

CLINICAL PATHOLOGY MENTORSHIP



VM 22700

CRITERIA HANDBOOK AND LOGBOOK

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NOTE THE FOLLOWING DUE DATES FOR THE TASKS ABOVE:

Fall or Spring semester	5:00p.m. ET Thursday of week 1 – Task 1
	5:00p.m. ET Thursday of week 3– Task 2
	5:00p.m. ET Thursday of week 5 – Task 3
	5:00p.m. ET Thursday of week 7– Task 4
	5:00p.m. ET Thursday of week 9– Task 5
	5:00p.m. ET Thursday of week 10 – Task 6
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	5:00p.m. ET Thursday of week 3 – Task 2
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	5:00p.m. ET Thursday of week 9– Task 8

Incomplete grades will not be assigned for mentorships at the end of the semester. Grade penalties will be assessed for tasks submitted after the due date. Resubmission due dates will be set by the instructor as required.

All tasks may be submitted prior to due dates, and students are encouraged to do so. However, task one must be successfully completed before submitting any other tasks.

Animal Use Guidelines

The student shall abide by the following guidelines when performing mentorship tasks:

1. A mentorship task may be performed only once on a single animal.
2. A student may perform a maximum of ten (10) minimally invasive tasks (denoted by one asterisk) on a single animal within a 24-hour period.
3. A student may perform a maximum of three (3) moderately invasive tasks (denoted by two asterisks) on a single animal within a 24-hour period.
4. When combining tasks, a student may perform a maximum of five (5) minimally and three (3) moderately invasive tasks on a single animal within a 24-hour period.
5. Tasks denoted with no asterisks do not involve live animal use.

For example, a student might perform the following tasks on an animal in a single day:

1. Restrain a dog in sternal recumbency
2. Restrain a dog in lateral recumbency
3. Restrain a dog for cephalic venipuncture
4. Restrain a dog for saphenous venipuncture
5. Restrain a dog for jugular venipuncture
6. Administer subcutaneous injection
7. Administer intramuscular injection
8. Intravenous cephalic injection – canine

Failure to comply with the Animal Use Guidelines may result in failure of the Clinical Mentorship.

STUDENT INFORMATION

GOALS OF VM 22700 CLINICAL PATHOLOGY MENTORSHIP

Working with a veterinary care facility, the student will perform tasks under the supervision of a clinical mentor (veterinarian or credentialed veterinary technician).

In order to achieve the goals for this Clinical Mentorship, the tasks must be performed to the level of competency as outlined by the *Criteria* for each task.

The student is responsible for providing documentation for each task as defined by the *Materials Submitted for Evaluation and Verification* section on each task.

In addition to the documentation, the Clinical Mentorship site supervisor will verify that the student performed the task under their supervision.

Final approval of successful performance and completion of the Clinical Mentorship will be made by the Purdue University instructor in charge of the Clinical Mentorship. This approval will be based upon the documentation provided by the student.

The Purdue University instructor in charge has the option to require additional documentation if, in their judgment, the student has not performed and/or documented the task to the level set by the *Criteria*.

Documentation of completed tasks is essential to validate the educational process and insure that the performance of graduates of the Veterinary Nursing Distance Learning Program meets the standards of quality required by the Purdue University College of Veterinary Medicine faculty and the American Veterinary Medical Association accrediting bodies.

CONTACT PERSONS

Any questions regarding the VM 22700 Clinical Mentorship process should be directed to either:

Pam Phegley, BS, RVT
Purdue University
Veterinary Nursing Program
625 Harrison Street, Lynn Hall G171
West Lafayette IN 47907
(765) 496-6809
phegley@purdue.edu

Jennifer Smith, BS, RVT, RLAT
Purdue University
Veterinary Nursing Program
625 Harrison Street, Lynn Hall G171
West Lafayette IN 47907
(765) 494-7618
jensmith@purdue.edu

PRE-REQUISITES FOR VM 22700 CLINICAL PATHOLOGY CLINICAL MENTORSHIP

Contracts and Agreements

Because of legal, liability and AVMA accreditation issues, the following documents must be completed *prior to beginning* the Clinical Mentorship

1. Facility Requirement Agreement
2. Clinical Mentorship Agreement
3. Supervisor Agreement
4. Health Risk and Insurance Acknowledgement
5. Professional Liability Insurance Coverage
6. Agreement and Release of Liability
7. Technical Standards Acknowledgement
8. Code of Conduct

These forms are available on the VNDLP website for download, printout, and completion.

If more than one Clinical Mentorship course is taken, a separate Facility Certification, Clinical Mentorship Contract, and Supervisor Agreement must be completed for each course.

More than one Mentorship Supervisor may sign the mentorship logbook. Each must be either a DVM or a credentialed technician, and must complete a separate Supervisor Agreement.

Failure to complete and return the listed documents and the payment for Student Professional Liability Insurance Coverage will prevent the student from enrolling in the Clinical Mentorship.

Insurance

Two types of insurance are recommended or required for the student working in a Clinical Mentorship.

Health Insurance is highly recommended to cover the medical expenses should the student become injured while on the job. It is the student's responsibility to procure such insurance.

Liability Insurance is required to protect the student in the event of a suit filed against the student for acts he/she performed while in the Clinical Mentorship.

Each VNDLP student is required to purchase, for a nominal fee, Professional Liability Insurance through Purdue University. This is done by completing the Professional Liability Insurance Coverage form and sending a check for the fee. This check must be separate from payment of course fees. The fee covers from the time of initiation of coverage until the subsequent July 31st.

Students will not be enrolled in Clinical Mentorships until the Professional Liability Insurance is paid, and the student is covered by the policy.

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. You must complete and have the facility veterinarian sign the Facility Requirement Agreement.

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

Microscope* and related supplies

- Binocular
- 10X oculars
- Objectives
 - 10X (low power)
 - 40-50X (high dry power)
 - 100X (oil immersion)
- Mechanical stage
- Functional and properly aligned condenser and diaphragm
- Light source of at least 20 watts
- Immersion oil
- Lens paper
- Lens cleaning solution

*NOTE: All parts of the microscope should be clean, functional, properly adjusted and aligned. We highly recommend, if the microscope has not been professionally serviced within the last six (6) months and/or is in a questionable state of repair, it be professionally serviced. Microscopes which are in a state of disrepair, out of adjustment, or dirty internally or externally will create difficulties for the student in providing accurate results.

Hematology Instruments and Supplies

- Automated hematology analyzer with appropriate supplies capable of providing:
 - Red blood cell counts
 - White blood cell counts + individual cell or composite differential
 - Platelet counts
 - Hematocrit
 - Hemoglobin (may be stand-alone instrument or a function of the automated hematology or chemistry analyzer)
- Microhematocrit (PCV) centrifuge
- Microhematocrit (PCV) tubes, plain
- Microhematocrit tube clay sealant
- Microhematocrit reader
- Refractometer (with total protein and specific gravity scales)
- Frosted-end glass microscope slides
- Quick stain (ex. Diff-Quik®)
- EDTA blood collection tubes (appropriate for patient size)
- Laboratory wipes
- Small, plain test tubes
- Microscope slide mailers
- Hand tally (single-digit and/or multi-key differential counter) optional

Urinalysis

- Centrifuge appropriate for tubes and centrifuging urine

- Conical centrifuge tubes
- Urine chemistry test strips (minimum tests: pH, glucose, ketones, bilirubin, blood, protein)
- Frosted-end glass microscope slides
- Coverslips
- Stain (optional) NMB or Sedi (type) stain
- Disposable pipettes
- Refractometer (with total protein and specific gravity scales)
- Test tube rack

Clinical Chemistry

- Automated chemistry analyzer with appropriate supplies capable of providing:
 - BUN, glucose, and common enzymes
- Plain, red-top blood collection tubes (appropriate for patient size)
- Serum or plasma separator blood collection tubes (appropriate for patient size)
- Anticoagulated blood collection tubes (appropriate for patient size)
- Centrifuge appropriate for the serum and plasma blood collection tubes
- Wooden applicator sticks

Serology

- Equipment, supplies and materials to perform the following tests:
 - SNAP®/ELISA
 - Slide or Card agglutination

Crossmatch

- Commercially available crossmatch kit (ex. RapidVet®-H companion animal crossmatch, Alvedia)
OR
- Simple crossmatch:
 - Minimum six 12 X 75mm (5mL) round-bottom disposable glass test tubes
 - Phosphate-buffered saline (PBS)
 - EDTA blood collection tubes
 - Plain, red-top tubes (Note: serum separator tubes are not appropriate for this procedure)
 - Centrifuge
 - Disposable pipettes
 - Wooden applicator sticks
 - Frosted-end glass microscope slides
 - Microscope (see previous requirements)
 - Thermostatically-controlled heating block or water bath

Coagulation

- Equipment, supplies and materials to perform one of the following tests:
 - Buccal bleeding time
 - Lancet
 - Timer
 - Filter or blotting paper
 - Roll gauze
 - Activated clotting time (ACT) (automated OR ACT tube test)
 - Automated ACT
OR
 - ACT test tubes
 - Thermostatically-controlled water bath or heating block
 - Timer
 - Automated Prothrombin time (PT)
 - Automated Activated Partial Thromboplastin Time (APTT)
 - Fibrinogen Assay (automated OR heat precipitation)

- Automated fibrinogen and
OR
- Thermostatically controlled heating block or water bath
- Refractometer
- Timer
- Microhematocrit tube centrifuge
- Microhematocrit tubes
- Microhematocrit tube sealant

Cytology

- Exam gloves
- Sterile, 6" cotton-tip swabs
- Quick Stain (ex. Diff-Quik®)
- Frosted-end glass microscope slides
- Sterile saline
- Sterile vaginal speculum (appropriate size for the patient)(optional)
- Sterile lubricant (optional)
- Mild non-irritating soap for vaginal cytology patient prep (optional)
- Microscope slide mailers

Patient Requirements

It is essential that the student perform the designated tasks on the same sample, when specified, so that related values may be verified when the submission is evaluated.

- Hematology (task 2a-2d): single sample from one healthy patient, any species
- Clinical Chemistry (task 3a-3c): single sample from one patient, any species
- Urinalysis (task 4): one patient, any species
- Coagulation (task 6): appropriate patient for the test performed
- Crossmatch (task 7): one canine donor and one canine recipient
- Ear cytology (task 8a): one patient, any species, with ear pathology. Do NOT use patients that have been treated in the past 48 hours with a topical ear medication
- Vaginal cytology (task 8b): one female canine patient; intact and/or with a reproductive pathology

SELECTION OF THE CLINICAL MENTORSHIP SUPERVISOR

The Clinical Mentorship Supervisor is the person who will sign your Logbook and verify performance of tasks at the Clinical Mentorship site. This person must be a credentialed veterinary technician (have graduated from an AVMA accredited program or met State requirements for credentialing as a veterinary technician) or a licensed veterinarian.

An individual who claims to be a "veterinary technician" but has not met the criteria for credentialing above is not eligible to be mentorship supervisor.

The individual is not considered to be an employee of Purdue University when acting as your Clinical Mentorship supervisor.

Each Clinical Mentorship Supervisor must complete a *Supervisor Agreement*. You must return this agreement with the other agreements prior to beginning your Clinical Mentorship. Multiple supervisors may be used for documentation of mentorship tasks. Each supervisor must complete a separate agreement.

Should your Clinical Mentorship Supervisor change during the course of the Clinical Mentorship, you will need to have your new supervisor complete a *Clinical Mentorship Supervisor Agreement* and return it to the Purdue VNDLP office. These forms are available on the VNDLP website for download and printing.

CRITERIA HANDBOOK AND LOGBOOK

This Criteria Handbook and Logbook contains the list of tasks that must be successfully completed in order to receive credit for this Clinical Mentorship. You are expected to have learned the basics of how, why, and when each procedure is to be done from the courses listed as pre-requisites for this Clinical Mentorship. This booklet contains the directions and forms that must be followed and completed in order to meet the standards set for successful completion of this Clinical Mentorship.

Please read each component of each task carefully before doing the task to minimize the number of times you have to repeat the task. The components of each task are summarized:

Goal – Describes the ultimate outcome of the task you will perform.

Description – Lists the physical acts that you will perform, and under what conditions these acts will be completed.

Criteria – Lists specific, observable, objective behaviors that you must demonstrate for each task. Your ability to demonstrate each of these behaviors will be required in order to be considered as having successfully completed each task.

Number of Times Task Needs to be Successfully Performed – States the required number of times to repeat the tasks. The patient's name and the date each repetition of the task was performed must be recorded on the Task verification form.

EACH REQUIRED REPETITION OF THE TASK MUST BE PERFORMED ON A DIFFERENT ANIMAL. You cannot use the same animal to do all of the repetitions of a task. However, you can use the same animal to perform different tasks. In other words, you can't do three ear cleanings on the same animal, however, you can do an ear cleaning, an anal sac expression, and a venipuncture on the same animal.

Materials Submitted for Evaluation and Verification – These specific materials, which usually include video or other materials, must be submitted to demonstrate that you actually performed the task as stated. Each evaluation states specifically what must be shown in the submitted materials.

The Purdue University course instructor for this Clinical Mentorship has the option to request further documentation if the submitted materials do not clearly illustrate the required tasks.

It is recommended that the video materials document all angles of the procedure. The purpose of the video and other material is to provide "concrete evidence" that you were able to perform the task to the standard required.

If you do not own a video camera, one may be borrowed or rented. Pre-planning the video procedures will help reduce the need to redo the video documentation. Explain what you are doing as you perform the video documentation, as narration will help the evaluator follow your thought process and clarify what is seen on the video. Voiceovers may be done to clearly explain what is being performed. At the beginning of each task, clearly announce what task you are doing, or insert a written title in the video.

Videos, photographs, slides, written projects, the Criteria Handbook and Logbook and any other required documentation will not be returned. These items will be kept at Purdue as documentation of the student's performance for accreditation purposes.

Prepare two (2) sets of slides for each procedure and patient. Do **NOT** put immersion oil on the films that are to be submitted to Purdue. Applying immersion oil to these films will negate our ability to evaluate the films and require the submission of new sets of films by the student. The student must save the films they read to review if necessary or to submit to the coordinator in case the initial films are destroyed in transit.

This validation is essential to help the Purdue VNDLP meet AVMA accreditation criteria. Therefore, it is essential that you follow the evaluation and validation requirements.

Task Verification Forms – Each task has a form that must be completed and signed by the Clinical Mentorship Supervisor.

Supplementary Materials – Logs, written materials, photographs, or other forms/documentation may be required for specific tasks. Be sure to read the materials to be submitted for evaluation section very carefully and return all documented evidence as prescribed.

COMPLETION OF THE CLINICAL MENTORSHIP

The mentorship logbook includes due dates for each task. Each completed task must arrive at the veterinary nursing office by the deadline (not a postmark date). It will often take a day or two for mail to reach the veterinary nursing office once it gets to Purdue. Late submissions will incur a grade penalty.

Paperwork may be submitted via:

- E-mail to jensmith@purdue.edu

Videos may be submitted via:

- Media Gallery in Blackboard. Send an e-mail to jensmith@purdue.edu to notify of the submission. You must assign the videos to the correct course in order for the instructor to view them.

Slides may be shipped to:

- 625 Harrison Street, Lynn Hall G171, West Lafayette, IN 47907

Feedback will be emailed until all tasks are completed successfully. A copy will be sent when the course is complete and a grade is assigned. As necessary, instructors may require resubmission of some tasks. When feedback is sent, due dates for resubmissions will be given. *It is crucial that students with pending feedback check their Purdue emails frequently so this information is received in a timely manner.*

Final approval of successful performance and completion of the Clinical Mentorship will be made by the Purdue University instructor in charge of the Clinical Mentorship based upon the documentation provided by the student.

Upon successful completion of all tasks in the clinical mentorship course, a grade will be assigned by the course instructor based upon the documented performance of the tasks.

CLINICAL MENTORSHIP TASKS

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 of you for each task.
2. Make sure you have whatever equipment and supplies you need to document the task. Pay particular attention to the details of what needs to be documented and submitted.
3. Make sure you obtain appropriate permissions where necessary. Please inform the facility's owner/manager of your activities. A good relationship with the veterinarian in charge is key to having a positive Clinical Mentorship experience.

After performing each task:

4. Label all items so that the materials you submit for evaluation and validation at Purdue are identified as your submission.
5. Label all videos posted to Blackboard with your last name and the task number. For example, "Phegley Task 2" or "Phegley Task 2 resubmission".
6. Submit all materials to Purdue by the deadlines listed in the logbooks.

1. MICROSCOPE USE, CARE, AND CLEANING

NOTE: This is the first task of this course and it must be completed and submitted for evaluation before beginning the remaining tasks. It is crucial that a functional and properly equipped microscope is available to the student for completion of the tasks in this mentorship.

Goal: To identify, demonstrate and explain the function of the parts of a microscope, and to clean it properly.

Description: The student accurately identified, demonstrated, and explained the function of the parts of the microscope and demonstrated the cleaning procedure.

Criteria: The student accurately identified and explained, using correct terminology, the function of the following:

- Make (manufacturer) and model of the microscope
- Oculars, including power of each
 - Focus adjustment ring (if so equipped)
 - Interpupillary distance adjustment device
- Objectives, including power
 - Scanning (if so equipped)
 - Low power
 - High dry
 - Oil immersion
 - Other (specify)
- Fine and coarse focus adjustment knobs
- Stage, including mechanical stage adjustment device(s)
 - Left and right adjustment device
 - Forward and back adjustment device
- Condenser, including
 - Vertical adjustment device
 - Horizontal control lever (iris diaphragm) adjustment device
- Field Diaphragm
 - Iris adjustment lever (if so equipped)
- On and off light switch
 - Rheostat control (if so equipped)
 - Location of light source (bulb)

The student demonstrated and described verbally the process of viewing a slide including adjustments of the microscope. The following must be included, in the proper order for the microscope used:

- Positioning of the slide on the stage
- Adjustment of the interpupillary device
- Adjustment of ocular focus ring (if so equipped)
- Positioning of each objective, lowest to highest power
- Positioning of the condenser, condenser (iris diaphragm) lever, light rheostat and field diaphragm in relation to each objective in use with this microscope
- Coarse and fine focus adjustment knobs

Starting at the oculars and ending at the light sources, the student cleaned the microscope so the field of view with each objective was debris-free.

Number of Times Task Needs to be Successfully Performed: 1

Materials Submitted for Evaluation and Verification:

1. Task verification form for microscope use, care, and cleaning signed by the clinical mentorship supervisor.
2. One video, narrated by the student, that clearly shows the parts of the microscope and the student identifying, describing the function, and describing the use, care and cleaning of the parts.

Date: _____

Student Name: _____

Supervisor Name: _____

RVT, CVT, LVT
DVM, VMD

I verify that the student performed this task under my supervision.

Signature of Clinical Mentorship Supervisor: _____

2A. NORMAL HEMATOLOGY (BLOOD FILM PREPARATION FOR DIFFERENTIAL COUNT)

Note: Task 2 is composed of four sub-tasks (a-d). All four sub-tasks must be performed simultaneously on a single sample collected from the same healthy patient.

Goal: To prepare and properly stain a quality blood film.

Description: The student, using either the handheld or tabletop wedge method, will prepare a quality blood film from fresh EDTA anticoagulated blood, using a base slide. The student will properly stain the film with quick stain so the cells and their components may be appropriately differentiated and identified.

Criteria: The student properly mixed, by 6-8 gentle inversions, a properly collected and anticoagulated (EDTA) tube of fresh, clot-free, whole blood

The student filled a capillary tube with blood from the tube and placed a drop of blood approximately 1cm from the frosted end, by touching the capillary tube to the base slide

For the handheld method, the student held the base slide between the thumb and index finger

For the tabletop method, the student held the base slide on the outer corner of the frosted end of the slide, with the frosted end toward their body

With the spreader slide held at a 30-45° angle, the student brought the spreader slide back into the drop of blood, allowed the blood to spread out along the edge of the spreader slide, and then moved the spreader slide forward in a rapid, even motion

The student produced a blood film 1/2 to 2/3 the length of the slide

The blood film was slightly narrower than the width of the slide

The feathered edge of the blood film was relatively straight across or slightly curved and did not end abruptly or have tail-like extensions

When viewed macroscopically, the blood film appeared to have a gradual transition from the thicker body to the feathered edge

The blood film did not have pressure ridges, holes, scratches, streaks or ridges within the smear

The student allowed the blood film to air dry vertically, with frosted end up

The student stained the film with fresh quick stain, dipping the slide for approximately ten, one-second dips in the fixative, then the eosin (red) then the thiazine (blue) stains

The student held the slide vertically by the frosted end and rinsed the *back* of the slide with water

The student allowed the blood film to air dry vertically with the frosted end up

The student labeled the slide on the frosted end with patient ID, species, specimen type and date

Number of Times Task Needs to be Successfully Performed: **1 set of blood films for the student and 1 set of blood films for submission**

Materials Submitted for Evaluation and Verification:

1. Task verification form for blood film preparation signed by the clinical mentorship supervisor.
2. One properly stained blood film and one properly unstained blood film from the same patient, submitted in an appropriate slide mailer.
3. One video showing the preparation, staining, and labeling of a blood film. The student should provide a narrative of the steps being performed during the video.

Date: _____

Student Name: _____

Supervisor Name: _____

RVT, CVT, LVT
DVM, VMD

I verify that the student performed this task under my supervision.

Signature of Clinical Mentorship Supervisor: _____

2B. NORMAL HEMATOLOGY (MANUAL DIFFERENTIAL COUNT)

Note: Task 2 is composed of four sub-tasks (a-d). All four sub-tasks must be performed simultaneously on a single sample collected from the same healthy patient.

Goal: To accurately classify and count the different types of white blood cells and evaluate the morphologic features of the red blood cells, white blood cells, and platelets.

Description: After preparation and staining of a blood film with quick stain, the student will count and classify 100 white blood cells. Additionally, the student will evaluate and report the morphology of the red blood cells, white blood cells and platelets and perform a white blood cell and platelet estimate.

Criteria: The student placed the slide from task 2a on the stage of the microscope

The student scanned the film under low power (10X objective) with the light, condenser and iris properly adjusted to identify and report the presence of any significant large objects (debris, microfilaria, platelet clumps, white blood cell aggregates, etc.), evaluate the staining quality of the film, and evaluate the distribution of cells

The student rotated the objective turret to the high dry (40-45X) objective, and readjusted the light, condenser and iris appropriately

The student performed and reported a WBC estimate

The student applied immersion oil to the film and rotated the objective turret to the oil immersion objective (100X), correctly adjusted the light, iris and condenser, and identified the appropriate starting area in the film for counting

The student observed, classified and counted 100 WBCs using correct units of measurement, reported the relative (%) and absolute (cells/microliter) value for each cell classification

The student evaluated and reported the morphology of the RBCs, WBCs and platelets based on the criteria in Appendix 1 and 2 in Regan et al: *Veterinary Hematology Atlas*

The student performed and reported a platelet estimate

The student counted and reported the number of nucleated RBC/100 WBC (if applicable)

Number of Times Task Needs to be Successfully Performed: 1

Materials Submitted for Evaluation and Verification:

1. Task verification form for manual differential count signed by the clinical mentorship supervisor.
2. One properly identified, stained, uncounted (no immersion oil) blood film and one properly identified unstained blood, submitted in an appropriate slide mailer (**same slides as for 2a**).
3. One video showing the student performing the differential count. The student should provide a narrative of the steps being performed during the video. *Note: Only the initial setup and periodic adjustments of the microscope need to be on the video, not the entire time counting.*
4. Completed written report of findings using the form on the following page, using proper medical terminology and units of measurement.

2B. NORMAL HEMATOLOGY (MANUAL DIFFERENTIAL COUNT) WRITTEN REPORT

RBC, WBC, and Platelet Morphology (Specify):

WBC Estimate:

(Average # WBCs per 40x field x 7,000= approximate # of WBCs/mm³)

Relative WBC Counts (%):

(number (%) of each WBC type observed in 100 WBCs)

Myelocytes: _____

Metamyelocytes: _____

Band Neutrophils: _____

Segmented Neutrophils: _____

Lymphocytes: _____

Monocytes: _____

Eosinophils: _____

Basophils: _____

Nucleated RBC: _____

Absolute WBC Counts:

(% of WBC type x WBC estimate)

Myelocytes: _____

Metamyelocytes: _____

Band Neutrophils: _____

Segmented Neutrophils: _____

Lymphocytes: _____

Monocytes: _____

Eosinophils: _____

Basophils: _____

Nucleated RBC: _____

**2B. NORMAL HEMATOLOGY (MANUAL DIFFERENTIAL COUNT)
WRITTEN REPORT (PAGE 2)**

Corrected WBC count for NRBCs (if applicable):

$$\frac{\text{WBC estimate} \times 100}{\text{\# of NRBCs} + 100} = \text{corrected WBC count/mm}^3$$

Platelet Estimate:

(Average # platelets per 100x field X 20,000 = Estimated platelets/mm³)

Date: _____

Student Name: _____

Supervisor Name: _____

RVT, CVT, LVT
DVM, VMD

I verify that the student performed this task under my supervision.

Signature of Clinical Mentorship Supervisor: _____

2C. NORMAL HEMATOLOGY

(MANUAL PACKED CELL VOLUME AND TOTAL PLASMA PROTEIN)

Note: Task 2 is composed of four sub-tasks (a-d). All four sub-tasks must be performed simultaneously on a single sample collected from the same healthy patient.

Goal: To accurately perform, read, and record the results of a packed cell volume and total plasma protein.

Description: The student, using a sample of properly collected and mixed anticoagulated (EDTA) fresh whole blood, will properly fill, seal and centrifuge a plain capillary tube and using a card or circular reader, accurately read and record the result as a percent (%) of packed red blood cells and evaluate the plasma.

The student, using a clean, properly calibrated refractometer and plasma from the capillary tube used to read the PCV, broke the tube, loaded the refractometer and accurately read the total protein value and recorded the result in g/dl.

Criteria: **Packed Cell Volume**

The student mixed, by 6-8 gentle inversions, a properly collected and anticoagulated (EDTA) tube of fresh, clot-free whole blood

The student filled a plain capillary tube 2/3 to 3/4 full, wiped the outside of the tube with a lab tissue, and sealed the end with sealing clay

The student accurately identified the make (manufacturer) and model of the microhematocrit tube centrifuge

The student placed the capillary tube into a slot in a microhematocrit tube centrifuge with the sealed end to the outside edge, noting the slot number

The student balanced the centrifuge with a balance tube or another patient tube

The student secured the centrifuge lid and cover

The student set and verbally identified the appropriate centrifugation time (and speed if applicable)

After the centrifuge stopped, the student removed the tube and recorded the appearance of the plasma and buffy coat, and visually guessed the PCV

Using a card reader, the student aligned the bottom of the red cell column with the zero line and the top of the plasma with the 100% line. The student read the PCV at the top of the red cell column and recorded the value as a percentage

Or using a circle reader, the student placed the capillary tube in the groove of the plastic indicator so the intersection of the clay sealant and the packed red blood cells lined up with the black line, located close to the center of the post of the reader

The student rotated the lower metal plate so the 100% line is directly beneath the red line on the plastic indicator

Keeping the lower metal plate in the same position and using the finger hole in the upper plate, the student rotated the upper plate so the black spiral line lined up at the top of the top of the plasma column

The student rotated both the upper and lower plates until the black spiral line lined up at the top of the red cell column. The student read the PCV from the scale directly beneath the red line on the plastic indicator and recorded the result as a %

Total Plasma Protein

The student accurately identified the make (manufacturer) and model of the refractometer

The student checked the calibration setting and cleanliness of the refractometer, identifying the scale and solution used to check calibration setting, and cleaned and/or adjusted if necessary

Using the patient's tube from the PCV, the student scored the tube above the buffy coat with the edge of a triangular file or corner of a microscope slide and snapped the tube by placing finger pressure on each side of the scored line

Holding the refractometer horizontally and with the cover plate in position on the prism, the student placed a drop of plasma adjacent to the cover plate, insuring that there was no contamination from the buffy coat, other cellular components, or glass shards. The student may enhance plasma flow by tapping the end of the tube close to the cover plate or dispensing the plasma with an appropriate pipetting bulb or insulin syringe

The student held the refractometer to their eye with the prism toward the light, focused if necessary, read the total protein value and recorded the result in g/dl

The student cleaned the measuring prism and cover plate with water and dried them with a laboratory tissue

Number of Times Task Needs to be Successfully Performed: 1

Materials Submitted for Evaluation and Verification:

1. Task verification form for PCV and Total Protein signed by the clinical mentorship supervisor.
2. One video showing the student performing the PCV and TPP procedures. The student should provide a narrative of the steps being performed during the video.
3. Written evaluations (see below).

Appearance of Plasma (circle one): Clear, Cloudy, Lipemic, Hemolyzed, Icteric

Buffy Coat Color: _____

Packed Cell Volume: _____

Total Plasma Protein: _____

Date: _____

Student Name: _____

Supervisor Name: _____

RVT, CVT, LVT
DVM, VMD

I verify that the student performed this task under my supervision.

Signature of Clinical Mentorship Supervisor: _____

2D. NORMAL HEMATOLOGY (AUTOMATED HEMATOLOGY PANEL)

Note: Task 2 is composed of four sub-tasks (a-d). All four sub-tasks must be performed simultaneously on a single sample collected from the same healthy patient.

Goal: To accurately perform, read and record the results of an in-house automated hematology panel/complete blood count

Description: The student, using a sample of properly collected and prepared whole blood, will accurately perform, read and record an in-house automated hematology panel and complete blood count

Criteria: The student identified the make (manufacturer) and model of the automated hematology analyzer

The student described the quality control procedures for the analyzer

The student followed the manufacturer's established protocol for the performance of an in-house automated hematology panel/CBC

The student commented on the results, noting on any discrepancies between the manual differential count and the automated count

Number of Times Task Needs to be Successfully Performed: 1

Materials Submitted for Evaluation and Verification:

1. Task verification form for automated hematology panel signed by the clinical mentorship supervisor.
2. One video showing the student performing the automated hematology panel procedure. The student should provide a narrative of the steps being performed during the video, including reporting the results.
3. Copy of the results printout.

Date: _____

Student Name: _____

Supervisor Name: _____

RVT, CVT, LVT
DVM, VMD

I verify that the student performed this task under my supervision.

Signature of Clinical Mentorship Supervisor: _____

3A. PREPARE SERUM AND PLASMA

Note: Task 3 is composed of three sub-tasks (a-c). All three sub-tasks must be performed simultaneously on a single sample collected from the same patient.

Goal: To prepare hemolysis- and lipemia-free serum and plasma from properly prepared samples

Description: The student, using a plain red-top collection tube, plain anticoagulated collection tube AND serum or plasma separation tube will properly collect and prepare samples of hemolysis and lipemia-free serum and plasma

Criteria: The student selected the appropriate vacuum collection tubes and the needle holder and needle or appropriate syringe and needle required to properly fill the three vacuum containers for the procedure, species, and size of the patient

The student, without injury to the patient, selected an appropriate blood vessel for the collection of venous blood and collected the sample.

Based on the manufacturer's stated capacity of the vacuum collection tube, the student properly filled one plain red-top serum tube, one anticoagulated (EDTA or lithium heparin) tube, and one plasma or serum separator tube. The student filled the tubes to not less than 90% or more than 100% of the capacity stated for use. *Each of the three tubes must be shown on the video with the label on the tube facing away from the camera so the full may be evaluated. The student will state verbally the manufacturer's stated fill capacity.*

The student mixed, by inversion, only the appropriate tubes

The student allowed serum tubes to adequately clot prior to centrifugation, noting the time for the clot to fully form

The student "rimmed" the red top serum tubes prior to centrifugation

The student accurately identified the make (manufacturer) and model of the centrifuge

The student balanced the centrifuge with a balance tube or another patient tube and secured the centrifuge lid and cover

The student set and verbally identified the appropriate centrifugation time (and speed if applicable)

After the centrifuge stopped, the student removed the tube and harvested the serum and plasma with a disposable pipette, delivering it into clean, plain transparent tubes

The student verbally noted the amount and condition of serum and plasma harvested

The serum and plasma were free from hemolysis and lipemia

Number of Times Task Needs to be Successfully Performed: 1 each:

Plain, red-top serum tube, Anticoagulated (EDTA or lithium heparin) tube, and Plasma or serum separator tube

Materials Submitted for Evaluation and Verification:

1. Task verification form for preparing serum and plasma signed by the clinical mentorship supervisor.
2. One video showing the student performing the collection and three preparations of serum and plasma, clearly showing the tubes after collection and following separation and placing into clearly labeled tubes. The student should provide a narrative of the steps being performed during the video.

Date: _____

Student Name: _____

Supervisor Name: _____

RVT, CVT, LVT
DVM, VMD

I verify that the student performed this task under my supervision.

Signature of Clinical Mentorship Supervisor: _____

3B. CHEMISTRY PANEL

Note: *Task 3 is composed of three sub-tasks (a-c). All three sub-tasks must be performed simultaneously on a single sample collected from the same patient.*

Goal: To accurately perform, read and record the results of a chemistry panel (BUN, glucose, common enzymes)

Description: The student, using a sample of properly collected and prepared serum or plasma, will accurately perform, read and record an in-house automated chemistry panel

Criteria: The student identified the make (manufacturer) and model of the automated chemistry analyzer

The student described the quality control procedures for the analyzer

The student followed the manufacturer's established protocol for the performance of in-house chemistry testing

The student verbally commented on the results, noting on any abnormalities

Number of Times Task Needs to be Successfully Performed: 1

Materials Submitted for Evaluation and Verification:

1. Task verification form for chemistry panel signed by the clinical mentorship supervisor.
2. One video showing the student performing the in-house chemistry test. The student should provide a narrative of the steps being performed during the video, including reporting the results.
3. Copy of the results printout.

Date: _____

Student Name: _____

Supervisor Name: _____

RVT, CVT, LVT
DVM, VMD

I verify that the student performed this task under my supervision.

Signature of Clinical Mentorship Supervisor: _____

3C. SEROLOGY

Note: Task 3 is composed of three sub-tasks (a-c). All three sub- tasks must be performed simultaneously on a single sample collected from the same patient.

Goal: To accurately perform, read, and record results of an ELISA and slide/card agglutination serology test.

Description: The student, using a properly collected and prepared sample, described and accurately performed, read, and recorded the results of the ELISA and slide/card agglutination serology test.

Criteria: The student demonstrated and described verbally on video, the entirety of both procedures and accurately reported the results, including proper units of measurement

The student followed the manufacturer’s established protocol for performance of the tests

Number of Times Task Needs to be Successfully Performed: 1

Materials Submitted for Evaluation and Verification:

1. Task verification form for serology signed by the clinical mentorship supervisor.
2. One video showing the student performing the serology tests. The student should provide a narrative of the steps being performed during the video.

Date: _____

Student Name: _____

Supervisor Name: _____

RVT, CVT, LVT
DVM, VMD

I verify that the student performed this task under my supervision.

Signature of Clinical Mentorship Supervisor: _____

4. URINALYSIS

- Goal:** To properly and accurately perform, read and record results of a urinalysis, including physical, chemical and microscopic observations
- Description:** The student, using a properly collected fresh urine sample, will accurately perform, read and record findings for a urinalysis
- Criteria:** The student verbally described the physical properties of the urine (color, clarity, volume, specific gravity with a refractometer, foam, odor) and reported results using proper units of measurement
- The student verbally identified the manufacturer and brand of chemistry strips used and/or automated reader if used
- The student followed the manufacturer's protocols for and described verbally the chemical properties of the urine and reported the results using proper units of measurement
- The student prepared the urine for microscopic evaluation
- The student accurately identified the make (manufacturer) and model of the centrifuge
- The student balanced the centrifuge with a balance tube or another patient tube and secured the centrifuge lid and cover
- The student set and verbally identified the appropriate centrifugation time (and speed if applicable)
- After the centrifuge stopped, the student removed the tube and prepared the urine for microscopic evaluation and reported the results for the urinary sediment

Number of Times Task Needs to be Successfully Performed: 1

Materials Submitted for Evaluation and Verification:

1. Task verification form for urinalysis signed by the clinical mentorship supervisor.
2. One video showing the student performing the urinalysis procedures. The student should provide a narrative of the steps being performed during the video using correct medical terminology.
3. Completed written report of findings using the form on the following page, using proper medical terminology and units of measurement.

Date: _____

Student Name: _____

Supervisor Name: _____

RVT, CVT, LVT
DVM, VMD

I verify that the student performed this task under my supervision.

Signature of Clinical Mentorship Supervisor: _____

4. URINALYSIS WRITTEN REPORT

Species: _____

Time of Collection: _____

Time of Testing: _____

Method of Collection: _____

Method of Preservation (circle one): None Refrigeration

Physical Evaluation

Volume (mL): _____

Color: _____

Turbidity: _____

Odor: _____

Foam: _____

Specific Gravity (Refractometer): _____

Chemistry Evaluation

Glucose: _____

Bilirubin: _____

Ketones: _____

Blood: _____

pH: _____

Protein: _____

Urobilinogen: _____

Sediment Analysis

WBC/HPF: _____

RBC/HPF: _____

Epithelial cells/HPF: _____

Sperm/HPF: _____

Bacteria/HPF: _____

Casts (Specify Type)/LPF: _____

Crystals (Specify Type)/LPF: _____

Other cells (Specify): _____

How well do the physical, chemical, and microscopic observations coincide with each other? Describe and explain.

5. ABNORMAL HEMATOLOGY

(MANUAL DIFFERENTIAL COUNT- CASE PROVIDED BY VNDLP)

- Goal:** To properly and accurately perform and record results of a manual differential count on a case slide provided by the VNDLP instructor
- Description:** The student, using a blood film provided by the VNDLP instructor, will perform and report results for a manual differential count as described in task 2b of this course
- Criteria:**
- The student performed a manual differential count as described in task 2b
 - The student counted and reported the number of nucleated RBC/100 WBC
 - The student accurately reported the results of the count
 - The student wiped the oil off the slide with a laboratory tissue and returned the slide to Purdue after receiving completion feedback from the instructor

Number of Times Task Needs to be Successfully Performed: 1

Materials Submitted for Evaluation and Verification:

1. Task verification form for abnormal hematology- manual differential, signed by the clinical mentorship supervisor.
2. Completed written report of findings using the form on the following page, using proper medical terminology and units of measurement.

Date: _____

Student Name: _____

Supervisor Name: _____

RVT, CVT, LVT
DVM, VMD

I verify that the student performed this task under my supervision.

Signature of Clinical Mentorship Supervisor: _____

5. MANUAL DIFFERENTIAL COUNT WRITTEN REPORT

Patient ID # _____

RBC, WBC, and Platelet Morphology (Specify):

WBC Estimate:

(Average # WBCs per 40x field x 7,000= approximate # of WBCs/mm³)

Relative WBC Counts (%):

(number (%) of each WBC type observed in 100 WBCs)

Band Neutrophils: _____	Monocytes: _____
Segmented Neutrophils: _____	Eosinophils: _____
Lymphocytes: _____	Basophils: _____
	Nucleated RBC: _____

Absolute WBC Counts:

(% of WBC type x WBC estimate)

Band Neutrophils: _____	Monocytes: _____
Segmented Neutrophils: _____	Eosinophils: _____
Lymphocytes: _____	Basophils: _____
	Nucleated RBC: _____

5. MANUAL DIFFERENTIAL COUNT - WRITTEN REPORT PG 2

Corrected WBC count for NRBCs:

$$\frac{\text{WBC estimate} \times 100}{(\# \text{ of NRBCs} + 100)} = \text{corrected WBC count/mm}^3$$

Platelet Estimate:

$$(\text{Average \# platelets per } 100\text{x field} \times 20,000 = \text{Estimated platelets/mm}^3)$$

6. COAGULATION

Goal: To accurately perform and record results of an in-house coagulation test.

Description: The student accurately performed an in-house coagulation test and read and recorded the results

Criteria: The student selected an in-house coagulation test from the following: buccal bleeding time, activated clotting time (ACT tube or automated), prothrombin time (PT), activated partial prothrombin time (APTT), fibrinogen assay (automated or heat precipitation), or other test approved by instructor

The student explained the rationale for the procedure

The student identified and described the quality control program for each procedure (if applicable)

The student demonstrated and described verbally on video, the entirety of the procedure and accurately reported the results, including proper units of measurement

Number of Times Task Needs to be Successfully Performed: 1

Materials Submitted for Evaluation and Verification:

1. Task verification form for coagulation signed by the clinical mentorship supervisor.
2. One video showing the student performing the coagulation test. The student should provide a narrative of the steps being performed during the video, including the equipment and supplies needed for each test.

Date: _____

Student Name: _____

Supervisor Name: _____

RVT, CVT, LVT
DVM, VMD

I verify that the student performed this task under my supervision.

Signature of Clinical Mentorship Supervisor: _____

7. CROSSMATCH

Goal: To accurately collect blood samples for and perform crossmatch procedure

Description: The student, using collected samples from a potential blood donor and recipient, accurately performed a crossmatch, using either the traditional method or a commercial test kit, to determine compatibility for a possible blood transfusion, and correctly reported the findings.

Criteria: The student demonstrated and described proper processing of the samples for a crossmatch procedure including identifying the donor and recipient samples as plasma or serum and the condition of the sample (NSF, hemolyzed, lipemic) prior to testing

The student demonstrated and described verbally on video, the entirety of the procedure and accurately reported the result of the crossmatch test, using proper medical terminology and units of measurement

Number of Times Task Needs to be Successfully Performed: 1

Materials Submitted for Evaluation and Verification:

1. Task verification form for crossmatch signed by the clinical mentorship supervisor.
2. One video showing the student performing the crossmatch procedure. The student should provide a narrative of the steps being performed during the video, including the equipment and supplies needed for the test.

Date: _____

Student Name: _____

Supervisor Name: _____

RVT, CVT, LVT
DVM, VMD

I verify that the student performed this task under my supervision.

Signature of Clinical Mentorship Supervisor: _____

8A. EAR CYTOLOGY

Goal: To properly collect, process, and accurately evaluate and report the cellular findings for ear cytology.

Description: The student properly collected a sample, and properly processed, accurately stained, and read and recorded the results for ear cytology.

Criteria: The student demonstrated and described proper care of the patient, collection, processing, evaluation and accurate reporting of the various cells found in the designated specimen

Using proper medical terminology, the student accurately identified specific anatomical structures in the collection of the specimens

Using proper medical terminology, the student accurately identified and demonstrated the instruments and supplies necessary for the entire procedure, and described the rationale for their use

Using proper medical terminology and units of measurement, the student accurately reported the results of the prepared specimens

Number of Times Task Needs to be Successfully Performed: 1 set of films for the student and 1 set of films for submission

Patient must be pathologic. Do NOT use patients that have been treated in the past 48 hours with a topical ear medication.

Materials Submitted for Evaluation and Verification:

1. Task verification form for ear cytology signed by the clinical mentorship supervisor.
2. One video showing the student performing and describing the cytology process (collection, preparation, reading and reporting). The student should provide a narrative of the steps being performed during the video.
3. One properly identified, stained, unread (no immersion oil) film and one properly identified unstained film, submitted in an appropriate slide mailer.
4. Completed written report of findings using the form on the following page.

Date: _____

Student Name: _____

Supervisor Name: _____

RVT, CVT, LVT
DVM, VMD

I verify that the student performed this task under my supervision.

Signature of Clinical Mentorship Supervisor: _____

8A. EAR CYTOLOGY WRITTEN REPORT

RIGHT EAR

Appearance of Ear (Describe):

Appearance of Exudate (Color, Odor):

Microscopic Evaluation (avg. #/OIF)

RBC: _____

WBC: _____

Epithelial Cells: _____

Yeast: _____

Bacteria (Rods): _____

Bacteria (Cocci): _____

Parasites: _____

Abnormal Cells (#/OIF and describe):

Other (Specify): _____

LEFT EAR

Appearance of Ear (Describe):

Appearance of Exudate (Color, Odor):

Microscopic Evaluation (avg. #/OIF)

RBC: _____

WBC: _____

Epithelial Cells: _____

Yeast: _____

Bacteria (Rods): _____

Bacteria (Cocci): _____

Parasites: _____

Abnormal Cells (#/OIF and describe):

Other (Specify): _____

8B. VAGINAL CYTOLOGY

- Goal:** To properly collect, process and accurately evaluate and report the cellular findings for canine vaginal cytology.
- Description:** The student properly collected a sample for vaginal cytology and properly processed, accurately stained, and read and recorded the results.
- Criteria:** The student demonstrated and described proper care of the patient, collection, processing, evaluation and accurate reporting of the various cells found in the designated specimen
- Using proper medical terminology, the student accurately identified specific anatomical structures in the collection of the specimen
- Using proper medical terminology, the student accurately identified and demonstrated the instruments and supplies necessary for the entire procedure, and described the rationale for their use
- Using proper medical terminology and units of measurement, the student accurately reported the results of the prepared specimen

Number of Times Task Needs to be Successfully Performed: 1 set of films for the student and
1 set of films for submission

Materials Submitted for Evaluation and Verification:

1. Task verification form for vaginal cytology signed by the clinical mentorship supervisor.
2. One video showing the student performing and describing the cytology process (collection, preparation, reading and reporting). The student should provide a narrative of the steps being performed during the video.
3. One properly identified, stained, unread (no immersion oil) film and one properly identified unstained film, submitted in an appropriate slide mailer.
4. Completed written report of findings using the form on the following page.

Date: _____

Student Name: _____

Supervisor Name: _____

RVT, CVT, LVT
DVM, VMD

I verify that the student performed this task under my supervision.

Signature of Clinical Mentorship Supervisor: _____

8B. CANINE VAGINAL CYTOLOGY WRITTEN REPORT

Appearance of labia and behavior of patient (describe):

Appearance of discharge (color, consistency, odor):

Microscopic evaluation (avg. # / HPF)

Basal: _____

Intermediate: _____

Parabasal: _____

Superficial: _____

Foam: _____

Bacteria (specify Rods or Cocci): _____

Metestral: _____

Mucus: _____

RBC: _____

Debris: _____

WBC (specify): _____

Other/Abnormal Cells (Specify/describe): _____