case is 'ACTIVE' in VetHosp.
3. CII orders require a SEPARATE prescription.
4. Allow 10-15 minutes for Rx processing with consideration to your position in the fill-line.
5. Did you already consider the COST of the medication?
6. Was Med-Rec performed? (Ensure the quantity prescribed meets the client's needs by verifying any medication supplies at home.)
7. For compounding, check with the pharmacist for its availability and timing. Allow at least 2 days of advance notice for compounded refills.

Important/relevant information?
Write a note to the pharmacy staff in the top margin.

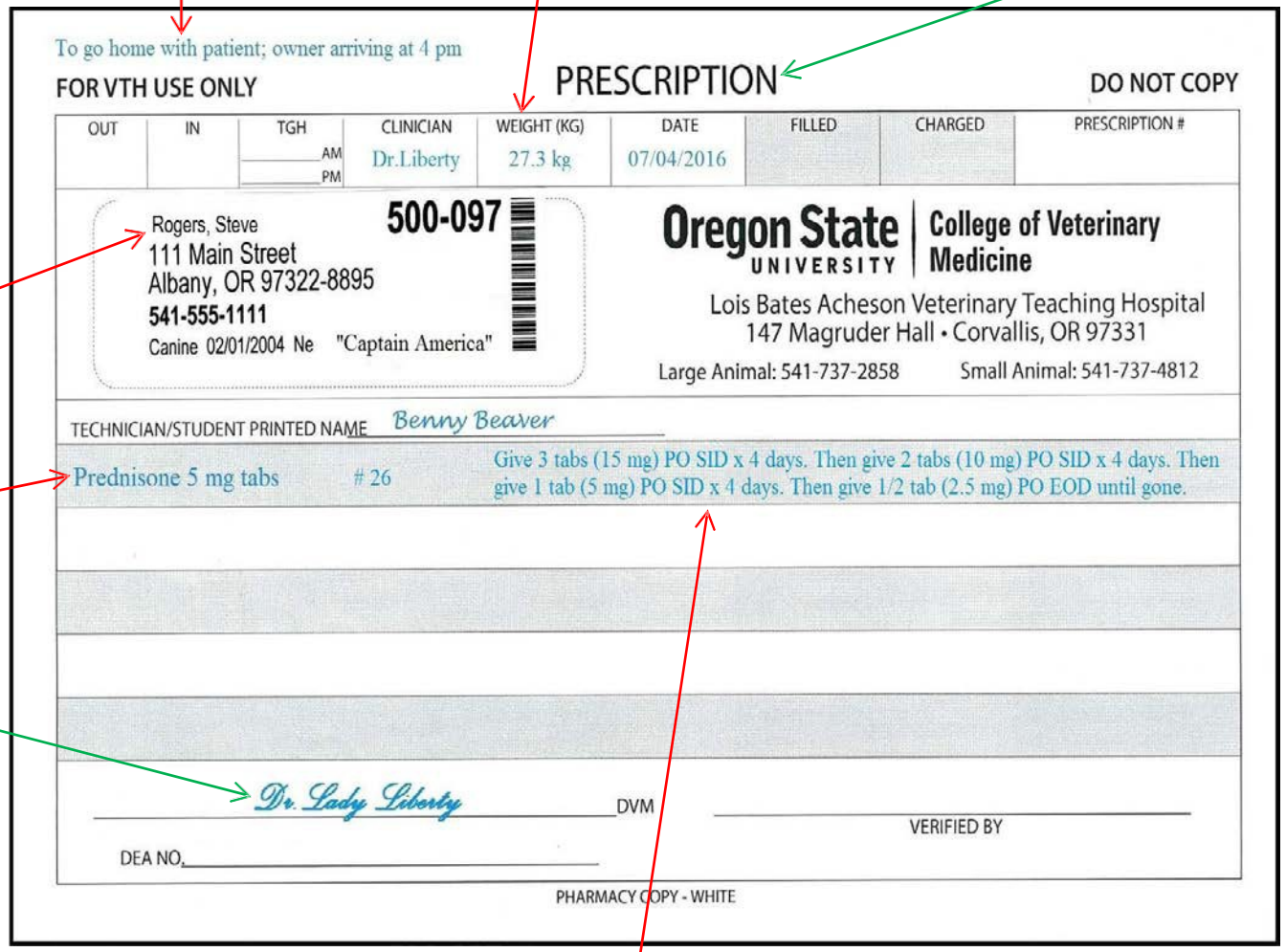
Is the patient's current weight provided?
Current weight is necessary to ensure safety and efficacy in dosing medications.

What is a prescription?
A finalized "drug order" for a specified patient that is complete with all requirements and reviewed for accuracy.

Patient Identifiers:
Patient-case labels contain all required elements and should be utilized on prescriptions. Required elements include the case number, patient's name, species, DOB, owner's full name, and physical address.

Drug Selection:
Copy the desired medication (including concentration/strength and formulation) exactly as it appears in VetHosp.

VCPR established and maintained?
By law, a veterinarian-client-patient-relationship (VCPR) is required to prescribe and dispense a prescription. Each prescription must be signed by the prescribing clinician associated with the case.



To go home with patient; owner arriving at 4 pm

FOR VTH USE ONLY

PRESCRIPTION

DO NOT COPY

OUT	IN	TGH	CLINICIAN	WEIGHT (KG)	DATE	FILLED	CHARGED	PRESCRIPTION #
		AM / PM	Dr.Liberty	27.3 kg	07/04/2016			

Rogers, Steve
111 Main Street
Albany, OR 97322-8895
541-555-1111
Canine 02/01/2004 Ne "Captain America"
500-097

Oregon State UNIVERSITY | College of Veterinary Medicine
Lois Bates Acheson Veterinary Teaching Hospital
147 Magruder Hall • Corvallis, OR 97331
Large Animal: 541-737-2858 Small Animal: 541-737-4812

TECHNICIAN/STUDENT PRINTED NAME Benny Beaver

Prednisone 5 mg tabs # 26
Give 3 tabs (15 mg) PO SID x 4 days. Then give 2 tabs (10 mg) PO SID x 4 days. Then give 1 tab (5 mg) PO SID x 4 days. Then give 1/2 tab (2.5 mg) PO EOD until gone.

Dr. Lady Liberty DVM

VERIFIED BY

DEA NO.

PHARMACY COPY - WHITE

IMPORTANT NOTES:

- Failure to meet the parameters outlined in this document may cause delays in prescription dispensing.
- Prescriptions should be written and dropped off by the student assigned to its related case. This will prevent delays should any questions/concerns arise.
- A pharmacist's job is to know exactly how a drug is being used for therapeutic effectiveness and safety while respecting the requirements of State and Federal Law.

Drug Information:

1. Directions for use should always be complete and include the dose, route and frequency. "For in-patient use" and "Use as directed" is NOT satisfactory.
2. Do NOT round the dose. Provide the dosing range or weight-based dose if uncertain about the dose.
3. Always double-check calculations (i.e. mg ≠ ml) and units (i.e. mg vs mcg)

PRESCRIPTION WRITING
for patient cases

Consider these elements for writing an accurate and complete prescription.
Consider these elements to supplement your prescription writing knowledge.
Review these elements before and after prescription writing.

Rx CHECKLIST:

1. ALWAYS review for accuracy & completeness.
2. Confirm your patient's case is 'ACTIVE' in VetHosp.
3. CII orders require a SEPARATE prescription.
4. Allow 10-15 minutes for Rx processing with consideration to your position in the fill-line.
5. Did you already consider the COST of the medication?
6. Was Med-Rec performed? (Ensure the quantity prescribed meets the client's needs by verifying any medication supplies at home.)
7. For compounding, check with the pharmacist for its availability and timing. Allow at least 2 days of advance notice for compounded refills.

Important/relevant information?
Write a note to the pharmacy staff in the top margin.

Is the patient's current weight provided?
Current weight is necessary to ensure safety and efficacy in dosing medications.

What is a prescription?
A finalized "drug order" for a specified patient that is complete with all requirements and reviewed for accuracy.

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Drug Selection:
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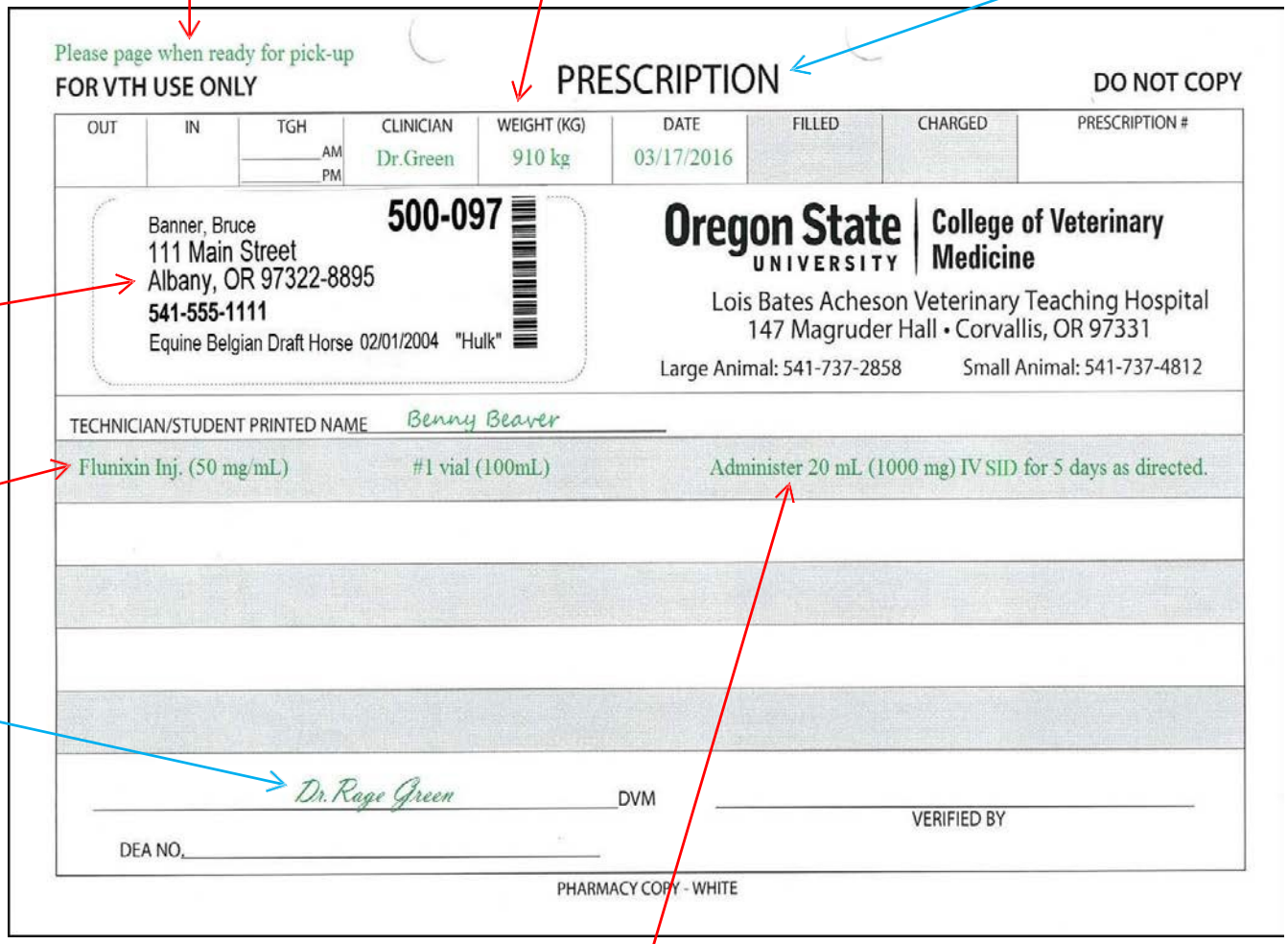
VCPR established and maintained?
By law, a veterinarian-client-patient-relationship (VCPR) is required to prescribe and dispense a prescription. Each prescription must be signed by the prescribing clinician associated with the case.



Please page when ready for pick-up

FOR VTH USE ONLY

PRESCRIPTION

DO NOT COPY

OUT	IN	TGH	CLINICIAN	WEIGHT (KG)	DATE	FILLED	CHARGED	PRESCRIPTION #
		____AM ____PM	Dr.Green	910 kg	03/17/2016			

Banner, Bruce
111 Main Street
Albany, OR 97322-8895
541-555-1111
Equine Belgian Draft Horse 02/01/2004 "Hulk"
500-097

Oregon State UNIVERSITY | College of Veterinary Medicine
Lois Bates Acheson Veterinary Teaching Hospital
147 Magruder Hall • Corvallis, OR 97331
Large Animal: 541-737-2858 Small Animal: 541-737-4812

TECHNICIAN/STUDENT PRINTED NAME Benny Beaver

Flunixin Inj. (50 mg/mL) #1 vial (100mL) Administer 20 mL (1000 mg) IV SID for 5 days as directed.

Dr. Rage Green DVM

VERIFIED BY

DEA NO.

PHARMACY COPY - WHITE

IMPORTANT NOTES:

- Failure to meet the parameters outlined in this document may cause delays in prescription dispensing.
- Prescriptions should be written and dropped off by the student assigned to its related case. This will prevent delays should any questions/concerns arise.
- A pharmacist's job is to know exactly how a drug is being used for therapeutic effectiveness and safety while respecting the requirements of State and Federal Law.

Drug Information:

1. Directions for use should always be complete and include the dose, route and frequency. "For in-patient use" and "Use as directed" is NOT satisfactory.
2. Do NOT round the dose. Provide the dosing range or weight-based dose if uncertain about the dose.
3. Always double-check calculations (i.e. mg ≠ ml) and units (i.e. mg vs mcg)

VMC 737
Veterinary Anesthesiology I
Guidelines and Procedures

Instructor in Charge:
Dr. Ron Mandsager

Co – Instructors:
Dr. Sandra Allweiler

COURSE DESCRIPTION

The course is a three-week, five-credit rotation in veterinary anesthesiology in the Veterinary Teaching Hospital. Emphasis will be placed on the selection of anesthetic techniques for various species and procedures, and anesthetic management and supportive therapy of anesthetized animals.

PREREQUISITES

Successful completion of VM 768, Principles of Veterinary Anesthesia, or its equivalent.

PREPARATION AND EXPECTATIONS

Students are expected to review all second- and third-year anesthesia notes and any relevant reference materials prior to starting the rotation. The most recent information from VMC 768 and other relevant information will be provided to you on Canvas.

Students will be expected to review the basic pharmacokinetics and pharmacodynamics of the commonly used anesthesia-related drugs when the rotation starts.

Students will be expected to be proficient and accurate when performing injections.

Students will be expected to have experience placing venous catheters.

Students will be expected to be proficient and accurate when performing endotracheal intubation.

Full scrub suit is required while present in the surgery rooms. Full scrub suits are not allowed outside the surgery areas unless a lab coat or coveralls is worn over them. Exam gloves should be worn at all times when handling vascular catheters placed in large animal patients. Use of exam gloves is recommended and may be required in small animal patients.

A stethoscope should be carried by the student. A thermometer is recommended but not required.

COURSE SCHEDULE

This rotation will begin at 8 am on Monday, the first day of the block, for orientation. Orientation will take approximately two to three hours. Depending on scheduling, subsequent daily activities in the rotation will commonly begin at 7:30 am. The next day's start time will be determined and communicated the prior afternoon. Rounds and other discussion sessions will likely be held each day and will cover a variety of topics.

CELL PHONE USE

Students should be mindful about using their cell phones during this course. Cell phones should not be used while one is actively managing an anesthetized animal. Please use your cell phones in a professional manner at other times.

EMERGENCY DUTY

Emergency duty is an important component in our service mission to the Veterinary Teaching Hospital. Students will be expected to assist with afterhours emergency cases. You will be asked to provide afterhours contact information. Emergency duty will be divided as equally as possible between participants in this rotation. Division of responsibility for emergency duty will vary depending on the number of students enrolled. Whenever cases extend beyond 5 pm, the students assigned to emergency duty that evening will finish those cases.

Two students, one as primary and one as secondary, will be available after hours when hospital patients need to be anesthetized on an emergency basis. It is expected that students will manage their availability in a dependable manner. We expect you to be able be present within the hospital within 20 minutes of an emergency call.

COURSE OBJECTIVES

1. Students will be able to explain the principles and techniques of veterinary anesthesiology.

2. Students will be able to relate physiology and pharmacology to veterinary anesthesiology.

3. Students will be able to explain why certain anesthetic agents are administered in selected cases.
4. Students will be taught the proper procedures for pre-anesthetic preparation of the patient, induction and maintenance of anesthesia, positioning of the patient, and recovery from anesthesia.

5. Students will be taught the effects of patient positioning on anesthetic management and post anesthetic complications.

6. Students will learn the variables used to monitor depth of anesthesia and the rationale for choosing them.

7. Students will learn to interpret the variables used to monitor depth of anesthesia and the use of supportive therapy to improve patient response to anesthesia.

8. Students will be able to interpret blood pressure data, electrocardiographic results, respiratory gas data, and blood gas analysis as they pertain to anesthesia.

9. Students will become proficient at venipuncture, tracheal intubation, venous and arterial catheterization, use of infusion pumps and ventilators, and other technical skills associated with anesthesia.

10. Students will be able to deliver supportive care to the anesthetized patient.

11. Students will be able to recognize and manage anesthetic emergencies.

12. Students will be able to recognize post anesthetic complications and administer appropriate therapy.

13. Students will be able to describe and modify anesthetic protocols for patients with co-morbid diseases and conditions.

SAFETY

Every precaution is taken to prevent human or animal injury during this rotation and students are briefed in safety procedures during orientation and during the rotation. When injections are given to animals in this rotation, that animal must be held or restrained by a second individual. Use of muzzles on canine patients is recommended or required whenever deemed necessary. While the rotation may seem daunting because of the size of the horse, no significant human injuries have occurred in this rotation. If you feel that you are being placed in an unsafe position while unsupervised in this rotation, you should notify the instructor. Any student who is pregnant should advise the instructor of her status.

OTHER

Providing anesthesia to our patients is a team sport. We encourage and expect you to work with and assist your colleagues on the rotation to provide care to our patients as much as possible, from setting up for a case to cleaning up after its completion. During ‘down time’ during the rotation, please use this time constructively. Ways to do so include discussion sessions with the clinician conducting the rotation, individual self-study reading anesthesia related articles in the literature, and completing assignments given by the instructor.

EVALUATION

A letter grade will be assigned and based upon the student's performance in the clinical setting, attendance, and upon the results of an examination should an examination be given following the completion of the rotation. Informal assessments of performance will be made during the rotation. Performance in the clinical setting will be assessed by the students' technical skills, ability to answer questions posed during the discussion sessions, case management and decision-making skills, and medical record keeping.

VMC 796
CLINICAL IMAGING

Course coordinator: Dr. Susanne Stieger-Vanegas
Email: susanne.stieger@oregonstate.edu
Phone: 541-737 4833 (office)

Link to instructor bio or website: http://vetmed.oregonstate.edu/people/susanne-stieger-vanegas

Course instructors: Drs. Stacy Cooley and Lauren Newsom
Link to Dr. Cooley's bio or website: https://vetmed.oregonstate.edu/people/stacy-cooley
Link to Dr. Newsom's bio or website: https://vetmed.oregonstate.edu/people/lauren-newsom

Course description: The course is a 2-week, 3 credit clinical rotation in veterinary diagnostic imaging in the Veterinary Teaching Hospital at the Carlson College of Veterinary Medicine at OSU. The emphasis will be placed on performing common radiographic procedures, learning to improve radiographic techniques, learning to perform a normal abdominal ultrasound study in a small animal and to gain experience in reading radiographic studies of clinical and teaching cases.

Prerequisite: Fourth-year standing in veterinary medicine

Preparation and Requirements: Students are expected to review the second-year diagnostic imaging course notes (VMC 764) or equivalent course material. Students are expected to know basic X-ray physics, computed radiography, digital radiography and artifacts associated with image creation or image development that were taught in the 2nd year radiology course or an equivalent course although these topics will not be covered directly or specifically in rounds. Additionally, all students are expected to be familiar with normal radiographic anatomy prior to the start of the clinical imaging rotation. Students are expected to read through the CANVAS course website before the first day of rotation and familiarize themselves with the information provided in the course website.

Course schedule: You are expected to be ready to contribute from Monday to Friday at 8am. At first day of the block, an approximately 1-hour session is given by the radiology technician to allow hands-on experience in patient positioning and radiographic technique. During the first day, the radiologist or one of the house officers in diagnostic imaging will familiarize the students with the ultrasound unit available for scanning and explain a standard small animal abdominal ultrasound examination. Additionally, all ultrasound introductory material is also provided on the CANVAS website.

All students should expect to be available for imaging from 8am until 5:00 pm from Monday through Friday. There may be days when our work will take us past that time and students are expected to assist with these cases, and there will be days when our caseload is light. During the rotation, students are assigned 1 day per week to ultrasound and may be assigned 1 day per week to the reading room. You may be instructed to attend journal reviews, necropsy rounds and senior paper presentations.

After the first Monday, the students will start each day from 8:00-9:00 am in Ultrasound. This is your opportunity to practice scanning on phantoms or on your own pets. Take advantage of this time, as you may not always be able to scan the clinical patients during appointments. We have an animal care and use protocol, which allows the students on diagnostic imaging rotation to bring in their own, healthy cat or dog for practicing ultrasound examinations under the supervision of the radiologist on the clinical floor. If this interests you, you have to read through the animal care and use protocol and sign an owner informed consent form. If you bring in your pet for practicing ultrasound and your animal is housed in one of the VTH kennels/cages or runs, you are required to clean their run/cage at the end of the day. Animals brought in for an ultrasound covered by the course ACUP can only be

kept in the facilities noted in the ACUP during the stay at the Carlson College of Veterinary Medicine. This is an exciting opportunity for you to learn ultrasound in small animal patients, please comply with the rules.

Daily morning rounds are scheduled (starting at 9:15 or 9.30 am) on every weekday except Thursday (senior papers), when they start after senior papers. Clinical imaging students are expected to attend senior papers if no clinical cases are scheduled for that time.

After rounds, you are expected to assist with clinical cases in imaging. When students are not busy with obtaining radiographs, in ultrasound, or performing case discussions, students are expected to make use of their time and review the clinical imaging cases from the day, study the teaching files, practice and perform ultrasound scans and read through the teaching materials on the Canvas teaching website.

Students are expected to be prompt and eager to participate in rounds, radiography, and ultrasound. Attendance is mandatory for this rotation. If an absence occurs, it must be excused and the course instructor needs to be informed.

Students should be dressed professionally and suitably for the work involved. Sandals and other open-toed shoes are inappropriate, as we are working with large and small animals.

TENTATIVE SCHEDULE FOR THE CLINICAL RADIOLOGY ROTATION

Please make sure you check the CANVAS website or check in with the radiologist on clinics for the newest information as the schedule may change.

Week #1

DAY	TIME	ACTIVITY
Monday	8:15 or 11.15 am	Radiology Orientation: duties while on radiology rotation, expectations, equipment use, radiation safety (rad techs)
	9:30-10:45 am	Case rounds- TOPIC: Small animal musculoskeletal system
	As time permits	Introduction to ultrasound including the machine and phantoms
Tuesday	8:00-9:00 am	Ultrasound practice
	9:00-10:15 am	Case rounds- TOPIC: Small or large animal musculoskeletal system
Wednesday	8:00-9:00 am	Ultrasound practice
	9:00-10:15 am	Case rounds – TOPIC: Large animal musculoskeletal system
Thursday	8:00-9:00 am	Senior papers (rotation students required to attend)
	9:15-10:00 am	Case rounds– TOPIC: Non-cardiac thorax
Friday	-9:00 am	Quiz 1 (theoretical and practical): Physics, safety, positioning, SA bone, LA bone, non-cardiac thorax

Week #2

DAY	TIME	ACTIVITY
Monday	8:00-9:00 am	Ultrasound practice
	9:00-10:15 am	Case rounds- TOPIC: Cardiac thorax
Tuesday	8:00-9:00 am	Ultrasound practice
	9:00-10:15 am	Case rounds – TOPIC: Abdomen
Wednesday	8:00-9:00 am	Ultrasound practice
	9:00-10:15 am	Case rounds– TOPIC: Abdomen
Thursday	8:00-9:00 am	Senior papers (rotation students required to attend)
	9:15-10:00 am	Case rounds – TOPIC (Thorax, abdomen, etc.)
Friday	8:00-10:00 am	Quiz 2 (theoretical and practical): Cardiac thorax, abdomen, ultrasound, review

Note: There can be changes to this schedule if clinical cases require immediate attention or if the imaging staff or radiologists have teaching or other responsibilities.

Specific Block Responsibilities

1. **Case related responsibility —** primary case responsibility equates to the acquisition of imaging examinations and is to be rotated among the imaging students
    a. Students will assume primary responsibility for an imaging case at the clinic and discuss with a technician or faculty on duty the views needed to evaluate the problem(s) identified on the request.
    b. Students determine the positioning of the animal, exposure settings, cassette size and adjust the settings on the digital screen. Students will receive close guidance when obtaining radiographs by the technicians early in the rotation and receive more responsibilities as they demonstrate competence.
    c. Please, make sure that a supervising technician from imaging or a radiologist is available before you start obtaining radiographs.
    d. Students decide with help of the staff or faculty on duty if the radiographs obtained are adequate or if the radiographs need to be repeated.
    e. Students will perform common radiographic procedures, learn radiographic troubleshooting techniques, and gain experience reading radiographs of clinical and teaching cases.
    f. Different types of film processing and processing maintenance will be discussed with the radiology technicians.
    g. Students assigned to an ultrasound case will help during the ultrasound study and if time and the condition of the animal permits will be able to scan the animal after the initial study is finished.
    h. If you are concerned about the health of the patient at any time during the imaging examination, inform the closest veterinarian, veterinary technician or radiology technician.

2. **General responsibilities**
    a. Your safety is important. As you are aware, animals are sometimes unpredictable. Listen to your intuition if you sense an animal is frightened and/or aggressive. Treat all patients humanely and as gently as possible, but use a muzzle if you sense that they could bite. If you have concerns, please ask the technician or radiologist on clinics for guidance and help.
    b. Be aware that you may encounter zoonotic diseases, including rabies. Wash your hands frequently while on this rotation, certainly after each patient. Use precautions (such as gloves and disposable aprons) when handling patients suspected or known to have zoonotic diseases. You should also see to it that the imaging room is properly disinfected and that other patients are not exposed, to the extent possible. If you have questions please ask the technicians or radiologists on clinics for guidance and help.
    c. When time permits, it is the responsibility of the student to study the teaching files available on the computer viewing stations and the additional radiology teaching files stored in a plastic bin. These are different cases than you have seen in previous radiography labs or rounds. Every student is expected to be familiar with small and large animal common radiographic disease and anatomy.
    d. Be prepared to discuss radiographic special procedures regarding feasibility, indications, contraindications, contrast media, procedure and interpretation.
    e. Review cases radiographed and visit with the attending clinicians or students to receive pertinent clinical information, which might help in the interpretation. Cases can be viewed on the computer stations in the common radiography area.
    f. Keep the imaging areas clean and neat at all times. The ultrasound, small animal and large animal rooms need to be tidied at the end of the day.
    g. Protect tables and the X-ray/US/CT/MRI equipment

3. CANVAS teaching website

All information pertinent to the course including assignments, reading material and case sets for morning rounds are posted on the course Canvas website. Please, make sure you read through the course website before you start the rotation.

4. Morning rounds

Each student is expected to be prepared for morning rounds including being able to describe and discuss diagnostic imaging findings of the clinical radiographic and ultrasound cases of the prior day or dependent on the case load be able to discuss the prepared case sets. Students are expected to be able to discuss differential diagnoses for each case. Students will be able to review the clinical cases of the day and the prepared case sets on the common shared viewing stations in radiology. The prepared case sets are organized in sets of 8-10 cases and are given to the students the day before rounds and all cases need to be reviewed by the students prior to morning rounds. Students are expected to read appropriate sections of the Thrall textbook to help prepare for rounds topics and/or discussions. If a contrast study was performed, students need to be able to describe how the study was performed including contrast agent used, contrast agent dose and timing of the contrast study. Furthermore, students need to be familiar with normal radiographic anatomy in small and large animals.
Students should be verbally able to formulate a diagnostic imaging report, summarize the findings and discuss differential diagnoses. A diagnostic imaging report should contain the following information. Below an example for a diagnostic imaging report for rounds is listed.

Outline for a diagnostic imaging report for the morning rounds

- **Case #**
- **Signalment of the patient**
- **Brief pertinent history of the patient**
- **Findings:** Describe your radiographic findings. In this section, be sure to include use of the 5 opacities, Roentgen signs, pulmonary patterns and other radiographic terms where appropriate.
- **Impressions:** Summarize your findings and list differential diagnosis for each finding. Make sure, you rank the most likely differential diagnosis first and then rank them in the order of likelihood.
- Describe the next appropriate step and why you would consider this the next step. This can be other diagnostic imaging tests, other diagnostic tests or therapeutic recommendations.
- Is your diagnosis consistent with the history/ clinical signs (if given)? Briefly, why or why not?

The following radiology topics will be covered and should be reviewed thoroughly by the students before morning discussions: Small and large animal appendicular and axial skeleton, non-cardiac thoracic disease, cardiac disease, abdominal disease. Week one rounds will cover small and large animal skeletal diseases and non-cardiac thoracic disease. Week two rounds will cover cardiac thoracic diseases and abdomen including ultrasound. Students are expected to know basic X-ray physics, artifacts associated with image creation, artifacts noted in computed and digital radiographs that were taught in the 2nd year course although this topic will not be covered directly or specifically in rounds.

Learning Outcomes

a. Students will integrate the knowledge learned in classes and labs to take diagnostic quality radiographs on clinic cases.
b. Students will learn to recognize high quality radiographs and know how to correct deficiencies in image quality.
c. Students will understand the basic function of film processing and what is required for processing maintenance.
d. Students will learn a structured and methodical approach to evaluate radiographs and apply this to clinical and teaching cases. In addition, they will learn proper terminology, refine reporting

skills and need to be able to present and discuss a prioritized differential diagnoses list.

e. Additional imaging modalities will be discussed on a case by case basis.

Textbooks for the clinical imaging rotation

Required:

- Thrall, DE, editor. Textbook of Veterinary Diagnostic Radiology*, seventh edition*. WB Saunders, Philadelphia, 2018

Optional:

- Burk DL, Feeney DA. Small Animal Radiology & Ultrasound*, 3rd edition*, WB Saunders, 2003.
- Butler JA, Colles CM, Dyson SJ, Kold SE and Poulos PW. Clinical Radiology of the Horse*, 4th edition*. Blackwell Science, 2017. ISBN: 978-1-118-91228-7
- Pennick D and D'Anjou MA. Atlas of Small Animal Ultrasonography, 2nd edition, Blackwell Publishing, 2015.
- Nyland TG. Small animal diagnostic ultrasound, 3rd edition, WB Saunders, Philadelphia, 2014.
- Kealy JK, McAllister H. Diagnostic Radiology and Ultrasonography of the Dog and Cat*, 5th edition*. WB Saunders, Philadelphia, 2010.
- Morgan, JP. Techniques of Veterinary Radiography*, fifth edition*. Iowa State University Press, Ames, 1993.

Additional learning material

- Auto-tutorial digital files are available to familiarize students with radiographic examples (including contrast imaging studies) of common diseases in small and large animals. The information of how to access the digital images is readily available in a plastic file box in the main radiology room and can be viewed on a DICOM viewer (NOVArad) on the computers in radiology. Any questions related to these cases can be directed to the radiology resident or radiologist on duty.
- Students can additionally familiarize themselves with radiographic anatomy using the free-ware radiographic anatomy software application developed by Dr. Nemanic. The program is available at https://veterinary-radiographic-anatomy.oregonstate.edu/

Grading: Grades will be given on an A – F scale. Students will be evaluated by their proficiency in reading radiographic case studies, by their performance at clinic rounds, by their participation in case discussions, their technical skills in radiography and ultrasound, and with exams in radiography and ultrasound.
Reading assignments, presentations, and other quizzes may also form the basis for part of the grade. Questions about the rotation, grading, problems, schedule changes, and special requests should always be directed to Dr. Stieger-Vanegas (Susanne.stieger@oregonstate.edu) and the radiologist on clinics.

Please remember to follow the expectations for student conduct during this rotation. https://studentlife.oregonstate.edu/sites/studentlife.oregonstate.edu/files/student-conduct-community-standards/Code/code_of_student_conduct_8_14_20.pdfPlease, read through the next section carefully.

Safety considerations for the clinical imaging rotation

Radiology

Any radiographic study performed by a student in the VTH has to be performed under the supervision of a technician certified in the safe use of the radiology equipment, a radiologist or veterinarian. The principle guiding radiation safety in the veterinary teaching hospital is the ALARA principle (**A**s **L**ow **A**s **R**easonably **A**chievable). It cannot be overstated that the last two words in ALARA are "reasonably achievable." Reasonably achievable is very different from "as low as possible." If the guiding principle was to obtain radiation exposure levels as low as possible, that would indicate a zero tolerance for radiation exposure. A goal of zero exposure would place unrealistic economic, design, and workflow constraints on the

veterinary profession to the point that obtaining radiographs in a general practice would likely be impractical or cost prohibitive. However, all possible precautions must be taken to minimize exposure to ionizing radiation and properly monitor exposure to radiation by using badges. It is completely inappropriate to take a radiograph without wearing badges and proper shielding equipment (gown, thyroid shield, lead gloves, eye glasses). If you are concerned that someone is not taking appropriate radiological safety precautions, please notify the radiology technician or radiologist on duty immediately. The clinical radiology rotation will be used to instruct and provide the students with the tools necessary to obtain radiation exposures as low as reasonable achievable. These tools fall into three categories: time, distance, and shielding.

Time: Always use the shortest exposure time possible and keep the number of repeat radiographs as low as possible. Use always the technique chart that is provided in- and outside each imaging room.

Distance: Always stay as far from the radiation source as practical. Small increases in distance will dramatically decrease exposure. If possible, exit the room during radiography! The use of sedation to allow for sandbag and non-manual restraint is recommended. A tutorial about the proper use of sandbags and tape for non-manual restraint (including instructional pictures) can be found in- and outside the radiology room as well as the library in the radiology reading room.

Shielding: Use proper lead shielding equipment such as lead apron, lead gloves and thyroid shield, etc. You are required to wear appropriate lead shielding. Not wearing gloves is not an option in any circumstance if holding a patient, cassette or cassette holder. Obtaining radiographs which include unshielded fingers or hands in the radiograph is unacceptable. There should never be unshielded fingers or hands or other body parts of a human in our veterinary radiographs. It is important to remember that hands or fingers even when covered by lead gloves should never be in the primary beam. Lead gloves are not made for protection from radiation in the primary beam and only protect the hands from scattered radiation.

Computed tomography
Never be in the CT room while a patient is being scanned. All monitoring can be performed remotely from the CT monitoring room. Students and staff are not allowed in the CT scanning room while a patient is scanned.

Ultrasound
Ultrasound is not associated with any harmful radiation and it is safe to spend time in the ultrasound room. The ultrasound equipment, especially the transducers are very sensitive to force e.g. falling on the floor etc. as they contain small piezoelectric crystals. Treat the ultrasound equipment with care and keep it clean. If you clean the transducers use a maximum of 50% solution of alcohol, as the surface of the probe gets otherwise damaged.

Magnetic resonance tomography
Remember that the magnet in an MRI unit is always on, 24/7, regardless of whether there are patients or staff present. The magnet is also unforgiving! If you enter the room with something with iron or many metals you will not get a second chance. The metallic substance will be attracted to the magnet and you will likely not be able to stop it! The magnetic field creates a projectile effect causing metallic items to rapidly

accelerate into the bore of the magnet. This means that metal items brought close to the bore of the magnet will be pulled into the magnet. If a patient is in the magnet at the time, this can result in injury and/or death of the patient. Remember, that the magnetic field is likely to have an immediate effect. A very few number of metallic items are not magnetic and will not get pulled into the magnet, so please assume that all metal will be affected.

Make sure you proper screen yourself and check your pockets so that you do not carry any metallic objects including a stethoscope, pen, needles, etc. before you enter the MRI environment. Leave all metallic objects in the MRI monitoring area. If you carry your wallet into the magnet room, your credit card strips will be wiped of all important information and will be rendered useless.

If a metallic object becomes attached to the magnet, or a patient or human life is endangered by a metallic object being carried into the magnet room, the magnet must be quenched. This can cost tens of thousands of dollars.

Absolute contraindications for entering the MRI environment are

- Pacemakers
- Implanted cardiac defibrillator/neuro-stimulators or infusion pumps
- Brain aneurysm clips
- Cochlear implants
- Metal fragments in eyes or in the head
- Magnetic implants
- External pacer wires

Conditional contraindications for entering the MRI environment include

- Shrapnel, bullets, etc.
- Intravascular stents, filters, tec.
- Bone joint pins, screws, plates, etc.
- Transdermal delivery systems
- Prosthetic devices
- Internal pacer wires
- Un-secured body piercings (Niobium piercings are non-magnetic)

If you have any of these objects/medical devices in your body, inform the MRI technician and clinician in charge of you. You MUST not enter the MRI environment.

REMEMBER:

- Never enter the magnet room for any reason unless accompanied by the MRI technologist or radiologist on clinics.
- Never take anything into the magnet room without checking first with the MRI technologist or radiologist on clinics.
- Always remove everything from your pockets that could potentially be a projectile
- Never take tools into the MRI room for any reason!
- The MRI technologist and radiologist have absolute authority over all personnel, patients and equipment entering the MRI environment.
- For the safety of all, under no circumstances should the MRI technician’s or radiologist’s directions be ignored!

Oregon Veterinary Diagnostic Laboratory Guidelines & Procedures

INTRODUCTION

The Oregon Veterinary Diagnostic Laboratory (OVDL) is an AAVLD-accredited facility providing a full range of testing services for the diagnosis of animal disease and the promotion of animal and public health. These services include necropsy, histopathology, bacteriology, virology, molecular diagnostics, clinical pathology and serology. The OVDL accepts animals, tissue and fluid specimens, and other materials for diagnostic testing. The results of these tests are provided to the VTH clinician, referring veterinarian, or animal owner to help them make informed decisions related to the health of the animals under their care.

The primary mission of the OVDL is to provide quality diagnostic services to clients in an accurate and timely manner and to teach veterinary and graduate students in the method of laboratory diagnostics. The OVLD also assists and is engaged in research efforts as well as public health and forensic issues.

HOURS OF OPERATION

The OVDL is open Monday through Friday, 8 a.m. to 5 p.m., and is closed on weekends and holidays. Case material is handled during normal business hours. The OVDL does not accept samples after hours. The OVDL has a pathologist on-call seven days a week. A roster listing the pathologist on duty and the OVDL cell phone number (541-740-8633) is posted in the OVDL Business Office, Receiving Room, Necropsy Room, and both Large and Small Animal Teaching Hospitals. Necropsies generally begin at 1 p.m., but may and often do commence earlier at the discretion of the pathologist.

Depending upon case load and the nature of a case, animals submitted late in the afternoon may be held, unless time sensitive at the discretion of the pathologist, for necropsy on the following work day.

OVDL CUTOFF TIMES FOR VTH SPECIMEN SUBMISSIONS AND TESTING

OVDL Receiving is open for receipt of specimens from the VTH from 8:00 a.m. until 5:00 p.m., Monday through Friday. Handling of those specimens after receipt is as follows:

- Specimens received by 4:00 p.m. will be delivered to section laboratories for testing or "set-up" as deemed appropriate for the specified test by that laboratory.

- Specimens received after 4:00 p.m. will be processed the following day. NOTE: Same day testing may not be available for some tests.

Clinical Pathology: STAT 4-4:30 pm

Same-day testing or "set-up" is available with a STAT request for most tests. A STAT is required for same day results on samples submitted between 4:00 pm and 4:30 pm. Coagulation tests: Notify the lab a minimum of one hour when possible prior to submission of coagulation tests including TEG, PT/PTT and Dimers. Endocrine Tests 10am-2pm: All endocrine tests (ACTH, cortisol, progesterone, and TT4) will be run between the hours of 10am to 2pm daily. STAT is not available for these tests. Call-in fee after 4:30pm: Only cytology and blood smear evaluations received after 4:30 pm may be run same day with the addition of a call-in fee. Contact the Clinical Pathology section at 7-6820 for more information.

Bacteriology: STAT 4-5:00 pm and Saturday

Same-day testing or "set-up" is available with a STAT request for most tests. A STAT is required for same day set-up of samples submitted between 4:00pm-5:00pm and on Saturdays when staff is available. Contact the Bacteriology Section at 7-6824 for more information.

Outside Lab shipments: STAT 11:30 am-1:00 pm M-Th, 1:00 pm Friday

Requests must be received by 11:30 am Monday–Thursday in order to be sent out by UPS the same day. Between 11:30 am and 1:00 pm a STAT must be added for same day shipping. Specimens submitted on Friday for send-out require a STAT by 1:00pm, and only certain outside lab samples may be shipped on Fridays. Specimens received Friday without a STAT will be sent out on the following business day. IDEXX STAT after 4:00pm: IDEXX requests between 4:00-5:00pm require a STAT for same day shipping.

Molecular Diagnostics: STAT 10:00 am

Same-day PCR testing is available with a STAT request for most PCR assays, if the specimen is received by 10:00 am. If the specimen is received after 10:00 am, results will be available the following business day. A STAT fee will be assessed for each specimen/test for which this request is made. Some tests require additional time for processing and are not available on a STAT basis. Contact the Molecular Diagnostics Section at 7-6615 for more information.

Virology: STAT 1:00 pm

Same day testing is available for some of the more rapid diagnostic assays with a STAT request, if the specimen is received by 1:00 pm. If specimen is received after 1:00 pm, results will be available the following business day. A STAT fee will be assessed for each specimen/test for which this request is made. Most virology tests require multiple days to complete and initial set up will be performed the following business day if the specimen is received after 4:00 pm. Contact the Virology Section at 7-2172 for more information.

Histopathology: STAT 11:00 am M-Th, 10:00 am Friday

Same day processing and reporting are available for some tests with a STAT request, if specimen is received by 11:00 am Monday through Thursday or 10:00 am on Friday. A STAT fee will be assessed for each specimen for which this request is made. Histology technicians or pathologists will determine the suitability of the specimen for same day processing. If deemed unsuitable, the client will be notified and the specimen will be held pending submission of a revised OVDL

Submission Form requesting routine histopathology processing and reporting. Contact the Histopathology Section at 7-6822 for more information.

Necropsy

Regardless of the time of submission, timing of necropsies is at the discretion of the Pathologist on duty.

OVDL AFTER-HOURS

After 5 p.m. and on the weekends and holidays, callers to the OVDL are automatically transferred to the pathologist on-call. If the case warrants, the clinician should request the option of an after-hours necropsy with the pathologist on-call.

NECROPSY SERVICE

There are three types of necropsies available for VTH cases.

1. Complete Necropsy (Complete Diagnostic Workup)
2. Gross Necropsy Only
3. Teaching Necropsy

Complete Diagnostic Workup includes a necropsy with specimen collection appropriate for diagnostic tests deemed appropriate by the pathologist. This may include histopathology, bacteriology, parasitology, virology, molecular diagnostics, serology, clinical pathology, and toxicology. Gross Necropsy Only is an option usually selected when the cause of death is obvious, such as, displacement or trauma, and no additional testing is necessary.

For all VTH necropsy submissions, unless specifically instructed otherwise on the submission form, the OVDL pathologist will collect a full set of tissue for histopathological examination and also may collect such fresh tissues as they feel may be useful for further diagnostic testing. This does not imply automatic processing of the samples; it only ensures the samples will be available in case they are needed later. By having these tissues available the pathologist will be able to pursue the case to the depth desired by the VTH clinician, as the desired level of investigation is not always clear on the submission form and can change according to necropsy findings.

Therefore, unless certain that additional tests are not warranted (e.g. colonic displacement, trauma cases) VTH clinicians are advised to request a Complete Diagnostic Workup

The OVDL technical staff, residents and pathologists use the hoist in the necropsy cooler to lift and move large animals. Stand clear of a hoisted animal; chains can slip.

TEACHING NECROPSIES

Requests for Teaching Necropsies must be indicated as such on the OVDL Accession form. These necropsies are charged to a separate VTH index. Teaching necropsy requests are initiated by a VTH faculty clinician for cases that they believe have significant teaching value and for which the client is unwilling to pay for a necropsy. Teaching Necropsies support the educational mission of

the college. Unless otherwise indicated by the requesting clinician, Teaching Necropsies will be done as Necropsy with Histopathology. The clinician submitting the animal should discuss further testing with the OVDL pathologist as soon as possible after submission. Additional testing at the discretion of the pathologist does not require approval but should be discussed and agreed upon between the responsible clinician and the pathologist.

Please note: The OVDL does not provide cosmetic necropsies.

Note to clinicians – The collection of specimens for teaching purposes (i.e. labs or demonstrations) requires that you contact the Pathology Laboratory Coordinator (76819, MAGR

122) to discuss your needs. Simple collections are provided as a courtesy; those requiring significant dissection or tissue manipulation may incur a collection fee. Samples will be collected and placed in the OVDL cooler by the Pathology Laboratory Coordinator. As cooler space is extremely limited teaching specimens must be removed from the OVDL cooler and taken to other storage within 24 hours of collection or they will be discarded. Any specimens placed in the OVDL cooler must be marked with the responsible party's name and date. Unlabeled specimens will be discarded immediately.

SPECIMEN SUBMISSION

All VTH specimens submitted for any diagnostic testing must be accompanied by a OVDL Accession form that includes the name of the clinician or house officer. Testing will not proceed without the requesting doctor's name on the form. It is also critical that an accurate and complete history accompany each specimen submitted. The OVDL diagnosticians may delay testing until a history is provided. Submission of live animals to the OVDL is not encouraged due to limited and inadequate holding facilities. If a live animal must be presented contact the pathologist immediately for instructions.

CARE OF REMAINS

In the interests of public safety and biosecurity the OVDL does not release any animal remains to owners, following a necropsy. Aside from routine disposal, remains can only be released to a licensed crematory service. For large animals, necropsy eliminates the possibility of cremation due to subsequent problems with transportation of the remains. Arrangements for cremation are the responsibility by clinicians and clients (not OVDL). Collection of keepsakes, such as clips of hair, must be done before the animal is delivered to the OVDL. "Care of Remains" instructions must be indicated on the OVDL submission form. Equine remains for cremation, burial, or owner pick up will only be held in the necropsy cooler for a maximum of one business day.

DISPOSAL REGULATIONS

There are several important regulations involving different disposal "streams" for biological materials in the necropsy area. Although no personnel should be utilizing these disposal streams out of hours, the regulations are emphasized here to avoid accidents that could results in fines or loss of access to current disposal services:

1) The dumpster offal carts (rectangular) cannot contain:

- Plastic and gloves
- Metal (no horseshoes, no fixation pins/plates)

2) Carcass/tissues cannot be freely disposed of through the OVDL – consult with the Pathology Laboratory Coordinator. In most instances a disposal fee is applicable, and therefore it will be necessary to complete an accession form for the disposal service.

3) Proper tagging of specimens and prompt completion of a submission form is critical. We do not wish remains intended for cremation to end up in the wrong disposal stream.

SAFETY

Safety is a priority in the OVDL. You will receive training applicable to our section laboratories as necessary. We use a variety of sharp instruments (knives, saws, scissors, scalpels, needles) that can cut and puncture. Work with heavy animals can cause back injury and muscle strains. Large animals can slip from the overhead hoist. The floor of the Necropsy Room is slippery when wet, and become even more so when blood and tissue are present. The animals and tissues we work with can harbor zoonotic pathogens. If you are injured while working in the VDL, please notify your supervisor and the OVDL (Pathology Laboratory Coordinator, Quality & Safety Manager, or Director) immediately. Report any safety concerns to the OVDL Pathology Laboratory Coordinator immediately.

A few words on rabies in Oregon…

The OVDL provides rabies diagnostic testing for Oregon and the Pacific Northwest. Rabies is not a common disease in this state. The majority of positive cases are found among migratory bats during the summer months. Occasionally, the disease spills over into other species such as foxes. On rare occasions we do find rabies in un-vaccinated domestic animals. Therefore, rabies should be considered as a possible differential diagnosis in the presence of compatible signs and history. Rabies suspect cases may come to the laboratory during your Diagnostic Services block. You will not be asked to work with any of these specimens until they have been verified to be rabies-free.

If in doubt, ask OVDL personnel for help…we will be happy to assist!

REPORT OF RESULTS

TURN AROUND TIMES (TATs)

Although there are instances in which finalization of a case is delayed for several weeks due to the nature of the test (Outside lab testing, virus isolation, toxicology assays, extended fixation times for brains and spinal cords, necessary lengthy decalcification of bone specimens, etc) the OVDL does have expected TATs for routine cases. These can be found on the OVDL web page, http://vetmed.oregonstate.edu/diagnostic. Clinicians are encouraged to contact the pathologist regarding a case which is "overdue" as a diagnosis may be available but not yet entered into a report.

Standard TATs:

1) Gross necropsy findings can usually be accessed by the clinician within 2 business days. This can take the form of CoreOne entry, phone call or email by the pathologist.

2) Histopathology from necropsies is completed for most cases within 10 business days.

CNS cases may take longer.

3) Biopsy written reports are generally completed within 2 business days of receiving a fully-fixed specimen. Incompletely fixed specimens, those requiring decalcification, and those cases needing special stains may be delayed.

ACCESS TO REPORTS

Reports can be viewed through VetHosp. Preliminary reports can be viewed under Hospital. OVDL uses CoreOne as report system and in 2021 a CoreOne portal will be available for client information.

Diagnostic Clinical Pathology
VMB 736

Instructors in Charge: Dr. Elena Gorman and Dr. Jen Johns
Co-instructor: Dr. Shannon Phelps

Diagnostic clinical pathology is a critical component of all disciplines in medicine and surgery. Veterinarians are required to understand and integrate laboratory findings in multiple species and understand comparative pathophysiology and variations between species. This course is designed to provide a systematic approach to 1) understand the need for particular diagnostic tests, 2) appropriately interpret and integrate findings (both normal and abnormal), and 3) utilize this information to formulate differential diagnoses, need for additional testing, and/or treatment.

All materials will be published for each class in Canvas. Class convenes every morning at 8:30, unless otherwise specified, in a room to be announced (see general schedule below). There will be an hour break for lunch and the afternoon will commence at 1pm until the days' activities are complete (typically 5-5:30 pm). The days' activities are variable and subject to change. During the days that clinical cases are reviewed (Wednesday, Thursday and Friday), students will work in small groups to assess the days' cases. The facilitator may be requested to assist at any time, but we encourage groups to investigate questions on their own as much as possible – much like general practice.

PowerPoints containing relevant information are available on the Canvas site. The cases are variable and may include interpretation of a peripheral blood smear, cytology specimens and laboratory data.

A. Subjects to be Covered

1. Procedures for creating and reviewing blood smears
2. Hematology and hemostasis
3. Cytology
4. Urinalysis
5. Parasitology
6. Biochemical and blood gas analysis
7. Interpretation of laboratory data in a case-based format

B. Objectives/Skills

1. Review basic clinical pathology procedures so that you are comfortable with performing these on your own and teaching them to your staff
2. Integrate appropriate laboratory results and apply them to your patient(s)
3. Assess a variety of infectious disease processes and determine appropriate confirmatory tests
4. By the end of this block, you should be able to:
    a) Make and assess good quality blood smears
    b) Perform differential cell counts on peripheral blood smears
    c) Perform basic hematology procedures such as PCV, total plasma protein, fibrinogen, and platelet estimate
    d) Identify morphologic abnormalities in blood and interpret them accordingly
    e) Perform a complete urinalysis including interpretation of urine sediment
    f) Evaluate and interpret uncomplicated cytologic samples and fecal mounts
    g) Interpret laboratory data from cases from common domestic species
    h) Understand the importance of quality control and appropriate submission procedures in laboratory medicine

C. Texts

There is no required text. The following might be helpful for reference:

Thrall MA. Veterinary Hematology and Clinical Chemistry. 2nd edition Lippincott Williams and Wilkins. 2012.

Stockham and Scott, Fundamentals of Veterinary Clinical Pathology, 2nd edition. Blackwell Publishing, 2008.

Cowell and Tyler's Diagnostic Cytology and Hematology of the Dog and Cat, 5th edition. Elsevier Saunders, 2019.

Cowell and Tyler. Diagnostic Cytology and Hematology of the Horse, 2nd edition. Mosby, 2007.

Raskin and Meyers. Canine and Feline Cytology: A Color Atlas and Interpretation Guide, 3rd edition. Elsevier-Saunders, 2015.

Cornell University: EClinpath online textbook. http://eclinpath.com/

D. Grading

Grades for this section will be based on attitude, attendance and active participation plus general knowledge, interpretive and critical thinking ability, preparation and involvement in laboratory procedures, an organism identification exercise and daily quizzes given throughout the week. Quizzes are all open book and are to be completed independently. Attendance is mandatory for all sessions unless prior approval for an absence is obtained or there is an emergency. Approval for planned absences must be cleared prior to start of the rotation (note that only ½ day absences are allowed for 1-week rotations per 4th year rotation guidelines). Tardiness is not tolerated. The EValue grading form is provided in Canvas for clarity.

E. Dress Requirements

A lab coat, covered legs and close-toed shoes are required as we will be working mainly in room 202.

F. Proposed Schedule (subject to change)

<table>
<tr><th></th><th>Monday</th><th>Tuesday</th><th>Wednesday</th><th>Thursday</th><th>Friday</th></tr>
<tr><td rowspan="2">8:30 AM</td><td rowspan="2">Hematology – Erython review</td><td rowspan="2">Hemology – Leukon review</td><td rowspan="2">Case correlations</td><td>8 am: Senior papers</td><td>8 am: Cytology rounds</td></tr>
<tr><td>Case correlations</td><td>Case correlations</td></tr>
<tr><td>1 PM</td><td>Infectious disease Lab</td><td>Hematology Lab</td><td>Case discussions</td><td>Case discussions</td><td>Case discussions Urinalysis Lab</td></tr>
</table>

VMB 795
Diagnostic Services
Guidelines and Procedures

Course Coordinator: Dr. Duncan Russell

Dr. Christiane Löhr	737-9673	MAGR 144
Dr. Duncan Russell	737-3146	MAGR 219
Dr. Sean Spagnoli	737-8781	MAGR 140
Dr. Beth Ihms	737-6965	MAGR 146

A Pathology Assistant will also participate in most rotations. He/she is located in the Necropsy area in MAGR 122 and may be reached by calling 737-6818. This individual is responsible for the day to day running of the necropsy area and students are therefore asked to follow his/her instructions carefully in order to maximize their learning experience and keep the necropsy area safe and efficient.

This rotation does have an "on-call" requirement, in which students in each block must coordinate their hours to provide weekend and evening coverage of at least 2 students (more depending on enrollments per block). Weekend necropsies are only performed under emergency circumstances.

The most up to date information for this rotation can be found on canvas and students should check this prior to beginning rotation. Necropsies generally commence between 10-3 pm each day but you should consult with the pathologist on duty and provide contact information in case there is a change in schedule. If necropsy cases are available please arrive in the Necropsy area dressed in coveralls and boots. These must be worn while in the necropsy room. Please wear your name tags. Aprons are available and should be worn to help keep coveralls clean. Have extra coveralls ready for this rotation as clothing easily becomes soiled during necropsy procedures. Safety goggles are required and are provided. Face masks may also be required depending on the nature of necropsy case and are available for your use at any time, as are face shields. Knives and other dissection equipment are provided. Orientation will take place on the first day of your rotation. The instructor-in-charge, resident or Pathology Assistant will speak to you briefly about protocols and also will give you a brief tour of the necropsy area.

Students will assist with the cases until the day's work is completed. Students will assist in the cleaning of necropsy instruments, necropsy room, and loading dock area before leaving. Students are not free to leave at the end of the day until all cases, cleanup, and related work is complete unless the pathologist on duty has given permission.

Please contact Dr. Russell in case of necessary absences. Unexcused absences will necessitate the assignment of an incomplete for this rotation until agreed upon arrangements can be made for you to make up the missed duty time.

As veterinary medicine and livestock production become more demanding in terms of disease identification and control, the demand for laboratory service had increased. Some of the major difficulties encountered by diagnostic laboratories in providing meaningful service includes:

1. Lack of a clear, concise clinical history submitted with the tissues or animals,

2. Failure to receive proper specimens with which to perform the requested exams,

3. Failure to receive properly preserved/packaged specimens

Hopefully, during this rotation you will gain an appreciation for some of these problems so that you can make better use of a diagnostic laboratory and its personnel during your professional careers.

Objectives of the Necropsy/histopathology portion of the rotation

The most up to date learning outcomes can be found on canvas. Upon completion of this rotation the student will be able to:

1. Perform a complete necropsy examination on both large and small animal species. This includes not only the physical/mechanical tasks, but the description and interpretation of macroscopic (gross) pathology. By combining the gross necropsy findings, history, and clinical signs the student will be able to make a preliminary or, if possible, a final diagnosis on these cases.

2. Efficiently utilize a diagnostic laboratory through proper selection, preparation, and shipment of specimens taken either at necropsy or from live animals. This includes the provision of a complete history and lesion description.

3. Interpret results of laboratory tests and correlate with history, signs, and macroscopic pathology to arrive at a final diagnosis. Recognition of the frequent discrepancies between gross pathology and the definitive diagnosis is an important component of this objective.

4. Discuss of the significance macroscopic and microscopic lesions, options for further testing, potential etiologies, and differential diagnoses as a result of review and improvement of the student's knowledge base on specific disease conditions investigated during the rotation.

5. Utilize learning resources in order to better understand the clinical consequences, pathophysiology, treatment and control options associated with diagnoses made during case work-ups.

6. Generate an accurate, clear and concise case summary (to be delivered in PowerPoint, written, or verbally).

Requirements to Meet the Objectives of the Necropsy/histopathology portion of the rotation

1. Perform proper necropsy and sampling techniques

When possible, students will interview submitting owners or veterinarians and obtain a complete history, clinical signs, lesion description, and other pertinent information. You are expected to conduct yourself as you would in a practice setting. You are expected to perform necropsy examinations on all the animals submitted to the Oregon Veterinary Diagnostic Laboratory. We expect that you will take cases as personal projects for which you will have personal responsibility. Failure to conduct the examination properly, or collect specimens appropriately will tend to result in unsatisfactory outcome for the client. We feel this is the best way for you to learn in this teaching setting. The student should perform the necropsy, perhaps with advice or some assistance from the duty pathologist and necropsy assistant.

There is no "right" way to do a necropsy (implying that all other ways are wrong). Each person must develop his/her own technique that ensures a thorough examination of each organ system. Different pathologists may use different procedures. Ask the duty pathologist or necropsy technician for assistance or instructions on the procedures when in doubt.

When presented with a case, please first familiarize yourself with the history, then develop a plan for what is necessary to establish the diagnosis(es). Discuss your plan with the duty pathologist before beginning the necropsy examination; then do the necropsy examination. Be prepared to change your initial plan during the necropsy examination if findings warrant. Be sure all necessary and appropriate tissues are saved for the various ancillary tests (microbiology, histopathology, toxicology, etc.,). **This is what you will have to do in a practice setting.** Do not discard any portion of the animal until you have consulted with the pathologist on duty.

You will get more detailed instruction regarding sample collection during the orientation. (Also, on Canvas and/or share drive under VMB 795). For instance, all VTH cases require the collection of a specific set of tissues for histopathology. Please be sure you are comfortable with these sampling instructions. Pathologists/necropsy technician are responsible for ordering tests and routing specimens but YOU are collecting the specimens. To do so properly, remember the following points:

> The processing of samples in the necropsy area involves the collection of various tissues and fluids then forwarding these specimens to various work areas in the OVDL using materials such as Whirl-Pak bags, Ziploc bags, jars, blood tubes, centrifuge tubes with lid, and autoclaveable carry trays.
>
> Collected specimens will be sent to other work areas in a secondary bag or container that preserves the integrity of the specimen and protects laboratory personnel from possible pathogens.
>
> Collected specimens must be clearly labeled with the accession number, tissue being submitted, and the work area.
>
> Permanent marker will be used on Whirl-Pak bags, Zip-Lock bags, and centrifuge tubes. Permanent marker or accession labels can be used on blood tubes and swabs. (Note: The glue on the accession labels fails in

freezing temperatures.)

Accession labels will be used on histopathology jars

Some specific areas should be practiced and mastered by the end of the rotation include:

- Triage a patient for possibility of zoonosis (both in terms of probability and impact), notifiable disease, or other disease(s) of relevant to population health
- Formulate differential diagnoses based on submission history and anticipate scenarios that might arise during the necropsy (including variations on necropsy technique, sample requirements)
- Efficiently open three body cavities (thorax, abdominal, pericardial) and screen major organs for lesions
- Apply a systematic approach to complete gross necropsy examination
- Remove the head at the atlanto-occipital joint.
- Remove the brain using field techniques (hacksaw, hatchet, "egg-shell").
- Open the joints in a manner that insures obtaining "sterile" joint fluid.
- Remove an eyeball.
- Dissect a heart, examining all 4 sets of valves.
- Demonstrate effective evaluation and sampling technique of major organ systems (respiratory, endocrine, gastrointestinal, lymphoreticular, urinary, reproductive, musculoskeletal, hepatobiliary, integument, CNS)
- Identify common autolytic changes and gross findings of no significance
- Maintain a sharp knife.

2. Demonstrate skills in the areas of: lesion description and interpretation, formulation of differential diagnoses, and articulation of pathophysiologic mechanisms.

- This includes summarizing, justifying and reflecting upon your necropsy findings/interpretations to groups of peers and faculty. These skills (and their underlying knowledge base) are demonstrated by the way in which you communicate your findings to the pathologist on duty. This may be in the format of group discussion/rounds, pre-prepared PowerPoint presentation, or written word document. The most up to date requirements for reporting can be found on canvas.
- Rank appropriate differential diagnoses using clinical and pathologic data
- Select appropriate ancillary tests to generate a definitive diagnosis (or refine differential diagnoses) and recommend appropriate tests depending on client expectations and economic circumstances

Weekly necropsy rounds (attended by clinicians, pathologists, and other students) may be in place depending on current circumstances. The most up to date requirements for expectations regarding this can be found on canvas and will be communicated by the pathologist on duty.

This rotation may also include sessions at the multi-headed scope to review histopathology of necropsy cases. The timing and occurrence of these sessions will be determined at the discretion of the pathologists on duty.

3. Other Activities

The most up to date required activities can be found on Canvas.

All students will be required to present cases to the pathologist/resident on duty (format of presentation variable).

Quizzes will be provided. Information on Canvas will be your primary resource for communicating whether these are required or optional, and whether your performance in these quizzes contributes towards your grade.

Review systemic pathology notes, textbooks and other resources

Evaluation of Your Performance

The format for student evaluation is as per other Evalue assessments of the 4th year rotations involving clinical skills, communication skills, technical skills, etc. Factors used to make those assessments include demonstration of mastery of necropsy techniques, communication of necropsy findings, demonstration of knowledge base, attitude and interactions with faculty, staff and students, performance during rounds, and performance in any quizzes (if applicable).

Rules and Regulations

1. Please be on time. It is unfair for the others on your rotation if they must hold up presentations, or delay in dividing up case responsibilities, or take over your share of the work when you are late.

2. Please get excused by the Necropsy Rotation instructor in charge, or Dr. Russell, if you are going to be or have been absent. Incompletes are messy for both you and us. All matters relating to absences, incompletes, or make-up work must be approved by the course coordinator. Dr. Russell.

3. Please do not eat, drink, smoke, or chew gum, in the necropsy room or adjoining areas for obvious safety reasons. Please wash your hands and your boots thoroughly when leaving the necropsy area.

4. Please stay out from under the hoist when it is working. Let the pathology assistant coordinate all operations connected with securing, pushing, and raising or lowering of animals.

5. The band saw and meat saw are not to be used by students. If specimens require dissection using these tools please as the necropsy assistant or duty pathologist for assistance.

6. Please exercise caution with regard to sharp instruments. If you do cut yourself, a First Aid Kit is available in MAGR 122B (off the Necropsy room). An instructional card is taped to the wall by this kit giving the phone numbers for medical assistance. Notify the duty pathologist of any injuries.

7. Please secure your hair if it is long enough to be in contact with the cases you are dissecting. Most jewelry is a bad idea in the necropsy room.

8. Do not be cavalier about the use of personal phones or tablets in the necropsy area. Photos should only be taken to help you recall gross details of a case. Photos may be taken with a camera provided in necropsy and these could be used for reporting.

9. If you have some form of immunosuppression please consult with Dr. Russell, and/or the duty pathologist about ways for you to do alternate work or do make-up work. Students who are pregnant or have deep lacerations also fall in this category. **Please inform the duty pathologist if you have NOT been vaccinated against rabies.**

10. Please be cautious about formalin. Formalin is a hepatic sensitizing agent, a suspected carcinogen/mutagen and can give rise to severe asthmatic or dermal reactions. If you spill some on your skin, be sure to wash the area well with soap and water. If you spill some on your clothing or cannot wash it away, be sure to return to your locker and change clothes immediately after washing and rinsing the area. Eyewash units are available if necessary. Inform the necropsy technician or pathologist of formalin spills on the floor as we have formalin spill kits for this purpose.

11. You may wish to use a <u>full-face shield</u> instead of safety goggles when chipping bone, (as when opening skulls) or whenever working with tissues containing trapped gases. These shields are located on hooks in the necropsy room and can be utilized at any time you believe there is a danger to your eyes/face.

12. Please exercise extra caution when dissecting specimens suspected to contain zoonotic agents. Wearing a facemask is generally appropriate with these cases. Take note of case history information suggesting possible rabies or *Salmonella* infections, for example.

13. Disposal "streams". You will be given specific instructions about where medical wastes, tissues from different animal species, etc. may be routed. For instance, horseshoes must never go into the offal bins. Please request detailed instruction on the disposal procedures if they were omitted during your orientation session.

14. It is very important that pathogens not spread from the necropsy floor to other areas such as the teaching hospital. Please be especially careful to maintain good foot

sanitation.

We hope you will visit again here in necropsy after the end of your rotation. We are also appreciative of the case consultations you often provide when on clinics and the well-written case abstracts you sometimes are asked to provide when submitting samples. Good luck and good learning.

OHS Small Animal Primary Care VMC 794

Guidelines and Procedures

Instructor in charge – Dr. Kirk Miller

This rotation is a three-week required rotation in Primary Care based at the Oregon Humane Society in Portland, OR. Students will perform medical and surgical treatments for the benefit of animals donated to OHS. Students will be provided with living quarters at the OHS for the duration of their three-week rotation. Students will be supervised by either an Oregon State University CVM faculty member (DVM) or a veterinarian employed by the Oregon Humane Society. This is a graded course and grades will be assigned by the Oregon State University faculty member.

The block will start with orientation on Monday. The students are expected to be on duty from Monday through Friday each week. The students will meet at the front of the building – SW corner labeled Incoming Pets - at 8:30 am the first Monday of the rotation. The morning will be spent getting oriented, assigning rooms, paperwork, etc. We will begin taking care of patients in the afternoon.

Learning Objectives:
To give students experience in performing physical examinations
To give students experience in providing preventative medicine and general health care
To give students experience in performing elective surgeries
To give students experience in dental techniques commonly used in small animal general practice
To expose students to behavioral problems in animals put up for adoption

Learning Outcomes:
After completing the course, the students will have participated in a number of ovario-hysterectomies and castrations of dogs and cats. They will understand the common behavioral problems of dogs and cats that might make them undesirable pets. They will enumerate the procedures and vaccinations necessary for continuing good health in pets.

Clinic Assignments:
Students will work under the supervision of the OSU CVM faculty member (Dr. Miller) and the veterinarians employed by OHS. OHS has 3 Veterinarians plus a Shelter Medicine Intern and a Shelter Medicine Resident – all are involved in student instruction. Each student is responsible for assigned cases until the patient is adopted or transferred to another student.

Students will be responsible for morning treatments on a daily basis. These should be completed prior to morning rounds at 8:30 am (starting treatments at 8 am is usually sufficient, depending on caseload at that time).

The morning is typically spent in special procedures/dentistry, seeing foster appointments, and taking care of medical cases presented through the shelter. Student surgeries are generally performed from 1:30 pm until 4 pm.
Evening rounds are held at 4:30 pm followed by evening treatments.

Evenings/Weekends:
Students should expect to work evenings while at OHS. Examples include helping process/intake large numbers of dogs from other shelters, discharging surgical patients, and providing medical information about pets to potential adopters. Students will typically be on duty until at least 7 pm Monday thru Wednesday and until 9 pm on Thursday.
There is no requirement that students work at OHS on the weekends. However, if students are staying in the Portland area, any help would be greatly appreciated. Students will be able to provide continuity of care for their hospitalized patients and be able to assist the on-call Doctor with any emergencies that arise.

Case Load:
OHS takes in about 12,000 animals per year. The save rate or "live release rate" is consistently around 98%. Students will be responsible for the care of their hospitalized patients as well as the patients in the Feline ICU or Upper Respiratory Ward. It is impossible to predict the number of cases per student but every effort is made to provide equitable distribution of cases.

Attire/ Professional Behavior:
Attire consists of surgical scrubs and a white doctor's coat.
Professional behavior will be expected when dealing with foster parents, fellow students, and staff.

Standard Equipment for Each Student:
Bandage scissors
Suture scissors
Stethoscope
Penlight
Name badge

Student Assessment:
Evaluation is based on criteria such as: attendance, rounds participation, case participation, case management, attitude, work ethic, and teamwork with each other and OHS staff.

Students will be given a grade based on the above criteria:
A letter grade of A, B, C, F will be assigned for students participating in the VMC 794 rotation. If a major problem (e.g. patient care insufficient, attitude problem) is noted early on, the clinician will give the student notice early in the block (formative comments) to give the student time to improve.

Textbooks:
There is a collection of books here at OHS which is comparable to many small hospitals. Between the books available here and resources on the web most students are able to access the information needed to care for their patients.

Living Conditions:
Dorm rooms are available for student use during your rotation. The rooms are equipped with beds and bedding, desks, lamps, etc. Students should bring their own towels and toiletries.
There is a kitchen and living room in the student living quarters. The kitchen is well-equipped with a refrigerator, microwave, stove, dishwasher, etc. Dishes, pots/pans and most items needed for cooking are provided. The living room has a television with a satellite dish and a DVD player.

Pet Policy:
Students are allowed to bring one small or medium sized dog to stay with them while they are at OHS. The dog must be spayed or neutered, well-behaved, house-trained, wear visible ID, and be crated while students are working. Do not bring large, loud, or poorly behaved dogs.

Contact Person:
If you have any questions regarding this rotation, please contact Dr. Miller. The best way to reach him is via e-mail at kirk.miller@oregonstate.edu.
The address is:

Kirk Miller, DVM, Diplomate ABVP
1067 NE Columbia Blvd
Portland, OR 97211

VMC 780
Veterinary Preceptorship
Guidelines and Procedures

Course Coordinator: Dr. Katherine Scollan

(541) 737-4843 office phone
Kate.Scollan@oregonstate.edu

Preceptorship Requirement
The opportunity to observe and to work with practicing veterinarians in a variety of settings is a very valuable experience for veterinary students. All fourth-year veterinary students are required to participate in at least four weeks and up to eight weeks of preceptorships. Preceptorships can be scheduled as one, two, three, or four weeks at a time as long as there are at least four weeks total. The weeks may all be with the same veterinarian or with different preceptors

Students are responsible for arranging their own preceptorships. There are resources available to help you do this. Here is a link to a spreadsheet that provides you detailed information about the preceptorships that our students have gone to for the last several years https://docs.google.com/spreadsheets/d/1vY7Gq8PW9csF89w8kOEXelGWyOm8r2H7MvHNnrEFenE/edit?usp=sharing

Students must get approval from the Dean's office for each preceptorship by entering the potential preceptor's name, practice address, and phone number and e-mail address in the google form here https://forms.gle/4JYB3nTbsh5RorQQ6. This must be approved at least 2 weeks before the preceptorship begins. The primary requirement for approval of a preceptorship is that the student will be supervised at all times by a licensed DVM. Within a week after completing the preceptorship, the student is to submit a report on the preceptorship and a "daily log" of the practice activities during the block to the student services coordinator. (**NOTE: This information is a requirement for graduation.)** Any changes in preceptorship rotation, i.e., change of preceptor, length of time, date, etc., must be approved by the Dean's Office.
***Students are not allowed to receive payment for time while receiving academic credit but can receive a stipend for travel and housing**

Objectives of the Preceptorship Program
1. To familiarize students with the problems associated with the practice of veterinary medicine. These include the clinical, financial, and management situations which may be different from those seen in a universityenvironment.
2. To increase the variety of clinical cases and clients that students are exposed to in their educational programs.
3. To acquaint the student with the philosophy of practice and the role of the veterinarian in a community.
4. To allow the student to interact with the practitioners and their clients.

5. To provide the student the opportunity to apply knowledge gained in an academic setting to practice situations.

6. To improve communication between veterinarians and the College.

Duties of Preceptors

The preceptorship program is intended to demonstrate the realities of practice to students. Consequently, working hours and conditions will be those negotiated by the student and the practitioner prior to the start of the preceptorship. Although the work day may not be an 8:00 a.m. to 5:00 p.m. arrangement, the preceptorship program is intended to be full-time participation, and include approximately 40 hours per week. The student should be allowed to perform and participate in those professional services approved by the practitioner that do not conflict with State Veterinary Medical Practice Acts.

Responsibilities of the Student

1. Conduct yourself in a professional and ethical manner.
2. Follow instructions and carry out assignments from the veterinarian.
3. Honor confidentiality of the doctor/client relationship.
4. Use good judgment in handling matters that arise when a veterinarian is unavailable for consultation.
5. Provide a description of the type of practice, experience gained, and turn in a "daily log" of the practice activities in which he or she was involved during the block.

Responsibilities of the Preceptor

1. Conduct his or her practice in a professional and ethical manner.
2. Advise student of his or her duties and responsibilities.
3. Supervise student in assignments when necessary.
4. Discuss important aspects of practice with student in a meaningful way.
5. Evaluate performance of student.

Emergency/Safety Information

If, at any time, or for any reason, you feel uncomfortable, unsafe, or unsupervised at your preceptorship, contact the Dean's office right away at (541)737-2098. If it is after hours or on the weekend, or there is no answer at the phone number given, call Dr. Scollan at the phone number listed at the top of this section.

Graduation Requirements

Registration

The course registration process continues each term for 4th year. All required courses, elective and preceptorship credits must be accounted for on your final OSU transcript in order to graduate.

Summer term= Evalue blocks 1, 2 and 3
Fall term= Evalue blocks 4, 5 and 6
Winter term= Evalue blocks 7, 8, 9 and 10
Spring term= Evalue blocks 11, 12 and 13

Senior Papers

A written paper and oral presentation of the paper are a part of the requirements for graduation. Students are encouraged to develop topics that might be used for presentations given after graduation or result in a publication. The subject should be related to veterinary medicine and be of interest to veterinarians. References used should provide the most current knowledge on the subject.

WRITTEN PAPER

The paper will be written in electronic format, double-spaced. The reference section is to be single-spaced. Your title page should show the title and the author. The advisor's name should be in the lower right-hand corner. When the advisor gives her/his final approval to the paper, she/he should email the Student Services Coordinator and/or the Associate Dean noting their approval of the final version. Failure to comply with these requirements will mean rejection of the paper, regardless of content. The written paper will be critiqued as to content, style, and format, by the student's senior paper advisor and the Dean's Office. Students should follow the instructions to authors of *JAVMA*. You can find the *JAVMA* instructions to authors for specific details at http://www.avma.org/News/Journals/Pages/javma-ifa.aspx

ORAL PRESENTATION

The oral presentation is scheduled for 15 minutes of presentation and 5 minutes of discussion, question and answer. The senior paper may be the main points and basic principles of a big subject or an in-depth research of a smaller subject. The oral presentation should be designed to best convey to the audience some of the material in the written paper. As much as possible the paper should not be read, as this is a poor way to present an oral paper.

The faculty attending the oral presentation will evaluate the content and the presentation, and give the presentation a PASS or NO PASS. Their comments will be informative and intended as constructive criticism. If a majority of the faculty gives a grade of NO PASS, then the student will be required to either re-submit a satisfactory paper, or make another oral presentation of passing quality, or both.

Calendar

1. *Selection of date and topic for the presentation*. All dates should be selected by June 30, 2021. No more than 3 papers may be scheduled on any one day. Topics should be selected as soon as possible and each presentation topic must be different from all others. The Dean's Office will serve as the coordinator for this program and will maintain the master calendar.

2. *Selection of advisor.* The advisor is usually someone in the College of Veterinary Medicine. Any faculty member may be asked to serve as a faculty advisor. Occasionally, the best advisor is someone outside the College, and this is acceptable if the individual is able to advise and review drafts of the paper. If you need help with finding a faculty member to advise you on your topic of interest, contact the Associate Dean for assistance.

   The advisor will:
   a. Help define an adequate subject and the scope of the paper. A proposed title and outline of the paper must be presented for approval to your advisor at least 60 days prior to the scheduled seminar presentation date. The student must complete the required form (including student name, topic, advisor's name, presentation date, paper draft due date, and final paper due date plus signatures of student and advisor) and submit to the Dean's office at least 60 days prior to the scheduled seminar presentation date. If this form is not submitted, the oral presentation will be delayed.
   b. Review the paper's rough drafts and give constructive comments on the content and format.
   c. Assist the student, as needed, regarding the oral presentation.
   d. Review and approve the final copy ***within 4 weeks of*** the oral presentation or prior to completion of program/graduation, whichever comes first. The final paper must be presented to the advisor at least 14 days prior to this deadline.

   Be sure that you and your advisor are clear on expectations and deadlines before you start researching your topic. If you can't agree on these, you should probably find a different advisor. Expectations of different advisors can vary quite a bit so this needs to be discussed at the outset.

3. *Submitting the final paper.*
   The final copy of the paper which has been approved by the advisor must be submitted ***within 4 weeks of*** the oral presentation or prior to completion of program/graduation, whichever comes first. At the same time, an email from the advisor approving the paper must be sent to the Student Services Coordinator and/or the Associate Dean. **The final paper needs to be uploaded to the senior paper depository.** If any of the above are not completed before this date, it is important to note that this could result in a delay of graduation.

4. *Final approval of the paper*
   The Dean's Office will notify the student once confirmation that it has been successfully uploaded to the digital archive and the signed cover page or email approval have been received. The student and faculty advisor will receive a compiled version of faculty comments on the presentation. If you do not receive notification of approval within a few weeks of completion, check with the Dean's office to find out the status of your paper.

Entrustable Professional Activities (EPAs)

- Entrustable Professional Activities (EPAs) are essential activities that veterinarians are expected to perform in clinical practice.
- Eight core EPAs have been developed (https://www.aavmc.org/wp-content/uploads/2020/10/CBVE-Publication-2-EPA.pdf)
    - EPA1: Gather a history, perform an examination, and create a prioritized differential list
    - EPA2: Develop a diagnostic plan and interpret results
    - EPA3: Develop and implement a management/treatment plan
    - EPA4: Recognize a patient requiring urgent or emergent care and initiate evaluation and management
    - EPA5: Formulate relevant questions and retrieve evidence to advance care
    - EPA 6: Perform a common surgical procedure on a stable patient, including pre-operative and post-operative management
    - EPA7: Perform general anesthesia and recovery of a stable patient including monitoring and support
    - EPA8: Formulate recommendations for preventive healthcare

Requirements for senior students:
Completion of a minimum of 3 EPA assessments in each of the 8 EPA categories is required for graduation (=total of 24 EPA assessments). These EPAs are intended to provide immediate and useful feedback to students on their mastery of workplace activities in a real patient, directly-observed setting. It is the responsibility of each senior student to request a faculty member/house officer to perform the EPA assessments and to make sure all EPA categories are fulfilled.
EPA assessments will be made using a 5-point entrustment scale and specific verbal feedback on what the student is doing well, and what is needed to advance to the next level. The entrustment scale is based on the question, "Can the learner do the activity unsupervised?" and is as follows:

1. Not ready to trust -- Learner could not perform and observed only --I did it
2. Trust with constant guidance --Learner required step by step guidance -- I talked them through
3. Trust with intermittent guidance -- Learner required direct supervision with intermittent guidance -- I directed them from time to time
4. Trust with on demand guidance --Learner required on demand supervision -- I was available just in case
5. Trust with no guidance -- Learner required minimal supervision, could trust to do on own if already graduated-- I did not need to be there

All EPA assessments will be performed using Smartsheet (Student Evaluations). Students will be able to view their individual assessments for each EPA as well as their cohort average through a Smartsheet dashboard. In addition, an email is sent to the student and evaluator upon completion of each EPA assessment. To initiate an EPA assessment, the student needs to ask a clinician (faculty member or house officer) to complete a specific EPA (*eg* EPA3) for a case or activity. The clinician then logs on to Smartsheet and completes the EPA. The clinician and student should then discuss the assessment and clarify any questions or concerns. Clinicians may also initiate EPA assessments at their discretion.
**Students are encouraged to complete at least 1-2 EPA assessments per clinical rotation and pay attention to EPAs that pertain only to specific rotations. A goal of 1 EPA per week of clinical rotation will allow students to achieve the required number of assessments and see their growth over time.
The following table provides examples of relevant EPAs for each of the required rotations (this is illustrative only-

any EPA can be completed in any rotation if it is deemed relevant to the specific EPA)

Required Rotations	Relevant EPAs
VMB 736- Diagnostic Clinical Pathology	1,2,3,4,5
VMB 795-Diagnostic Services	1,2,5
VMC 732- LA Clinical Medicine	1,2,3,4,5,8
VMC 734- LA Clinical Surgery	1,2,3,4,5,6
VMC 735- RVP	1,2,3,4,5,6,7,8
VMC 737- Vet. Anesthesiology	1,4,7
VMC 782-LA Emergency Care	1,2,3,4,6
VMC 791-Clinical SA Medicine	1,2,3,4,5,8
VMC 793-Clinical SA Surgery (1 wk ortho/1 wk soft tissue)	1,2,3,4,5,6
VMC 794- OHS SA Primary Care	1,2,3,4,5,6,7,8
VMC 796- Clinical Imaging	1,2,5
VMC 797- SA Critical Care	1,2,3,4,5
VMC 711- Clinical Cardiology **OR** VMC 712-Clinical Oncology	1,2,3,4,5
VMC – Theriogenology	1,2,3,5

**Expectations: It is expected that students may receive lower entrustment scores earlier in the senior year and that these will improve over time. Some categories will have lower entrustment scores than others. Cohort averages will help students to gauge their performance with their peers. At 6 months, student progress will be monitored to identify students consistently below the cohort average for their EPA assessments. Remediation plans will be developed and implemented based on input from the faculty, student, and student progress committee.

Student Procedures List

All of the procedures in the General Procedures List must be completed before graduation.
You may have a veterinarian or technician who observes you perform the procedure initial the booklet. Either Proficient or Developing is acceptable for completion of the procedure. You may complete the procedures during required courses, elective courses, or during preceptorships. The booklet must be submitted to the Dean's Office for approval at least 1 week prior to graduation.

Miscellaneous

Graduation Policy for Guest Hooders

A graduating veterinary student may request to be hooded by an immediate relative (parent, grandparent, sibling, or spouse) who is a veterinarian. Such requests should be submitted to the Associate Dean for Student and Academic Affairs, at least 6 weeks prior to the graduation ceremony. If approved, the student will be notified by the Dean's Office regarding specific arrangements and expectation.

International Travel Registry

The Oregon State international travel registry is designed to capture travel information for all faculty, staff, and students traveling internationally for university-related activities such as conferences, research, professional or club activities, etc. If you are traveling out of the US for preceptorship or electives please use this registry.

https://oregonstate-idea.terradotta.com/index.cfm?FuseAction=Security.LoginWizardStepOne

Registry Benefits

- Automatic enrollment in the Travel Accident & Sickness Plan which includes access to the 24/7 safety and security emergency services.
- In the event of an emergency, this registry will enable OSU to locate and contact you to coordinate help.
- The registry allows travelers to securely store a copy of their passport.

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Clinical Rotation Evaluation Form-CBVE competencies

SKILL LEVEL:	NOVICE: The minimum expectation for entry to clinical rotations	ADVANCED BEGINNER: Developing competence	COMPETENT: Expectation for day-one practice	PROFICIENT: Aspirational expectation after some time in practice

Clinical Reasoning and Decision-making

Competency 1.1
Gathers and assimilates relevant information about animals (i.e. Collects history; Performs physical examination; Interprets diagnostic test results; Performs necropsy examination). *(Question 1 of 43 - Mandatory)*

N/A	Pre-Novice	Novice	Advanced Beginner	Competent	Proficient

Competency 1.2
Synthesizes and prioritizes problems to arrive at differential diagnoses (i.e. Identifies problems; Creates refined problem list; Prioritizes differential diagnoses). *(Question 2 of 43 - Mandatory)*

N/A	Pre-Novice	Novice	Advanced Beginner	Competent	Proficient

Competency 1.3
Creates and adjusts a diagnostic and/or treatment plan based on available evidence (i.e. Appraises available clinical information; Explains justification for plan; Re-evaluates animal or population to adjust plan; Uses critical thinking to determine appropriate action). *(Question 3 of 43 - Mandatory)*

N/A	Pre-Novice	Novice	Advanced Beginner	Competent	Proficient

Competency 1.4
Incorporates animal welfare, client expectations, and economic considerations into the diagnostic or treatment plan (i.e. Considers disease in context of the whole animal and client; Presents a range of options to the client; Considers euthanasia as a management option when appropriate). *(Question 4 of 43 - Mandatory)*

N/A	Pre-Novice	Novice	Advanced Beginner	Competent	Proficient

Competency 1.5
Prioritizes situational urgency and allocates resources (i.e. Triages cases to address most urgent and important problems first; Recognizes emergent situation and directs action; Recognizes and responds to reportable, transboundary, epizootic, and emerging/re-emerging diseases). *(Question 5 of 43 - Mandatory)*

N/A	Pre-Novice	Novice	Advanced Beginner	Competent	Proficient

Competency 1.6
Adapts knowledge to varied scenarios and contexts (i.e. Extrapolates knowledge to novel species or situations; Adjusts existing protocol or procedure when standard measures are unavailable). *(Question 6 of 43 - Mandatory)*

N/A	Pre-Novice	Novice	Advanced Beginner	Competent	Proficient

Competency 1.7
Recognizes limitations of knowledge, skill and resources and consults as needed (i.e. Identifies situations in which referral is warranted; Consults experts both within and outside the veterinary profession). *(Question 7 of 43 - Mandatory)*

N/A	Pre-Novice	Novice	Advanced Beginner	Competent	Proficient

Individual and Population Animal Care and Management

Competency 2.1
Performs veterinary procedures and post-procedural care (i.e. Performs elective procedures-e.g. castration; Performs routine therapeutic procedures; Performs emergency procedures; Provides analgesia and postoperative care; Anesthetizes and recovers patients; Manages patient comfort). *(Question 8 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Competency 2.2
Promotes comprehensive wellness and preventive care (i.e. Recommends disease prevention measures; Provides nutritional counseling; Advises clients regarding routine dental care; Counsels clients about husbandry and welfare needs). *(Question 9 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Competency 3.1
Applies population management principles in compliance with legal regulations and economic realities (i.e. Recommends disease prevention measures; Advises on nutritional management; Recommends housing and husbandry protocols; Designs therapeutic plans for disease management). *(Question 10 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Competency 3.2
Recommends and evaluates protocols for biosecurity (i.e. Develops isolation protocols; Selects disinfection protocols; Recommends protocols for animal movement) *(Question 11 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Competency 3.3
Advises stakeholders on practices that promote animal welfare (i.e. Advocates for animal welfare; Explains ethical and welfare-related aspects of production processes; Recognizes proper handling and/or adequate production facilities; Advises on animal husbandry and transport). *(Question 12 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Public Health

Competency 4.1
Recognizes zoonotic diseases and responds accordingly (i.e. Identifies the clinical signs, clinical course, transmission potential and pathogens associated with zoonotic diseases; Responds to zoonotic disease diagnosis through owner education, reporting, quarantine, and disinfection). *(Question 13 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Competency 4.2
Promotes the health and safety of people and the environment (i.e. Makes recommendations for management of animal waste, carcasses, and by-products; Implements safety and infection control practices; Advises on disaster/emergency preparedness and response; Practices responsible use of antimicrobial agents; Describes the role of the veterinarian in food safety). *(Question 14 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Communication

Competency 5.1
Listens attentively and communicates professionally (i.e. Communicates with diverse audiences; Utilizes a variety of communication platforms). *(Question 15 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Competency 5.2
Adapts communication style to colleagues and clients (i.e. Demonstrates client-centered communication; Elicits client goals, expectations, perspectives and constraints; Engages clients in difficult conversations such as financial decisions and end-of-life care). *(Question 16 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Competency 5.3
Prepares documentation appropriate for the intended audience (i.e. Documents care and communication using professional terminology; Ensures documentation fulfills professional and legal requirements) *(Question 17 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Competency 6.1
Solicits, respects and integrates contributions from others (i.e. Invites input from others; Acknowledges input and incorporates into ongoing plan of action; Leverages roles to achieve shared goals). *(Question 18 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Competency 6.2
Functions as leader or team member based on experience, skills and context (i.e. Applies principles of teamwork; Bases action on collaborative input; Manages conflict). *(Question 19 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Competency 6.3
Maintains ongoing relationship to provide continuity of collaborative effort (i.e. Follows up to determine if collaborator can implement the plan; Provides support through encouragement, education, or redirection to refine the plan of action). *(Question 20 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Competency 6.4
Demonstrates inclusivity and cultural competence (i.e. Demonstrates respect for diversity; Encourages diverse contributions within the workplace) *(Question 21 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Professionalism and Professional Identity

Competency 7.1
Adopts an ethical approach to meeting professional obligations (i.e. Applies an ethical approach to professional decision-making; Recognizes and responds to evidence of neglect and abuse). *(Question 22 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Competency 7.2
Practices time management (i.e. Recognizes impact of time management on stakeholders; Prioritizes and completes tasks according to importance and urgency) *(Question 23 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Competency 7.3
Reflects on personal actions (i.e. Invites and responds to constructive feedback on performance; Critiques decision-making process and its outcomes) *(Question 24 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Competency 7.4
Engages in self-directed learning and career planning (i.e. Engages in self-directed learning as a foundation for life-long learning; Identifies and undertakes professional development to meet learning needs; Uses appropriate resources for learning and decision making). *(Question 25 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Competency 7.5
Attends to wellbeing of self and others (i.e. Recognizes sources of workplace stress and acts to remedy adverse situations; Recognizes signs of stress in self and colleagues, engages in self-care; Manages expectations of client and self) *(Question 26 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Financial and Practice Management

Competency 8.1
Weighs economic factors in personal and business decision-making (i.e. Applies financial principles to professional decisions; Explains work-related insurance; Describes relationship between revenue generation, expense categories, and compensation). *(Question 27 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Competency 8.2
Delivers veterinary services compliant with legal and regulatory requirements (i.e. Acts in accordance with codes of professional practice, veterinary practice acts and licensing board regulations; Acts in accordance with legal and regulatory requirements; Selects drugs in accordance with regulatory and legal requirements). *(Question 28 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Competency 8.3
Advocates for the health and safety of patients, clients, and members of the team within the workplace (i.e. Complies with workplace health and safety regulations; Applies safe practices for handling hazardous materials). *(Question 29 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Scholarship

Competency 9.1
Evaluates health-related information (i.e. Retrieves and evaluates information based on research principles; Analyzes information for accuracy, reliability, validity and applicability). *(Question 30 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Competency 9.2
Integrates, adapts and applies knowledge and skills (i.e. Formulates questions and customizes solutions; Applies literature to solve clinical or scientific problems). *(Question 31 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Competency 9.3
Disseminates knowledge and practices to stakeholders (i.e. Develops and disseminates educational material; Explains evidence-based recommendations). *(Question 32 of 43 - Mandatory)*

○ N/A	○ Pre-Novice	○ Novice	○ Advanced Beginner	○ Competent	○ Proficient

Clinical Reasoning and Decision-making: (35 points possible) = *(Question 33 of 43)*

Animal Care and Management: (25 points possible) = *(Question 34 of 43)*

Public Health: (5 points possible) = *(Question 35 of 43)*

Communication: (10 points possible) = *(Question 36 of 43)*

Collaboration: (10 points possible) = *(Question 37 of 43)*

Professionalism: (5 points possible) = *(Question 38 of 43)*

Financial and Practice Management: (0 points possible) = *(Question 39 of 43)*

Scholarship: (5 points possible) = *(Question 40 of 43)*

Total Overall Points: (100 points possible)= *(Question 41 of 43)*

Final Grade: *(Question 42 of 43)*

Comments: *(Question 43 of 43)*

Review your answers in this evaluation. If you are satisfied with the evaluation, click the **SUBMIT** button below. Once submitted, evaluations are no longer available for you to make further changes.

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