PURDUE
VETERINARY MEDICINE

PURDUE UNIVERSITY COLLEGE OF VETERINARY MEDICINE

Veterinary Nursing Distance Learning
Fall 2025 version

Necropsy Mentorship

VM 22400

Criteria Logbook

Index of Logbook

Student Information

Clinical Mentorship Tasks

Clinical Mentorship Projects

Student Information

Contact Information

Questions regarding the overall Clinical Mentorship process should be directed to-

Jennifer Smith, BS, RVT, LATG

Clinical Mentorship Coordinator

jpope@purdue.edu

Questions regarding this mentorship (tasks, due dates, etc.) should be directed to the instructor for this mentorship course.

Selecting the Clinical Mentorship Site – Facility Requirements

You must visit the Clinical Mentorship Site and determine if the following supplies and equipment are readily available to you for use during your Clinical Mentorship. The mentorship supervisor will verify the availability of required items by completing the Mentorship and Facility Requirement Agreement.

The veterinary care facility must be equipped with the following equipment:

- Necropsy knife (sturdy and able to be sharpened)
- Scalpel handle
- Mayo or Metzenbaum scissors
- Forceps
- Serrated utility scissors
- Pruning shears or other instrument for cutting ribs

In addition, the following disposable items must be available:

- Heavy-duty latex gloves
- Scalpel blades
- Jars of formalin
- Sterile culture tubes or culture swabs
- Zipper-top plastic bags
- Indelible marking pen

Note: If an appropriate case for necropsy does not present to the mentorship site, a large rat may be purchased and used. Any differences in rat anatomy should be noted verbally on the video. A fresh cadaver (not preserved or frozen) should be used.

Introduction to Essential Tasks and Criteria

Before starting each task-

1. Read the Goal, Description, Criteria, and Materials to be Submitted for Evaluation and Verification. Understand what is expected for each task.
2. Make sure that all equipment and supplies needed to complete the task are available. Pay particular attention to the details of what needs to be documented and submitted.
3. Make sure to obtain appropriate permissions where necessary. Please inform the facility's owner/manager of activities. A good relationship with the veterinarian in charge is key to having a positive Clinical Mentorship experience.
4. Ensure your mentor is available to supervise the completion of the task.

After performing each task-

1. Label all items submitted so that the materials submitted for evaluation and validation at Purdue are identified as the student's submission.
2. Label all videos posted to Brightspace with the task number.
3. Submit materials by the deadlines listed in the course syllabus

Introduction to Special Projects

Certain mentorships will have required projects to complete in addition to the required tasks. Written projects should be typed, and checked for correct grammar and spelling. Photos should be embedded into the related written documents.

Before starting each project-

1. Read through the project in its entirety. This will give you a description of the project and what is needed to complete it successfully.
2. Determine what materials, if any, need to be submitted for completion of the project.
3. Most projects will come with a list of questions/points that need to be addressed and included in the written document.
4. If video is required for a project, it should be noted on the videotape verbally that this is for the project and not another required task. Some projects may require a verbal narration of a student doing something. Each individual project will define if that is a necessary requirement for that project.

Note to Students

As there is no didactic course to accompany the Necropsy Clinical Mentorship, handouts have been included in the mentorship logbook to inform the student of techniques and procedures that will be needed to complete the tasks. The first is the technique used by the Purdue Animal Disease Diagnostic Laboratory (ADDL) for performance of necropsy. The second is a page of guidelines for packing and shipping samples to outside labs.

The student should review anatomy to be able to identify anatomical landmarks mentioned in the necropsy technique. In addition, the student should understand all the terminology used to describe the technique or lesions observed (i.e., “transudate”, “in situ”, etc.)

The student’s role is to assist the DVM with the necropsy as well as document findings. The student must, either during or after the necropsy, identify each of the listed structures themselves. Then the student should collect, preserve and package the samples for shipping. The samples should NOT be shipped to Purdue – it may be a simulation if the samples will not be submitted to a lab for analysis.

Thoroughly review and understand the technique prior to beginning the necropsy.

Veterinary Necropsy Technique

From the Purdue University Animal Disease Diagnostic Laboratory

The following is a brief outline of the technique that is to be used when performing postmortem examinations. Do not begin the necropsy until a permission sheet signed by the owner is in your possession. A signed owner's release form must accompany any animal to be euthanized.

Remember that the entire carcass, including all systems and organs, must be carefully examined. Lesions may appear anywhere and care should be taken to expose and examine all lesions. Examine each of the paired organs.

Every animal should be weighed and/or measured (i.e., crown-rump length for aborted feti) prior to pro-section.

Preliminary Review and Observations:

1. Signalment – species, breed, sex, sexual status, age, color
2. History and clinical diagnosis
3. Clinical pathology
4. External appearance
    a. Body condition (adequate or inadequate fat stores, emaciated, etc)
    b. Mucous membranes
    c. Body orifices
    d. General conformation
    e. Superficial lesions (tumors, dermatitis, etc.)
    f. Hair coat
    g. Parasites
    h. Lips, gums, cheeks, teeth

Veterinary Necropsy Technique (continued)

Opening the Body Cavities:

1. Place animal carcass in lateral recumbency and incise skin at axilla
    a. Continue the ventral midline skin incision anteriorly to the symphysis of the mandible and posteriorly to the perineum.
    b. Do not damage the udder
    c. To avoid cutting hair, incise the skin from the subcutaneous side
2. Raise the front leg and scapula and dissect and reflect dorsally
    a. Remove the remaining skin between the excised front and rear limb to the level of the spinal column and reflect dorsally.
    b. Examine the **exposed superficial lymph nodes** and **jugular veins**
3. Excise through the "up" rear limb (at the level of the pelvis) and continue to incise through the coxofemoral joint and reflect the rear limb dorsally
4. Examination of the **mammary glands or testes**
    a. Mammary glands and mammary lymph nodes are completely cut away from the body
    b. Examine for symmetry, swellings, tumors, atrophy
    c. Examine the lymph nodes and incise them
    d. Incise the gland through the cistern and teat canal, examining each portion
    e. Palpate for thickenings, fibrosis, tumors
5. Examine **prepuce and penis**
6. Make a paracostal incision through the abdominal wall just behind and parallel to the last rib
    a. Extend the incision dorsally to the vertebrae and ventrally to the midline
    b. Raise the body wall to avoid cutting viscera
7. Make a paralumbar incision through the abdominal wall caudally to the pelvis
    a. Reflect the muscle wall ventrally and expose the abdominal cavity
8. Cut the **diaphragm** on the right side in an arc from the sternum along its costal attachments to the vertebral column
    a. Listen for an in rush of air indicative of negative pressure in the pleural cavity
9. Sever the ribs at their sternal and vertebral ends with a pruning shear or other suitable instrument and lift off the thoracic wall, thus exposing the entire thoracic cavity

Gross Examination of the Thoracic and Abdominal Cavities:

1. Examine both cavities and all contents carefully with minimal movement of the viscera
    a. Note transudates, exudates, and hemorrhage
        i. Open the **pericardial sac**
        ii. Note amount, color, and consistency of abnormal fluid accumulations
2. Examine for adhesions, displacements, absence of organs, and size and symmetry of organs in situ
3. Record lesions of organs and perform detailed examination of organs prior to removal
4. Take initial samples for microbiology, especially exudates in body cavities

Veterinary Necropsy Technique (continued)

Examination of the Thoracic Viscera:

1. Separate the **mandibles** at the symphysis
    a. Cut along the lingual surface of both sides of the mandible
    b. Remove the **tongue** and pull it down between the rami
    c. Disarticulate the hyoid bones. The tongue, **larynx, trachea** and **esophagus** are dissected ventrally back to the thoracic inlet
    d. Lift up viscera and detach **heart** and **lungs** from the body wall by cutting dorsal and ventral mediastinum
    e. Sever the **aorta** post cava and esophagus back to about 2-3 cm anterior to the diaphragm
    f. Sever and remove the thoracic viscera (“pluck”)
2. Examine thyroid, parathyroid, and thymus glands
    a. Note size, shape, consistency
    b. Incise glands examining for lesions
3. Arrange the organs in approximately normal position
    a. Examine tongue by incising transversely
    b. Open esophagus and examine carefully
    c. Examine bronchial lymph nodes by palpating and incising
    d. Observe and palpate lungs for consolidation, emphysema or other abnormal consistency
    e. Open the larynx, trachea, **bronchi** and small bronchioles
        i. Note exudates, hemorrhage, foreign bodies or lung worms in bronchial tree
        ii. Examine areas of consolidation and other abnormal lung tissue by incising

Veterinary Necropsy Technique (continued)

Examination of the Thoracic Viscera (continued):

4. Examine the heart
    a. Observe any disproportion of parts (dilation, hypertrophy, anomalies) and alterations in shape; note presence of normal adipose tissue
    b. Open Heart
        i. Cut through the right atrial free wall (including the auricle) horizontally
        ii. Examine the endocardium and **vena cava**
        iii. Examine the atrial side of the right A-V valve
        iv. Check for sufficiency of valve if indicated
    c. Cut through the right A-V valve and wall of the right ventricle, keeping the incision near the interventricular septum
        i. Continue the incision around the right ventricle through the pulmonic valve and pulmonary artery
        ii. Examine for patent ductus arteriosis
    d. Open the left atrium and examine in the same manner as the right atrium
        i. Cut through the left A-V valve, incising the ventricle through the mid-portion of the free wall
        ii. Continue the incision to the apex
        iii. Make a horizontal incision in the ventricle approximately mid-way between the coronary groove and the apex, incising from the first cut to the septum
        iv. At the septum, cut upward through the aortic valve and aorta
        v. This process should result in a small flap of left heart with aortic valve on one side and left A-V valve on the other
    e. Examine vessels, valves and septa for anomalies
    f. Examine **endocardium** and **myocardium**

Examination of Abdominal Viscera:

1. Remove the **spleen;** examine grossly and incise several times
2. Examine the **pancreas** grossly
3. Make a small incision into the duodenum at the level of the pancreatic duct and apply manual pressure to the **gall bladder** to see if bile enters the intestine
4. Remove and examine the **liver**
    a. Examine the peritoneal surface for fibrosis or adhesions
    b. Excise the liver from the diaphragm
    c. Note the size, shape, weight, color and consistency
    d. Open the gall bladder and the larger bile ducts
        i. Examine for stones, inflammation, flukes, thickening of the wall
    e. Palpate and incise the liver liberally from the abdominal surface; observe for necrosis, fibrosis, abscesses, etc.
5. Examine the **adrenal glands** (prior to removing the kidneys)
    a. Cut adrenals in cross-section and note cortical-medullary ratio

Veterinary Necropsy Technique (continued)

Examination of the Abdominal Viscera (continued):

6. Remove urinary organs as a unit, including both **kidneys, ureters** and **urinary bladder**
    a. Cut each kidney longitudinally in half from the convex surface to the hilus and note alterations in color, consistency, size, etc.
    b. Strip off capsule and examine the kidney surface
        i. Note the ease with which the capsule comes off
    c. Open and inspect the ureters, bladder and urethra
        i. Inspect all mucous and serous surfaces
    d. Open vagina, cervix and uterine horns along their dorsal borders and examine carefully all surfaces
    e. Examine ovaries for cysts, corpora lutea, atrophy, etc.
    f. Examine male accessory sex organs; observe size, consistency, inflammation, etc.
7. Remove the **stomach** and **intestines** to the rectum
    a. Place the rectum over the lumbar area when it is cut so that the abdomen will not be contaminated
    b. Free the intestine from the **mesentery** as it is removed and observe its lymph nodes

Examination of the Gastrointestinal Tract:

1. The esophagus has been opened
2. Open the stomach along the greater curvature
    a. Observe the mucosal and serosal surfaces; ingesta must be removed
    b. Examine for hemorrhage, parasites, foreign bodies, abnormal ingesta, etc.
3. Open the small intestine
    a. Observe all surfaces and ingesta
    b. Leave 1-inch segments closed for histopathology
4. Open the **cecum** and colon back to the **anus**, and examine carefully

*****Note: If the musculoskeletal system, central nervous system and eyes are not of particular interest in the patient, dissection of these is not required.***

The necropsy procedure may stop at this point.

Veterinary Necropsy Technique (continued)

Examination of the Musculoskeletal System:

1. Open the stifle, hock and humero-scapular joints
    a. To open the stifle, cut the straight patellar ligament 1/3 of the way proximal to the tibial tuberosity and medial to the trochlea of the femur, and reflect the patella
    b. Observe synovia, articular surfaces, articular cartilages, and synovial membranes
2. Examination of the muscular system
    a. Examine and incise the muscles of various parts of the body, especially lumbar and thigh muscles; check development, color, etc.
3. Examination of the skeletal system
    a. Examine body for broken bones or healed fractures
    b. For marrow inspection, remove femoral head with shears and crack femur longitudinally

Examination of the Eyes:

1. Remove the eyeball from the orbit if indicated (not routine)
    a. Incise periorbital tissues and avoid direct contact with the eye
    b. Look for corneal opacities, cataracts, tumors, etc.

Examination of the Central Nervous System:

1. Remove the head from the body at the atlanto-occipital articulation
    a. Incise the spinal cord before excessive traction is placed on the skull
2. Reflect skin and muscles of the head and examine skull for traumatic lesions
3. Remove the brain as described below
    a. Make a transverse cut behind the orbits (exact location varies in species) using a hacksaw
    b. Make lateral cuts from the ends of the transverse cuts just medial to the occipital condyles (leave room for brain to be removed intact)
    c. List off bony cap carefully with a chisel
    d. Incise the dura over the dorsal brain surface and incise the tentorium cerebelli
    e. Hold the skull with the nose pointing upward and tap it gently on the table
        i. Carefully cut the olfactory tracts and other cranial nerves and allow the brain to slip out
        ii. Avoid traction on the brain
    f. Remove the pituitary gland by cutting diaphragmatic sella on both sides, clipping the bony projection posterior to the gland, and cutting soft tissues around the gland with scissors
4. Observe the dura
5. Incise the brain <u>transversely</u> (1-cm slices) and look for lesions
    a. When entire brain is to be fixed, make only one transverse cut into lateral ventricles so fixative may enter tissues

Veterinary Necropsy Technique (continued)

Species-Specific Procedures:

1. Horse
    a. When the abdomen is opened, move the left parts of the large colon cranially so that the pelvic flexure is lying anterior; move the cecum dorsocranially, the small intestine over the right flank, and the small colon posterior and down
        i. The mucosa of the guttural pouches is examined when the head is disarticulated
    b. The cranial mesenteric artery should be opened from the aorta past the ilealcecal and colic artery bifurcations
2. Ruminants
    a. When the abdomen is opened, place small intestine and colon over the right lumbar area; examine the forestomachs and abomasums for position and adhesions
    b. Remove forestomachs and abomasums as a unit; separate serosal attachments to stretch the organs out. Open and examine each organ. Remove ingesta and rinse the rumen mucosa with water to examine.

Guidelines for Packing and Shipping of Samples

1. Label all sample containers with the following information, using indelible ink:
    a. Client name
    b. Animal name
    c. Case number (if used)
    d. Date of collection
    e. Site of collection (e.g. liver, right kidney)
2. Ship in plastic containers whenever possible
3. Be sure that lids are tight on containers that contain liquid. The ratio of formalin to soft tissue should be at least 10:1. If the sample is bone, the ratio should be at least 20:1.
4. Containers with liquid should be placed into zippered plastic bags separate from submission forms to prevent forms from becoming damaged and unreadable in case of leaks. Sufficient absorptive material should be placed inside the bag to absorb all the liquid if it should leak.
5. Complete submission forms, including all requested information. Paperwork should be placed in a separate bag from the samples.
6. Include address, phone number and FAX number for your clinic to facilitate return of results
7. Pack container and submission form in box for mailing, allowing room for packing materials such as foam peanuts, bubble plastic, or newspaper as appropriate
8. Check with lab to determine if sample must be received at room temperature, cool, or frozen and include coolant source if needed

1. ASSIST IN PRO-SECTION OF NON-PRESERVED ANIMAL

Goal: To assist a DVM in performing basic prosection techniques on a non-preserved animal for purposes of necropsy and sample collection.

Description: The student will assist a DVM in performing basic prosection techniques on a non-preserved animal, identifying internal structures as they are exposed.

Criteria:

- The student checked and recorded signalment for the patient.
- The student reviewed the patient history and clinical diagnosis.
- The student reviewed laboratory data submitted with the animal.
- The student examined and recorded the patient's external appearance, including:
    - Body condition
    - Mucous membranes
    - Body orifices
    - General conformation
    - Superficial lesions (tumors, dermatitis, etc.)
    - Hair coat
    - Parasites
    - Lips, gums, cheeks and teeth

***Note**: *External examination should be done with the DVM present, or the DVM should examine the animal before proceeding.*

- The student placed the animal in left lateral or dorsal recumbency.
- The student correctly identified the following structures during the pro-section:

1. ASSIST IN PRO-SECTION OF NON-PRESERVED ANIMAL (CONTINUED)

***Note**: If the listed structures are too small to identify, or absent, the student should state such verbally and point out the location where the structure would normally be found.*

  - Exposed superficial lymph nodes (mandibular, popliteal, superficial cervical)
  - Jugular veins
  - Mammary glands or testes
  - Prepuce and penis (male animal)
  - Diaphragm
  - Pericardial sac
  - Mandible
  - Tongue
  - Larynx
  - Tonsils
  - Esophagus
  - Trachea
  - Bronchi
  - Lungs
  - Pulmonary vessels
  - Heart
  - Aorta
  - Vena cava
  - Omentum
  - Spleen
  - Pancreas
  - Liver
  - Gall bladder
  - Kidneys
  - Adrenal gland
  - Ureters
  - Urinary bladder
  - Stomach
  - Pyloric region
  - Duodenum
  - Jejunum
  - Ileum
  - Cecum
  - Colon
  - Rectum
  - Mesentery
- The student collected initial samples for microbiology as directed by the DVM.
- The student accurately documented all observations made by the DVM.

1. ASSIST IN PRO-SECTION OF NON-PRESERVED ANIMAL (CONTINUED)

Number of Times Task Needs to be Successfully Performed: 1

Materials Submitted for Evaluation and Verification:

1. Task Verification form for the Assisting in Pro-section on a Non-Preserved Animal task, signed by the clinical mentorship supervisor.
2. One video showing the student (with their mentor present) assisting with a pro-section procedure. The video will clearly show all criteria for the task, and the student will narrate the procedure, including identification of all required structures. The camera should be zoomed in as needed to show each structure clearly.
3. Copy of written documentation of findings by student and DVM during the pro-section.

Student Name: _____

Patient Name: _____ **Date:** _____

Supervisor Name: _____ RVT, CVT, LVT, LVMT, DVM, VMD

I verify that the student performed these tasks under my supervision.

Signature of Clinical Mentorship Supervisor: _____

2. COLLECTION, PRESERVATION AND SHIPPING OF SAMPLES

Goal: To collect, preserve, and ship samples collected during a necropsy procedure.

Description: The student will collect samples of liver, kidney and intestine during a necropsy procedure, and properly preserve and ship the samples for histopathologic evaluation according to laboratory and practice protocols.

Criteria:

- The student examined the liver grossly and collected samples of lesions and adjacent normal tissue, ½ cm thick and 1 cm x 1 cm square. If the liver was grossly normal, the student collected a representative sample (1/2 x 1 x 1 cm)
- The student examined the kidneys grossly and collected samples of lesions and adjacent normal tissue in longitudinal wedge sections ½ cm thick. If the kidneys were grossly normal, the student collected a representative sample (1/2 cm longitudinal wedge).
- The student examined the intestines grossly and collected samples of lesions and adjacent normal tissue in ½ cm cross-sections. Care was taken not to touch the mucosal surface, and the sample was rinsed gently under water to remove ingesta and feedstuffs. If the intestine was grossly normal, the student collected a representative sample (1/2 cm cross-section).
- The student placed the tissue samples into separate formalin jars, one jar per site/organ. The kidney samples were separated by left or right kidney.
- The student labeled each formalin jar with the following information:
    - Client name
    - Animal name
    - Case number (if used)
    - Date of collection
    - Site of collection (e.g., liver, right kidney)
- The student completed submission forms for samples collected and properly packaged the samples for shipping.

2. COLLECT, PRESERVATION AND SHIPPING OF SAMPLES (CONTINUED)

Number of Times Task Needs to be Successfully Performed: 1

Materials Submitted for Evaluation and Verification:

1. Task Verification form for the Collection, Preservation and Shipping of Samples task, signed by the clinical mentorship supervisor.
2. One video showing the student (with their mentor present) collecting samples and properly preserving and packaging them. The video will clearly show all criteria for the task, including labels on jars.
3. Copy of submission form completed by the student to be sent with samples to a laboratory (even if samples will not actually be sent to the lab).

Student Name: _____

Patient Name: _____ **Date:** _____

Supervisor Name: _____ RVT, CVT, LVT, LVMT, DVM, VMD

I verify that the student performed these tasks under my supervision.

Signature of Clinical Mentorship Supervisor: _____

3. SAFE HANDLING OF RABIES SUSPECT BODIES AND SAMPLES PROJECT

The student will provide a written paper detailing the clinic SOP for handling of rabies suspect bodies. The first section will be for a patient that needs to be tested for rabies only. The second section will be for a patient that needs a necropsy performed but is a rabies suspect. There will also be a section on human exposure to rabies. The paper will be typed and checked for spelling and grammar.

Section 1 – Testing Animal for Rabies Only

Address the following:

1. Describe your clinic SOP for a stray dog of unknown history brought to your clinic for euthanasia after biting a human. Include how clinic personnel protect themselves from possible exposure to rabies.
2. Describe how the dog is submitted for rabies testing, including how the brain is collected, preserved and submitted. Include PPE used by staff.
3. Evaluate the above protocol and describe changes that you would make in the protocol, and why.

Section 2 – Necropsy on Rabies Suspect

Address the following:

1. Describe your clinic SOP for a dog that was a patient in your clinic, was a rabies suspect but had not bitten anyone, and died in your clinic. The cause of death is unknown and the owner requests a necropsy. Include how clinic personnel protect themselves from possible exposure to rabies.
2. Describe how the dog is submitted for rabies testing, as well as how the necropsy is accomplished safely.
3. Evaluate the above protocol and describe changes that you would make in the protocol, and why.

Section 3 – Human Exposure to Rabies

Discuss what action should be taken if a patient that was treated at your hospital tests positive for rabies. What should a human healthcare provider recommend for the staff who handled the patient? For more information, visit the website for the Center for Disease Control at http://www.cdc.gov/ and look for rabies under “Health Topics A-Z”.

4. STORAGE AND DISPOSAL OF DECEASED ANIMALS PROJECT

The student will provide a written paper detailing the clinic SOP for storage and handling of deceased animals. The paper will be typed and checked for grammar and spelling. The following should be addressed:

1. Describe storage of deceased animals that are for disposal only, not to be necropsied. Include storage "containers" used and where the storage area is located. Discuss labeling methods.
2. Describe storage of deceased animals that require necropsy. Include storage "containers" used and where the storage area is located. Discuss labeling methods.
3. Describe disposition options available to an owner whose pet has died (cremation, burial, return body to owner, etc.) Include storage and labeling methods during the holding period until disposition occurs.
4. Describe the clinic SOP for disposal of deceased animals that do not have owners or whose owners do not have a preference for how the body is disposed. Include storage and labeling methods during the holding period until disposition occurs.
5. Evaluate the clinic's protocol for the handling of deceased animals. Describe changes that you would make in the protocol and why.