

Surgical Exercises, VETM*4540

Fall/Winter 2017-2018

1.75 Credits

Calendar Description

Veterinary students receive training in preoperative planning, anesthesia and surgical techniques, operating-room decision-making, and postoperative care in this laboratory course. Students begin by practicing technical skills on inanimate models and becoming familiar with anesthetic equipment and procedures. They progress to performing a series of supervised surgical procedures designed to parallel the most commonly performed surgeries in private practice with appropriate anesthesia and analgesia. Regularly scheduled rounds sessions will allow students to discuss questions arising from previous laboratories, and plan for the upcoming laboratory. Though some didactic material is presented, the course is mainly experiential.

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Administrative Information

For questions regarding academic consideration, continuation of study, academic misconduct, safety, confidentiality, and experiential learning involving the use of animals, please refer to the Program Information section on the Phase-3 Information and Schedule web-site.

Photography, Video and Confidentiality

Taking photographs or videos of the animals, facilities and personnel, before, during or after the laboratories is NOT permitted. Any information regarding the animals is confidential and is not to be circulated in any shape or form unless specifically required for the course.

Failure to abide by those rules will result in expulsion from the laboratory and failure of the course.

Overview of the laboratories

Lab 1: Aseptic Technique, OR, Patient and Surgeon preparation:

Patient preparation: Clipping, scrubbing, final surgical preparation and draping.

Surgeons' preparation: Scrubbing, gowning, gloving.

Surgical instruments, opening the table and maintaining asepsis.

Lab 2: Abdominal surrogate model

Perform simulated abdominal surgery on a DASIE model with a low fidelity uterus. Students are expected to scrub, glove, gown, drape as if it was a live animal surgery. Perform an abdominal exploration, ligate pedicles, remove uterus and close abdomen in 3 layers using appropriate suture patterns.

Lab 3: Anesthesia Equipment and Skills Laboratory

In this laboratory, there will be an opportunity to review and perform anesthetic delivery and monitoring equipment assembly, as well as practice orotracheal intubation, IV catheterization, and fluid administration set-up with models. Basic laboratory techniques (performing PCV, TP and BUN) will also be performed. The procedures and protocols for the spay/neuter laboratories will be reviewed.

Lab 4: Cadaver surgery

Perform an exploratory laparotomy and surgical procedures on a cadaver. Students are expected to scrub, glove, gown, drape as if it was a live animal surgical procedure.

Care must be taken during the surgical approach to identify the various layer of the body wall.

Following exploration of the abdomen, a gastrotomy will be performed while maintaining asepsis; a splenectomy will be performed by ligating the splenic hilar vessels using a variety of techniques. If additional time is available, liver biopsy can be performed using a guillotine technique. Proper closure of the ventral midline incision including the linea alba, subcutaneous tissues and skin will be conducted with careful attention paid to ensure appropriate layer closure and knot tying.

Entry Examination

The purpose of the examination is to ensure adequate basic competency in anesthesia and surgery related skills prior to live animal laboratories. Review of VETM*3470 and VETM*3510 learning outcomes is essential prior to the examination.

Lab 5: CPR

Learn and practice the principles of cardio pulmonary cerebral resuscitation and associated care on a simulator.

Lab 6: Advanced Suturing Techniques

In this lab, the students will have the opportunity to practice and perfect their suturing skills on ex-vivo animal tissues. The focus of this lab will be on proper instrument handling, knotting tying technique and buried sutures and intradermal patterns.

Lab 7: Intestinal surgery

This lab will be dedicated to atraumatic tissue handling, the handling of instruments and proper suturing of ex-vivo small animal intestine. Proper tissue handling, proper recognition of the holding layers and performance of a leak-proof intestinal anastomosis will be the focus of this lab. The concept of dirty and sterile surgical field will be discussed.

Lab 8: Medical procedures

In this lab, the student will have the opportunity to practice several diagnostic and therapeutic procedures such as abdomino-centesis and thoraco-centesis, joint taps and bone marrow aspirates.

Lab 9: Ophthalmologic procedures

Spay and neuter Laboratories (1 to 5):

These laboratories will use live animals from various humane societies. All surgical and anesthetic principles will be practiced and reinforced. Attendance is mandatory.

Lectures, rounds and independent laboratory preparations

Two lectures will be provided prior to the CPCR laboratory. Several anesthesia and surgery rounds will be provided during the year to introduce the student to the laboratory or to reinforce previously learned concepts. The rounds are opportunities to ask questions and delve further into appropriate anesthetic and surgical case management.

All students must complete the assigned reading, audiovisual material prior to the rounds session or the laboratory (see Resources below); and be prepared to participate in a group discussion of this material.

Course Objectives

Veterinary practice requires a level of theoretical and technical expertise in anesthesia and surgery. Laboratories utilizing surgical models, cadavers, and live animals are an effective means of initiating anesthesia and surgical training prior to clinical exposure. All of the laboratories in this course illustrate various principles of anesthesia and/or surgery. Most of the procedures performed are also commonly encountered in clinical practice. The use of live animals offers great potential for teaching anesthesia and surgery, but it also requires responsibility from both students and instructors. **The conscientious and humane care of animals used in this course is a priority at all times.**

Students will be responsible for recognizing and recording any problems associated with the anesthesia or surgical procedure. Direction and support from the anesthesia and surgical instructors (AHTs, DVScs and faculty) will be an integral part of the learning process in this course, however, students gain confidence in taking a primary case care role. Strict adherence to the principles of anesthesia, aseptic technique, and proper tissue handling are a necessity, not an academic ideal. The results of poor preparation or execution and technique will be quickly apparent and may result in excusal from the laboratory.

The Surgical-Exercises course will provide several opportunities for students to gain insight into the pathophysiological principles of anesthesia and surgery, and to practice the technical aspects of anesthesia and surgery as a basis for their Phase-4 externship and clinical rotations. The objectives described below will be met as you progress from the initial orientation/introductory laboratories through the final humane-society neuters.

A. Anesthesia and Anesthetic Procedures:

At the end of the course, the student will be able to:

- Efficiently perform a pre-anesthetic and preoperative assessment and preparation of a patient.

- Efficiently select, prepare, evaluate and use anesthetic equipment and accessories including commonly used monitors.

- Efficiently perform a general anesthetic on a healthy dog or cat, including:

 - Select appropriate sedation and injectable drugs, and drug doses for use in a healthy elective case of various size, age and potentially pre-existing condition

 - Calculate drug volumes of administration for anesthesia as well as primary emergency drugs

 - Calculate and appropriately prepare crystalloid fluid bags and administration drip sets

 - Safely and humanely restraining a dog or cat throughout the anesthesia period

 - Safely administer an IM injection and assess sedation level

 - Place and secure an IV catheter

 - Induce general anesthesia using injectable anesthetics

 - Perform efficient and atraumatic orotracheal intubation

 - Connect a patient to an anesthetic machine and efficiently initiate delivery of inhalant anesthesia

 - Deliver a general anesthetic including appropriate adjustment of drug delivery to ensure an adequate but not excessive depth of anesthesia for various stages of surgery

 - Recognize and describe the expected physiologic effects and side-effects of the drugs and supportive agents used during the anesthetic period

 - Manually monitor anesthetic depth during induction anesthesia and recovery

 - Monitor and assess the status of a patient's physiologic variables including HR, Doppler arterial blood pressure, respiratory rate, and temperature

 - Become familiar with oscillometric, ECG, pulse-oximetry and end-tidal CO₂ monitoring

 - Recognize and assess the significance of clinical/physical signs and measured physiologic variables outside of normal expected ranges

 - Manage common complications that occur in the pre, intra and post anesthetic period

 - Discuss the rationale behind various strategies used to manage complications

 - Extubate a patient at an appropriate time during recovery from anesthesia

 - Completely and appropriately fill out an anesthetic record and anesthetic recovery record

 - Manage a canine or feline patient in the post-anesthetic and post-operative period including the delivery of appropriate analgesic therapy.

 - Perform commonly employed local anesthetic blocks in cats and dogs and explain each procedure's indication, contraindication and consequences depending on the drugs chosen to perform the procedure.

 - Discuss the rationale; risks and benefits associated with anesthesia and common anesthesia related procedures.

Anesthesia skill lists will be available for each student to ensure they have accomplished the necessary skills throughout each semester.

B. Surgery/ Ophthalmology / Medical procedures

At the end of the course, the student will be able to:

- Properly perform a pre- and post-operative patient assessment of a patient for routine spay and neuter procedure.

Understand and apply the principles of surgical asepsis and antisepsis for routine surgical procedures.

Prepare a patient for aseptic surgery.

Prepare, set-up and take down the surgical table and equipment using appropriate aseptic technique.

Perform appropriate surgeon preparation and antisepsis for routine surgical procedure.

Maintain asepsis throughout surgery. Know and avoid the common pitfalls that result in break in aseptic technique.

Recognize and appropriately correct any break in aseptic technique.

Appropriately select and rationalize the choice of suture material for commonly performed surgical procedures.

Perform adequate and secure knots and suture lines using appropriate technique and perform safe surgical closure.

Practice appropriate and gentle tissue handling while demonstrating good handling and proper use of instruments.

Know, avoid and resolve the most commonly encountered surgical complications associated with the most common surgical procedures performed in private practice.

Maintain a non-sterile field during aseptic surgery.

Apply routine bandages and be able to list the most common complications with each and determine avoidance or remedial strategies.

Complete appropriate surgical records and discharge statements for spay and neuter surgeries.

Know the indications, complications, technique and perform several routine medical procedures commonly used in small animal practice.

Know the indications, complications, technique and perform several routine ophthalmologic surgical procedures.

C. CPR

At the end of the course, the student will be able to:

Recognize the pathophysiology and the most frequent causes of cardiopulmonary arrest and know how to avoid or correct them if possible.

Know the signs and recognize cardiopulmonary arrest in a patient and perform basic CPR on a dummy.

Interpret ECG, Clinical signs and laboratory values and appropriately interpret the results to determine the most appropriate course of action.

Evaluation

1. **Attendance is required at all laboratories. Requests for consideration of absence for medical, compassionate reasons must be made to the Associate Dean Students. Consideration of absence for any other reason must be made directly to the course coordinator(s). Students will not switch lab sections or surgical teams without prior authorization by the course coordinator(s) and the anesthesia or surgery faculty instructing each section. A student with an unexcused absence will fail the laboratory.**

2. Laboratory Grades
 - A. Assessments will be provided following each laboratory.
 - B. A grade of **Outstanding, Pass, Incomplete or Fail** will be given to each student after every laboratory on the basis of **preparation, background knowledge, efficiency and technical performance** during that laboratory. The grade will be given after consultation among instructors (AHTs, interns, DVSc students, instructors, and faculty) supervising the laboratory and ALL aspects of the laboratory will be considered in the assignment of the grade.
 - C. If the student is marginal or unsatisfactory in any of the above categories, he/she will receive an Incomplete for that laboratory. The instructor will discuss her/his evaluation with the student and make suggestions for improvement. This Incomplete will later be converted to a Pass or a Fail, based on either:
 - a. Evaluation of the student in subsequent laboratories, in which he/she is in a similar role (i.e. anesthetist, assistant surgeon or surgeon)
 - b. The student's performance on a supplemental assignment or condition (more likely if an Incomplete is received during the latter part of the winter Semester or if a laboratory is no longer offered).
 - D. Animal care and medical records will be evaluated by the AHTs and the instructor(s). Evaluation of the team's performance will be based on patient care, use of the problem-oriented medical-record approach, completeness and legibility. The entire surgical team is responsible for animal care and for the overall quality and organization of patient records. Failure to maintain adequate care of your animal will result in **failure** of that laboratory for the entire team.

3. Examinations
 - A. **Entry Examination:** Students must pass this examination to be able to participate in live animal laboratories. If a student fails this examination, remediation plans will be developed with one of the course coordinators and the individual student. The competencies tested in the examination will have to be mastered prior to participating in the live animal laboratories.
 - B. **Midterm exam** - 40% of the numerical examination grade
 - a. Covers all material from September through November
Anything relevant to the principles and procedures of anesthesia, surgery (including suture materials, relevant anatomy, relevant pathophysiology, complications), aseptic technique, and associated patient care that were covered in labs, rounds, reading material or audiovisual material.
Following the mid-term examination, there will be a three-week period in which the examination can be reviewed. There will not be an opportunity to review the examination outside of this period. To arrange a time to review the examination, please contact the Administrative Assistant to the Faculty and Chair in the Department of Clinical Studies, Linda Wing (lwing@uoguelph.ca).
 - C. **Final exam** = 60% of the numerical examination grade
 - a. Summative evaluation - comprehensive over the entire course

Anything relevant to the principles and procedures of anesthesia, surgery (including suture materials, relevant anatomy, relevant pathophysiology, complications), aseptic technique, and associated patient care that were covered in labs, rounds, reading material or audiovisual material. A student must pass both the surgery and anesthesia component of the examination to pass the course.

4. Final Course Grade: Outstanding, Pass or Fail
 - A. **Outstanding** - The student must:
 - a. Receive at least a Pass grade in all labs, and
 - b. Receive an Outstanding grade in at least 2 labs, and
 - c. Have a total numerical examination score $\geq 80\%$
 - B. **Pass** - The student must:
 - a. Receive at least a Pass grade in all labs, and
 - b. Have a total numerical examination score $\geq 50\%$
 - C. **Incomplete** - If the student:
 - a. Has total examination score $\geq 50\%$, but
 - b. Has an Incomplete grade in one or more labs, or
 - c. Missed 3 or more labs with appropriate consideration (excused absences)
 - D. **Fail** - If the student:
 - a. Has a total examination score $< 50\%$, or
 - b. Has a Fail grade in one or more labs, or
 - c. Missed one or more labs without appropriate consideration (unexcused absence)

PLEASE NOTE – A numerical grade is NOT provided for this course, only an Outstanding, Pass, Incomplete or Fail, based on the above criteria. Therefore, this course will not be a part of DVM program average calculation.

Failure to pass this course will result in failure of phase 3.

Instructors' Responsibilities

The course instructors will point out important aspects of the laboratories and will clarify information from prelaboratory reading and audiovisual material. Although instructors will always be available to provide assistance with anesthesia or the surgical procedure, they are not present to compensate for inadequate prelaboratory preparation. The instructors will review and comment on the medical records. They will also assist students in assessment and treatment of animals during the pre and post laboratory periods.